Fluency Experiences in Knowledge-Intensive Individual Work and Collaboration

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Abstract

Although knowledge-intensive work and leadership of knowledge workers have been studied from different viewpoints and with different approaches, the research in the field appears to be very fragmented. The existing literature concentrates on the nature of knowledge-intensive work, or productivity and effectiveness of it. Because of limited amount of scientific literature and lack of empirical evidence, significance of fluency is not well understood, although fluency is an important concept from viewpoint of e.g., effectiveness. Fluency refers to an expectation of planned, effective, and goal-oriented flow of work, which becomes apparent in fluency experiences.

Data of this multiple-case study, aiming at finding enablers and hindrances affecting fluency experiences in knowledge-intensive individual work and collaboration, was gathered using two methods: texts written by the informants, and semi-structured interviews. Data was analyzed using inductive-abductive reasoning to construct enablers and hindrances affecting fluency experiences based on the informants' responses. Factors related to fluency experiences were analyzed with help of relevant theory-based frameworks. Nine informants representing various professions participated in this study.

Contribution of this thesis is a generic model, which describes fluency experiences in knowledge-intensive individual work and collaboration. The model introduces knowledge workers' most common fluency experiences, and contextual and work factors related to them.

This thesis suggests that: 1) an individual's fluency experiences are partly independent of the environment, because an individual's experiences seem to emerge from individual emotional experiences, which are influenced by different external and internal triggers; 2) fluency is a core concept in producing positive results in knowledge-intensive individual work and collaboration, and that fluency should be considered as important a concept as productivity and effectiveness when evaluating knowledge-intensive work; and, 3) enablers and hindrances affecting fluency experiences in knowledge-intensive individual work and collaboration should be evaluated more thoroughly as factors affecting productivity and effectiveness of knowledge-intensive work, because fluency as a part of the work process has a significant influence on effectiveness and quality of work.

Tiivistelmä

Vaikka tietointensiivistä työtä ja sitä tekevien ihmisten johtamista on tutkittu eri näkökulmista ja erilaisin menetelmin, alan tutkimus on pirstaleista. Kirjallisuus keskittyy tietointensiivisen työn luonteeseen tai sen tuottavuuteen ja tehokkuuteen. Aihetta sivuavan tieteellisen kirjallisuuden ja empiirisen tutkimuksen puute johtavat siihen, ettei sujuvuuden merkitystä oikein ole ymmärretty – sujuvuus on tärkeä käsite esimerkiksi tehokkuuden näkökulmasta. Sujuvuus tarkoittaa tässä suunniteltua, tehokasta ja tavoitteellista työnkulkua, joka saadaan näkyväksi sujuvuuskokemuksia tarkastelemalla.

Tämän tietointensiivisen yksilötyön ja yhteistyön sujuvuuskokemuksia tutkivan case-tutkimuksen aineisto on kerätty informanttien kirjoittamista teksteistä ja heitä puolistrukturoidusti haastattelemalla. Informanttien sujuvuuskokemuksia edistävät ja ehkäisevät tekijät on löydetty ja analysoitu induktiivis-abduktiivista päättelyä hyödyntäen. Sujuvuuskokemuksiin liittyvät tekijät on analysoitu käyttäen olennaisimpia teoriapohjaisia viitekehyksiä. Tähän tutkimukseen osallistui yhdeksän eri ammateissa toimivaa tietointensiivisen työn tekijää.

Tämän väitöskirjan keskeisin kontribuutio on geneerinen malli, joka kuvaa sujuvuuskokemuksia tietointensiivisessä yksilötyössä ja yhteistyössä. Malli esittelee tutkimuskohteena olleiden tietointensiivisen työn tekijöiden yleisimmät sujuvuuskokemukset, sekä niihin sidoksissa olevat kontekstiin ja työhön liittyvät tekijät.

Tämän tutkimuksen perusteella voidaan todeta, että 1) yksilön sujuvuuskokemukset ovat osaksi riippumattomia ympäristöstä, koska ihmisen kokemukset näyttävät kumpuavan hänen yksilöllisistä emotionaalisista kokemuksistaan, joihin vaikuttavat erilaiset ulkoiset ja sisäiset impulssit; 2) sujuvuus on keskeinen käsite myönteisten tulosten tuottamisessa tietointensiivisessä yksilötyössä ja yhteistyössä, ja että sujuvuus pitäisi ymmärtää yhtä tärkeänä käsitteenä kuin tuottavuus tai tehokkuus, silloin kun tietointensiivistä työtä arvioidaan; 3) sujuvuuskokemuksia edistäviä ja ehkäiseviä tekijöitä tietointensiivisessä yksilötyössä ja yhteistyössä pitäisi arvioida perusteellisemmin tuottavuuteen ja tehokkuuteen vaikuttavina tekijöinä, koska työprosessiin kuuluvana sujuvuudella on merkittävä vaikutus tehokkuuteen ja työn laatuun.

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1 Introduction

This chapter provides an overall view to this thesis; including a short introduction to the issue in question and structure of the thesis itself.

1.1 Research in the field of fluency in knowledge-intensive work

The starting point of this thesis was an observation that the expectation of planned, effective, and goal-oriented flow of work, referred to as *fluency* in knowledge-intensive work in this thesis, appeared to cause both positive and negative feelings among knowledge workers. The author of this thesis was interested in why knowledge workers encountered those feelings, and what kinds of issues cause positive feelings and negative feelings during work? After reading existing literature, more questions arose, and the need for this thesis became clear.

Although knowledge-intensive work and leadership of knowledge workers have been studied from different viewpoints and with different approaches, the research in the field appeared to be very fragmented. Knowledge-intensive work as a research field is quite challenging, with its multi-oriented approaches and without general acceptance of basic theories relating to it. Even the concepts and meanings seem to vary according to researchers, not forgetting lack of common methods for measuring knowledge-intensive work. It cannot pass unnoticed that there are multiple scientific studies of knowledge work and even several studies discussing knowledge-intensive work from different viewpoints, e.g., effectiveness and productivity of knowledge work. However, this author was unable to locate any scientific studies emphasizing *fluency* in knowledge-intensive work or enablers and hindrances affecting *fluency experiences* in knowledge-intensive work.

One existing study by Kemppilä and Lönnqvist (2003) identified factors affecting knowledge work performance. In another study, Antikainen and Lönnqvist (2005) constructed a tool assessing knowledge work productivity. As a side product of their study, subjective indirect factors affecting knowledge work performance were found. Bosch-Sijtsema, Ruohomäki, and Vartiainen (2009) reviewed literature around the theme and defined enabling and hindering elements affecting knowledge work productivity in the context of distributed teams. So far, no other related scientific studies have been conducted, to the knowledge of this author. Therefore, the theoretical goal of this thesis is to fill that gap by producing new information, by conducting an empirical study.

The aim of this thesis was to study fluency experiences in knowledge-intensive work and factors affecting those experiences, at rough level. The starting point of the study was research questions (what are fluency experiences in knowledge-intensive individual work and collaboration, and, what are the enablers and hindrances affecting fluency experiences in knowledge-intensive individual work and collaboration) and absence of existing theories (what af-

fects fluency experiences). The data was gathered using two methods: first, texts written by the informants and then, interviews. The contribution of this thesis is a generic model, which describes enablers and hindrances affecting fluency experiences in knowledge-intensive individual work and collaboration by introducing fluency experiences of knowledge workers, and contextual and work factors related to them.

Why, then, fluency and fluency experiences? Why not effectiveness, productivity, work engagement, flow of work, or some other phenomenon and concept? The interest in fluency grew because there were many studies emphasizing these other four concepts in the context of knowledge-intensive work, but there were few if any studies emphasizing fluency or fluency experiences. However, intuitively, the experience of fluency seemed to be a critical phenomenon, potentially explaining why some factors in the environment are perceived as harmful and others as supporting. Randomly chosen experiences in everyday work life might have indicated that fluency, nevertheless, could be an important concept that influences effectiveness and quality of knowledge-intensive work.

1.2   Structure of the thesis

In addition to the introduction Chapter 1, this thesis is divided into four chapters. Chapter 2 presents the most relevant studies and literature around the theme in question, in order to justify the theoretical concept of this thesis. First, nature of knowledge-intensive work is reviewed by examining some of its important characteristics. After that, fluency is reviewed by presenting some relevant viewpoints and concepts, as well as factors affecting fluency in knowledge-intensive individual work and collaboration. Finally, the literature is summarized, the research gap in the existing literature to be filled is defined, and background theories and constructed analysis framework are presented.

Chapter 3 introduces the research design. First, the objective and research questions of the thesis are presented. Next, research approach and methods are shown. After that, data gathering and analysis from two viewpoints are described: categories and chains derived from the data (fluency experiences), and categories based on theory (contextual and work factors related to fluency experiences). Finally, phases of the study are described.

Chapter 4 shows the results. First, enablers and hindrances affecting fluency experiences in individual work and collaboration are presented. Then, fluency experiences are summarized. After that, contextual and work factors related to fluency experiences in individual work and in collaboration are presented, and an enriched analytic framework to analyze fluency experiences and how they are related to work and contextual factors is introduced. Finally, fluency experiences and contexts studied in individual cases are presented, and the individual variations in experiences, contexts, and work contents are discussed.

Chapter 5 shows the scientific contribution, practical implications, and evaluation of this thesis. Scientific contribution includes a generic model illustrating fluency experiences in knowledge-intensive individual work and collab-

oration. Practical implications suggest how the results of the thesis can be implemented in practice. Then, this thesis is evaluated by discussing reliability, validity, and generalization of the research. Finally, some suggestions for future research are presented.

2 Literature Review

The purpose of this chapter is to define the main concepts and justifications behind the research questions. First, the characteristics of knowledge-intensive work are reviewed (Section 2.1). Next, 'fluency' is defined by presenting some relevant viewpoints and concepts and by showing factors affecting fluency in knowledge-intensive work, both in individual work and in collaboration (Section 2.2). Finally, the literature is summarized, the knowledge gap to be filled in this thesis is defined, and, the framework used in the analysis is presented (Section 2.3).

2.1 Nature of knowledge-intensive work

Many authors understand knowledge-intensive work as an important aspect of our current society (Drucker, 1991; Pyöriä, 2005a), but no clear and commonly accepted definition of knowledge-intensive work has been developed (Kelloway & Barling, 2000; Pyöriä, 2005a). In the literature, knowledge-intensive work has been classified in various ways. Some authors define it as a function (Coates, 1986; Kelloway & Barling, 2000). Other authors focus more on the content of knowledge-intensive work (Davenport & Prusak, 1998/2000; Drucker, 1991; 1999; Kelloway & Barling, 2000; Ruggles, 1998; Suchman, 2000), in which several tasks of mainly individual knowledge workers are discussed; e.g., creation, application, packaging of knowledge, and acquisition of existing knowledge (Davenport, Jarvenpaa & Beers, 1996; Kelloway & Barling, 2000; Sveiby, 1997), or where the process of knowledge creation or knowledge conversion is emphasized (Sveiby, 1997; Nonaka & Takeuchi, 1995; Nonaka, Toyama & Konno, 2000).

Even though knowledge-intensive work is understood as a high-level cognitive work, knowledge workers also perform mundane routine tasks, such as storing and retrieving information, calendaring, telephone calls, and e-mail (e.g., Suchman, 2000), which can take a substantial amount of time (Reder & Schwab, 1990), and which can be demanding, as well. The literature also discusses knowledge-intensive work related to physical space (e.g., Davenport, Thomas & Cantrell, 2002; Heerwagen, Kampschroer, Powell & Loftness, 2004). Knowledge workers are classified according to status, geography, or job definition, mobility required for the job, amount of time engaged in teamwork versus independent work, number of projects undertaken at one time, and the amount and type of communication with others that is needed to perform one's job (Davenport et al., 2002). Since knowledge-intensive work is both highly cognitive and highly social, knowledge workers need time alone to think and develop ideas, and to draw upon their own memories, insight, and analytical skills. *However*, knowledge-intensive work *also* involves conversations and interaction, allowing one to externalize internal thoughts making them accessible to others through writing, speech, or graphic visualization in both formal

and informal social networks (Allen, 1977; Backhouse & Drew, 1992; Bosch-Sijtsema et al., 2009; Brown & Duguid, 2000; Heerwagen et al., 2004).

In addition, knowledge-intensive work has been diversely defined as a profession, as a characteristic of individuals, and as an individual activity. Kelloway and Barling (2000) reviewed and criticized these definitions and proposed that knowledge-intensive work is best understood as a discretionary behavior focusing on the use of knowledge in organizations (for knowledge use, see e.g., Davenport et al., 1996; Nonaka & Takeuchi, 1995; Nonaka et al., 2000; Sveiby, 1997). Knowledge workers are defined primarily by the nature of their work, which is extremely unstructured and organizationally contingent, and which reflects the changing demands of organizations more than occupationally defined norms and practices (Davenport, 2004; 2005; Scarbrough, 1999). Authors understand knowledge-intensive work to be non-routine, complex and situation-specific (Alvesson, 2004; Antikainen & Lönnqvist, 2005; Davenport et al., 1996; Quinn, 2005; Scott, 2005; Sveiby, 1997), opportunistic, non-linear, and improvisational (Heerwagen et al., 2004), and, strongly bounded in the context (Sveiby, 1997). Knowledge workers often use information technology, design at least the most important aspects of their own jobs, and, they have a good education (Pyöriä, Melin & Blom, 2005). Descriptive reviews of knowledge workers and their behavior in organizations have been produced by e.g., Sveiby (1997, 53-64), Davenport (2004; 2005, 11-22), and Alvesson (2004, 21-26).

Vartiainen (2007b) found that the work of knowledge workers takes place in solitude, asynchronously and virtually online, and in face-to-face collaboration with other individuals, during their working days. Working in solitude is actually often not private, as it may include focusing on one's own work, virtual asynchronous collaboration with others by e-mail, and simultaneous presence in collaborative net meetings (Ibid.). Knowledge-intensive work is usually, in practice, not an individual task, but performed in collaboration with other individuals, in teams or networks, to complete tasks which knowledge workers cannot perform alone (Bosch-Sijtsema et al., 2009; Pyöriä et al., 2005; Scott, 2005). The work of knowledge workers is a continuous process and a mixture of solo work and face-to-face meetings (Vartiainen, 2007a, 9-10). Around forty percent of total working time is solo work, which involves tasks requiring concentration and asynchronous and synchronous communication. Therefore, the work content of knowledge workers is demanding both cognitively and socially; approximately fifty percent of the work includes thinking and demands on creativity (Ibid.). In this thesis, knowledge-intensive work is studied from the individual's perspective, when she or he is working solo and when working in collaboration.

Knowledge-intensive organizations are organizational environments in which knowledge workers perform their jobs. Knowledge-intensive companies refer to companies in which most work is intellectual in nature, in which well-educated, qualified employees form the major part of the workforce (Alvesson, 1995; Morris & Empson, 1998; Starbuck, 1992), and, in which workers value the approval of their professional peers more than the approval of their superiors (Sveiby, 1999). Also, according to Sveiby (1997; 1999) knowledge workers

should be treated as revenue creators, not as cost items. Smart knowledge-intensive organizations treat knowledge workers more like customers than employees, because they have to compete with other knowledge-intensive organizations to attract knowledge workers in the same way they compete to attract customers. Retaining key knowledge workers is a particular problem for many knowledge-intensive organizations, making commitment and loyalty significant (Alvesson, 1995; Davenport & Prusak, 1998/2000). The most typical knowledge-intensive organizations operate in the fields of consultancy, advertising, law, and accounting, but also, industry-specific research laboratories, universities, and many civil service departments are regarded as knowledge-intensive organizations (see e.g., Eklund, 1992; Laitinen, 2004; Lönnqvist & Mettänen, 2003; Pyöriä, 2005a; Sveiby, 1990). This study's informants represent some of these fields (more information in Section 3.3).

The environments in which knowledge workers perform their jobs have been categorized to some extent, in the literature. Spaces are divided into three types: physical, virtual, and mental/social spaces (Nonaka & Takeuchi, 1995). The *physical* spaces that knowledge workers use for working are further divided into five categories (Vartiainen, 2007a, 29-31): 1) home, 2) the main workplace ('main office'), 3) moving places (cars, trains, planes, and ships), 4) premises of customers, partners, or premises other than one's company ('other workplaces'), and, 5) hotels and cafés, etc. ('third workplaces'). The *virtual space* refers to an electronic working environment or virtual workspace, or to collaborative working environments. Harrison, Wheeler, and Whitehead (2004) call the combination of physical work settings and virtual space a '*workscape*', which refers to the 'layers of where we work', i.e., the constellation of 1) real and virtual work settings, (furniture and IT), within 2) particular spaces (meeting rooms, project areas, cafés, etc.), that are, again, 3) located in a specific environment (office building, city district, street, home, airport, bus, etc.). Together, they form a hybrid work environment. The *mental/social space* refers to cognitive constructs, thoughts, beliefs, ideas, and mental states that individuals share (Vartiainen, 2007a, 29-31). To summarize from these lists, the current working contexts of knowledge workers (individuals and groups) are combinations of physical, virtual, and mental/social working spaces, especially in collaborative work (see Tables 8a-8e in Subsection 4.4.1, for example. This thesis studies environments, as well). Vartiainen (2007a) also reminds us that the knowledge worker's work is characterized by a continuous search for places to concentrate, to share and to socialize. Frequent interruptions occur in traditional offices, *causing losses in productivity*. On the other hand, while collaboration technologies are contributing to greater versatility, and the degree of tool and device integration grows, harmful interruptions may now effectively reach the other work environments in which knowledge workers have historically sought the privacy they need to concentrate on some of their tasks (Ibid., 10).

González and Mark (2004) confirmed that knowledge-intensive work is very fragmented. What surprised them was exactly how fragmented the work was, with *work fragmentation* defined as a break in continuous work activity. They found that knowledge workers spent only a few minutes working on a single event before switching to another event. Knowledge-intensive work

seems to be very fragmented, with shorter amounts of time spent on a task, and with more interruptions (Mark, González & Harris, 2005). That said, task switching might also be beneficial, because it could serve to refresh an individual and provide new ideas (Ibid.). This author's thesis also produced evidence of beneficial task switching. Surprisingly, fragmentation did not surface as an issue for this author as was expected, in light of González and Mark's (2004) findings.

González and Mark (2004) introduced the concept of *working spheres* to explain the inherent way in which individuals conceptualized and organized their basic units of work. Individuals divided their work among an average of ten different working spheres, which were also fragmented. Individuals spent about twelve minutes in a working sphere before they switched to another. The researchers argued that information technology design should support this continual switching between working spheres. González and Mark (2004; 2005) referred to practical activities that individuals pursue as working spheres. A working sphere can refer to short-term tasks (such as fixing a software component), routine work (such as daily maintenance of equipment), events (such as a provider's exhibition), or long-term projects (such as implementing a new infrastructure for a client). More precisely, they define a working sphere as a unit of work, which, from the perspective of an individual, has a unique time frame, involves a particular collaborative structure, and is oriented towards a specific purpose. Clearly, collaborations are often based on more than one working sphere. Considering both the collaborations and the working spheres that individuals are involved in suggests that multitasking involves not only managing and keeping track of working spheres, but also managing the collaborations related to working spheres (Ibid.). Su and Mark (2008) compressed the idea of working spheres into thematically connected events.

Previous studies have recognized that knowledge workers are typically involved in multiple activities and collaborations (Hudson, Christensen, Kellogg & Erickson, 2002; Perlow, 1999; Sproull, 1984); they are multitasking because of an increased amount of work and projects (Vartiainen, 2007a, 36-37). This is the kind of work performed, for example, by administrators, managers, financial analysts, consultants, and accountants. Collaboration is defined as a system of behaviors including individual, focused work, and interaction (Heerwagen et al., 2004, 522). To add to the complexity, knowledge workers also use a variety of digital and physical devices to perform their work: e.g., e-mail, instant messaging, PDAs, cell phones and paper documents (González & Mark, 2004). Researchers have often said that multitasking involves the management of a set of diverse aspects such as time, contacts, documents, and even physical space (Belloti, Ducheneaut, Howard & Smith, 2003; Blandford & Green, 2001; Boardman & Sasse, 2004).

It is still not well understood how knowledge workers cope with the management of multiple activities and interruptions (González & Mark, 2005). However, there has been much interest in how individuals manage multitasking and interruptions in the course of their work (Bailey & Konstan, 2006; Czerwinski, Horvitz & Wilhite, 2004; Dabbish & Kraut, 2004; Fogarty, Hudson & Lai, 2004; González & Mark, 2004; Hudson et al., 2002; Iqbal & Horvitz,

2007a; 2007b; Mark et al., 2005). A study by Mark et al. (2005) revealed that knowledge workers manage, on average, twelve different projects. Each project often involves a unique set of contacts (colleagues, managers, customers, vendors, etc.). Thus, knowledge workers are managing and switching between multiple projects throughout the workday, and at the same time, they are managing and switching between multiple discrete and overlapping social networks of individuals associated with these various projects (Ibid.). The hectic nature of work has long been documented, even before e-mail and instant messaging entered the workplace (e.g., Mintzberg, 1973). Yet in focusing on present-day work, there are more communication media available than in Mintzberg's era. The documented high level of multitasking and interruptions leads to a question as-yet unanswered: has the prevalence of communication media in the workplace created more opportunities for interaction (and consequently interruptions), or rather, has the expanded number of projects that individuals are involved in created more need for communication (and thus interruptions)? Are these two phenomena inseparable (Su & Mark, 2008)? To multitask and to cope with the resulting fragmentation of their work, individuals constantly refresh their overviews of their working spheres, they strategize how to manage transitions between contexts, and they maintain flexible foci among their multiple, diverse working spheres (González & Mark, 2005; Su & Mark, 2008).

Interruptions at work often interfere with the workflow of knowledge workers in offices and elsewhere (Vartiainen, 2007a, 36). Knowledge workers interrupt their work themselves (*internal interruptions*) about as often as they are interrupted by external influences. This suggests that the type of task may influence the nature of interruptions. Most interruptions are due to face-to-face interactions (González & Mark, 2004; Mark et al., 2005), similar to what O'Conaill and Frohlich (1995) found. Mark et al. (2005) presented data from detailed observation of twenty-four knowledge workers showing that they experienced work fragmentation as common practice. The researchers examined work fragmentation along three dimensions: *effect of collocation*, *type of interruption*, and *resumption of work*. Mark et al. (2005) found work to be highly fragmented. Individuals averaged little time in working spheres before switching, and fifty-seven percent of their working spheres were interrupted. Collocated individuals worked longer before switching, but had more interruptions. Though most interrupted work was resumed on the same day, more than two intervening activities occurred before it was resumed (Ibid.). Surprisingly, O'Conaill and Frohlich (1995) found that forty-one percent of the time, people do not resume their original task after an interruption. The study by Mark et al. (2005) showed that the context determined whether interruptions were considered beneficial or detrimental. In general, they found that interruptions that occurred outside an individual's current working sphere context were disruptive, as they led an individual to shift his thinking, sometimes radically. In contrast, interruptions that concerned an individual's current working sphere were considered helpful.

Disruptions refer to *external* interruptions. Mark, Gudith, and Klocke (2008) performed an empirical study to investigate whether the context of interruptions makes a difference. They found that the context does not make a differ-

ence, but surprisingly, individuals completed interrupted tasks in less time, with no difference in quality. Their study data suggested that individuals compensate for interruptions by working faster, but this comes at a price: the individuals experienced more stress, with greater frustration, time pressure and effort, and that individual differences existed in the management of interruptions: personality measures of openness to experience and need for personal structure predict the disruption costs of interruptions. Results of Mark et al. (2008) differ from those of Gillie and Broadbent (1989). Mark et al. (2008) looked at similarity of the content of interruptions and a task, whereas Gillie and Broadbent (1989) focused on similarity of cognitive processes of interruptions to a task, finding that the nature and complexity of an interruption affects how much performance will be disrupted. Czerwinski, Cutrell, and Horvitz (2000) found that interruptions that were extremely consistent with the task were facilitating. The interruption context of Mark et al. (2008) shared the same topic as the main task (email), but unlike Czerwinski et al. (2000), the operations and details differed. Along with the studies by Mark et al. (2008) and Mark et al. (2005), both of which reported informants' subjective views, it appears that interruptions that share a context with the main task might be *perceived* as being beneficial, but the actual disruption cost is the same as with interruptions with a different context (Mark et al., 2008). Studies emphasizing stress resulting from disruptions correlate very weakly to this author's thesis, because only one of this author's nine informants stated that she experienced stress due to unexpectedly emerging work tasks.

In her recent study on interruptions and gaps in the flow of work, Kalliomäki-Levanto (2009) found that interruptions were triggered by 1) poor availability of expert knowledge for the work at a given moment; 2) changing needs and environment of a client and difficulties in transmitting client information; and 3) poor availability of exact knowledge of product solutions. She also studied strategies for dealing with the interruptions: 1) to influence the causes of interruption; 2) to use existing methods of work for support; 3) to anticipate, especially based on experience; and, 4) to extend working time. Kalliomäki-Levanto (2009) suggested that interruptions can be reduced by securing continuity of employment or/and establishing work groups in which members stay longer.

Though researchers have focused on interruptions during the workday (Czerwinski et al., 2004; Hudson et al., 2002; O'Conaill & Frohlich, 1995), interruptions are only part of the story. Mark et al. (2005) found that even when individuals are not interrupted, they spend short amounts of time in one working sphere before switching to another. They could not explain why individuals moved on to other working spheres quickly, even when there was no evidence of an interruption. Their best interpretation from their observations was that individuals were responding to the external demands in the workplace. Individuals were continually juggling their priorities according to the work context. When the work context changed, some tasks may have taken higher priority, and knowledge workers switched tasks to adapt to these conditions. Most informants of Mark et al. (2005) reported, however, that they preferred to complete one task before moving on to another. Working spheres interrupted exter-

nally were more likely resumed, and to be resumed faster. Individuals may have been more involved in working spheres that were externally interrupted. Internal interruptions may have been more within the individual's control, e.g., if an individual took a break to let a problem incubate. Thus, if individuals were more involved in a working sphere when externally interrupted, they may have been more likely to try to resume work in that sphere. Studies of managers' interruptions (Hudson et al., 2002; Mintzberg, 1973; Sproull, 1984) are comparable to Mark et al.'s (2005) external interruptions. Internal and external interruptions are addressed in this author's thesis, as well, although not emphasized as strongly as in the literature at large.

To be effective team members, knowledge workers must have the time, space and tools to do work that can only be done solo, such as reading, writing, thinking, searching for information and synthesizing information into internal knowledge structures (Heerwagen et al., 2004; Perlow, 1999). Work that requires focused attention, comprehension, and/or continuing access to short-term memory or computation, suffers from distractions and interruptions (Banbury, Macken, Tremblay & Jones, 2001; Jones & Morris, 1992; Perlow, 1999). The availability of individual workspaces, aiding focused attention and reducing distractions and interruptions, has numerous benefits (see Heerwagen et al., 2004, 522-524), including increased time on individual tasks (Perlow, 1999), reduced stress (Kaplan, 1992), improved performance on mental tasks (Wyon, 1996), and the ability to maintain the train of thought and cognitive flow (Csikszentmihalyi, 1990).

According to the literature reviewed hitherto, there are a few citations of elements affecting knowledge work productivity among characterizations of knowledge-intensive work. These citations raise the interest in productivity: if interruptions (and especially disruptions) cause losses in productivity, and working at home improves productivity, does multitasking or collaboration include elements that influence the productivity of knowledge-intensive work? Productivity appears to be the concept most emphasized in existing literature: is there a relationship between productivity and fluency, and if so, what kind of a relationship? What kinds of factors affect *perceived fluency* in knowledge-intensive work? Is there a difference in the influence of those factors on perceived fluency between individual work and collaboration? The literature must be examined more thoroughly in order to answer these questions.

2.2   Fluency in knowledge-intensive work

This section presents the concept 'fluency' in the context of knowledge-intensive work. Discussion begins with relevant concepts and continues focusing on factors affecting fluency in individual work and in collaboration. Because literature does not discuss experiences related to productivity and effectiveness (only productivity and effectiveness as such), factors affecting fluency (*not* fluency experiences) are examined in subsections 2.2.2 and 2.2.3. *Individual work* is defined as solo work, i.e., working in solitude, concentrating on issues and without physical contact with other individuals. *Collaboration* is

defined as work done in interaction, i.e., working physically face-to-face with other individuals in the same physical place or collaborating from afar, virtually. Collaboration includes both formal (e.g., meetings) and informal (e.g., coffee table discussions) communication.

Within these two working modes remain two modes, namely asynchronous and synchronous working. *Asynchronous* work refers to communication and collaboration taking place at different times, e.g., via e-mail and text messages. Co-workers work at different times but temporally consecutively. Sometimes asynchronous work means individual work performed at the same clock time, but in different time zones, which results in working at different times in the different time zones. S*ynchronous* work refers to collaboration and communication taking place at the same time virtually, e.g., via telephone, Skype, Adobe Connect Pro, etc. Both asynchronous and synchronous mediated work takes place physically solo, and working in solitude does not mean just 'working alone in privacy', because work is affected either by self-initiated virtual outgoing contacts with other individuals, or externally by an incoming flow of requests (Vartiainen, 2007a, 49). These kinds of transitional stages between deep concentration and fully social polyphonic events can be described by the concept 'pseudo-privacy', as Becker and Sims (2000, 15) defined (Ibid.). In this thesis, asynchronous and synchronous mediated work include both formal and informal communication. Additionally, this thesis focuses on an individual's perspective; although an individual's experiences in collaboration emerge from interaction, those experiences are studied from the individual, not from the group perspective.

2.2.1   Constructing fluency in knowledge-intensive work

Generally, 'fluency' is defined as 'smoothness of flow with which sounds, syllables, words and phrases are joined together when speaking' (Harrell, 2007). Binder (1987; 1990; 2003) focused on fluency in the context of trainees developing into experts and defined fluency as the true definition of mastery: 'Fluency is the mark of the expert… this is a level of performance that goes well beyond the point of 100 percent accuracy and into the realm of over-learning'. Behavioral fluency (or just plain fluency) is a fluid combination of accuracy plus speed of performance that characterizes competent performance (Binder, 1988; 1990; Binder & Sweeney, 2002). Fluency has also been described as a combination of quality plus pace (Haughton, 1980), automatic (Binder & Bloom, 1989), second nature level of performance (Binder, 1990; Binder & Bloom, 1989), and correct performance (i.e., doing the right thing) without hesitation (Binder, 1996; Binder & Bloom, 1989; Binder & Sweeney, 2002). However, these definitions of fluency are not valid in this thesis. Instead, fluency in the context of knowledge-intensive work is herein constructed with help of concepts 'work engagement', 'flow of work', 'productivity of knowledge-intensive work', and 'effectiveness'. This was necessary because the author did not find any acceptable definition in existing literature. Fluency in the context of knowledge-intensive work appears to be a concept that is seldom used.

According to positive organizational behavior approach (see e.g., Luthans, 2002), *work engagement* is a multidimensional construct, defined and operationalized as 'a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption' (Bakker, Demerouti, Hakanen & Xanthopoulou, 2007; Bakker, Schaufeli, Leiter & Taris, 2008; González-Roma, Schaufeli, Bakker & Lloret, 2006; Hakanen, 2002; 2009; Hakanen, Schaufeli & Ahola, 2008; Schaufeli & Bakker, 2004; Schaufeli, Salanova, González-Roma & Bakker, 2002). Vigor is characterized by high levels of energy and mental resilience while working, the willingness to invest effort in one's work, and persistence even in the face of difficulties. Dedication refers to being strongly involved in one's work, experiencing a sense of significance, enthusiasm, inspiration, pride, and challenge. Absorption refers to being fully concentrated and happily engrossed in one's work, whereby time passes quickly and one has difficulties with detaching oneself from work. Work engagement is likely to remain relatively stable over time (Mauno, Kinnunen & Ruokolainen, 2007; Schaufeli et al., 2002; Schaufeli, Bakker & Salanova, 2006), whereas the state of *flow* (defined as a state of mind in which individuals are so intensively involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that individuals will do it even at great cost, purely for the sake of doing it) is defined as peak experiences, which often occur outside the work context (Csikszentmihalyi, 1990; Hakanen, 2009, 33-34; Mauno et al., 2007).

To distinguish from Csikszentmihalyi's 'flow', Kalliomäki-Levanto (2009, 85) used the concept *flow of work* in the sense of working without interruptions and gaps (Watson-Manheim, Chudoba & Crowston, 2002). Kalliomäki-Levanto (2009, 85) continued her reasoning: "Working is often described by words *fluency* of work or working fluently, existence of which can easily be recognized in everyday work". In her thesis, she chose the concept 'flow of work' instead of the concept 'fluency of work'. Based on her description of data gathering, she first used the concepts 'fluency' and 'productivity', and then later, the concept 'flow of work': "…what informant needs in order to work fluently, in order to be productive, in order to maintain well-being… aimed at an overall view of fluency of work… and arrived at ordinary flow of work" (Ibid., 38). Furthermore, she was searching for "informants' concrete reports on situations leading to gaps of fluency of work" and examined "obstacles of fluency of work as interruptions and gaps" (Ibid., 52). Kalliomäki-Levanto's concepts 'fluency of work' and 'flow of work' are very close to each other and focus on work process, whereas the construct 'fluency' in this thesis is defined more as self-perceptions and feelings about the fluent flow of work. In order to arrive at the final construct, concepts 'productivity' and 'effectiveness', and their relation to fluency must first be explained.

In the field of economics, *productivity* is measured as outputs divided by the inputs necessary to produce them (see e.g., Davenport, 2005; Sink, 1985). This thesis does not use the concept 'productivity' in its original meaning, because it carries a strong economic connotation with its measurement aspect. There also are 'softer' approaches to productivity cited in the context of knowledge-intensive work. Drucker (1969; 1997), for example, emphasized the importance of productivity of knowledge and knowledge workers and their decisive nature.

Drucker (2004) also commented that "nobody has really looked at productivity in white collar work in a scientific way. But whenever we do look at it, it is grotesquely unproductive". Drucker's argument still seems to be valid today and we have yet to define a way to achieve his goal. Davenport, for example, agreed with Drucker's statements and found solid reasons to keep trying to achieve the goal that Drucker defined (see Davenport, 2005, 8-9, 39; 2007, 39-40). Davenport (2005, 46-47) discussed some aspects to be considered and emphasized when considering productivity in the context of knowledge-intensive work. First, productivity only indirectly addresses the quality of work. Quality is a critical factor, and it is usually not good enough to measure it by how much people will pay. Second, it is often difficult with knowledge-intensive work to determine what constitutes an 'output', making knowledge worker outputs difficult to define and measure. Third, inputs in productivity analysis do not encompass all the factors that can affect the quality and quantity of outputs; e.g., it is easy to view management and IT only as cost factors instead of as factors positively contributing to productivity. Extending Davenport's critique, Ouye (2008) took a human technologist point of view of productivity and expanded the output/input model of productivity to encompass the context and the processes that translate the inputs into outputs. The processes (i.e., the work processes, practices, and behaviors to produce the outputs) are described as being 'surrounded' by the context in Ouye's Workplace Performance Model, with the context consisting of the organizational, management, human resources, data and technological, and, place milieus in which individuals work. Ouye's model indicates that the *context* is essential in performance processes. In this author's thesis, the input-process-output model definitely contains the context.

Effectiveness is generally defined as an indicator that relates output to input (Sveiby, 1997), but it is narrowly defined as a ratio of output relative to goal or expectation, e.g., the ratio of satisfied service needs versus identified service needs (Bosch-Sijtsema et al., 2009). Some authors (Davenport, 2005; Gordon, 1997; Sveiby & Simons, 2002) used the concept 'knowledge work effectiveness' instead of the concept 'knowledge work productivity', while acknowledging the similarity of these concepts. They understood effectiveness as a collection of several factors that might better describe and measure what knowledge workers do, yet it is not limited to the quantity of work. According to Gordon (1997), knowledge worker effectiveness is a basket that includes quantity (how much gets done), quality (how well it gets done), timeline (when it gets done), and multiple priorities (how many things can be done at once). In this framework, the effective knowledge worker would score well on all four criteria. Gordon's approach is similar to Taylor's (1911/1967), by focusing on the task. Notably, however, Drucker (1999) urged management to see the knowledge worker as an asset instead of a cost, where costs need to be controlled and reduced and assets need to be made to grow (Ramírez & Nembhard, 2004). This author's thesis emphasizes the quality aspect of effectiveness. Therefore, effectiveness is used to describe quality of performance in knowledge-intensive work.

In this thesis, *fluency* is related to the input-process-output model, with the context, because the model is useful in examining both individual work and

work in collaboration. As with the idea of work 'engagement', fluency is understood as a stable state of mind and it is not just an individual phenomenon – it can be seen as a collective phenomenon, as well. Fluency is a phenomenon that describes how fluently the work progresses. An underlying presumption is that fluency is related to a mode of working that makes effectiveness possible. Factors related to perceived fluency emerge from the context in which input-process-output model takes place, but also from input factors such as work design or tasks. Output factors were omitted for two reasons: previous studies focused mainly on such output factors, and the author was not interested in measuring outputs, which is necessarily involved in the consideration of output factors. Rather, this thesis is interested in factors affecting the process through which results or outcomes are achieved. Fluency is understood as an experienced fluency that is related to an individual's mental space, i.e., an individual's thoughts and emotions. Fluency refers to a subjective expression of effectiveness. By subjective expression of effectiveness, this author refers to effective performance, i.e., how the informants of this thesis experienced having achieved their goals.

In summary, short definitions of the key concepts are necessary to indicate how they are understood in this thesis. *Work engagement* refers to a stable work-related state of mind that is presumably present in the informants' everyday work life, as, e.g., Schaufeli et al. (2002) defined it. *Flow of work* refers to a starting point of fluency. It is a standard mode of working without any particular emphasis on goals, processes, environment, etc. *Effectiveness* refers to achievement of intended goals, i.e., how successfully the informants of this thesis achieved their intended goals by doing right things. In this way, effectiveness includes a quality aspect, which is significant in the context of knowledge-intensive work. Effectiveness is a state of well-being that can be attained by working effectively. *Productivity* refers to a basic concept that covers components of input-process-output –model, including the context. *Fluency* refers to the expectation of planned, effective, and goal-oriented flow of work. *Fluency experiences* refer to the informants' self-perceptions and feelings about the planned, effective, and goal-oriented flow of work, which are influenced by enablers and hindrances in work and working environment.

2.2.2 Factors affecting fluency in individual work

Many factors influence both individual and collaborative knowledge-intensive work. Some of the factors are at the organizational level: organizational context, structure and culture, availability of required resources, management style, compensation, work environment, work process, work conditions, and information technology (see e.g., Bond, Flaxman & Loivette, 2006; Davenport et al., 2002; Litschka, Markom & Schunder, 2006). Other factors are at the team and/or individual level: nature of tasks, working conditions, social context, collaboration between group members, individual commitment, abilities and skills, motivation, and job satisfaction (see e.g., Bosch-Sijtsema et al., 2009; Kelloway & Barling, 2000; Litschka et al., 2006; Pritchard & Watson, 1992). In this thesis, factors are examined separately in individual work and in collab-

oration. Organizational level is understood more as a contextual factor that is related to enablers and hindrances found in individual work and in collaboration.

Drucker (1999, 84-87) was one of the first authors who opened the discussion about productivity of knowledge-intensive work. He defined six significant factors *influencing productivity*:

1) The task itself
2) Knowledge worker himself, who should be responsible for his own productivity, given that he is also responsible for self-management by virtue of working independently
3) Continuing innovation as a part of the work, the task and the responsibility of a knowledge worker
4) Continuous learning and continuous teaching of the knowledge worker
5) Quality is at least as important as quantity, as the productivity of a knowledge worker is under discussion. In fact, quality is the essence of the output.
6) In order to work productively, a knowledge worker should be treated as an asset, not as a cost, by the management. Productivity requires that a knowledge worker wants to work for the organization in preference to all other opportunities.

Drucker's original factors listed above can be implemented in the context of fluency, as well. This is because task is an input factor, knowledge workers are actors in input-process-output –model with the context, quality is an output factor, and the rest of the factors (innovation as a part of the work, continuous learning and teaching, and management) belong to the work process in input-process-output –model.

Researchers have recognized that interaction with others facilitates the work process (e.g., Festinger, Schachter & Back, 1950; Kraut, Egido & Galegher, 1990; Mintzberg, 1973) and that interruptions have effects, mostly negative, on the work process (e.g., Mandler, 1984; Weick, 1995). Perlow (1999) described in detail how engineers fell into the trap of cycle spinning, arising from the pressure to get the product to market. However, there was never enough time to prepare for deadlines and, therefore, they only confronted each deadline when it was around the corner and had already become a crisis. While engineers were busy solving the most recent crisis, they delayed the work they had intended to do, until it, too, was perceived as a crisis. Therefore, engineers continuously confronted crises and had little or no time to invest in future work. Managers' attention was on products and only those individuals who stayed around and solved crises emerged as 'heroes' and became role models and they were encouraged to do whatever it took to get their own work done. This led to a situation in which engineers felt justified in interrupting whomever they needed and whenever they felt it was necessary, to complete the task at hand. Accordingly, this led to constant interruptions, less time to accomplish individual technical problem solving, and no appreciation for the positive contributions that interactive activities made to the work process. Naturally, this kind of situation had consequences for individuals and the organization, not least in the form of *losses in productivity*. To help the engineers, Perlow organized an experiment. The

engineers were required to organize their own individual work and time, allowing time for interactive activities. During their scheduled quiet times, engineers could work without constant interruption and finish their tasks. Interaction time was for advancing tasks that actually required interaction. Had this work design lasted after Perlow left the organization, there would have been no need for a crisis mentality going forward, no need for individual heroics, and there would have been fewer interruptions and a suitable amount of interactive activities – all of which would have increased productivity. Figure 1 illustrates the vicious cycle described by Perlow (1999), along with this author's view of the 'presumed way out'.
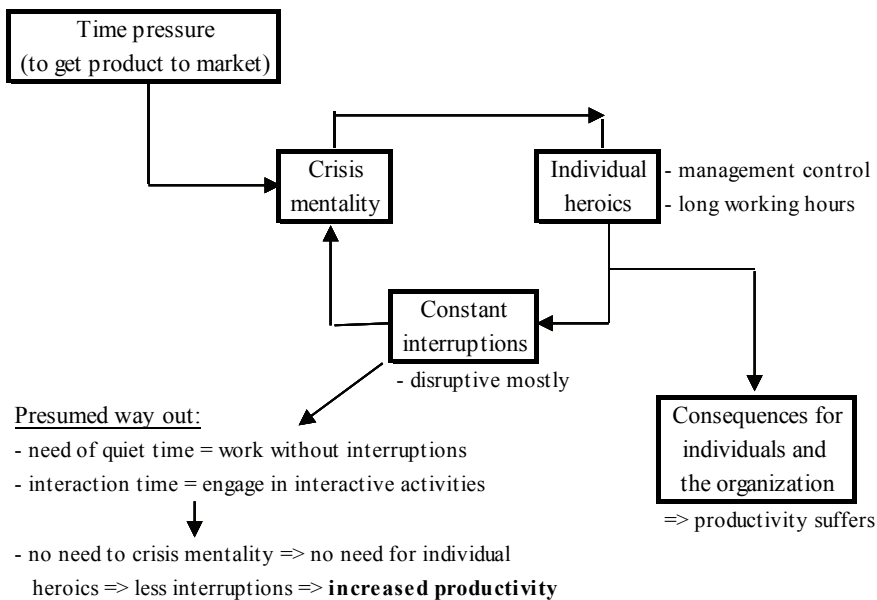
Figure 1. The vicious work-time cycle and the presumed way out. Modified and improved from Perlow (1999)

This example by Perlow primarily refers to work performed in solitude. It emphasizes the individual's mental space; when an individual experiences time pressure and is interrupted, he may experience the situation as so chaotic that concentration on the task suffers. If he does not have coping methods for the situation, he may stay in the cycle, finding no way out. As Perlow proved, discrete times for individual work and collaboration helped to improve productivity. Continuing this thought, this manner of working should also lead to improved effectiveness and increased fluency. The data from this thesis indicates that this is reasonable, with one example being the cited advantages of teleworking.

Today, the nature of work for many knowledge workers resembles what used to be the exclusive terrain of top level managers, i.e., characterized by brevity, talking and listening, collaborative relationships, utilization of informal information (Stewart, 1967/1988), and, fast-paced and varied activities, frequent fragmentation of actions, and constant interpersonal interactions

(Mintzberg, 1973). Mintzberg (1973) developed his framework for the *contingency theory of managerial work* by analyzing the differences in the work of managers and studying different kinds of variables while the type of managerial work and the size of organization remained constant. According to Mintzberg, "the work of a particular manager at a particular point in time is determined by the influence that four 'nested' sets of variables have on the basic role requirements and work characteristics" (Ibid., 102). The *variables influencing on a manager's work* were as follows: 1) environmental variables (organization, industry, and milieu), 2) work related variables (level and function), 3) person related variables (personality and style), and 4) situational variables (seasonal variations and temporary threats). These variables, nature of managerial work, and demands of the role, form the managerial work (Ibid., 102-103). Mintzberg's model (Figure 2) can be applied to today's knowledge-intensive work by simply changing the term 'manager' to 'knowledge worker': the variables, nature of knowledge-intensive work, and demands of the role comprise the work of a knowledge worker. Furthermore, when examining studies on knowledge work productivity and realizing the similarity of the elements affecting productivity of knowledge-intensive work, this author argues that variables identified by Mintzberg actually resemble elements affecting fluency in knowledge-intensive work. Mintzberg's variables, placed in input-process-output –model with the context, characterize factors affecting or related to fluency in knowledge-intensive individual work. Job variables are equivalent to input factors, environmental and situational variables refer to context and process, and person variables refer to process and input factors.
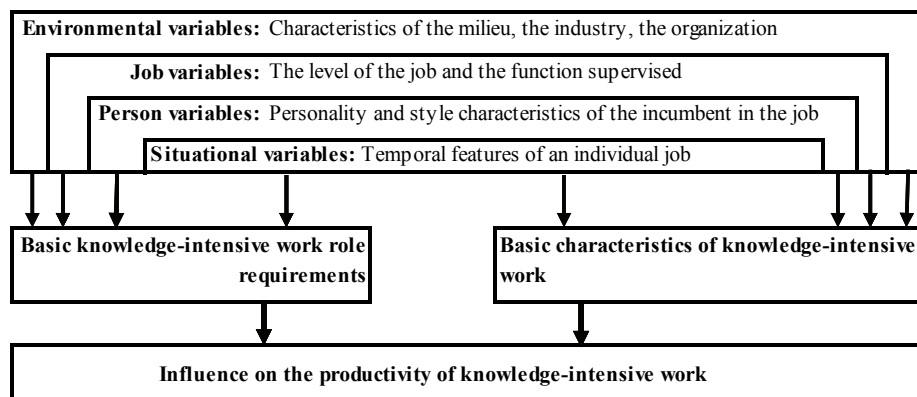
Figure 2. Variables affecting productivity of knowledge-intensive work. Modified from 'contingency view of managerial work' by Mintzberg (1973, 103)

Some knowledge workers (twenty percent), in Davenport's (2005) studies, felt overwhelmed by the information flow surrounding them. In their opinion, there was too much use of e-mail in their organizations. They also viewed e-mail and other technologies as hindrances rather than as enhancing their effectiveness. The rest of the knowledge workers saw no real problem when discussing these issues, although there were considerable differences in the received

information and the used media. E-mail was one of the most frequently used media in Davenport's study, and one of the most problematic in terms of negative attitudes. Fifty-three percent of knowledge workers in Davenport's study felt that e-mail increased the productivity of their work, and fifteen percent felt that e-mail diminished the productivity of their work. Telephone (i.e., actual telephone calls, voice mail, and conference calls) elicited somewhat fewer negative and more positive attitudes than e-mail (Ibid., 122-132). These results by Davenport refer to asynchronous and synchronous mediated working. In this author's thesis, the informants mainly had positive attitudes towards e-mail and other technologies, and they saw no real problem related to productivity, effectiveness, or fluency. Instead, telephone was experienced as more disturbing than e-mail.

Pyöriä (2005c, 142-143) concluded that, especially for those knowledge workers who are engaged in creative problem solving, a part-time teleworking arrangement (i.e., working from home) could *increase productivity* by helping them to concentrate on tasks that require peace and solitude, away from office distractions. On the other hand, partial teleworking, especially if the worker initiates the arrangement, should not jeopardize crucial relations with peers, or result in feelings of social exclusion. In the best-case scenario, a part-time teleworking arrangement could boost individual and organizational productivity and create more flexibility in the labor market. Stewart (1997/1999, xv, 118) mentions two *remedies for increasing productivity* of knowledge workers. First, by improving the efficiency and effectiveness of the information environment in which the knowledge workers work. Second, in addition to mapping and deepening expertise, the explicit management of structural capital can increase productivity. Most of this author's informants experienced that working at home was more effective than working in the office because of tranquility. Some of them could not perform tasks requiring concentration anywhere else. In discussions with the informants emerged that improvement of information infrastructure is ongoing in today's organizations and flexible ways of working are being introduced. From these viewpoints, Pyöriä's conclusions proved to be valid in this thesis.

Clements-Croome and Kaluarachchi (2000) proposed a five-level analytical hierarchy process model to represent the main factors that influence productivity. The model contains environmental factors (e.g., temperature and humidity, ventilation, lighting, crowding) which are linked to health factors (e.g., respiratory, skin, nervous, nasal). Although this model emphasizes environmental and comfort components associated with productivity, it lacks the social and behavioral components that are essential parts of modern work. Clements-Croome (2000) addressed the main weakness of the model by including a social factor as an important element affecting productivity. According to Clements-Croome (2000, 11), factors that affect productivity are as follows:

1) Personal factors: career achievement and home/work interface intrinsic to job
2) Social factors: relationships with others
3) Organizational factors: managerial role and organizational structure

4) Environmental factors: indoor climate, workplace, and indoor air quality

Some of these above factors presented by Clements-Croome are included in the data of this thesis, as well.

Mawson (2002) proposed that the two major causes of productivity loss in offices are distractions and place mismatch. Having acknowledged that distractions can even be beneficial for some people, Mawson proposed that a distraction-free working environment is more productive than an environment that has many distractions throughout the day. Place mismatch is at issue when the office environment does not support the work process undertaken in that environment. It is therefore proposed that a mix of workplace settings and services are considered to be enablers for better performance (Ibid., 3-7). The informants of this thesis strengthened these notions of distractions and workplaces. There were statements of beneficial distractions as well as distraction-free environments in relation to productivity, effectiveness, or fluency. There also were examples given of suitable workplaces for certain tasks.

Concluding from the literature (e.g., Laitinen et al., 1999; Uusi-Rauva, 1997) Kemppilä and Lönnqvist (2003, 2) listed factors affecting performance:

1) Work patterns: absences, delays, and breaking security rules
2) Work climate: amount of complaints, turnover of personnel, and work satisfaction
3) Attitudes and emotions: changes in attitudes, positive reactions, and observed changes in performance
4) New skills: decisions made, conflicts avoided, ability to listen, reading speed, and frequency of using new skills
5) Developments: increase in effectiveness, amount of promotions and pay raise, and requests for transfer
6) Proposals: successfully conducted projects and amount of implemented proposals
7) Physical working environment: tidiness, ergonomics, routes, noise, and lights

Many of these factors listed above can be found in this thesis, as well. However, some of these factors may affect performance, but have little or no importance when fluency is the focus, at least when considering what emerged in discussions with the informants.

Indirect productivity factors may consist of a much larger group of factors than thought. The indirect productivity factors are mostly intangible, difficult to observe, related to human interactions, and related to personal factors, as well (Antikainen, 2006, 76). Even though factors related to productivity may seem to be in order, when observed from the outside or measured by objective methods, negative beliefs of employees can hinder their productivity (Antikainen & Lönnqvist, 2005, 3). Because this is a study focusing on mental level issues, intangible factors are more likely to be expected. Knowledge-intensive work is socially oriented work, fraught with human interaction that is necessarily influenced by personal factors. Personal attitude, whether positively or negatively oriented, has its influence on fluency, as well. The informants gave examples of how their attitudes affected fluency in their work.

Davenport et al. (1996) studied thirty attempts to improve knowledge-intensive work in a standardized experimental context. They found that most successful initiatives addressed the external circumstances of work, including location and team structure (i.e., not the process of knowledge generation itself). Davenport and Prusak (1998/2000, 52-67) mentioned some *principles that can help make knowledge-intensive work effective*:

1) Fostering awareness of the value of the knowledge processes
2) Identifying key knowledge workers
3) Emphasizing the creative potential inherent in the complexity and diversity of ideas, seeing differences as positive, and avoiding simple answers to complex questions
4) Making the need for knowledge generation clear by encouraging, rewarding, and directing it toward a common goal, and, by introducing measures and milestones of success that reflect the true value of knowledge more completely than balance-sheet accounting

The data of this thesis take into account some of Davenport and Prusak's principles, but the focus is not on *making* knowledge-intensive work more effective.

To summarize, this thesis draws its conclusions based on the reviewed literature and this author's study. The literature has some common characteristics, whether in examining factors affecting fluency in individual work or in collaboration. First, the literature does not always classify factors into enablers and hindrances. Some researchers present factors without assigning any positive or negative attributes, while others present factors that are both enablers and hindrances, depending on the viewpoint. Second, nearly all of the factors are focused on output (e.g., effectiveness), not the process. Third, most of the researchers present factors that may increase productivity; fewer focus on the present state or diminishing influence of the factors.

Where factors affecting fluency in individual work are concerned, researchers seemed to focus on one or two factors per study; for example, Drucker (1999) focused on the quality aspect of productivity, Perlow (1999) focused on interruptions, Davenport (2005) focused on the influence of e-mails, etc. Some other researchers emphasized how to increase productivity in individual work: Davenport et al. (1996) discussed how to improve knowledge-intensive work, Davenport and Prusak (1998/2000) discussed how to make work effective, Pyöriä (2005) found that part-time teleworking could increase productivity, Stewart (1997/1999) suggested remedies for increasing productivity, etc. Only a few researchers emphasized factors that cause productivity losses (e.g., Mawson, 2002; Antikainen, 2006). Some valuable classifications were presented, as well: Mintzberg's (1973) variables were classified into categories, which could be adapted to knowledge-intensive work; Clements-Croome's (2000) productivity factors were classified into groups; and Kemppilä and Lönnqvist's (2003) performance factors were classified into groups. Environmental factors and individual factors seemed to be common denominators for these classifications, and both were identified in this thesis, as well. Classifications and factors were significant, from the viewpoint of this thesis. However, methods used for increasing productivity were not of interest for this particular thesis.

2.2.3   Factors affecting fluency in collaboration

There is an increasing evidence of large differences in the productivity of knowledge workers. The reasons for variability can be accounted for with three main elements (Bosch-Sijtsema et al., 2009): First, the work tasks vary from routine to creative. Second, the quality of individual human resources, such as skills and competencies, varies. Third, the influence of enabling and disabling *contextual* work factors on the ability to execute the work tasks:

   a) Organizational and social factors: culture, strategy, structure, leadership, and support from co-workers, reward and benefit structures
   b) Physical environment of knowledge workers (e.g., Chan, Beckman & Lawrence, 2007): office or home in which work takes place
   c) Virtual environment: available communication and collaboration technologies which are needed because many knowledge workers often work remotely and in multiple workplaces in addition to the main office (Davenport, 2005) and this makes their working contexts dynamically changing and complex

Identifying these influential elements is deemed important for the improvement and stimulation of knowledge-intensive work (Bosch-Sijtsema et al., 2009). In their assessment, there is a strong emphasis on enabling and disabling contextual factors.

Bosch-Sijtsema et al. (2009) derived, from earlier studies, five categories that are suggested to affect productivity of knowledge-intensive work in distributed teams. Furthermore, they constructed an integrative model including elements that affect the *outcomes* of distributed knowledge workers in terms of productivity, efficiency, and effectiveness (Figure 3). According to them, by defining elements that enable or hinder productivity of knowledge-intensive work, it is possible to find suitable indicators for knowledge-intensive work and to influence certain factors in order to support productivity and quality of knowledge-intensive work.

Organizational context: structure, culture, strategy, policy, rewards
Workplace: physical location, virtual (IT) and social workplace
Team process: interpersonal, planning and action process
Team structure/composition: size, diversity, skills and knowledge
Team task: individual or collaborative
Mode of working:
   - solo
   - technology mediated collaboration
   - face-to-face collaboration

Productivity: efficiency and effectiveness

Figure 3. Enabling and hindering elements of knowledge work productivity in distributed teams. Adopted from Bosch-Sijtsema et al. (2009, 538)

The most important aspects in the framework of Bosch-Sijtsema et al. (2009) are:

1) *Organizational factors* (e.g., the organizational structure, culture, strategy, and leadership) that support or not sharing and re-using of knowledge are increasing productivity of knowledge-intensive work.

2) *A workplace* as a combination of different spaces in which work is conducted. Becker (2002) understood the workplace as a complex web of interdependent social and organizational factors which, when combined, affect informal communication, interaction, and learning patterns. Knowledge-intensive work is described as multi-locational because it is often done in multiple places and in a mobile manner (Vartiainen, 2007b). Each workplace can be viewed as an integration of imbedded spaces consisting of *physical, virtual*, *social,* and *mental* spaces, through which an individual perceives and interprets other spaces (Ibid.). The physical workspace is known to affect productivity, however, only a few studies focus on measuring these aspects, and empirical evidence is limited (Haynes, 2007; Heerwagen et al., 2004). The literature discusses virtual space and social space as important for knowledge workers who are distributed or work virtually (Davenport et al., 2002; Scott, 2005).

3) *Task content*, i.e., complexity and interdependency of tasks (Drucker, 1999; Gladstein, 1984), performed within distributed teams. Task interdependence describes the degree or requirement of task-driven interaction among group members and it is determined when a team task is designed. In order to understand the impact of distributed work settings on outcomes of distributed teams, it is also important to understand the modes in which the tasks are performed, i.e., solo, face-to-face, and/or virtual.

4) *Team structure and composition*. Group structure focuses on, e.g., leadership, shared working values, role and goal clarity, and team rewards (Gladstein, 1984). Scott (2005) found that group size and proximity to team members affect productivity of the group. Group composition involves job skills, experience and group member personalities, knowledge, skills, and abilities (Martins, Gilson & Maynard, 2004; Powell, Piccoli & Ives, 2004).

5) *Team processes* related to communication, coordination and planning of tasks, and building trust. Autonomy of knowledge workers, their interdependence, team development, and management issues are important for team productivity and effectiveness (e.g., Janz, Colquitt & Noe, 1997). The following team processes are beneficial to the productivity of knowledge-intensive work of distributed teams:

   a) Interpersonal processes (mutual trust, high autonomy, strong team identity, few personal conflicts, and high team cohesion)

   b) Clear planning processes (clear goal setting, clarity of roles and goals, and shared norms within the team)

   c) Action processes (coordination of distributed teams, effective team communication, and high and motivated participation)

In this thesis, the informants worked quite independently, though in collaboration with other individuals. They did not have fixed teams with which they worked. Rather, they belonged to several work groups, comparable with the concept 'team' because these work groups had goals and a defined way of working. Here, the definition by Katzenbach and Smith (1993, 45) is used: "A team is a small number of people with complementary skills who are committed to a common purpose, performance goals, and approach for which they hold themselves mutually accountable." With the exception of one informant, teams or work groups in which they worked were not distributed, when in reference to employees of the same organization. If a broader perspective is applied here, i.e., that a team consists of individuals who work with a certain project or task, then individuals from different organizations formed distributed teams in this thesis as well, and the thinking of Bosch-Sijtsema et al. (2009) can be applied.

Pyöriä (2005b, 11) found that longevity may be one of the key preconditions for optimal team performance, especially in knowledge-intensive organizations. A number of studies support this finding. For example, Sveiby and Simons (2002) found that a collaborative climate tends to improve with age (however, their study lacked a clear definition of knowledge-intensive work). *Collaborative climate* is one of the major factors influencing effectiveness of knowledge-intensive work. Collaborative climate tends to improve with age, education level, and managerial role. Process design, office design, information sharing software, etc., help knowledge transfer and creation processes become more effective in creating value. Sveiby and Simons (2002, 420-421) grouped the final set of factors influencing knowledge sharing into four clusters:

1) *Employee attitude*, as ascertained by responses to a questionnaire to assess the respondent's own attitude
2) *Work group support*, which described knowledge sharing behavior of the individual's closest colleagues
3) *Immediate supervisor*, which described behavior of the immediate manager
4) *Organizational culture*, which described leadership factors outside the individual's immediate working environment

Sveiby and Simons (2002, 425) concluded that "it takes much longer for new employees to become truly effective in their new environment than has been generally understood and definitely more than accounted for in induction programs, which typically rarely last longer than six months." In this thesis, the informants described 'collaborative climate' with the term 'synergy' in the context of work environments that consisted of employees who had worked together for a long time. There also was an example of how a new employee had difficulties becoming a part of the work community, from the viewpoint of collaboration between co-workers. The factors influencing knowledge sharing, as defined by Sveiby and Simons, appear clearly in the work contexts of the informants of this thesis.

Many business-related factors are in some way interrelated; e.g., there is a link between product quality, client satisfaction, market share and profits (Antikainen et al., 2006). Clients can influence productivity (Kemppilä &

Mettänen, 2004), both through the quality of what they contribute and the resulting quality and quantity of the output (Ojasalo, 2003), and they can cause delays with their actions (Antikainen & Lönnqvist, 2005). Experience has a clear influence on the productivity of an organization (Boone & Ganeshan, 2001); increasing competence of the personnel and improving quality of business processes increase productivity. In addition, investments in intellectual capital may lead to better performance (Kujansivu, Lönnqvist, Jääskeläinen & Sillanpää, 2007.) In this thesis, quality of collaboration refers to factors that influence fluency in collaboration. Chapter 4 thoroughly explains these factors.

For the purposes of this thesis, organizational level is understood primarily as a contextual factor that is related to enablers and hindrances found in (individual work and) collaboration. As Antikainen and Lönnqvist (2005) show, organizational level is an important context that may include factors affecting fluency: since productivity is a part of the performance of an organization, they could derive *drivers of knowledge work productivity from factors affecting performance*. According to Laitila (2002, 20-21), preconditions for a successful knowledge-intensive organization can be listed as follows: quality of the output (Drucker, 1999), time-efficiency and control over time, knowledge and competence of employees (Sipilä, 1996), common needs of an organization and an employee (Drucker, 1999), good working environment, intense collaboration with the client (Sipilä, 1996), ability to convert knowledge beneficially, and, information flow between members of networks (Nonaka & Takeuchi, 1995). Antikainen and Lönnqvist (2005, 5) stated that because productivity is only a part of organizational performance, together with effectiveness, efficiency, quality, quality of work life, innovations, and profitability (Sink, 1983, 36), these aspects should be considered in more detail. From the general definition of productivity, Antikainen and Lönnqvist (2005) derived four groups of factors:

1) *Personal input factors* are usually invisible to other individuals, although they affect the knowledge worker: motivation, job satisfaction, personal network, affairs in personal life, and physical condition.
2) *Organizational input factors* are partly visible, partly invisible: human capital, innovative potential, organizational standards, practices and routines, information systems, quality of information, networks, time allocation, working environment, and aims.
3) *Process factors* include factors which are needed in order to transform inputs into outputs: organization of work, division of tasks, organization of decision-making, clarity of job descriptions, teamwork, knowledge sharing, delays and waiting, and ability to affect own work.
4) *Output factors* can mostly be observed by an outsider observer, although knowledge workers can often best analyze their own work process: innovations, quality, and utilization of innovations, time-efficiency, and, fulfillment of client's expectations.

Antikainen and Lönnqvist presented factors that can be applied to both individual work and collaboration, but they do not classify the factors into these two groups. However, although there are factors related to individual work in

their list, they appear to focus on collaboration. Most important to this study is their use of the input-process-output model with the context.

To summarize, conclusions of this thesis are made based on the reviewed literature and studies. Where factors affecting fluency in collaboration are concerned, researchers emphasized contextual factors such as physical and virtual environments, and other specifically organizational factors are also referenced (e.g., Bosch-Sijtsema et al., 2009; Chan et al., 2007; Davenport, 2005; Haynes, 2007; Heerwagen et al., 2004; Sveiby & Simons, 2002). Team or group related factors were studied by e.g., Bosch-Sijtsema et al. (2009), Janz et al. (1997), and Scott (2005). Surprisingly, management related factors were referenced only by Antikainen and Lönnqvist (2005), Janz et al. (1997), and Sveiby and Simons (2002). Clients and quality aspects were referenced by e.g., Antikainen et al. (2006), Kemppilä and Mettänen (2004), and Ojasalo (2003). Improving productivity and effectiveness was focused on collaboration to some extent, as well (e.g., Bosch-Sijtsema et al., 2009; Janz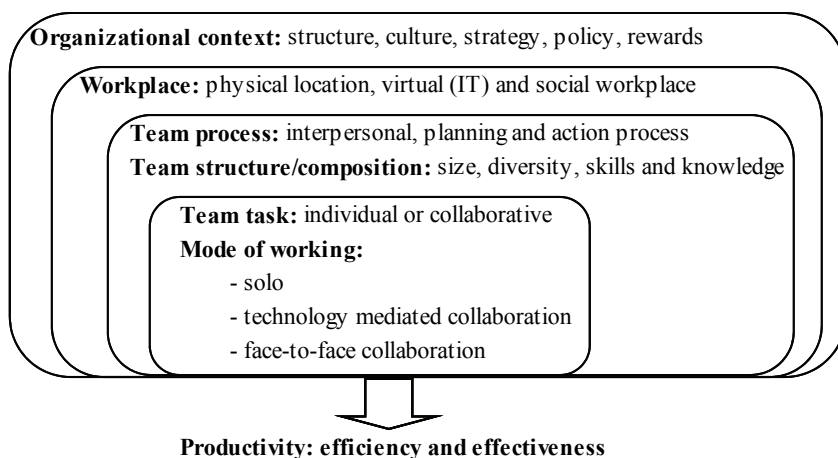 et al., 1997). Some groupings of factors were found in the context of collaboration: enabling and hindering elements of knowledge work productivity in distributed teams by Bosch-Sijtsema et al. (2009), factors influencing knowledge sharing by Sveiby and Simons (2002), and drivers of knowledge work productivity by Antikainen and Lönnqvist (2005). All of these classifications emphasized outcomes, although classification by Sveiby and Simons had also some elements referring to process. Classifications related to collaboration seemed to have somewhat clearer foci (e.g., teams, effectiveness, productivity) than classifications related to individual work.

2.3 Searching for enablers and hindrances affecting fluency experiences in knowledge-intensive work

In this section, the literature is summarized and the knowledge gap to be filled in this thesis is presented. After that, background theories influencing on the viewpoint of this thesis, and the constructed framework are presented.

2.3.1 Summary of the literature and the knowledge gap

In the beginning of the literature review, the nature of knowledge-intensive work was described. Key highlights, from the viewpoint of this thesis, are summarized here. As described in Section 2.1, knowledge-intensive work consists of individual (solo) work and collaboration; usually both are needed in order to accomplish tasks. Fragmentation of knowledge-intensive work is defined as a break in continuous work activity. Fragmentation has two components; length of time that individuals spend in a continuous activity, and frequency of interruptions occurring in the middle of that activity (Mark et al., 2005). Fragmentation of knowledge-intensive work may also be approached three dimensionally; effect of collocation, type of interruption, and resumption of work. The most evident factors influencing fluency experiences and fragmentation in knowledge-intensive work are (dispersed) workplaces, multitask-

ing and collaboration, interruptions, and the general nature of knowledge-intensive work (Figure 4).

General nature of knowledge-intensive work
individual (solo) work: tasks requiring concentration, asynchronous and synchronous mediated communication
collaboration: social interactions with other individuals in collocated work, e.g., face-to-face meetings
demanding both cognitively and socially: autonomous, creative, includes a lot of thinking

Fragmented knowledge-intensive work
fragmentation: a break in continuous work activity resulting from interruptions
two *components*: length of time individuals spend in a continuous activity and interruptions of that activity
three *dimensions*: effect of collocation, type of interruption, resumption of work

FLUENCY EXPERIENCES in knowledge-intensive work
fluency experiences: self-perceptions and feelings about the planned, effective, and goal-oriented flow of work, which are influenced by enablers and hindrances in work and working environment
fluency: expectation of planned, effective, and goal-oriented flow of work
productivity: outputs/inputs => input-process-output -model + context
effectiveness: achievement of intended goals + quality
flow of work: a starting point of fluency, mode of working without special emphases on goals, processes, environment, etc.
work engagement: a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption

Dispersed workplaces	Multitasking & collaboration	Interruptions
physical spaces: home, main (office), moving places, client/partner premises, hotels & cafés	*multitasking:* switching between tasks and communication partners	*interruptions:* beneficial when they concern individual's current working
virtual spaces: electronic collaborative working environments	*collaboration:* a system of behaviors including individual, focused work, and interaction	*disruptions:* detrimental interruptions that occur outside individual's current working sphere
mental/social spaces: cognitive constructs, thoughts, beliefs, ideas, and mental states shared by individuals	*working sphere:* a unit of work that has a unique time frame, involves a particular collaborative structure, and is oriented towards a specific purpose	*internal* interruptions: caused by an individual himself
		external interruptions: caused by external influences
	multitasking of working spheres is framed by the collaborations established with other individuals	type of tasks *may* influence on the nature of interruptions
	spontaneity, changing contexts, projects, problem-solving, social networks, digital & physical devices, the use of media (e-mail, communication chains)	the context of interruptions does *not* make a difference but individuals tend to complete interrupted tasks in less time with no difference in quality
	management of time, contacts, documents and physical space	
	when individuals are under time pressure, asynchronous communication may suit best for multitasking	

Figure 4. Summary of the factors that are emphasized in the context of fluency experiences, based on previous literature. Figure is constructed from multiple sources (e.g., González & Mark, 2004; 2005; Mark et al., 2005; Su & Mark, 2008; Vartiainen, 2007a, etc.)

Fluency was defined as the expectation of planned, effective, and goal-oriented flow of work. *Fluency experiences* refer to self-perceptions and feelings about the planned, effective, and goal-oriented flow of work, which are influenced by enablers and hindrances in work and working environment. The concepts of 'work engagement', 'flow of work', 'effectiveness', and 'productivity' are used in this thesis whenever they are needed per those defined meanings as presented at the end of the subsection 2.2.1. Because the literature to date does not discuss *experiences* related to fluency, productivity,

or effectiveness (it only discusses productivity and effectiveness as such), factors affecting fluency (*not* fluency experiences) were examined in subsections 2.2.2 and 2.2.3. However, the focus is on the concept 'fluency experience', the main concept of this thesis. Figure 4 illustrates these concepts, and their contribution to fluency experiences in knowledge-intensive work. As results reported in Chapter 4 show, these characteristics of knowledge-intensive work are mostly valid, but with some more emphasized than others.

In several studies, there are some elements or factors stated to have an influence on productivity or effectiveness of knowledge-intensive work. Usually these citations appear as minor points of these studies that have their focus on something else. Despite a deep search, this researcher was unable to find any scientific studies focusing on factors affecting *fluency* or *fluency experiences* in knowledge-intensive work studies, nor any focusing on enablers or hindrances. Table 1 lists the most frequently quoted factors, in the relevant literature, suggested to have an effect on productivity or effectiveness of knowledge-intensive work as such, or through performance of an organization. The elements presented in Table 1 are either (depending on the author), factors as such, or higher-level concepts including elements that could be grouped under the named concept. The literature to date usually lists, rather than explains, such factors. There is at least one question arising from the information presented in Table 1: Are there factors affecting fluency experiences in knowledge-intensive work *other* than those quoted in existing productivity-focused literature?

Table 1. A summary of the factors that may affect productivity or effectiveness of knowledge-intensive work. Categorization into individual work/collaboration was done by the author

Factor that affect or may affect productivity/effectiveness of knowledge-intensive work directly or through performance of an organization	Individual work/ collaboration	Literature referring to the factor
Nature of the task (task itself, complexity, mode in which the task is performed, etc.)	Individual and collaboration	Bosch-Sijtsema et al., 2009; Davenport, 2005; Drucker, 1999; Gladstein, 1984; Kemppilä & Lönnqvist, 2003; Mintzberg, 1973
Physical environment (external circumstances, location, place, etc.)	Individual and collaboration	Bosch-Sijtsema et al., 2009; Clements-Croome, 2000; Davenport, 2005; Davenport et al., 1996; Haynes, 2007; Heerwagen et al., 2004; Kemppilä & Lönnqvist, 2003; Mawson, 2002; Mintzberg, 1973; Pyöriä et al., 2005; Stewart, 1997/1999
Team (composition, structure, processes, etc.)	Collaboration	Bosch-Sijtsema et al., 2009; Davenport et al., 1996; Gladstein, 1984; Janz et al., 1997; Martins et al., 2004; Powell et al., 2004; Scott, 2005; Sveiby & Simons, 2002
Organizational context (structure, management, working conditions and climate, etc.)	Mostly collaboration, but also individual	Antikainen & Lönnqvist, 2005; Bond et al., 2006; Bosch-Sijtsema et al., 2009; Clements-Croome, 2000; Davenport et al., 2002; Kemppilä & Lönnqvist, 2003; Litschka et al., 2006; Mintzberg, 1973; Sveiby & Simons, 2002
Personal characteristics (competence, attitudes, emotions, etc.)	Mostly individual, but also collaboration	Antikainen & Lönnqvist, 2005; Clements-Croome, 2000; Kelloway & Barling, 2000; Kemppilä & Lönnqvist, 2003; Litschka et al., 2006; Martins et al., 2004; Mintzberg, 1973; Powell et al., 2004; Sveiby & Simons, 2002
Situational variables (interruptions, relationships, social interaction, etc.)	Mostly collaboration, but also individual	Davenport, 2005; Mawson, 2002; Mintzberg, 1973; Perlow, 1999
Learning	Mostly collaboration, but also individual	Davenport, 2005; Drucker, 1999
Clients and customers	Collaboration	Antikainen et al., 2006; Antikainen & Lönnqvist, 2005; Kemppilä & Mettänen, 2004; Ojasalo, 2003

Environmental factors were quoted most often by the researchers, and then organizational context, or the nature of the task. Despite the citations of factors that affect, or factors that *may* have an influence on, productivity or effectiveness of knowledge-intensive work, there are only a few statements that take a stand as to whether the factor *is* an enabler or a hindrance. Table 2 illustrates which factors are considered to be enablers and which hindrances, according to the existing literature.

Table 2. Enablers and hindrances affecting productivity or effectiveness of knowledge-intensive work. Categorization into individual work/collaboration was done by the author

Enablers affecting productivity/effectiveness of knowledge-intensive work	Individual work/ collaboration	Hindrances affecting productivity/effectiveness of knowledge-intensive work	Individual work/ collaboration
Interactions (Festinger et al., 1950; Kraut et al., 1990; Mintzberg, 1973; Perlow, 1999)	Collaboration	Interruptions and distractions (Banbury et al., 2001; Jones & Morris, 1992; Mandler, 1984; Mawson, 2002; Perlow, 1999; Vartiainen, 2007a; Weick, 1995)	Mostly individual
Continuing innovations, continuous learning and teaching (Drucker, 1999)	Collaboration and individual	Insufficient number of interactive activities (Perlow, 1999)	Mostly individual, but also collaboration
E-mails and other technologies, relationships, learning modes (Davenport, 2005)	Mostly individual, but also collaboration	Characteristics of transformational leadership (Kelloway & Barling, 2000)	Collaboration and individual
Part-time telework, working at home (Jay, 2002; Pyöriä et al., 2005)	Individual	Place mismatch (Mawson, 2002)	Individual
Increases in the competences, investments on intellectual capital (Kujansivu et al., 2007; Stewart, 1997/1999)	Individual and collaboration	Negative attitude towards e-mails and other technologies (Davenport, 2005)	Individual
Improvements in the information environment, explicit management of structural capital (Stewart, 1997/1999)	Mostly individual, but also collaboration	Negative beliefs (Antikainen & Lönnqvist, 2005)	Individual

Because the existing literature concentrates on productivity and effectiveness, and, because of the limited amount of scientific literature and lack of empirical evidence, the significance of *fluency* is not well understood, although fluency may be an important concept from the viewpoint of effectiveness, i.e., how well work processes succeed. Neither is it known if there are factors that enable or hinder fluency experiences in knowledge-intensive work. Therefore, there is a clear need for an empirical study that concentrates on fluency and aims at finding enablers and hindrances affecting fluency experiences in knowledge-intensive work, both individual and collaborative.

2.3.2 Analytic framework of the study

A few classifications were presented in subsections 2.2.2 and 2.2.3. Those classifications are important from the viewpoint of this thesis because of the categories, but there is one significant difference between them and the focus of this thesis. Those classifications *focus on the final outcome* (e.g., effectiveness which is understood as a state of well-being), *whereas this thesis focuses on the process through which the final outcomes can be achieved*. The input-process-output model with the context was chosen because it is suitable

for examination of individual work and collaboration. Although the model as such has been criticized, it is useful when the context is added. Organizations usually classify processes as either operational processes or managerial processes (see also e.g., Davenport, 1993a; 1993b; Davenport et al., 1996; APQC, 2009). Appendix 1 explains more thoroughly how processes are understood and how they are classified in this thesis.

In this thesis, analysis is done at individual level; an individual performs his work by processing issues mentally and by producing a certain outcome through his performance. Fluency experiences are constructed on basis of the informants' self-perceptions and feelings about the planned, effective, and goal-oriented flow of work, which are influenced by enablers and hindrances in work and working environment. In other words, fluency experiences emerge from an individual's mental space, i.e., thoughts and emotions related to the planned, effective, and goal-oriented flow of work. Factors that are related to fluency experiences are presumed to be the work (tasks and work processes) and the context (organizational and societal, and workplaces). In other words, as fluency is related to success, contextual and work factors are related to fluency experiences and make them understandable. In this thesis, the context has two roles. First, this author's definition of the context for the purposes of this thesis consists of the environment in which the work is done, and the processes through which the work is translated from inputs into outputs. Second, the context is one of the key categories of enablers and hindrances. Therefore, the context as such is understood as an explaining factor, but the context as a key category is understood as a ceiling concept for contextual enablers and hindrances. Figure 5 illustrates the focus of this thesis and it is considered as an analytic framework of this thesis, as well.
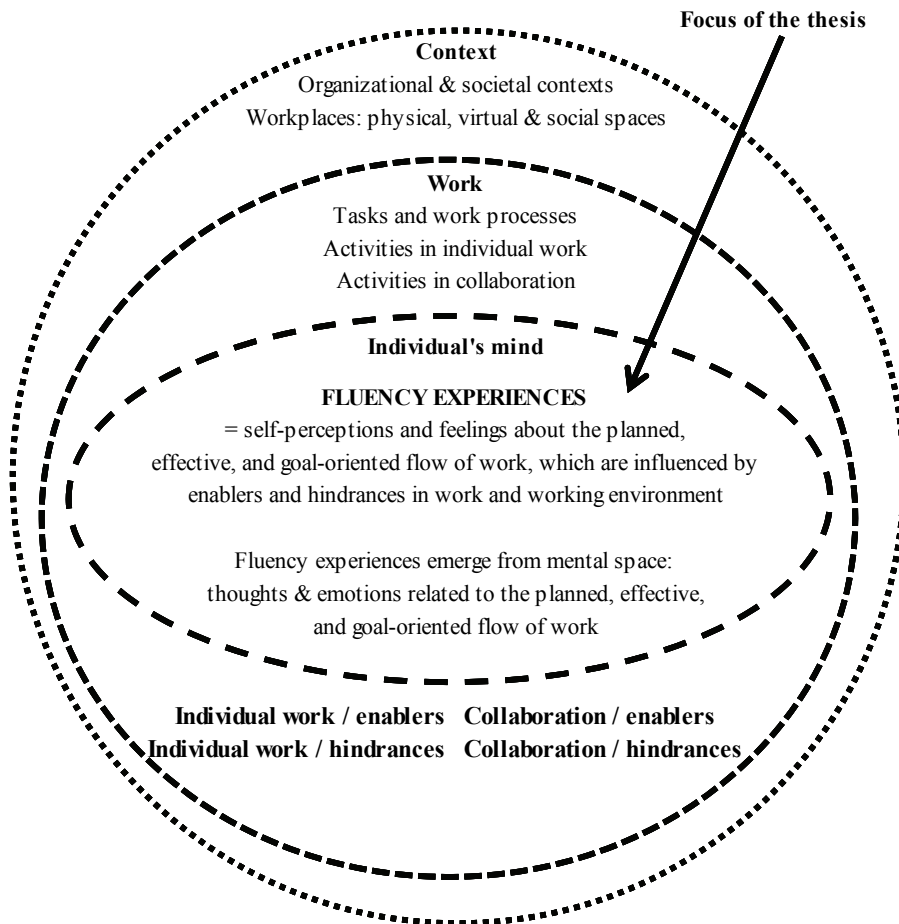
Figure 5. Analytic framework of the thesis

In this thesis, knowledge-intensive work is understood as a behavior focusing on the use of knowledge in organizations as defined by e.g., Nonaka & Takeuchi (1995), Nonaka et al. (2000) and Sveiby (1997). Knowledge-intensive work is also understood as a systematic entity because it can be defined as a goal-oriented behavior; the goal is knowledge use in its different forms. Perhaps the most well known form of knowledge use is described by Nonaka et al. (2000) in their SECI-process which concretized knowledge conversion modes (socialization, externalization, combination, and internalization), i.e., how knowledge is converted from tacit to explicit, and vice versa. Here the focus is on socialization, which is a process of converting new tacit knowledge through shared experiences. Tacit knowledge is difficult to formalize and it is often time and space specific; it then appears as e.g., mental models. In this thesis, mental models refer to mental space in the 'fluency experiences' section in Figure 5.

There is a considerable evidence, however, that individuals have limited access to the reasons for their evaluations (Wilson & Dunn, 2004). Individuals do

not have complete access to the actual reasons behind their feelings, attitudes, and judgment (Senge, 1990, 8; Wilson, 2002) and thus generate reasons that are consistent with cultural and personal theories and that are accessible in memory (Nisbett & Wilson, 1977). Individuals construct a new attitude, at least temporarily, that is consistent with the reasons that happen to come to mind, but which might not correspond to their implicit attitudes (Wilson & Dunn, 2004; Wilson, Dunn, Kraft & Lisle, 1989; Wilson, Hodges & LaFleur, 1995; Wilson, Lindsey & Schooler, 2000). This means that things are not necessarily as individuals think and interpret them; implicit attitudes do not appear in speech. Attitudes that happen to come to mind influence behavior and words. Because these mental models (i.e., subjective views) are deeply ingrained assumptions or generalizations (or even pictures or images) that influence how the informants understand the world and how they act (Senge, 1990, 8), there is a need to make them visible. Therefore, it was not possible to present the informants' views about the enablers and hindrances affecting *fluency* in their work as results, as such, but rather, *fluency experiences* had to be constructed based on the informants' self-perceptions and feelings.

The construction of fluency experiences required a systematic approach. The idea was to find factors that followed each other building chains of influence. As Senge (1990, 68-69) stated, systems thinking is a discipline for seeing wholes or structures that underlie complex situations, and, systems thinking offers a language that begins by restructuring how individuals think. In this thesis, reasoning patterns were used in an attempt to visualize this thinking by individuals. Senge (1990, 73-92) described causalities with the help of circles, whereas Kalliomäki-Levanto (2009) used chronological chains of events in order to construct categories in her thesis. A systematic approach is suitable for analyzing working contexts because knowledge-intensive work is usually done through purposeful object-oriented and usually communicative actions, in collaboration with other individuals (Vartiainen, 2007a, 28). Section 3.4 presents how the systematic approach is applied in this thesis. The next entire chapter (research design) shows the methods that were used to fill in the knowledge gap.

3 Research Design

This chapter describes the research design of this thesis: objective and research questions (Section 3.1), research approach and methods (Section 3.2), data gathering (Section 3.3), data analysis (Section 3.4), and phases of the study (Section 3.5). Description of data analysis is divided into:

1) Categories and chains derived from the data: fluency experiences (Subsection 3.4.1), which refer to categories and chains emerging from the data, and according to which enablers and hindrances affecting fluency experiences in knowledge-intensive work were classified.

2) Categories based on theory: contextual and work factors related to fluency experiences (Subsection 3.4.2), which refer to methods invented by other researchers – these methods were used for analyses of factors related to fluency experiences.

3.1 Objective and research questions

Starting point of this thesis was an observation that the expectation of planned, effective, and goal-oriented flow of work, called *fluency* in this thesis, causes both positive and negative feelings among knowledge workers. The author of this thesis was interested in why knowledge workers encountered those feelings, i.e., what were reasons for those feelings and exactly what those feelings were. This interest arose because it seemed that what happened during the work process also influenced the outcome. The first step was to find out what the literature offered on the topic. It became clear that research in the field is very fragmented. The author found multiple studies of knowledge work and even several studies discussing knowledge-intensive work from different viewpoints, e.g., effectiveness and productivity. However, scientific empirical studies concentrating on *fluency* in knowledge-intensive work, or enablers and hindrances affecting fluency experiences in knowledge-intensive work, seemed to be virtually nonexistent.

On basis of the existing productivity and effectiveness focused literature, some presumptions concerning fluency experiences in knowledge-intensive work might have been formulated, but the author wanted to approach the data inductively without any restrictions. For example, some studies emphasize work environment as source of enablers and hindrances in the context of knowledge work productivity (see e.g., Bosch-Sijtsema et al., 2009; Davenport, 2005; Heerwagen et al., 2004; Mawson, 2002). Interruptions and discontinuities have been studied, too (see e.g., Kalliomäki-Levanto, 2009; Mark et al., 2005; Perlow, 1999). However, the interest was first to analyze the data and then compare the findings with relevant productivity and effectiveness focused literature. Because the data of this thesis consisted of the informants' views, it needed to be abstracted. Therefore, the target of this thesis was to construct enablers and hindrances affecting fluency experiences in knowledge-intensive

individual work and collaboration, from the informants' self-perceptions and feelings. In addition, factors related to fluency experiences were analyzed. The contribution of this thesis is a generic model, which describes fluency experiences in knowledge-intensive individual work and collaboration. The model introduces fluency experiences of knowledge workers, and contextual and work factors related to their fluency experiences.

The research questions of this thesis were formulated as follows:

1) *What are the fluency experiences in knowledge-intensive individual work and collaboration?*
2) *What are the enablers and hindrances affecting fluency experiences in knowledge-intensive individual work and collaboration?*

The concept 'enabler' can be understood as promoting, progressing, encouraging, or contributing. The concept 'hindrance' can be understood as delaying, preventing, or disabling. The research questions are important because they express the target of this thesis. Plausible theory and empirical evidence that offer feasible answers *exactly* to these questions are lacking because the studies usually focus on productivity and effectiveness. However, productivity and effectiveness are closely related to fluency, and therefore, fluency can be approached with the help of these concepts. The phenomenon of knowledge intensive work itself is important because knowledge-intensive work comprises perhaps the most significant type of work today.

3.2   Research approach and methods

Research methods are usually classified into either a positive or a hermeneutic philosophy oriented approach. In the hermeneutic philosophy oriented approach, the researcher's pre-understanding is the starting point. Hermeneutic philosophy searches for interpretations and understanding by paying particular attention to the research subject's context and the purpose of action. An essential part of hermeneutic philosophy is the hermeneutic circle, where theory and empiricism intersect and dialogue. In addition, a certain subjectivity is part of the hermeneutic philosophy, because the researcher's knowledge based on her experience may have a significant role (see e.g., Metsämuuronen, 2000, 11; Varto, 1996, 58–59; Wahlgrén, 1995, 54.) This thesis follows hermeneutic philosophy and principles, because the main objective was to identify factors affecting fluency experiences, to interpret them, and to understand whether the identified elements are enablers or hindrances. However, as this thesis strongly emphasizes activities of living creatures in a particular context, there is also a kind of pragmatic interest in the knowledge; the objective is to understand and explain, in order to find new ways to evaluate knowledge-intensive work, and to break out of the ordinary productivity-oriented thinking. The approach of this thesis is somewhat open, which means that the data analysis was done without beforehand designed *exact* analytic framework. Therefore, this thesis does not strictly follow (and cannot be classified under) any specific research approach. This kind of openness was important because the objective was to construct categories, chains, and patterns emerging from the data.

Inductive and abductive reasoning are both applied in this thesis. *Inductive reasoning* is appropriate for a group of observations with the objective of building generalizations or theories. In inductive reasoning, the researcher begins to detect patterns and regularities from the data, continues formulating some tentative hypotheses for examination, and finally ends up developing some general conclusions or theories (e.g., Heit, 2000; Trochim, 2006). In this thesis, 'a group of observations' refers to the data gathered from the informants, and interpreted by the author, and finally, it refers to the conclusions made by the author, based on that data. Chains of fluency experiences are kinds of cause and effect chains, constructed by the author, which aspire to probable outcome, not absolute truth. In this thesis, it is more a question of expanding existing knowledge than aspiring to an absolute truth.

Abductive reasoning is suitable when the desire is to make sense of patterns, explanations, or regularities behind the empirical phenomenon. It emphasizes the best possible explanation based on the empirical data. Abductive reasoning is based on inductive reasoning, but it utilizes deductive reasoning, as well. In other words, abductive reasoning has its base in empirical data but it does not exclude theory. It takes the researcher's interest in some presumptions of significant issues into consideration (for abductive reasoning, see e.g., Hallberg, 2006; Harman, 1965; Richardson & Kramer, 2006). The interest of this thesis was to interpret and to illustrate the informants' ways of rationalizing their views about fluency and factors affecting them. Therefore, the author constructed chains and patterns based on these fluency experiences of the informants. On the other hand, theoretical frameworks were used for analyses and interpretations, as well. This mixture of theoretical frameworks and empirically based constructed chains and patterns refer strongly to abductive reasoning. However, abductive reasoning has a notable weakness; it does not tell *how* the phenomenon is made visible (Niiniluoto, 1999). An attempt to overcome this inherent weakness was made by describing data analysis and the phases of the study, as thoroughly as possible.

This thesis is characterized as a *multiple-case* study, because the objective is to gather data from the individual life experiences of the nine informants. "Building theory from case studies is a research strategy that involves using one or more cases to create theoretical constructs, propositions and/or midrange theory from case-based, empirical evidence" (Eisenhardt, 1989). Case studies are rich, empirical descriptions of particular examples of a phenomenon that are typically based on a variety of data sources (Yin, 1994). The central notion is to use cases as the basis from which to develop a model inductively. "The theory is emergent in the sense that it is situated in and developed by recognizing patterns of relationships among constructs within and across cases *and* their underlying logical arguments" (Eisenhardt, 1989), i.e., each case serves as a distinct experiment that stands on its own as an analytical unit. Case studies emphasize the rich, real-world context in which the phenomena occur. "The theory-building process occurs via recursive cycling among the case data, emerging theory, and later, extant literature" (Eisenhardt & Graebner, 2007). Thus, this cycling character resembles the hermeneutic circle. "A major reason for the popularity and relevance of theory building from case studies is that it is

one of the best of the bridges from rich qualitative evidence to mainstream deductive research" (Eisenhardt & Graebner, 2007).

The target of this thesis is to develop a model, not to test theory. Therefore, theoretical sampling is appropriate. Theoretical sampling means that cases are selected because they are particularly suitable for illuminating and extending relationships and logic among constructs. While single-case studies can richly describe the existence of a phenomenon (Siggelkow, 2007), multiple-case studies typically provide a stronger base for theory building (Yin, 1994) because the theory is better grounded, more accurate, and more generalizable when it is based on multiple case experiments. "Constructs and relationships are more precisely delineated because it is easier to determine accurate definitions and appropriate levels of construct abstraction from multiple cases. Multiple cases also enable broader exploration of research questions and theoretical elaboration. In multiple-case studies, case numbers are typically small" (Eisenhardt & Graebner, 2007). The author asked fifteen knowledge workers to participate in this study, but six refused; two individuals gave no reason for their refusal, and four refused because the burden of data gathering was excessive during seasonal or permanent work overload. Although this thesis then comprises just nine cases, this is a sufficient number for the purposes of this thesis and to offer a valid sample.

"Interviews are a very efficient way to gather rich, empirical data, especially when the phenomenon of interest is highly episodic and infrequent… The challenge of interview data is best mitigated by data collection approaches that limit bias. A key approach is using highly knowledgeable informants who view the focal phenomena from diverse perspectives. These informants can include organizational actors from different hierarchical levels, functional areas, groups, and geographies, as well as actors from other relevant organizations and outside observers" (Eisenhardt & Graebner, 2007). Another key approach to mitigating bias is to combine retrospective and real-time cases (Leonard-Barton, 1990). In this thesis, interviews were one method of data gathering. The informants were chosen from different professions in order to ensure diverse perspectives on knowledge-intensive work. The informants were from different hierarchical levels, different organizations or at least worked at different times in the same organizations, and they all were considered to have as deep knowledge of knowledge-intensive work as possible. Nearly all of the informants worked in Helsinki and within its environment; one of the informants worked far from the Helsinki area, and another had clients around the country. Three of the informants worked in the same organization, but only one was currently employed by the organization, with the other two former employees.

3.3   Data gathering

All of the informants for this thesis are knowledge workers. This is because they are known to be the best informants related to issues regarding their work (e.g., Alvesson, 2004; Davenport, 2005; Sveiby, 1997). One of the most important tasks of a researcher is to make sure that the informants are familiar

with the phenomenon that is the focus of the study (Burns & Grove, 1993, 82-83; Eisenhardt & Graebner, 2007). The informants were selected from a variety of work settings to gain a richer variety of data (Eisenhardt & Graebner, 2007). A rich variety of data was achievable, although there were just nine informants. Each of the nine informants worked in a different kind of work setting, although some of them worked in the same company. Because of the sizes of the organizations and because the informants did not primarily work together (or even at the same time in the organization), the contexts can reasonably be deemed different from each other. Informants 1, 4 and 5 were employed by the same organization, and informants 3 and 6 were employed by another organization. The nine informants therefore represented six different organizations.

Three of the nine informants are male, the rest of them female. At the time of data gathering (Fall 2009), the average age of the informants was forty-seven years, ranging from twenty-nine to sixty years. Average knowledge-intensive work experience of the informants was approximately nineteen years, ranging from four to twenty-nine years. Average length of employment in present workplace was eleven years, ranging from one to twenty-nine years. Fields in which the informants worked were information technology services, human resource services, education, and pharmacy. Job titles of the informants varied from analyst to manager and entrepreneur. Table 3 shows background information. Section 4.5 more thoroughly describes the informants' work tasks, complexity of their tasks, and working environments, because these details form the contexts of the cases. Tables 6 and 7 in subsection 4.4.1 show examples of task contents and individual tasks.

Table 3. Background data

	Informant/Case	Age	Gender	Years in KW	Years in firm	Field	Work	Duration of interview	Text pages for analyses
1	Sales Manager	46	female	24	10	IT/HR Services	Owner-Manager, Sales	2,25	12
2	Education Specialist	56	female	20	15	Education	Official, Coach	2,50	19
3	Project Manager	53	female	28	28	Education	Project Manager, Coach	2,00	12
4	Team Leader	32	female	6	5	IT/HR Services	Team Leader, HR Specialist	2,50	14
5	HR Specialist	42	female	4	1	IT/HR Services	Consultant, Project Manager	3,00	20
6	Business Line Manager	60	male	29	29	Education	Manager, Business Line	4,00	27
7	HR Analyst	29	male	4	4	HR Services	HR Analyst, Project Manager	3,00	21
8	Entrepreneur	50	female	25	2	Pharmacy	Entrepreneur	1,50	10
9	IT Expert	55	male	29	6	IT Services	IT Expert	2,75	18
							Total	23,50	153

Data was gathered in two phases; first using texts written by the informants, and then using in-depth interviews. In the first phase of data gathering, the author formulated questions (see Appendix 2) that the informants were expected to answer in writing. Questions were then sent by e-mail to the informants. All of the informants wrote their answers to the questions as part of their regular work and sent them by e-mail back to the author. Then, the author familiarized herself fully with the informants' texts. In the second phase of data gathering, interviews were scheduled and all informants were interviewed in a semi-structured way, i.e., the author asked the same questions of all informants (see Appendix 3). Some additional questions were used with some informants for

clarification, after reading some of the informants' texts, and to ensure that the author had understood exactly what the informants meant by their answers. Interviews lasted from one and a half to four hours (see Table 3 for duration of interview per informant). The informants were allowed to manage time in interviews and to answer interview questions in any order that they felt comfortable. Interviews were first stored with the author's intelligent mobile phone and then transferred to the author's laptop immediately after the interview. Each interview was then transcribed, question by question and answer by answer, as soon as possible. Texts based on interviews were combined with texts written by the informants; lengths of the texts produced in this way varied from ten to twenty-seven pages (see Table 3 for text pages for analyses, per informant). Total amount of text pages for analyses was 153 (font Times New Roman, font size 12, line space 1).

The informants were informed about the focus of this study when the author inquired their willingness to participate in the study. The focus was reminded when the author sent questions to answer in writing, and again when the author sent the interview questions to the informants. During the interviews, the author could evaluate whether the informants had understood the focus as the author meant it, by asking detailed questions. The author was interested in how the informants rationalized their views about fluency and factors affecting them. Based on these views, the author constructed fluency experience chains and reasoning patterns as they appear in this thesis.

3.4 Data analysis

Each case was analyzed with two objectives in mind; to identify enablers and hindrances affecting fluency experiences in their work and to identify factors related to fluency experiences. Enablers and hindrances affecting fluency experiences were constructed on the basis of the informants' self-perceptions, and factors related to fluency experiences with the help of relevant theory-based frameworks. The frameworks used for analyses are presented in the following two subsections. Categories were derived from the data as systematically as possible, and factors related to fluency experiences were analyzed with the help of theory-based frameworks as systematically as possible. This systematic way of analysis is emphasized in order to diminish the inevitable certain subjectivity that is present in this thesis.

3.4.1 Data-based analysis: fluency experiences

Texts written by the informants combined with the texts produced on basis of interviews formed primary data. This primary data was first analyzed with the help of Atlas.ti software, in order to find all quotations referring to fluency, and enablers and hindrances affecting fluency experiences in the informants' work. 'Quotations' refer to reasonable entities of sentences and clauses in which the informants described their views about factors or issues that affect the planned, effective, and goal-oriented flow of work; these quotations are called *fluency experiences* in this thesis. Quotations of the informants also included one or

several reasons for their statements, i.e., why they perceived a certain factor as an enabler or a hindrance. 'Reasons' refer here to causes that the informants gave to ground their views about enabling and hindering factors. Data was analyzed in five phases, which are explained next: 1) coding the quotations, 2) coding the reasoning quotations, 3) grouping the categories, 4) arranging the fluency experiences into chains, and 5) constructing the common language chains.

In the first phase of data analysis, quotations were coded as follows:
   a) Quotations were chosen for analysis if they had a clear statement that was relevant to this thesis
   b) Quotations referring to enabling, promoting, progressing, encouraging, or contributing factors or issues were coded as 'enablers'
   c) Quotations referring to hindering, delaying, preventing, or disabling factors or issues were coded as 'hindrances'

Total number of single quotations referring to enablers and hindrances was 765, which was divided nearly equally between enablers (forty-eight percent of quotations) and hindrances (fifty-two percent of quotations). Table 4 shows how single quotations for enablers and hindrances were divided, by case.

Table 4. Frequencies of quotations for enablers and hindrances

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	total
Enablers	23	33	32	49	44	62	53	34	44	**374**
Hindrances	57	48	34	46	44	44	49	20	49	**391**
Quotations, total	**80**	**81**	**66**	**95**	**88**	**106**	**102**	**54**	**93**	**765**

However, a single quotation usually included not only one reason for the quotation but several reasons, and in some cases, both enablers and hindrances were included in a single quotation. During the second phase of data analysis, quotations that gave reasons for enablers and hindrances were coded sentence by sentence, simultaneously compressing them into short titles that described the contents of the quotations as well as possible. The initial number of titles, i.e., codes that are considered as *categories* going forward, was seventy. Each category that was synonymous with another category was combined into a single new category, and, after several such combining actions, forty-one categories remained. These categories are listed and explained in Appendix 4. Total number of reasoning quotations included in the forty-one categories, was 1,405, including 676 quotations for enablers and 729 quotations for hindrances. Frequencies for quotations that reason enablers and hindrances are shown case by case in Appendices 5 and 6.

In the third phase of data analysis, categories derived from the informants' fluency experiences were grouped into ***main categories*** that present reasonable entities (i.e., a group of categories that refer to the named main categories), according to the meaning and the nature of the categories. Nine main categories resulted:
   1) *Self*, which refers to issues related to a person himself
   2) *Work*, which refers to issues related to human labor

3) *External collaboration*, which refers to collaboration between the individual and individuals from other organizations

4) *Internal collaboration*, which refers to collaboration between individuals in the same organization by which the individual is employed

5) *Quality of collaboration*, which refers to issues related to collaboration that may be a part of both external and internal collaboration

6) *Situation*, which refers to a particular condition or set of circumstances related to work

7) *Management*, which refers to human actions to facilitate the production of useful outcomes from a system (i.e., organization), or act of getting individuals together to accomplish desired goals

8) *Organization*, which refers to a social arrangement which pursues collective goals, controls its own performance, and has a boundary separating it from its environment

9) *Society*, which refers to economic, social or industrial infrastructure, made up of a varied collection of individuals

Next, these main categories were grouped into **key categories** that, again, present reasonable entities (i.e., a group of main categories that refer to the named key categories), according to the meaning and the nature of the main categories. This means that key categories are understood as ceiling concepts for enablers and hindrances that were categorized into defined main categories. Three key categories resulted:

1) *Self*, which refers to a person. This key category includes main categories 'self' and 'work'.

2) *Collaboration*, which refers to a recursive process in which two or more individuals or organizations work together in an intersection of common goals. This key category includes main categories 'external collaboration', 'internal collaboration', and 'quality of collaboration'.

3) *Context*, which refers to surroundings, circumstances, environment, background, or settings, which determine, specify, or clarify the meaning of an event. This key category includes main categories 'situation', 'management', 'organization', and 'society'.

Appendix 7 shows, using an extract of the data, how the author has found enablers and hindrances, reasons which emerged for these factors, and how the quotations were categorized, grouped into main categories, and finally, into key categories. The three phases of data analysis described helped to construct a general view about factors that knowledge workers perceived as enablers and hindrances affecting fluency experiences in their work.

In the fourth phase of data analysis, fluency experiences were arranged into chains that embody situations, events, and emotions that led to fluency experiences of the informants. This was done in order to find regularities between enablers and hindrances. The chains were constructed based on the quoted texts: first, a fluency experience was derived from the informant's view, and then, reasons for the view were arranged into a chain according to the order in which they appeared in the quotation. Naturally, rationality of the chains was controlled during the construction. Fluency experiences that did not include any reason, or, fluency experiences that included only one reason, were left out

of the chains because this kind of short reasoning was implied a statement that might be thoughtless. This resulted in each constructed chain including at least two reasons per fluency experience. On the other hand, no one gave more than five reasons per fluency experience. A total of 137 chains of fluency experiences were constructed in this way and included in further analysis.

In the fifth phase of data analysis, each chain was translated into common language by employing as few core words as possible to describe the contents of the chains. This was done to find possible regularities and patterns in the chains. At the same time, whenever there was more than one category linked with a reason, only one of the categories was chosen. Finally, each reason had only one category so the chains could be compared. Appendix 8 shows how the chains were constructed. On average, chains included three reasons. Appendix 9 shows the number of reasons per chain. Appendices 10a-10d present the constructed common language chains.

Next, common language chains were examined in groups of main categories, and reasoning patterns found in this comparison were constructed. Reasoning patterns refer to the informants' ways of rationalizing their views about fluency and factors affecting them, and they are the author's generalized interpretations of fluency experience chains presented in Appendices 10a-10d. Altogether thirty-two reasoning patterns were identified; patterns are presented and explained in sections 4.1 and 4.2, each in relevant context. Section 4.5 also presents patterns, in figures that illustrate fluency experiences and the factors related to them for each case. Some fluency experience chains are used as examples in sections 4.1 and 4.2. These quotations by the informants help the reader to evaluate the interpretations that the author has made.

Sections 4.1 and 4.2 present results of categorized and chain-formed enablers and hindrances as follows: 1) results for individual work and collaboration are presented separately; 2) enablers and hindrances are presented separately in individual work and in collaboration; 3) enablers and hindrances are presented according to grouped main categories, with the main category including the most chains presented first. Each subsubsection in subsections 4.1.1, 4.1.2, 4.2.1, and 4.2.2 is named after the main category explained in that subsubsection. Categories included in these main categories are presented as unnumbered subsubsubheadings and explained thoroughly in each subsubsection. Table 5 lists reporting levels, main categories, categories, and frequencies, and also shows the subsubsections in which each of the main categories are explained. Table 5 also shows the number of informants referring to each category, number of quotations referring to the named categories, number of chains constructed per named category, number of chains per main category, and, number of chains per enablers (individual/collaboration) and hindrances (individual/collaboration).

Enablers and hindrances repeatedly emerging from the chains resulted in twenty-seven factors, including 924 quotations for fluency experiences with reasoning by the informants, of which 395 referred to enablers and 529 referred to hindrances. Sixty-six percent (924 of 1,405) of all quotations for fluency experiences with reasoning were included in final analysis. At least six of the nine informants (and at least twice per informant) cited nearly all of these twenty-

seven factors. However, there were two exceptions: 1) 'Economic recession' emerged because of societal-economic reasons (i.e., worldwide economic recession). This factor especially appeared in individual work and it was included in the analysis, although only five of the informants cited it. 2) 'Unexpected situations' appeared especially in collaboration and was quoted by only five of the informants, as well.

Table 5. Reporting levels, main categories, categories, and frequencies

Reporting level	Enablers/ hindrances	Main category	Category	Number of informants referring to the category	Number of quotations referring to the category	Number of chains per category	Number of chains per main category	Number of chains per enabler/ hindrance
Individual (Section 4.1)	**Enablers** (Subsection 4.1.1)	**Situation** (Subsubsection 4.1.1.1)	Suitable physical premises	7	24	12		
			Well-functioning devices	9	48	2	14	
		Self (Subsubsection 4.1.1.2)	Positive attitude	9	95	8		
			Positive interest	9	62	2	10	24
	Hindrances (Subsection 4.1.2)	**Situation** (Subsubsection 4.1.2.1)	Unsuitable physical premises	9	36	14		
			Poorly functioning devices	9	42	6	20	
		Self (Subsubsection 4.1.2.2)	Negative attitude	8	36	11		
			Negative interest	6	20	6		
			Negative emotions	8	29	2	19	
		Society (Subsubsection 4.1.2.3)	Economic recession	5	14	3	3	42
Collaboration (Section 4.2)	**Enablers** (Subsection 4.2.1)	**Quality of collaboration** (Subsubsection 4.2.1.1)	Availability of face-to-face contacts	9	29	3		
			Positive atmosphere	8	29	3		
			Positive influence of social networks	8	26	2	8	
		Situation (Subsubsection 4.2.1.2)	Suitable physical premises	7	24	7	7	
		Management (Subsubsection 4.2.1.3)	Managerial support	8	29	6	6	
		Internal collaboration (Subsubsection 4.2.1.4)	Positive influence of co-workers	7	29	5	5	26
	Hindrances (Subsection 4.2.2)	**Management** (Subsubsection 4.2.2.1)	Managerial problems	7	63	6		
			Lack of resources	6	22	6		
			Lack of information	8	17	2	14	
		Situation (Subsubsection 4.2.2.2)	Unsuitable physical premises	9	36	7		
			Unexpected situations	5	16	2	9	
		Quality of collaboration (Subsubsection 4.2.2.3)	Scheduling problems	9	28	4		
			Communication problems	7	27	3	7	
		External collaboration (Subsubsection 4.2.2.4)	Negative cultural differences	8	19	3		
			Problems of clients/partners	6	24	3	6	
		Internal collaboration (Subsubsection 4.2.2.5)	Negative influence of co-workers	6	32	6	6	
		Organization (Subsubsection 4.2.2.6)	Negative organizational culture	8	68	3	3	45
					924	137	137	137

The more chains a category has, the more informants refer to it, and, the more quotations refer to it, the more common and reliable the enabler/hindrance in question is. Chains strengthen the reliability because enablers and hindrances are better justified with multiple reasons than those with single statements and no reasoning. In addition, reasoning patterns opened the opportunity of understanding the informants' thinking and argumentation more thoroughly. They also helped to bring awareness to relationships between categories, main categories, and key categories. These connections also provided a certain kind of 'cause and effect' perspective to the relationships.

3.4.2 Theory-based analysis: work and context factors related to fluency experiences

Multi-disciplinary research questions and research problems are typical for the research area of knowledge-intensive work. Few researchers approach a research problem from only one perspective or framework (see e.g., Köppä & Vuori, 2007, 61; Lampela, 2007, 85-90). In this thesis, categories based on fluency experiences were derived from data because there was no existing suitable framework available. However, factors related to fluency experiences could be found with help of existing theories. From the perspective of relevance to this

thesis, the most important frameworks relate to *work and context*: as fluency experiences are considered as process factors when input-process-output model is concerned, factors related to fluency experiences are work (input factor) and context (context in which the work is done). Next, these theories and frameworks are explained. Subsection 4.4.1 contains a cross-case analysis based on the frameworks presented in this subsection. The result of the analysis is included in 'Analytic framework for the cases', presented in subsection 4.4.2, as well.

Work related factors consist of 'Work processes', 'Complexity of tasks', 'Activities in individual work', 'Activities in collaboration', and 'Types of interruptions'. Context related factors consist of 'Workplace', which approaches places from multiple viewpoints. These particular frameworks were chosen because the frameworks on which these factors are based have been used successfully in studies that focus on knowledge-intensive work. Another reason for choosing these frameworks was that they were determined to best relate to fluency experiences which are more 'invisible' than these 'visible' factors (visibility refers to issues that can be quantified with help of the frameworks).

The framework for analyzing the *processes* in which the informants were involved during their work was developed based on the contributions of several researchers (see e.g., Davenport, 1993a; 1993b; APQC, 2009). Processes were classified into operational processes and managerial processes, and the framework (see Appendix 1) illustrates cross-field processes. The informants' working time divided between processes was estimated as follows: First, the informants' individual activities and collaborative activities were classified into process groups following Process Classification Framework by APQC (2009). Second, main mode of working was taken into account by comparing time spent on group categories of individual activities and collaborative activities. This resulted in ascertaining the most important processes that the informants followed in their work; Figure 7 in subsection 4.4.1 illustrates this.

Complexity of tasks, i.e., *cognitive requirements of tasks*, was the result of categorizing the informants' work tasks from routine to creative tasks, based on Hacker (2005, 239-250). The informants, using Table 1 presented in Appendix 3, first estimated the cognitive requirements of their tasks. The informants were also asked to give examples of their tasks. Then, the author evaluated the informants' estimates, compared estimates with the informants' work descriptions, and finally ended up with the shown percentages. See Table 6 in subsection 4.4.1 for levels of cognitive requirements and examples of tasks classified at each level. Categories of cognitive requirements of tasks were then organized into three group categories, which are presented in Figure 8 in subsection 4.4.1. This additional grouping was made in order to illustrate and summarize the results.

Activities in individual work of the informants were grouped according to generic knowledge work task categories adapted from Harrison et al. (2004, 54-55). Tasks conducted in solitude, or asynchronously mediated, were classified as 'Activities in individual work'. Figure 1 in Appendix 3 was presented to the informants, which were asked to estimate their time use for each task group and to give examples of their tasks. Then, the author evaluated the informants'

estimations, and finally ended up to the chosen percentages. See Table 7 in subsection 4.4.1 for categories and examples of individual activities of the informants. Categories of individual activities were grouped into four group categories, which are presented in Figure 9 in subsection 4.4.1. This additional grouping was made in order to illustrate and summarize the results.

Activities in collaboration were analyzed with a framework developed by McGrath (1984, 61; see also McGrath & Hollingshead, 1994, 67), see Appendix 11 for further information. Work tasks conducted in face-to-face collaboration with other individuals, or synchronously mediated, were classified as 'Activities in collaboration'. Figure 2 in Appendix 3 was presented to the informants, who were asked to estimate their time use for each task group and to give examples of their tasks. Then, the author evaluated the informants' estimations, and finally ended up with the shown percentages. See subsection 4.4.1 for categories and examples of collaborative activities of the informants. Collaborative activities were grouped into four categories based on McGrath's classification; Figure 10 in subsection 4.4.1 illustrates these categories.

Types of interruptions were used as such, according to the informants' assessments. This was because the informants were considered to have the best knowledge of this issue. For the same reason, the author did not define the types of interruptions. The informants were given the freedom to define *how* they were interrupted. Four types of interruptions resulted, as Figure 11 in subsection 4.4.1 shows. If the author had separately asked for internal (i.e., self-initiated) interruptions, it is possible that there would have been more quotations for internal interruptions. However, the author's intention was not to steer conversations in desired directions; it was more important to give the informants the opportunity to describe how they experienced interruptions.

Where context related factors (organizational and societal contexts, and workplaces) are concerned, the framework developed by Vartiainen (see e.g., 2007a, 28-31) was used to analyze what kind of tasks the informants performed in each physical *workplace*, virtual devices, other individuals, and social situations that each place includes, and, thoughts and emotions each place arouses in the minds of the informants. In this framework, individual and collaborative contexts were outlined as follows. First, each *individual* exists in a psychological field of forces that determines and limits the individual's behavior. This emphasizes the meaning of personal perceptions and interpretations of the contexts. As Lewin (1972) put it, this 'life space' stands for a highly subjective 'space' dealing with the world as the individual sees it. Second, the concept of '*ba*' (Nonaka et al., 2000) focuses on *shared contexts*, which is useful for differentiating various spaces in collaborative work. *Ba* unifies the physical space (e.g., office, home), the virtual space (e.g., e-mail, Skype), and the mental or social space (e.g., common experiences, values, ideas); these places are particular positions in spaces in relation to others in which individual knowledge workers and groups of individuals collaborate. The use of the various spaces varies, depending on the content and interdependence of work (Vartiainen, 2007a, 28-31). Based on the framework shown in Table 1 in Appendix 2 and Table 2 in Appendix 3, the informants were first asked to specify places in which they worked, and estimate percentages of their working time spent in

each place. Then the informants were asked about virtual tools, other individuals and social situations, and thoughts and emotions related to each place. The informants' estimations about time spent in each place were used as given, because the informants were determined to have the best knowledge of this issue – Figure 12 in subsection 4.4.1 illustrates time spent in each place. Based on the informants' quotations, a synthesis of how the informants used each workplace (i.e., purposes of using different physical places for work, tool use, social situations, and emotions related to each place) was constructed as Tables 8a-8e show, in subsection 4.4.1.

3.5 Phases of the study

To summarize the design of this research, phases of the study are presented next. Figure 6 outlines the process, to help the reader better to understand the study process. As Figure 6 shows, the study process followed hermeneutic principles, as evidenced by the author's moving back and forth between phases, literature review and empiricism, i.e., revisiting earlier phases each time some issue needed sharpening. Phases of the study process were as follows:
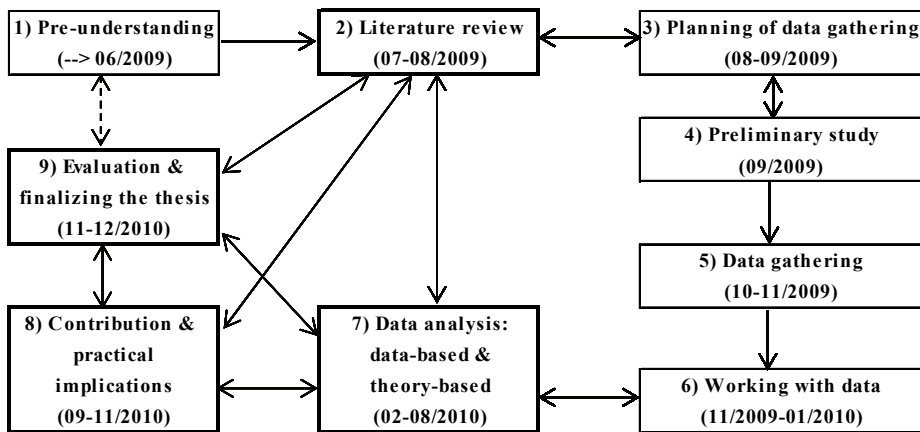
Figure 6. Phases of the study

Phase 1: Acquiring pre-understanding about the topic (up through June 2009). An observation that the planned, effective, and goal-oriented flow of work causes both positive and negative feelings among knowledge workers piqued the author's interest in the topic. Pre-understanding of the topic was acquired through familiarization with the relevant literature and by reflecting on the author's own tasks and work experience in knowledge-intensive organizations. Literature review included studies and other literature emphasizing knowledge-intensive work, knowledge workers, productivity and effectiveness of knowledge-intensive work, and, factors affecting productivity and effectiveness of knowledge-intensive work.

Phase 2: Literature review outline (July-August 2009). On basis of the literature and studies mentioned in Phase 1, a topic overview was outlined by mapping relevant discussion. The focus of the thesis was then defined, and preliminary research questions were drafted.

Phase 3: Planning of data gathering (August-September 2009). Methods of data gathering were evaluated and questions for the informants were drafted. With no clear indication for the best data gathering method, the idea of using questionnaires requiring written answers, plus in depth interviews, emerged. Written answers offered the informants the opportunity to both reflect on their work and orient to the interview. Observation and self-reflection diaries were rejected as data gathering methods as demanding excessive time resources from both the informants and the author.

Phase 4: Preliminary study (September 2009). Preliminary study was conducted by testing the drafted narrative response questions and interview questions, analyzing the data gathered with these methods, and writing out a case description. The primary objective of the preliminary study was to design data gathering, but results were so rich that it was included in the thesis. This proved to be prudent, with the total number of cases totaling just nine. Case 1 formed the data for the preliminary study. With help of this first case, questions for data gathering phases 1 and 2 were designed as they appear in Appendices 2 and 3.

Phase 5: Data gathering (October-November 2009). Data was gathered systematically with the questions designed during phase 4. First, the questions were sent to the informants and after returning their answers, the informants were given the option to decide the most suitable time and place for an interview. The reason for this was an assumption that the informants manage their time themselves, and therefore, know the most suitable time in their schedules and the most comfortable place for an interview. This allowed an atmosphere of trust and relaxation for each interview and the informants were able to speak confidentially. Interviews were first stored with an intelligent mobile phone and then immediately transferred to laptop after the interview. Each of the informants was asked how he or she experienced reading and responding in writing to the questionnaire, and the interview. As a rule, the informants initially experienced writing about their own work and answering the interview questions to be difficult, because they normally did not think about these issues so deeply. However, when they concentrated on the topic, the task became easier. Of note, the informants found participation in this study to be an interesting experience that helped them to analyze their own thinking related to their work experience, as a whole. According to the informants, their understanding of their own work and use of different kinds of work environments broadened. Many of the informants also learned how to analyze their work in a more versatile manner.

Phase 6: Working with data (November 2009 - January 2010). Each interview was transcribed question by question and answer by answer as soon as possible. Texts based on interviews were combined with texts written by the informants. These combined texts formed primary data for each case, which were then imported into Atlas.ti software for coding. Primary data for each case

was analyzed in order to find quotations related to fluency and the reasoning behind those quotations; each identified quotation was coded with a one or two word descriptive title. These coded quotations could then be assigned within the framework of enablers and hindrances. Frequencies for enablers and hindrances were calculated with help of Atlas.ti (see Appendices 5 and 6 for frequencies). Chapter 4 was outlined during this phase.

Phase 7: Data analysis: data-based and theory-based (February-August 2010). Each of the cases was analyzed from two perspectives: individual work (i.e., work conducted in solitude, or asynchronously mediated) and collaboration (i.e., work conducted in face-to-face collaboration with other individuals, or synchronously mediated). Enablers and hindrances were classified according to these perspectives. Data was analyzed in several phases. An important part of the analysis was the construction of 'categories', 'main categories', and 'key categories' emerging from the data, fluency experience chains, and the reasoning patterns. Quotations obtained in phase 6 were considered to be examples of the informants' fluency experiences, and they formed the basis for deriving the categories (these examples are presented in sections 4.1 and 4.2). 'Categories', as well as common language chains, and reasoning patterns are the author's interpretations of the informants' fluency experiences. 'Main categories' were processed based on categories and are the result of combining categories into reasonable entities (i.e., a group of categories that refer to the named main categories). They represent a level that is yet more abstract. 'Key categories' represent the most abstract level and are the result of combining 'main categories' into reasonable entities (i.e., a group of main categories that refer to the named key categories). Fluency experience chains were constructed in order to find regularities and connections between enablers and hindrances. In addition to categories and fluency experience chains, factors related to fluency experiences were analyzed with the help of theory-based frameworks that offered feasible analytic tools that concentrate on task and context, both essential here. Factors related to fluency experiences are presented via cross-case analysis in subsection 4.4.1 because they are in a sub-role, as the title 'related to' indicates. Finally, fluency experiences, constructed categories, reasoning patterns, and factors related to fluency experiences were combined in 'Analytic framework for the cases' in subsection 4.4.2, and in figures describing fluency experiences and factors related to them, case by case, in section 4.5. This was done because it was necessary to indicate how the constructed categories, fluency experience chains, and reasoning patterns are interlinked and how factors related to fluency experiences are connected to them. During this phase, Chapters 2, 3, and 4 were rewritten. NB: Chapter 4 has an inherent subjectivity because it includes examples of the informants' self-perceptions. The reported issues deal with human emotions, which always have subjective emphasis. Therefore, the author concludes that it is impossible to present results of this thesis in a completely objective manner. The author has used categories, chains, and reasoning patterns, in order to achieve a more abstracted, objective tone in results.

Phase 8: Contribution and practical implications (September-November 2010). The contribution of this thesis is a generic model describing fluency experiences in knowledge-intensive individual work and collaboration. Contribu-

tion was constructed during the study process: the first phase was 'Analytic framework of the thesis' (Figure 5); the second phase was 'Analytic framework for the cases: cross-case fluency experiences and factors related to them' (Figure 13); and the third phase was 'Generic model of fluency experiences in individual work and collaboration' (Figure 24). Practical implications were concluded on the basis of the author's understanding of the contexts and work of modern knowledge workers, and on the basis of the results of this thesis. During this phase, Chapter 1 was rewritten and Chapter 4 was reorganized.

Phase 9: Evaluation and finalizing the thesis (November-December 2010). This final phase included evaluation of the study, suggestions for future research, and finalizing the thesis. This thesis was evaluated from three perspectives: reliability, validity, and generalization. Here, methods, data gathering, and data analysis were targets of evaluation. Suggestions for future research were derived not only from the author's remaining questions, but also on the basis of earlier relevant literature emphasizing areas that should be addressed. Finalizing included checking the readability of the thesis and other practical measures in order to prepare the thesis for pre-examination.

4   Results

This chapter presents the results of this thesis. First, the fluency experiences, i.e., self-perceptions and feelings about the planned, effective, and goal-oriented flow of work, which are influenced by enablers and hindrances in work and working environment, are presented (Sections 4.1 and 4.2). These two sections answer research questions 1 and 2. Then, fluency experiences are summarized (Section 4.3). Next, theory-based analysis of work and context factors related to fluency experiences in individual work and collaboration are presented, and 'Analytic framework for the cases' is introduced (Section 4.4). This section embodies the abduction: work and context related factors complement fluency experiences, and the outcome of this section is 'Analytic framework for the cases'. Finally, fluency experiences and contexts in individual cases analyzed are presented (Section 4.5). This final section also shows individual variations in fluency experiences, contexts, and work.

4.1   Fluency experiences in individual knowledge-intensive work

In this section, fluency experiences in individual work are described more thoroughly. Both enablers and hindrances related to individual fluency experiences are presented. Individual work is defined as solo work, i.e., working in solitude, concentrating on issues and without face-to-face contacts with other individuals, or asynchronously mediated. As defined in section 3.1 and in subsection 3.4.1, an *enabler* refers to a factor that is promoting, progressing, encouraging, or contributing, and a *hindrance* refers to a factor that is delaying, preventing, or disabling. *Enablers and hindrances are to be understood as variables that the author constructed* based on the issues the informants brought up. There are also examples included in every subsubsection. *Examples are direct quotations* from the informants' speech in causal order and they refer to enablers and hindrances. Reasoning patterns, presented and explained in the beginning of each subsubsection, refer to the informants' ways of rationalizing their views about fluency and factors affecting them. *Reasoning patterns are the author's generalized interpretations of fluency experience chains* presented in Appendices 10a-10d. Arrows in reasoning patterns reflect to causal order, i.e., the order in which the reasons came up when the informants explained their views. If there is an arrow both to the left direction and to the right direction starting from a single reason, that single reason is to be thought as a starting point of the reasoning pattern. Otherwise, the reasoning patterns read from the left. This means that irrespective of whether the starting point of the reasoning pattern is on the left or in the middle of the pattern, most left is always presented the enabler/hindrance under discussion.

Each subsubsection in subsections 4.1.1 and 4.1.2 is named after the main category explained in that subsubsection (see subsection 3.4.1 for main categories and categories). Categories (which refer to enablers and hindrances) in-

cluded in these main categories are presented as unnumbered subsubsubhead-ings (using font Bold Italics) and explained thoroughly in the order that they were presented in Table 5.

4.1.1 Enablers affecting positive fluency experiences in individual work

Enablers affecting fluency experiences in individual work fall into two main categories: *situation* and *self*. Altogether twenty-four chains referring to ena-blers in individual work were constructed.

4.1.1.1 Situation related enablers

Enablers related to situation consisted of the categories *suitable physical place* and *well-functioning devices*. Altogether fourteen chains were constructed of situation related enablers. Chains consisted of two to four reasons. Chains in this main category seemed to follow two reasoning patterns:

| Suitable physical place | ⟵ | Tranquility: no interruptions | ⟶ | Effectiveness Creativity/innovativeness Ability to concentrate on tasks | ⟶ | Positive emotions Positive attitude Positive interest |
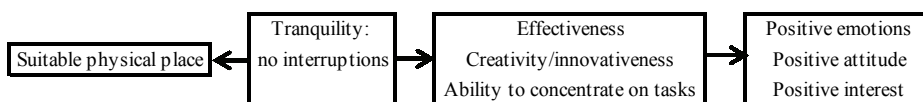
A physical workplace was considered suitable when it was tranquil. Experi-ences of tranquility were based on interruption-free time that the informants spent in that place. Tranquility allowed the informants to experience effective-ness, creativity and innovativeness, and, it was possible to concentrate on tasks. Finally, these experiences resulted in the informants having strong experiences of positive emotions, positive attitude, and positive interest regarding that place.

| Well-functioning devices | ⟵ | No disturbances | ⟶ | Effectiveness |
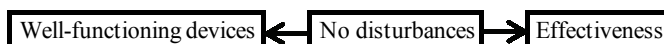
Devices were considered well-functioning if there were no disturbances in Internet or intranet connections, or in devices themselves. Well-functioning devices allowed the informants to work effectively. Devices did not affect the informants' experiences emotionally as strongly as suitable physical places did.

Suitable physical place
Home as a workplace was experienced in a positive way among the informants. Main reason for this was tranquility of the place because there were no inter-ruptions and it was possible to concentrate on issues; home was experienced as an effective place because there were no clients or colleagues to disturb one's work. The informants felt better when they worked at home because it was eas-ier to reach a state of flow, which influenced their ability to reach defined goals (see the example below), or it was easier to switch between work and leisure time. At home, experiences of independence were heightened because it was

possible to manage their own time and schedules, and to choose the most suitable way to work according to one's personal preference. This usually led to time savings, and the work was experienced as meaningful.

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4
C4E1: "Working at home **enables** my work."	C4E1RQ1: "There are no interruptions and I can concentrate on my tasks."	C4E1RQ2: "I don't need to use my energy to environment and unnecessary social load."	C4E1RQ3: "Home is attractive as an environment, because it is flexible and easy place to work."	C4E1RQ4: "It is easy to reach state of flow at home and keep thoughts together; results develop spontaneously."

Working in the office was experienced as an enabler when the physical premises were well designed for the tasks and activities that needed to be conducted there. Especially after regular office hours, it was peaceful to work on these premises and the informants felt themselves to be more productive and effective whenever they worked in these peaceful conditions.

The informants experienced hotels and their own cars as suitable places for work because there were no interruptions and they could make confidential phone calls. In addition to this, they regarded these places as environments conducive to innovation, where they could concentrate on issues and attain flow in their thinking, which led to experiences of innovations.

Well-functioning devices
Well-functioning devices were experienced as enablers because the informants could concentrate on work instead of wasting time in solving IT problems or waiting for someone else to solve them. It was important to the informants that there were no disturbances in IT network or in devices themselves, and that there was help available when needed. Functionality of devices did not necessarily depend on the place; the informants could also use devices without problems in workplaces other than the office. This option led one of the informants to first describe, enthusiastically, well-functioning devices, which then led him to describe the train as a work place (see the example below).

Fluency experience (FE)	Reasoning 1	Reasoning 2
C7E4: "Ability to read e-mails and answer to them in some public transportation vehicle makes my work **fluent**."	C7E4RQ1: "I have a feeling that I do not waste time; I can concentrate on specific issues in other places after I have worked with e-mail in bus or train."	C7E4RQ2: "Trains are usually places that are full of options and choices. Trains are effective as workplaces; documents are easy to write in these places. Trains are also places for socializing. Restaurant car in a train between Helsinki and Tampere on Friday evenings is the most social place in Finland."

4.1.1.2 Self-related enablers

Self-related enablers consisted of the categories *positive attitude* and *positive interest*. Altogether ten chains were constructed for self-related enablers. Chains consisted of two to five reasons. Chains in this main category seemed to follow three reasoning patterns:
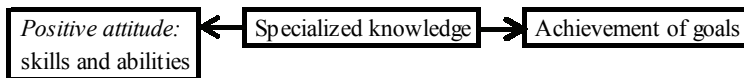
Specialized knowledge needed for work positively influenced the informants' attitude toward their own skills and abilities, as seen in the reasoning pattern above. This made them justify and describe this specialized knowledge more thoroughly. All of the informants referenced here emphasized that their specialized knowledge helped them to achieve goals or achieve goals more easily than without that knowledge.
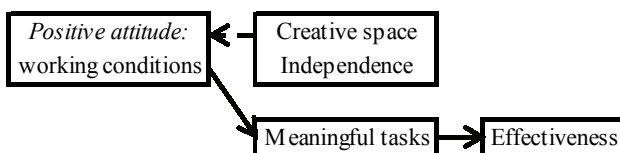
Working conditions, meaningful tasks, and productivity and effectiveness seemed to have a connection, as shown in the reasoning pattern above. Positive attitudes toward working conditions were justified by experiences of creativity and independence, among other things. This positive attitude also led to experiences of meaningful tasks, which led to experiences of effectiveness. The arrow with the dotted line in the reasoning pattern above refers to an extended

interpretation by the author: the informants emphasized different sources for their positive attitudes.

Positive attitude in general	←	Some work related issue(s)	→	Independence & flexibility with customers Fluent collaboration with clients & partners Technical development & clients' needs increase work opportunities
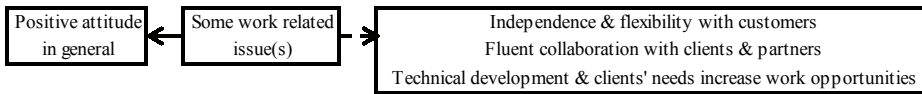
One third of the informants experienced a positive attitude that was primarily caused by one or more work related issues. This positive attitude was general in nature because it did not refer to a certain issue that the informants emphasized. The arrow with the dotted line in the reasoning pattern above refers to an extended interpretation by the author: each of the informants had different kinds of experiences caused by experiences of some work related issues.

Positive attitude

Three issues were common denominators for experiences of positive attitude: skills and abilities, working conditions, and general feeling of positive attitude. *Positive attitude towards skills and abilities* was based on one or more elements of specific specialized knowledge that the informants had and that they needed in their work. Whatever this specialized knowledge was, it was experienced as an enabler, especially where achievement of goals was concerned. Successful performance by the informants required regular and effective use of this specific specialized knowledge.

Experiences of *positive attitude towards working conditions* were caused by an inspiring atmosphere; creative space and ability to work independently. These favorable conditions led to experiences of meaningful work tasks, which led to experiences of productivity and effectiveness. Descriptive positively charged words, such as 'energizing tasks' and 'joy of work', were used in this context. Economic recession was emphasized as one of the hindrances in individual work (see subsubsection 4.1.2.3), and it was considered positive by one of the informants in a single context; his broad selection of skills assured better employment opportunities during poor economic conditions. The example below shows how this informant explains the enabling influence of his positive attitude toward working conditions (and refers to economic recession as an enabler).

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3
C9E1: "Working alone **enables** and influences positively my work."	C9E1RQ1: "When I work alone, I get things done quickly because I do not have to wait for someone else's work to be done first. Independence is a great plus in my work."	C9E1RQ2: "I have a broad selection of skills, which means that I am able to work alone and it is a good issue especially now as this poor economic situation is prevailing; there is enough work for me despite of economic recession."	C9E1RQ3: "My work, e.g., building up a well-functioning entity from dozens of cardboard boxes, is meaningful and a part of my joy results from realizing that my skills and decisions has led to clients' satisfaction in form of a well-functioning IT system."

Positive attitude in general was a result of different kinds of work related issues. These work related issues also led to experiences of fluent work, which took different forms: e.g., flexibility with customers, fluent collaboration with clients and partners, and more work opportunities.

Positive interest

Chains referring to positive interest seemed not to follow any particular pattern. Rather, the two chains in this context seemed to emphasize different kinds of issues. The first emphasized the informant's interest in new situations, and, the second emphasized the informant's interest in ways of organizing own work. See below for an example of the latter experience. This example shows what kinds of benefits one can gain if he is interested in organizing his own work.

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3
C7E2: "Time management and management of own work load saves my time and resources and working is **more fluent**."	C7E2RQ1: "I have developed follow-up lists in order to keep me up-to-date with ongoing tasks and deadlines. It is also motivating to strike out tasks that have been done."	C7E2RQ2: "I have made templates which I use for answering certain e-mail questions; this kind of automation affect **fluency** in my work at once."	C7E2RQ3: "Standard document templates help collaboration and interpretation of documents, e.g., investment calculation is easier to do on the basis of a template. Otherwise, it would take too much time to clear out how to do it."

There are two noteworthy issues that were classified into category 'positive interest' but which were not reasoned thoroughly enough so that the author could successfully construct chains from them. First, one third of the informants emphasized that they did not necessarily experience interruptions as hindrances. Rather, breaks in the middle of thinking or doing something were experienced as important interventions, because they either helped to re-orient to the task, or offered time for solving other tasks, or for having discussions with another expert. Second, some specific features of the work seemed not only to motivate some of the informants; they appeared to make their work enjoyable.

4.1.2 Hindrances affecting negative fluency experiences in individual work

Hindrances affecting fluency experiences in individual work fall into three main categories: *situation*, *self*, and, *society*. Altogether forty-two chains referring to hindrances in individual work were constructed.

4.1.2.1 Situation related hindrances

Hindrances related to situation consisted of the categories *unsuitable physical place* and *poorly functioning devices*. Altogether twenty chains were constructed from situation related hindrances. Chains consisted of two to five reasons. Chains in this main category seemed to follow four reasoning patterns:

Unsuitable physical place	Too slow or out-of-order devices/connections Absence of suitable premises	Impossible to do certain work tasks
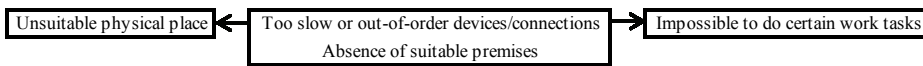
First, a physical place was considered unsuitable for working if devices or (Internet/intranet) connections, in a *certain* physical place, were too slow or out-of-order, or, if there were no suitable premises for certain work tasks. Both reasons led to situations in which the informants experienced that it was impossible to do certain work tasks. This reasoning pattern above included less emotional charge than the following two.

Unsuitable physical place	*Factors behind negative attitude:* Lack of stimuli Bad weather conditions Expectations too high Place not designed for working	*Outcomes of negative attitude:* No innovations Impossible to think Frustration Uncomfortable place
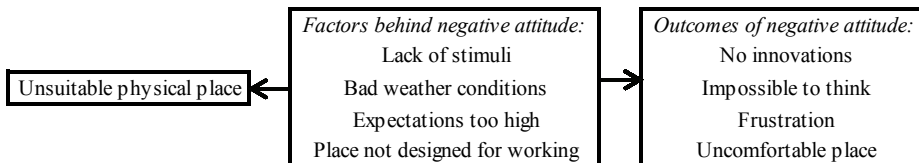
Second, a physical place was considered unsuitable for working because of different reasons that caused negative attitude in the informants' minds: lack of stimuli, bad weather conditions, too high expectations towards a certain place, and some places that were not designed for working, were examples of reasons that led to negative attitudes. In addition to experiences of unsuitable physical places, negative attitudes led to certain outcomes:

1) Lack of stimuli led to a situation in which it was impossible to produce any new innovations
2) Bad weather conditions made thinking impossible
3) Overly high expectations regarding a specific physical place led to frustration
4) Places that were not designed for working led to an experience of an uncomfortable place

| Unsuitable physical place | ← | Interruptions / Fragmentation / Noise caused by other individuals | → | Impossible to concentrate | → | Negative emotions |
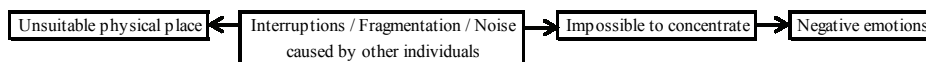
Third, other individuals, working in the same premises with the informants, influenced experiences of unsuitable physical workplaces in the form of interruptions, fragmentation of the work, and noise. When the informants experienced interruptions, fragmentation, or noise, they found concentration on work tasks impossible, and finally, their negative emotions became even more visible.

| Poorly functioning devices | ← | Too slow or out-of-order internet connections Problems with devices | → | Difficulties to do some tasks Problems with document management Delays in service processes |

Deficient IT skills may cause problems
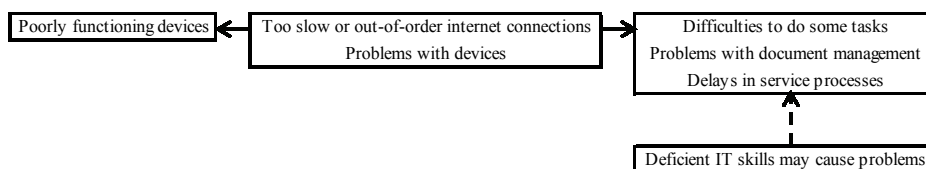
Irrespective of a physical place in which the work was performed, overly slow or out-of-order Internet connections and different kinds of (hardware/software) problems with devices were considered reasons for experiences of poorly functioning devices. Both reasons led to different kinds of problems in daily work: difficulties in doing certain tasks, problems with document management, or delays in service processes, for example. Two informants questioned their own abilities when IT issues were concerned; they admitted that at least some of the problems could have been caused by their deficient IT skills. The arrow with the dotted line in the reasoning pattern above refers to an extended interpretation by the author: deficient IT skills may *or* may not cause problems.

Unsuitable physical place

A physical place was experienced as being unsuitable for solo working for any or all of the following three reasons: 1) poorly functioning devices or connections in a *certain* place; 2) negative attitude towards a certain physical place; and 3) interruptions, fragmentation, or noise caused by other individuals. Office was considered unsuitable mainly because of interruptions and noise, which caused fragmentation of work. Chains referring to office as an unsuitable place for solo working usually followed the third reasoning pattern presented above. Two informants experienced that there were structural issues in the office causing negative effects on their work; changed layout of the office (from normal open air office to mobile workstations) and lack of 'traffic lights' outside the informant's office door. These two structural issues seemed to affect the number of interruptions. The informants characterized office as "a communal place with social interaction", but also as "a place in which social interaction could turn into social load". Office as an unsuitable place for solo working was described with emotional expressions, such as "sterile", "too ordinary", and "mentally nothing happens in the office" (see the example below).

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5
C1H6: "Office as an environment clearly **hinders** my work."	C1H6RQ1: "Agendas do not get realized or they are changing rapidly; actual work tasks remain to be done at home."	C1H6RQ2: "Other people disturb me, phone disturbs."	C1H6RQ3: "Targets or values of the organization do not appear in any way in practice; common culture and course of action are lacking."	C1H6RQ4: "My stimulus threshold is overdrawn easier in this working environment than in any other environment."	C1H6RQ5: "Mentally nothing happens in the office; I am like in a vacuum, I cannot be innovative, it is difficult to be productive or creative."

Home was experienced unsuitable place for solo working primarily because of poorly functioning devices and connections. If Internet connections did not work properly, it was impossible to do certain work tasks. Some of the informants experienced that it was difficult to separate work and leisure time when they worked at home, and therefore, they had mixed feelings about working at home. Feedback was more difficult to get and contacting colleagues was more challenging when working at home, than when working in the office.

Moving places (referring to trains here) were considered unsuitable places for solo working because of security issues (e.g., strangers on public transportation) and poorly functioning Internet connections. These hindrances prevented the informants from doing some work tasks. Moving places (trains and car) aroused negative emotions among the informants as well, and these places were experienced as unsuitable places for solo working because of negative emotions. Expressions such as "working in the car is waste of time", "bad weather conditions hinder thinking in the car", "trains are not designed for work; even the thought of an uncomfortable place prevents working", etc., were used in this context.

Poorly functioning devices

Irrespective of physical place, the informants' experiences concerning poorly functioning devices and connections strengthened the author's thoughts of how strong an influence different kinds of tools (for work and communication) actually have on work for a modern individual; there are very few work tasks that can be performed without any tools. Therefore, it is not surprising that the informants used such expressions as "when problems appear, my work becomes significantly more difficult", "sometimes nothing works anywhere", "time is lost while the problem is traced", etc., in this context. Technical issues influence processes, as well: doing certain tasks without tools may take an unreasonable amount of time and energy (see the example below), whereas doing the same tasks with the help of a proper tool takes a reasonable amount of time. Organizational demands may also challenge an IT infrastructure; the needs of a dispersed organization differ greatly from the needs of a traditional organization.

Fluency experience (FE)	Reasoning 1	Reasoning 2
C7H3: "Lack of a proper virtual project management tool **hinders** my work."	C7H3RQ1: "Poor document management processes force me to collect and send information with e-mail, which causes uncertainty and no one knows which are the latest versions of the documents."	C7H3RQ2: "Delays in form of additional administrative work, due to lacking tools and processes, are related not only to projects; they affect service implementations, too."

4.1.2.2 Self-related hindrances

Self-related hindrances consisted of the categories *negative attitude*, *negative interest*, and *negative emotions*. Altogether nineteen chains were constructed from self-related hindrances. Chains consisted of two to four reasons. Chains in this main category seemed to follow four reasoning patterns:
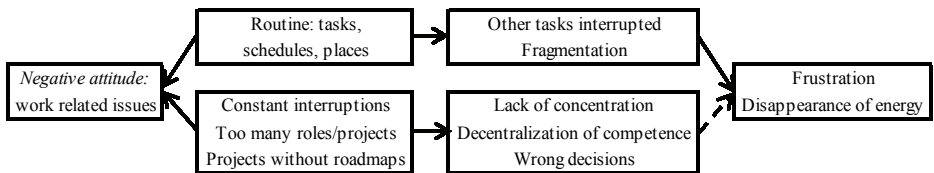
A group of *work related issues* caused experiences of *negative attitude*, as indicated in the reasoning pattern above. Routine tasks, schedules, and places were the most common reasons for such experiences. Routines were strongly experienced by the informants; when they had to perform routine tasks, they experienced that other tasks were interrupted by routines and that their work was fragmented. Furthermore, these experiences led to frustration and loss of energy. Constant interruptions, too many roles or projects, and projects without roadmaps were reasons for experiences of negative attitude, as well. Constant interruptions led to lack of concentration, too many roles or projects led to de-centralization of competence, and projects without roadmaps led to wrong de-cisions. The arrow with the dotted line in the reasoning patterns above refers to an extended interpretation by the author: all of these outcomes could lead to frustrations and loss of energy. Although this kind of a chain is reasonable, there were no clear statements by the informants to strengthen it.
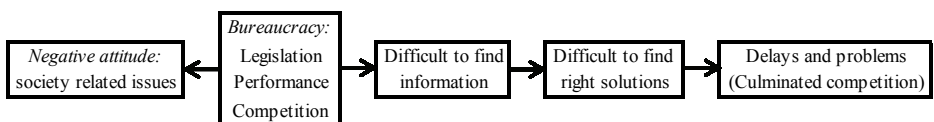
Another factor group that caused experiences of *negative attitu*de was *society related issues,* as illustrated in the reasoning pattern above. Bureaucracy, including legislation, performance of public authorities, and competition, were considered sources of negative attitude. Bureaucracy influenced information flow; it was difficult to get information necessary for work. If information was not available, it was difficult to find the right solutions to problems. Further, this led to delays and problems in service processes, and culminated in a competitive situation, especially in the field of education.

| *Negative attitude:* organization related issues | ← | Several cultures conflicting | → | *Managerial problems:* resources, leadership | → | Leadership problems |
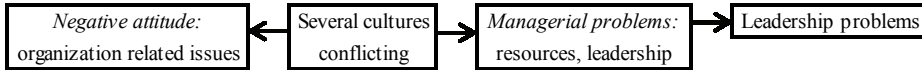
The third factor group that caused experiences of *negative attitude* was *organization related issues*, as illustrated in the reasoning pattern above. Although these fluency experience chains referred to one particular organization, they embodied a situation that was relevant in many other organizations, as well. The organization experienced rapid growth through mergers, with inadequate time for coordinated integration, and the relevant informants experienced multiple cultures conflicting with each other as sources of negative attitude. Conflicting cultures led to different kinds of managerial problems (especially concerning resources and leadership issues), which led to leadership problems.

| *Negative interest:* work related issues | ← | *Factors behind negative interest:* Solving problems

Lacking organizational targets
Changing situations/plans
Technical development | ⇢ | *Outcomes of negative interest:* Lack of motivation
Uncomfortableness
Weakening commitment
Scheduling problems
Mentally heavy to keep oneself updated |

Some *work related issues* were experienced as factors that caused *negative interest*. As shown in the reasoning pattern above, each of these factors led to another outcome, as well:

1) Solving problems was considered uncomfortable and it led to lack of motivation
2) If an organization did not have visible or clearly defined goals, this led to weakening commitment of the staff
3) Changing situations or plans during a workday led to scheduling problems
4) Constant technical development led to continuous self-development, i.e., one had to keep oneself updated in order to be able to perform the work

The arrow with the dotted line in the reasoning pattern above refers to an extended interpretation by the author: each of these factors led to its own outcome, and the author cannot generalize these relationships because individuals may experience these issues in very different ways.

Negative attitude

Negative attitude was one of the hindrances related to fluency experiences in individual work. Three groups of reasons were identified: 1) routine tasks, schedules, and places (work related issues), 2) bureaucracy (society related issues), and, 3) conflicting organizational cultures (organization related issues). In addition to routine tasks, schedules, and places, there were some other work related issues that are worth mentioning. First, in certain situations, one of the informants refused to act as expected because he confronted internal conflict between desired result and use of time. In these situations, he did not find learning new things meaningful and decided not to proceed with the task in question, or, acted only as a coordinator. Second, limitations of e-mail communication (i.e., communication only by words without expressions and gestures) were considered a hindrance that prevented understanding of messages and could lead to wrong decisions or unnecessary tasks (see the example below).

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4
C7H5: "Some of my tasks **hinder** my work."	C7H5RQ1: "I want to get rid of routine tasks because these tasks make project work and development work fragmented."	C7H5RQ2: "If I receive inaccurately defined questions, I may refuse to answer them because I feel that answering is not good use of my time."	C7H5RQ3: "I also receive questions related to IT issues by e-mail. These questions are difficult to understand because of limitations of e-mail communication. I usually do not answer these questions."	C7H5RQ4: "Sometimes there is a need to explain same issues over and over again; I do not have patience to do that."

Three aspects were noted regarding the influence of bureaucracy: legislation, performance of public authorities, and competition. Laws, regulations, and standards were considered too complicated, which affected fluency experiences in the work by increasing administrative tasks related to projects, especially in educational organizations. Performance of public authorities were experienced as time consuming; decision making processes were described as too slow and inflexible, which resulted in long waits for decisions to be made. Because this work was in the highly regulated field of education, where processes and procedures, including those related to competitive practices, must be performed in full compliance, and where the characteristic practices and performance of public authorities had to be taken into account, informants reported lost time, as well as consequences for client relations.

Conflicting internal cultures were experienced as hindrances, either because integration of several organizations into one entity was still ongoing, or because it had not been implemented successfully. Leadership was performed according to line organization and management according to matrix organization, which caused confusing situations among staff. Orders and restrictions that are common in this kind of an organizational transformation were experienced as distressing.

Negative interest

Experiences of negative interest had one common factor: all informants referred to some work related issue as a cause of negative interest. Those factors

varied by the informant, but there was one issue that came up for two informants: solving problems. Solving a *single* problem was not considered motivating because the informant was not able to see the whole picture; organizational goals were not visible enough. Therefore, it led to a weak outcome of his work, and it affected the depth of his commitment. The informant referred to economic recession in this context, as well. Solving *tricky* problems (e.g., interpreting contract of employment) was considered uncomfortable because the informant simply did not like that kind of a task; when he identified a situation including these elements, negative emotions disturbed his performance (the example below illustrates this experience).

Fluency experience (FE)	Reasoning 1	Reasoning 2
C6H4: "Although solving of tricky problems is a part of managerial work, it is a **hindering** factor because I do not like solving them at all."	C6H4RQ1: "In the office, there may appear sudden situations requiring my attention immediately; these situations (e.g., conflicts between clients) require change from one mental space to another and may therefore be quite challenging."	C6H4RQ2: "I have negative feelings when I have to solve conflicts, e.g., interpreting contract of employment is not my favorite task because our collective agreement is not clear and there are many problematic paragraphs. These conflicts may even lead to legal actions which makes the situation more complicated."

Negative emotions

Chains referring to negative emotions did not follow any particular reasoning pattern. In addition, chains were constructed based on quotations of only one informant, so the results cannot be generalized. However, the informant used an interesting concept: *mental absence*. By that concept, the informant meant that an individual is physically present but mentally he is not present. This kind of human presence (or actually absence) can be identified every now and then in different kinds of interactive situations. The example below illustrates how the informant experienced mental absence.

Fluency experience (FE)	Reasoning 1	Reasoning 2
C6H2: "Mental absence may **hinder** my work."	C6H2RQ1: "If an individual is physically present but mentally somewhere else, it is difficult to concentrate on issues and effectiveness suffers."	C6H2RQ2: "This kind of a mental state can appear especially when an individual moves from one situation to another; he may remain thinking about the previous situation and does not mentally move to the present physical situation. When I notice myself or someone else doing this, it may disturb me."

4.1.2.3 Society related hindrances

Hindrances related to society consisted of the category *economic recession*. Relevant literature to date focused on productivity and effectiveness does not refer to this hindrance in the context of factors affecting productivity or effectiveness of knowledge-intensive work. Altogether three chains were constructed from society related hindrances. Chains consisted of four to five reasons. Chains in this main category seemed to follow one two-branch reasoning pattern:
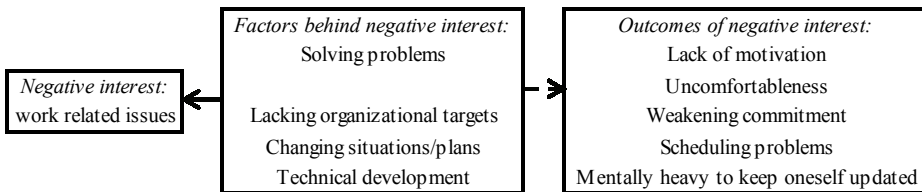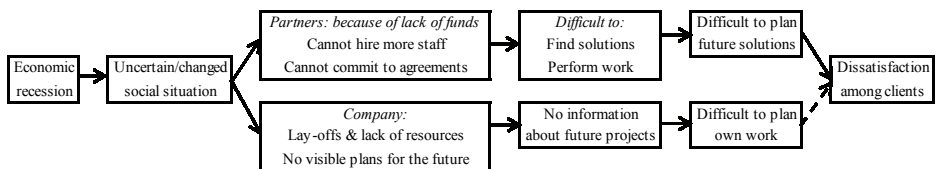

Economic recession was the reason for the uncertain social situation. Uncertainty was experienced as a hindrance from the company aspect and from a partners' aspect. On the one hand, because of lack of funds, partners could not hire more staff, nor could they commit to agreements. This led to experiences of difficulties in finding new solutions to problems, which led to experiences of difficulties in planning future solutions. On the other hand, if an informant's company suffered from a lack of human resources because of lay-offs and management could not present visible plans for the future, this led to experiences of lack of information, because the informant received no information about future projects. Therefore, it also was difficult to plan one's own work. Both branches of the reasoning pattern above led to clients' dissatisfaction. The arrow with the dotted line in the reasoning pattern above refers to an extended interpretation by the author: this arm of the pattern is reasonable, but was not confirmed by a clear expression by the informant.

Economic recession

Uncertain (or changed) social situation was caused by the worldwide economic recession, which had effects on nearly every organization in some form. Economic recession was experienced as a hindrance from two aspects: one's company and one's partners. Partners could not hire more staff and/or they could not commit to agreements without money. Then it was difficult to find solutions to problems, or to do one's work at all. This naturally led to experiences of difficulties in planning future solutions, as well. If an informant's company suffered from lay-offs and management did not, or could not, present plans for the future, or if plans were not visible, the staff was uncertain about the future; for example, the informant was not informed about future projects, making it difficult to plan one's own work. Finally, due to both of these branches as shown in the reasoning pattern above, clients were dissatisfied because the informants' companies were not able to meet clients' needs as desired. The company aspect is illustrated with the example below.

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4
C9H7: "Lay-offs **hinder** and delay my work."	C9H7RQ1: "At the moment, it is difficult because of this uncertain economic situation. It reflects in resources; I just had to say to my client that I can continue with the project next week after I have spent my lay-off days."	C9H7RQ2: "In our organization, there is an uncertain situation because we do not know what management will decide. There is an uncertain feeling all the time."	C9H7RQ3: "I do not know about future projects, how big they are, how urgent they are, what kind of projects they are. I cannot have long range plans because my work load depends on agreed contracts with clients and amount of new contracts has been decreased because of this recession. I cannot plan my work and I do not know if I have work in the future or not."	C9H7RQ4: "It is always somewhat unclear who is responsible for certain issues, although they have tried to make the structure of our organization clearer. This economic situation affects this, as well. Employees quit and new ones start and it is unclear who has said what and what has been said. It would be more meaningful if we had clear plans at least for the near future. But it is impossible, it depends on everything else."

4.2 Fluency experiences in knowledge-intensive collaboration

In this section, fluency experiences in collaboration are described more thoroughly. Both enablers and hindrances related to fluency experiences in collaboration are presented. Collaboration is defined as work done in interaction, i.e., working physically face-to-face with other individuals in the same physical place, or synchronously mediated. Collaboration includes both formal (e.g., meetings) and informal (e.g., coffee table discussion) communication. What was valid in section 4.1, is valid in this section, too. For example: 1) Enablers and hindrances are to be understood as variables that the author constructed based on the issues the informants brought up. 2) Examples are direct quotations from the informants' speech in a causal order and they refer to enablers and hindrances. 3) Reasoning patterns are the author's generalized interpretations of fluency experience chains presented in Appendices 10a-10d.

Each subsubsection in subsections 4.2.1 and 4.2.2 is named after the main category explained in that subsubsection (see subsection 3.4.1 for main categories and categories). Categories (which refer to enablers and hindrances) included in these main categories are presented as unnumbered subsubsubheadings (using font Bold Italics) and explained thoroughly in the order that they were presented in Table 5.

4.2.1 Enablers affecting positive fluency experiences in collaboration

Enablers affecting fluency experiences in collaboration fall into four main categories: *quality of collaboration*, *situation*, *management*, and, *internal collaboration*. Altogether twenty-six chains referring to enablers in collaboration were constructed.

4.2.1.1 Quality of collaboration related enablers

Enablers related to quality of collaboration consisted of the categories *availability of face-to-face contacts*, *positive atmosphere*, and, *positive influence of social networks*. Altogether eight chains were constructed from quality of collaboration related enablers. Chains consisted of three to five reasons. Chains in this main category seemed to follow two reasoning patterns:

```
┌──────────────────┐      ┌──────────────────────────────────────┐
│  Availability of │─────▶│ Communication & decisions more fluent │
│ face-to-face     │      │      Answers easier & faster          │
│ contacts         │      │      Fewer misunderstandings          │
│                  │      └──────────────────────────────────────┘
│                  │─────▶┌──────────────────────────────────────┐
└──────────────────┘      │   Positive effect of interruptions:   │
                          │    Stimuli & contribution to tasks    │
                          └──────────────────────────────────────┘
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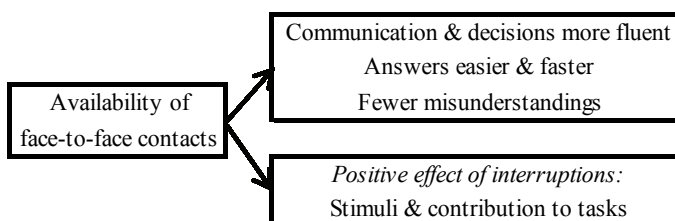
Availability of face-to-face contacts with other individuals was perceived as an enabler, for two main reasons. First, some everyday work situations were easier to handle face-to-face and the informants experienced that they could work more fluently face-to-face in these kinds of situations. For example, general communication and decision-making were experienced as more fluent face-to-face than virtually, asking for help and getting answers happened faster face-to-face, and, fewer misunderstandings developed face-to-face than virtually because it was easier to confirm that the discussion partner had understood what was meant. Second, a positive effect of interruptions was associated with face-to-face contacts. Interruptions caused by other individuals were not necessarily considered disturbing by one third of the informants. Instead, interruptions caused by colleagues were either experienced as stimulating because stimuli developed during the interaction, or as a contribution to one's work tasks.
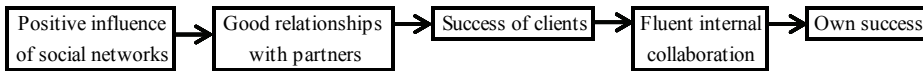
Positive influence of social networks was experienced as an enabler especially in collaboration with partners and clients. When collaboration with partners progressed well, it resulted in clients' success, which led to fluent collaboration with colleagues, and finally, to informants' own success, as illustrated in the reasoning pattern above.

Availability of face-to-face contacts

Availability of face-to-face contacts was experienced as an enabler because some everyday situations were easier to handle face-to-face than virtually. For example, it was important that key individuals participated in meetings because decision-making required their participation. It also was important to have regular meetings during projects because these meetings tended to minimize misunderstandings and enable information flow during projects. Working sessions in the same physical space (e.g., conference room) with colleagues were described with words "idea factory". Depending on the work description, one's work could be impossible without face-to-face contacts; e.g., one informant needed to evaluate individuals (that is clients and partners) on basis of their behavior. Availability of face-to-face contacts might also have enabled personal ways of doing certain tasks; another informant tended to solve issues during she walked around the office (see the example below).

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4
C3E4: "Face-to-face conversations in the office **progress** my work."	C3E4RQ1: "Face-to-face discussions, in general, make decisions and communication more fluent and reduce misunderstandings."	C3E4RQ2: "I get answers from my superior fast and help from other co-workers."	C3E4RQ3: "I can solve issues easily by walking around the office and meeting even 10 individuals during that walk. This is very important from the viewpoint of fluency in my work."	C3E4RQ4: "Office premises are renovated; negotiations are now possible in my own room because there is a space for them. Design of office premises influence my willingness to work in my room."

Availability of face-to-face contacts enabled ad-hoc discussions with colleagues, as well. For example, this meant that a colleague who dropped in to the informant's office, did not necessarily disturb him. Instead, these interruptions were seen more as opportunities for collaboration that could have a notable significance on progress of one's work. Interruptions could contribute to a task; even individuals who were considered troublesome could bring new aspects to the informant's work by questioning issues. Interruptions caused by colleagues were also experienced as stimulating; stimuli developed in interaction with other individuals.

Positive atmosphere

Chains referring to positive atmosphere did not follow any special reasoning pattern. Mutual trust and confidentiality among staff were emphasized in this

context. Another factor that was highlighted in the context of developing positive atmosphere was organizational culture that supported knowledge workers' learning and aimed at finding synergies. An interesting issue (related to cultural differences, as well) arose in this context; although Finland is a rather small country, individuals living in Northern Finland usually have different kinds of mindsets than individuals who live in Southern Finland. One informant, who lived in the south and worked in the north, strengthened this observation; open communication culture, or "common mentality", in Northern Finland enabled her work because taking care of issues was easier and faster in a positive and more open atmosphere. The reason for this "common mentality", according to the informant, was reasonable: smaller population meant more time to meet individuals. The example below illustrates this experience.

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3
C8E4: "Common mentality in this certain geographical area of Finland **enables** my work."	C8E4RQ1: "Here all of the individuals act like they were a part of a big family. Communication is open, spontaneous, and full of character."	C8E4RQ2: "Main reason for this friendly behavior is the fact that in this geographical area population is smaller than in the rest of the country and, therefore, there is more time to meet individuals."	C8E4RQ3: "Everything is close here and taking care of issues is easy and fast. It is also a great advantage that I have familiarized myself with everyone here."

Positive influence of social networks

Good relationships with clients and partners were experienced as an enabler for effective working. Relationships with partners and clients were described with such words as "confidential", "open", and "informal". Although there were only two chains in this context, they both referred to similar issues. One informant referred to effective decision-making process by private companies, which enabled her to work fluently because of good relationships with those companies, and it also enabled fluent internal collaboration. Another informant emphasized how important good relationships are when the success of collaborative parties is examined. The example below illustrates this latter viewpoint.

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3
C2E6: "Social networks are **essential** from the viewpoint of **fluency** and success in my work."	C2E6RQ1: "Most rewarding thing in my work is good relationships with partners; collaborative educational establishments and good personal relationships with teachers, education managers and directors affect success of my work significantly."	C2E6RQ2: "Relationships with partners influence the success of the client, which directly affects the success of my work."	C2E6RQ3: "Long collaboration progresses with confidentiality and openness when the parties have learnt how the other acts. Then, also awkward issues can be discussed. Open and trustworthy atmosphere is important."

4.2.1.2 Situation related enablers

Enablers related to situation consisted of the category *suitable physical place*. Altogether seven chains were constructed from situation related enablers. Chains consisted of two to three reasons. Chains in this main category seemed to follow two reasoning patterns:
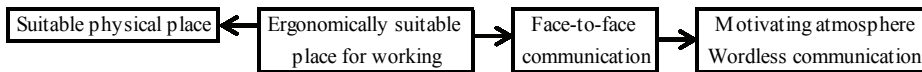
First, a physical place was considered suitable for collaboration because it was ergonomically suitable for that purpose (see the reasoning pattern above). The next justification was that face-to-face communication was available in that certain place; meetings and (especially internal) collaboration were more fluent face-to-face. Finally, because of fluent collaboration promoted by face-to-face communication, atmosphere was experienced as motivating, and, e.g., clients' reasoning became more understandable because wordless communication became available.
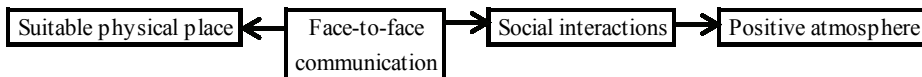
Second, a physical place was considered suitable for collaboration because face-to-face communication was available (see the reasoning pattern above). Face-to-face communication enabled fluent social interactions, e.g., networking opportunities and brainstorming sessions in atypical places and contexts. Opportunity to fluent social interactions led to experiences of positive atmosphere.

Suitable physical place

A physical place was considered suitable for collaboration for two reasons: 1) it was ergonomically suitable for working (and it enabled face-to-face communication), and, 2) face-to-face communication was possible in that particular place. An office was experienced as suitable mainly for ergonomic reasons, which consisted of physical working conditions such as lighting, heating, air conditioning, well-functioning devices and connections, etc. Another reason for enabling experiences was that an office was valued as a place in which social contacts with colleagues were easier and internal collaboration natural – because it was possible to meet colleagues face-to-face and have confidential discussions with them. Positive experiences in the office environment led to experiences of positive organization atmosphere. The example below illustrates one of the experiences described above.

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3
C5E2: "Office premises **enable** my work."	C5E2RQ1: "Office premises are functional and ergonomically suitable for working, and the environment is tidy and cozy. Selection of devices, connections and software is broad, so there is the ability to choose the best alternative case by case."	C5E2RQ2: "Office is a place for face-to-face meetings and counseling, which I experience as essential in order to manage my work. I feel good because I have different kinds of individuals around me. Internal collaboration is natural and informal, relaxed, not hierarchical."	C5E2RQ3: "Atmosphere is motivating and this has a huge influence on mental resources. I feel as if I am accepted and appreciated at work. I have not noticed any rumors behind one's back and I think this indicates positive organizational culture."

Clients' premises were deemed suitable for collaboration because face-to-face communication with clients was possible in these places. The client premises enabled wordless communication, i.e., gestures and expressions, and it was easier to understand clients' needs and line of reasoning. Positive atmosphere was an integral part of the experiences.

Moving places and third places (hotels and cafés) were experienced suitable for collaboration because of possibilities to face-to-face contacts. These places were considered informal, which enabled creative working; networking and brainstorming were examples of fluent activities in these places. An atypical place may offer new ways to think. Positive organization atmosphere was an integral part of these experiences, as well.

4.2.1.3 Management related enablers

Enablers related to management consisted of the category *managerial support*. Altogether six chains were constructed from management related enablers. Chains consisted of two to five reasons. Chains in this main category seemed to follow two reasoning patterns:

| Managerial support | ← | Superior's positive approach/attitude/ understanding | → | Independency | → | Fluent collaboration Professional synergy Positive atmosphere |
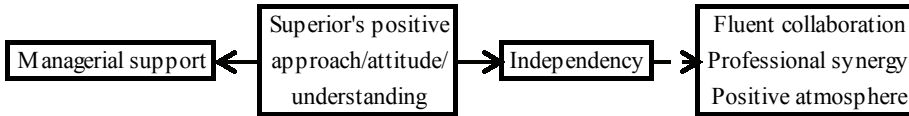
First, as shown in the reasoning pattern aboven, experiences of a superior's positive approach to issues, the superior's attitude towards different kinds of issues and individuals, and the superior's ability to understand his subordinates' work were reasons why the informants experienced that their superiors supported them. Superior's positive approach, attitude, and understanding led to experiences of independence, which led to experiences of fluent collaboration, professional synergy, and positive organizational atmosphere. The arrow with the dotted line in the reasoning pattern above refers to an extended interpretation by the author: this kind of an arm in the pattern is reasonable, but each of the informants had different experiences that were promulgated by an experience of independence.

| Managerial support | ← | Trust | → | Fluent collaboration |
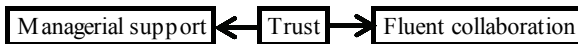
Second, experiences of trust were other reasons why the informants considered that their superiors supported them, as shown in the reasoning pattern above. Trust was also experienced as a prerequisite for fluent collaboration with superiors.

Managerial support
On the one hand, experiences of superior's positive approach to issues, superior' attitude towards different kinds of issues and individuals, and superior's ability to understand his subordinates' work, and on the other hand, experiences of trust, were reasons why the informants experienced that their superiors supported them. Superior's positive approach, attitude, and understanding led to experiences of independence, which manifested as independent decisions, independently agreed contracts, and independently solved problems. The informants who experienced independence, also experienced, for example, 1) that collaboration with superiors was natural and problem-free; 2) that there were both already obtained and achievable synergies because of open and professional relationship, and common goals with superiors, and 3) that positive atmosphere prevailing in an organization was partly a result of superiors' positive attitude. One informant emphasized that a superior who is a knowledge worker himself has better qualifications for functioning as a superior for other knowledge workers because he understands the requirements of their work. This aspect has its advantages and disadvantages. The author emphasizes advantages rather than disadvantages. The example below presents a practical experience from this viewpoint.

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4
C9E3: "My superior's support **enables** my work."	C9E3RQ1: "My superior is a professional himself. Therefore, he understands my problems and requirements of my work."	C9E3RQ2: "Main task of my superior is to **enable** my and other specialists' work. I think that this is essential in this kind of independent work concentrating on problem solving."	C9E3RQ3: "My superior trusts me and supports the freedom and tranquility required in my work. I am allowed to decide, e.g., what kind of education I need. Our relationship is fluent, businesslike and positive."	C9E3RQ4: "Actually all of the superiors in our organization are quite positive; they are optimistic, enthusiastic and interested in issues. Therefore, atmosphere is positive, too."

Experiences of trust were another reason why informants felt that their superiors supported them. The informants who emphasized trust used words such as "appreciation", "encourage", "empower", "feedback", and expressions such as "suitable boundaries" and "no need to control". Trust was also experienced as a prerequisite for fluent collaboration with superiors and the informants highlighted, e.g., "superiors' supportive decisions", "open and constructive collaboration", "coaching-like relationship with superior", and, "clearly defined goals and resources". Trust and an open communication style made information sharing easy and helped in prioritization of tasks, according to one informant.

4.2.1.4 Internal collaboration related enablers

Enablers related to internal collaboration consisted of the category *positive influence of co-workers*. Altogether five chains were constructed from internal collaboration related enablers. Chains consisted of three to four reasons. Chains in this main category seemed to follow a single reasoning pattern:
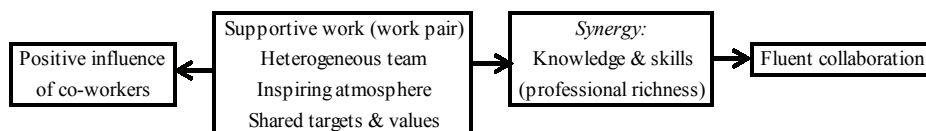
The reasoning pattern above shows several different reasons why the informants experienced that co-workers have positive influence on their work: supportive work done by work pair, heterogeneous team, inspiring atmosphere, and shared goals and values were examples of these reasons. Although there were many different reasons, all of these reasons led to experiences of synergy of knowledge and skills, which also could be termed professional richness. Experiences of synergy led to experiences of fluent collaboration.

Positive influence of co-workers
A group of issues in internal collaboration yielded positive experiences. First, supportive work done by a work pair helped an informant immediately because she did not have to do those tasks alone. Second, a heterogeneous team made a broader selection of services possible because team members were capable of providing broader clients service. Third, inspiring atmosphere among staff af-

fected work positively because well-functioning models of working and processes, and well-educated staff left room to handle human issues. Fourth, staff that had accepted and shared goals, values, and strategies, and, management that appreciated knowledge-intensive work by leading in an individual-oriented manner, brought elements of a knowledge-intensive organization together. All of these reasons seemed to lead also to experiences of individual-centered synergies; synergy of knowledge and skills, or professional richness that could be achieved through collaboration. Finally, these strong experiences of synergies seemed to create experiences of fluent collaboration. One informant (see the example below) highlighted importance of synergies by describing her fluency experience from the viewpoint of synergy of knowledge and competence, and transformation of tacit knowledge.

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4
C4E4: "In the office, synergy of knowledge and competence and transformation of tacit knowledge **enable** my working."	C4E4RQ1: "Tacit knowledge transforms only by being physically in the office and participating in communication."	C4E4RQ2: "Synergy of knowledge and competence come up especially in collaboration; everyone is willing to aim at the same goal."	C4E4RQ3: "Social interactions are emphasized in the office. Social comparison is positive; it is an empowering feeling to notice that the same issues are important to everyone else, too."	C4E4RQ4: "Social acceptance is easier to gain in the physical midst of co-workers."

4.2.2 Hindrances affecting negative fluency experiences in collaboration

Hindrances affecting fluency experiences in collaboration fall into six main categories: *management*, *situation*, *quality of collaboration*, *external collaboration*, *internal collaboration*, and, *organization*. Altogether forty-five chains referring to hindrances in collaboration were constructed.

4.2.2.1 Management related hindrances

Hindrances related to management consisted of the categories *managerial problems*, *lack of resources*, and, *lack of information*. Altogether fourteen chains were constructed from management related hindrances. Chains consisted of two to five reasons. Chains in this main category seemed to follow four reasoning patterns:
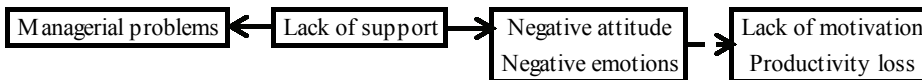
Lack of managerial support was the first reason why informants experienced managerial problems, as illustrated in the reasoning pattern above. Lack of managerial support led to relatively strong experiences of negative attitudes and/or negative emotions. As results of these strong emotions, experiences of lacking motivation and productivity losses surfaced. The arrow with the dotted line in the reasoning pattern above refers to an extended interpretation by the

author: some of the informants emphasized these outcomes, and the author generalized that the rest of the informants also might have continued their reasoning towards these outcomes because their quotations included strong references thereto.

| Managerial problems | ← | Poorly performed management
Poorly managed internal collaboration | → | Negative emotions | ⇢ | Confusing atmosphere
Struggles
Lack of commitment |
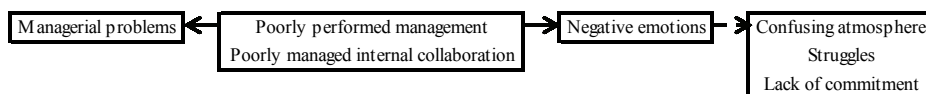
Other reasons for experiences of managerial problems were, poorly performed managerial acts and poorly managed internal collaboration. As shown in the reasoning pattern above, these reasons led to strong experiences of negative emotions. Finally, negative emotions led to experiences of a confusing organizational atmosphere, internal struggles, and lack of commitment. The arrow with the dotted line in the reasoning pattern above refers to an extended interpretation by the author: each of the informants had different experiences that were caused by negative emotions.

| Lack of resources | ← | *Lack of:*
Special knowledge
Human resources
Follow-up systems
Time | → | *Lack of:*
Commitment
Motivation | → | Negative attitude | ⇢ | Productivity loss
Fragmentation of resources |

Lack of resources was a common denominator for resources, such as, lack of specialized knowledge, lack of human resources, lack of follow-up systems, and lack of time (see the reasoning pattern above). These lacking resources led to lack of commitment or motivation, which led to experiences of negative attitude towards various issues. Finally, experiences of negative attitude led to productivity losses or fragmented resources. The arrow with the dotted line in the reasoning pattern above refers to an extended interpretation by the author: only some of the informants emphasized these outcomes. The author generalized that the rest of the informants might also have continued their reasoning towards these outcomes because their quotations included strong references thereto.

| Lack of information | → | Wrong decisions | → | Lost advantages & synergies |
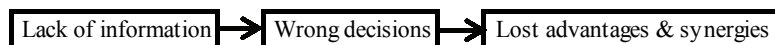
Lack of necessary information led to experiences of wrong decisions (see the reasoning pattern above). Wrong decisions were made because of insufficient information, and they led to experiences of lost advantages and synergies.

Managerial problems
Managerial problems were experienced as hindrances for two reasons: first, lack of managerial support, and second, poorly performed managerial acts and/or poorly managed internal collaboration. Lack of managerial support

seemed to lead to strong experiences of negative attitude and/or negative emotions towards different issues. Quotations such as "enormous waste of time", "my work is not appreciated", "unnecessary tasks", etc., were common in this context. For example, one informant experienced that her superior hid from the staff in his office; it was difficult to perform urgent duties without approval or support from the superior. Different kinds of strong negative emotions led to experiences of lacking motivation or productivity losses. For example, "irrelevant orders without support", and routine work led to experiences of energy loss and decrease of the informant's productivity, or, insufficient justification for certain managerial processes instead of supporting creative ways of working could decrease the informant's motivation and increase resistance to, e.g., performance measurements or professional and personal development discussions.

Poorly performed managerial acts and/or poorly managed internal collaboration also led to strong experiences of negative emotions and/or negative organizational culture. Two informants experienced that their levels of authority and their responsibilities were not in line; both experienced their responsibilities as bigger than their levels of authority permitted. They both confronted different kinds of problems in their organizations due to this defect. Quotations such as "irrelevant managerial behavior", "bouncing managerial style", "too tight/much control", and, "too many orders without any flexibility" were common in this context. Finally, negative emotions led to experiences of confusing atmosphere, internal arguments, and lack of commitment. The example below illustrates internal arguments that were frequent in two of the organizations. Arguments seemed to begin because each personnel group primarily aimed at its own goals without understanding the needs of other personnel groups.

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3
C4H2: "Internal collaboration is managed poorly in our organization and this **hinders** my work, too."	C4H2RQ1: "A lot of struggles and efforts have to be spent in order to get help from internal interest groups."	C4H2RQ2: "Mindset 'only external client is a profitable client' is prevailing in the organization. I think that this mindset is insulting."	C4H2RQ3: "Therefore, in order to get help from internal interest groups, help has to be asked in the name of an external client. This is ridiculous but the only way to act."

Surprisingly, the answer to the above described problem 'personnel groups with their own goals' was found in the data: another informant explained an opposite view of the issue (see the example below, column titled 'Reasoning 4'; although this quotation refers to hindrances in individual work, a portion of it is useful here). In conclusion, this strengthened the author's presumption that arguments between personnel groups begin because each personnel group primarily aims at its own goals without understanding the needs of other personnel groups. This example is also a good practical example of poorly managed internal collaboration.

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4
C5H1: "There are a few issues that **hinder** my work in the office."	C5H1RQ1: "Devices and connections are too slow or out-of-order sometimes. Almost all of the software are too rigid to use."	C5H1RQ2: "Document management tools and processes do not function well. Documents containing similar information are placed into different physical or virtual places and the distinction between internal and external documents is unclear."	C5H1RQ3: "This document management issue influences also time management; if the information is not available, it is difficult to manage time during projects, especially if I am not in a role of a project manager."	C5H1RQ4: "My work is often interrupted by internal meetings and requests for help from co-workers. If I help my co-workers or other internal co-workers, my occupancy rate weakens. For this reason, internal interest groups may find it difficult to get help from consultants."

Lack of resources

Lack of certain resources, such as specialized knowledge, human resources, follow-up systems, and time, were commonly denominated by the category 'lack of resources'. First, lack of specialized knowledge was linked to hidden tacit knowledge. If only one individual in the organization knew certain information, it was a huge managerial and organizational risk, from any standpoint. Second, lack of specialized knowledge also related to misunderstandings; if there were no other individuals who performed similar tasks, there were no discussion partners, and misunderstandings could easily develop between individuals who did different kinds of work. Lack of follow-up systems or well-functioning processes, and lack of time, complicated many managerial tasks but also the tasks of knowledge workers, and affected individuals' emotions negatively. Lack of human resources referred to tasks or projects that required several participants. The example below shows what kinds of experiences the lack of human resources can produce. All of the above described resource shortages seemed to lead to experiences of lacking commitment or motivation, which led to experiences of negative attitude towards issues, such as company policies, work time arrangements, distribution of work, colleagues, etc. Finally, experiences of negative attitudes led to experiences of productivity losses or fragmented resources.

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5
C7H4: "Lacking project resources **hinder** my work."	C7H4RQ1: "Projects may start suddenly; my superior asks me to manage a project and I have to start recruiting project members. It usually is very challenging to find resources for a project without planning."	C7H4RQ2: "Project resources may be problematic if line organization is not aware of the project or if line managers are not committed to the project. I do not know if management has informed rest of the organization about the project."	C7H4RQ3: "There surely are many specialists in the organization but they are difficult to reach because everything is based on informal social networks and coffee table discussions; we do not have a shared database of competences. In addition, fragmentation of resources makes it difficult to ensure continuity of the project and this **hinders** my work a lot."	C7H4RQ4: "Individuals are not necessarily interested in putting their efforts to projects because bonuses policy does not support it. Here lack of motivation of project resources affect my work by increasing my work load. Management should emphasize the link between projects and bonuses."	C7H4RQ5: "Even if individuals were interested in participating in a project, they may not have enough time for it. They have to prioritize their tasks based on decisions made by their superiors (who may not be aware of the project)."

Lack of information

Lack of necessary information led to wrong decisions. This was because knowledge workers usually need relevant information in order to solve work related problems, which are a natural part of knowledge-intensive work. Wrong decisions led to experiences of lost advantages and synergies, and even frustration and delays. The example below shows what kind of experiences may follow, if one does not have relevant information at hand.

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4
C7H7: "Lack of necessary project related information **hinders** my work a lot."	C7H7RQ1: "There are examples of situations where I have made wrong decisions only because my superior or project member has not informed me about certain issues. These kinds of situations lead to frustrations and delays."	C7H7RQ2: "At the moment, communication is only vertical and hierarchical, from top to bottom. There is no horizontal communication and all of the information goes through management."	C7H7RQ3: "This state of 'no-coordination' seems not to disturb management and management does not understand what kind of relations issues may have. This means that advantages and synergies may be lost because issues are not coordinated."	C7H7RQ4: "This kind of indirect supervision is not comfortable. If individuals' developmental paths were visible, it would be easier to keep myself informed where I should direct my energy."

4.2.2.2 Situation related hindrances

Hindrances related to situation consisted of the categories *unsuitable physical place* and *unexpected situations*. Altogether nine chains were constructed from situation related hindrances. Chains consisted of two to five reasons. Chains in this main category seemed to follow a single reasoning pattern:
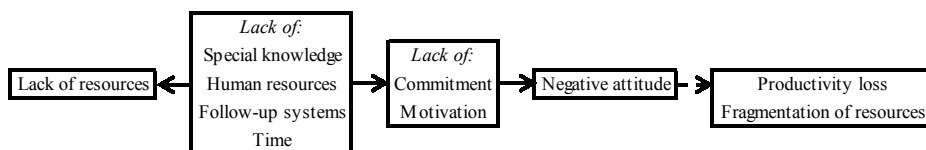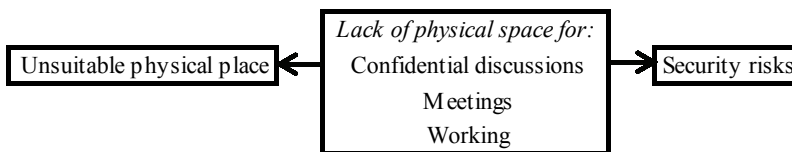

A physical place was deemed unsuitable for collaboration, as indicated in the reasoning pattern above, if there was no physical space for confidential discussions, meetings, or for working on certain tasks. Lack of physical space was experienced as a security risk because the informants processed many confidential issues.

Unsuitable physical place

Lack of suitable physical places for confidential discussions, meetings, or for working on certain tasks, was experienced as a hindrance in collaboration. The office was considered unsuitable for collaboration mainly because the informants did not necessarily have their own offices, or there were no meeting rooms in the office, or, if office premises were otherwise not up-to-date, it was difficult to have confidential phone calls or meetings with clients and partners. Therefore, lack of suitable physical space was experienced as a security risk.

Dependence on other individuals' schedules was especially emphasized in the office context. One informant experienced inefficiency in the office because of opportunities for (personal) social interactions. An example of experiences in the office context is shown below.

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4
C2H5: "In the office, lack of physical space **hinders** my work; too small premises, lack of confidentiality during phone calls, and lacking conference rooms."	C2H5RQ1: "Office premises are too cramped; I do not have a room of my own, there are a lot of documents."	C2H5RQ2: "Lack of confidentiality during phone calls is a security risk because my colleague works in the same room and his client may hear what I am talking with my client."	C2H5RQ3: "Because there are not enough conference rooms in the office, there may be no other place for client/partner meetings than kitchen."	C2H5RQ4: "Psychic atmosphere in the office cause feeling of isolation."

Clients' and partners' premises were not considered suitable for collaboration because of lack of conference rooms, or because conference rooms were not suitable for defined purposes (e.g., no network connections). Another reason why clients' premises in particular were experienced as unsuitable for collaboration was that the place was unsuitable for ergonomic reasons, or reasons referring to working conditions (e.g., climate, noise), when several individuals were working in the same space. Third reason was that although the informants worked in clients' premises, clients' key individuals were not available. Causes referring to clients' and partners' premises led to security risks, too, because of above mentioned reasons. One informant described some challenging, even frightening, experiences: sometimes she experienced her partners' premises as security risks because oddly behaving patients in mental hospitals or marginalized prisoners in penitentiaries could attack her.

Unexpected situations

Chains referring to unexpected situations did not follow any particular reasoning pattern. Two chains were constructed and they both referred to different kinds of issues. One informant referred to unexpected situations in collaboration with clients, and in internal collaboration; for example, problems could require contacting specialists abroad that brought its own challenges to project schedules. Another informant referred to background with unexpected situations; the field in which she worked and why she regarded the field as a hindrance. The example below illustrates this latter experience.

Fluency experience (FE)	Reasoning 1	Reasoning 2
C2H11: "The field in which I work and people working in the field are quite challenging; depending on the issue, I confront situations that may **hinder** my work."	C2H11RQ1: "The challenge is caused by humanity and organizational targets."	C2H11RQ2: "Changes in the field and changing factors inside the system influence the challenging situation."

4.2.2.3 Quality of collaboration related hindrances

Hindrances related to quality of collaboration consisted of the categories *scheduling problems* and *communication problems*. Altogether seven chains were constructed from quality of collaboration related hindrances. Chains consisted of two to four reasons. Chains in this main category seemed to follow two reasoning patterns:

```
┌─────────────────────┐   ┌─────────────────────┐   ┌─────────────────────────┐
│ Scheduling problems │◄──│ Difficult to find suitable │──►│ Tasks depending on meetings │
│                     │   │   time for meetings  │   │    do not proceed        │
└─────────────────────┘   └─────────────────────┘   └─────────────────────────┘
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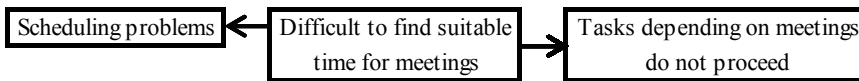
    Scheduling problems were experienced as hindrances in collaboration because it was difficult to find suitable times for meetings, both with internal and external partners (see the reasoning pattern above). Because it was difficult to find suitable time for meetings, tasks depending on these meetings did not proceed.

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┌─────────────────────────┐   ┌───────────────────────────────┐
│ Communication problems  │──►│ Clients' needs may remain unclear │
│                         │   │ Problems in internal collaboration │
└─────────────────────────┘   └───────────────────────────────┘
          ▲
          ┊
┌─────────────────────┐
│   Different kinds of │
│  professional jargon │
└─────────────────────┘
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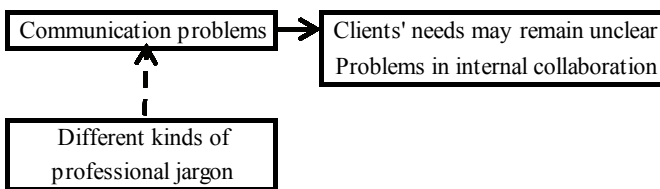
    Communication problems were regarded as hindrances in collaboration, as well. Communication problems led to experiences of uncertainty about clients' needs and/or different kinds of problems in internal collaboration (see the reasoning pattern above). The arrow with the dotted line in the reasoning pattern above refers to an extended interpretation by the author: the author's conclusion is that different kinds of professional terminology (or actually jargon) cause communication problems in this context.

Scheduling problems
Difficulties to find suitable time for meetings with internal and external clients and partners led to experiences of scheduling problems. Individuals tended to prioritize their time in different ways, which caused challenges with meeting schedules – there usually was "no time for meetings". This led to a situation in which tasks or issues did not proceed without decisions that were to be made in those meetings. Another notable problem the informants confronted was that it was difficult to reach other individuals, and if they succeeded in reaching them, these individuals did not have time or willingness to concentrate on issues at hand. The example below presents an experience of this kind.

Fluency experience (FE)	Reasoning 1	Reasoning 2
C3H1: "Unattainability of individuals is a huge **hindrance** because issues do not progress and the project does not proceed."	C3H1RQ1: "Clients and partners are difficult to reach in order to find a suitable time for a meeting, because of constant hurry."	C3H1RQ2: "A client may have only a limited time for a meeting or he/she may not be able to (or want to) concentrate on the issue because of stress caused by upcoming lay-offs, etc."

A critical issue was identified concerning internal collaboration in some organizational cultures that the informants represented: nonchalant attitude of the staff, especially towards internal collaboration and internal issues. Mode of thinking seemed to prioritize client service needs at the expense of internal processes. For example, selling more services to clients or finding new clients were considered more important than developing internal processes. In the long run, this kind of prioritizing may have unpredictable consequences from the viewpoint of an organization's success. Although the ongoing economic recession during interviews might have partly influenced this kind of attitude, managers should direct their energies to supporting the staff in achievement of goals, which inevitably include development of internal processes, as well.

Communication problems

Different kinds of professional languages that knowledge workers use were the most likely reasons for experiences of communication problems. These languages, or jargons, may have been developed due to the field of work, educational background, or different organizational policies among personnel groups. When two individuals have a difficulty in understanding each other when they are in conversation, misunderstandings are more likely to appear. The informants referred to experiences of uncertainty about clients' needs and different kinds of problems during internal collaboration resulting from communication problems. The example below shows an experience that includes both angles.

Fluency experience (FE)	Reasoning 1	Reasoning 2
C4H3: "Communication problems **hinder** my working."	C4H3RQ1: "Creating plans and negotiations with colleagues take much time because goals satisfying all negotiating parties require surprisingly much time and interaction."	C4H3RQ2: "Communication problems may come up also in negotiations with clients; if motives or needs of the client are not understandable, problems cannot be solved."

4.2.2.4 External collaboration related hindrances

Hindrances related to external collaboration consisted of the categories *negative cultural differences* and *problems of clients/partners*. Altogether six chains were constructed from external collaboration related hindrances. Chains consisted of two to four reasons. Chains in this main category seemed to follow two reasoning patterns:

Negative cultural differences	←	Different cultural backgrounds	→	Communication problems	→	Challenging situations

Different cultural backgrounds were identified as reasons for experiences of negative cultural differences, as shown in the reasoning pattern above. Different cultural backgrounds also led to experiences of communication problems, which led to experiences of different kinds of challenging situations.

Problems of clients/partners	←	Disagreements between clients & partners Unclear responsibilities & roles Client not capable to make decisions	⇢	Extra work Challenging situations Delays
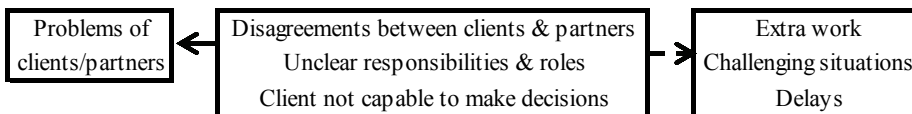
'Problems of clients/partners' refers to problems that are internal to the clients or partners, and not influenced by the informants or their organizations. The hindrance 'problems of clients/partners' was a common denominator for several reasons, such as disagreements between clients and partners, unclear responsibilities and roles, and clients not capable of making decisions. These reasons led to extra work, challenging situations, or delays. The arrow with the dotted line in the reasoning pattern above refers to an extended interpretation by the author: these outcomes follow from either one or several reasons presented in the middle of the reasoning pattern.

Negative cultural differences
Experiences of negative cultural differences were caused by different cultural backgrounds (individual or organizational), or insufficient knowledge about one's own and/or foreign culture. Different cultural backgrounds led to experiences of communication (or understanding) problems due to two kinds of reasons: language barriers in communication between native and non-native speakers, and, (individual or organizational) cultures at extreme ends of the spectrum (an example of the latter reason is presented below). Communication problems led to experiences of challenging situations; different ways of behaving caused different kinds of challenges, negotiations with clients or partners did not necessarily end in common understanding, etc.

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3
C3H8: "Problems due to different cultural backgrounds **hinder** my work."	C3H8RQ1: "As we here in Finland have our own will and we know what we want, this kind of individualistic behavior is lacking in some cultures, e.g., because of religion."	C3H8RQ2: "I have faced clients who do not want to or who cannot be guided, e.g., a Muslim male cannot take my advice because I am female, or a Muslim female cannot decide her own issues because she is obliged to ask opinion of her spouse and family first."	C3H8RQ3: "Religion seems to drive individuals a lot; it even may have such effective influence on an individual that he or she has no influence over him/herself at all. It is very difficult to do my work in these kinds of situations."

Problems of clients/partners

'Problems of clients/partners' was a common denominator for several reasons: 1) disagreements between clients and partners led to extra work, experience of haste, scheduling problems, and they usually included juridical problems; 2) unclear responsibilities and roles were connected with insufficient knowledge of clients or partners, and they led to misunderstandings because of different cultural backgrounds and other kinds of challenging situations; 3) delays were expected, if clients were not capable to make decisions, or if they had authorized their service providers incorrectly, or if they had not reserved enough resources for the project. The example below illustrates the first alternative and introduces hindering influence of legislation in this context, as well.

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4
C2H4: "Disagreements between clients and partners can cause problems and **hinder fluency** in my work."	C2H4RQ1: "Problems of clients and partners cause extra work because I have to find solutions to these problems."	C2H4RQ2: "Finding solutions has to be done quickly but it takes a lot of time, sometimes even unreasonable amount of time."	C2H4RQ3: "Decision making in these situations is slow and difficult because legislation may impose limitations; there are usually not enough arguments defined in legislation. Sometimes it is impossible to make decisions and then it really is **hindering** my work."	C2H4RQ4: "When I have to spend time on issues of this kind, my work is not fluent and I get irritated because other tasks are impossible to be done in time."

4.2.2.5 Internal collaboration related hindrances

Hindrances related to internal collaboration consisted of the category *negative influence of co-workers*. Altogether six chains were constructed from internal collaboration related hindrances. Chains consisted of three to five reasons. Chains in this main category seemed to follow a single reasoning pattern:

| Negative influence of co-workers | | *Challenges with colleagues:*
Different interests
Individuals requiring space in meetings
Lack of communication in sales situations
Inability/unwillingness to collaborate | | Poorly functioning processes | | *Outcomes:*
Delays
Decisions without plans
Unsuccessful projects
Wrong decisions |
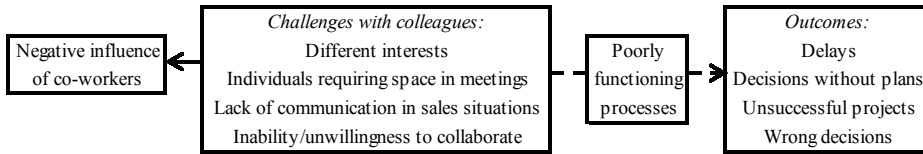
Different kinds of challenges with colleagues were reasons for experiences of negative influence of co-workers (i.e., negative influence on flow of work), as illustrated in the reasoning pattern above. These challenges, e.g., different interests, individuals who need a lot of space in meetings, lack of communication in sales situations, and inability or unwillingness to collaborate, combined with poorly functioning processes in the organization, led to experiences of numerous negative outcomes: delays, decisions without plans, unsuccessful projects, and wrong decisions. The arrow with the dotted line in the reasoning pattern above refers to an extended interpretation by the author: poorly functioning processes are seen as invisible reasons for negative outcomes, i.e., if processes were functioning well, the outcomes would most likely be positive because processes would control the actions and direct them to alternative solutions.

Negative influence of co-workers
Negative influence of co-workers was experienced as a hindrance in several ways:
  1) Different interests of personnel groups led to time consuming communication methods, because issues had to be explained many times, or in many different ways, in order to get them understood.
  2) Co-workers who took up a lot of time in meetings led to ineffective or overly long meetings, and decisions were made without clear implementation plans.
  3) Lack of communication in sales situations led to unsuccessful or delayed projects because sales persons had made empty or false promises to clients.
  4) Co-workers' inability or unwillingness to collaborate led to wrong decisions or delays because right answers were not available.

All of these consequences could have been avoided if the organizations' processes had been up to date. The example below presents one of the experiences referring to the fourth cause-consequences scenario.

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3
C3H9: "Individuals that work with supportive tasks (i.e., office people) every now and then have a **hindering** influence on my work."	C3H9RQ1: "Office people are used to having coffee breaks and luch breaks together, at the same time. Therefore, even if I have an urgent issue to take care of, I must wait until they are back in their rooms."	C3H9RQ2: "Some of these office people have such exactly defined job descriptions that they cannot (or do not want to) help if the issue at hand does not belong to their field exactly."	C3H9RQ3: "In addition, some of these office people often wander around the office and stop by every room gossiping about their personal issues. These are situations in which I have to leave office and move to home for work."

4.2.2.6 Organization related hindrances

Hindrances related to organization consisted of the category *negative organizational culture*. Altogether three chains were constructed from organization related hindrances. All of the chains consisted of three reasons. Chains in this main category seemed to follow a single reasoning pattern:
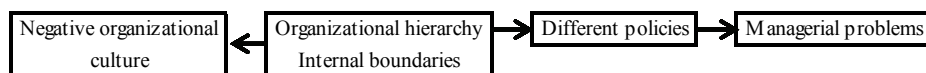
Organizational hierarchy and internal boundaries between teams and departments were reasons for experiences of negative organizational culture. Restricting organizational hierarchy and internal boundaries were causes of many different policies in the same organization, which led to experiences of managerial problems.

Negative organizational culture
Negative organizational culture was experienced as a hindrance because of hierarchical organizational structure (e.g., unsuccessful operational structure of the organization) or because of internal (partly visible) boundaries between teams and departments. Hierarchy and internal boundaries seemed to lead to different policies and courses of action among personnel groups in the same organization. Finally, this led to experiences of managerial or communication problems. The example below illustrates an experience referring to hierarchical organizational structure.

Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3
C1H4: "Operating in a matrix organization is clearly a **hindrance**."	C1H4RQ1: "Operating in a matrix organization is a new way to operate in the organization."	C1H4RQ2: "The local sales management is very traditionally oriented and it is not used to act in a matrix organization, i.e., having reporting responsibilities horizontally, not only hierarchically upwards, or, that management has clear sales targets with named solutions which it is able and which it desires to communicate to the subordinates."	C1H4RQ3: "The reason is inside the organization; how personnel groups are organized and how my superior acts in his role (i.e., he is unable to encourage his subordinates)."

4.3 Fluency experiences in knowledge-intensive individual work and collaboration

This section summarizes the results of the preceding sections. Fluency experience chains arranged according to the themes (Appendices 10a-10d) show that most chains refer to hindrances (87 chains) as compared to enablers (50 chains). *The informants more thoroughly explained hindrances than enablers.* Enablers and hindrances related to the key category *context* had more chains both in individual work (37 chains) and in collaboration (39 chains) than enablers and hindrances in the key categories *self* (29 chains) or *collaboration* (32 chains). This leads to the conclusion that *the informants felt the need to explain their context related enablers and hindrances more thoroughly than those related to their emotions or interactions with other individuals*. The length of the chain, i.e., number of reasons per chain, indicated the informant's need to rationalize his fluency experience. Six informants used two to five reasons for their fluency experiences; informants 4, 5 and 8 used only two to four reasons. This indicates that *those six informants felt the need to rationalize their fluency experiences more thoroughly than the other three informants* (Appendix 9).

Enablers related to fluency experiences in individual work (24 chains). Main category *situation* related enablers (fourteen chains) consisted of the categories 'suitable physical place' and 'well-functioning devices'. Main category *self*-related enablers (ten chains) consisted of the categories 'positive attitude' and 'positive interest'. Key categories indicated that 58 percent of enablers in individual work referred to the key category *context* (main category: 'situation'), and 42 percent to the key category *self* (main category: 'self'). Chains followed one of the five reasoning patterns that were identified when the in-

formants' reasoning was examined. Two of the reasoning patterns were strong enough that they can be generalized to a certain extent:

1) Tranquility of a physical place was the reason for positive experiences of **suitable physical** work**place**. Tranquility of a certain place led to perceptions of effectiveness. Experiences of effectiveness led to experiences of positive emotions. (Main category: *situation*)

2) Attitudes towards skills and abilities, working conditions, and other work related issues caused experiences of **positive attitude**. These positive attitudes led to experiences of effectiveness and other positive emotions. (Main category: *self*)

Hindrances related to fluency experiences in individual work (42 chains). Main category *situation* related hindrances (twenty chains) consisted of the categories 'unsuitable physical place' and 'poorly functioning devices'. Main category *self*-related hindrances (nineteen chains) consisted of the categories 'negative attitude', 'negative interest', and 'negative emotions'. Main category *society* related hindrances (three chains) consisted of the category 'economic recession'. Key categories indicated that 55 percent of hindrances in individual work referred to the key category *context* (main categories: 'situation' and 'society'), and 45 percent to the key category *self* (main category: 'self'). When the informants' reasoning was examined, chains followed one of the nine reasoning patterns identified. Two of the reasoning patterns were strong enough that they can be generalized to a certain extent:

1) A workplace was considered an **unsuitable physical** work**place** because of poorly functioning devices and connections, negative attitude towards a particular physical place, and interruptions, fragmentation, or noise caused by other individuals in that particular place. These reasons led to experiences of negative emotions because it was impossible to concentrate or perform certain work tasks. (Main category: *situation*)

2) Experiences of **negative attitude** were caused by work related issues (routine tasks, schedules, places), society related issues (bureaucracy), or organization related issues (conflicting organizational cultures). Outcomes of experiences of negative attitude were experiences of negative emotions, delays, and problems. (Main category: *self*)

Enablers related to fluency experiences in collaboration (26 chains). Main category *quality of collaboration* related enablers (eight chains) consisted of the categories 'availability of face-to-face contacts', 'positive atmosphere', and 'positive influence of social networks'. Main category *situation* related enablers (seven chains) consisted of the category 'suitable physical place'. Main category *management* related enablers (six chains) consisted of the category 'managerial support'. Main category *internal collaboration* related enablers (five chains) consisted of the category 'positive influence of co-workers'. Key categories indicated that 50 percent of enablers in collaboration referred to the key category *context* (main categories: 'situation' and 'management'), and 50 percent to the key category *collaboration* (main categories: 'quality of collaboration' and 'internal collaboration'). Chains followed one of the seven reasoning patterns identified when the informants' reasoning was examined. Two of

the reasoning patterns were strong enough that they can be generalized to a certain extent:

1) Experiences of **suitable physical** work**place** were caused by ergonomically suitable places for collaboration, and by availability of face-to-face communication. Availability of face-to-face communication led to experiences of motivating and positive atmosphere. (Main category: *situation*)

2) Managerial support was a reason for experiences of **superior's positive approach, attitude, understanding, or trust**. Superior's approach, attitude, understanding, or trust led to experiences of independence and fluent collaboration. (Main category: *management*)

   Hindrances related to fluency experiences in collaboration (45 chains). Main category *management* related hindrances (fourteen chains) consisted of the categories 'managerial problems', 'lack of resources', and 'lack of information'. Main category *situation* related hindrances (nine chains) consisted of the categories 'unsuitable physical place' and 'unexpected situations'. Main category *quality of collaboration* related hindrances (seven chains) consisted of the categories 'scheduling problems' and 'communication problems'. Main category *external collaboration* related hindrances (six chains) consisted of the categories 'negative cultural differences' and 'problems of clients/partners'. Main category *internal collaboration* related hindrances (six chains) consisted of the category 'negative influence of co-workers'. Main category *organization* related hindrances (three chains) consisted of the category 'negative organizational culture'. Key categories indicated that 58 percent of hindrances in collaboration referred to the key category *context* (main categories: 'management', 'situation', and 'organization'), and 42 percent to the key category *collaboration* (main categories: 'quality of collaboration', 'external collaboration', and 'internal collaboration'). Chains followed one of the eleven reasoning patterns identified when the informants' reasoning was examined. Three of the reasoning patterns were strong enough that they can be generalized to a certain extent:

1) Managerial problems were reasons for experiences of **lack of managerial support and/or poorly performed management, or poorly managed internal collaboration**. They also led to strong negative emotional experiences. Negative emotions led to experiences of motivation and/or productivity loss, lack of commitment, and negative organization atmosphere. (Main category: *management*)

2) Lack of physical space for confidential discussions, meetings, or working caused experiences of **unsuitable physical place** for collaboration. Lack of suitable spaces led to security risks, as well. (Main category: *situation*)

3) Experiences of **negative influence of co-workers** were caused by different kinds of challenges with colleagues. Challenges with colleagues added to poorly functioning processes led to experiences of delays, unsuccessful projects, and deficient decisions. (Main category: *internal collaboration*)

   One additional significant finding should be emphasized here. As categorized, management is defined as a collaborative factor, also from the viewpoint

of hindrances, because managing is usually performed in interaction. Therefore, one could presume that managerial problems have effects only on collaboration. However, as fluency experience chains here indicated, *managerial problems have strong effects on individuals; managerial problems clearly influence on individual emotions*. Chains gave examples of how strongly poorly performed management influenced the informants' emotions.

Fluency experiences, or actually, reasoning patterns emerged from fluency experiences summarized in this section, are revisited in subsection 4.4.2. They are presented as a part of the 'Analytic framework for the cases', together with work and context related factors.

4.4   Contextual and work factors related to fluency experiences in individual work and collaboration

In this section, the theory-based frameworks presented in subsection 3.4.2 are used to analyze contextual and work factors related to fluency experiences in individual work and collaboration. Then, a summary of these factors is presented in the 'Analytic framework for the cases' in which a summary of fluency experiences is also included.

4.4.1   Work and context factors related to fluency experiences

First, work and context factors related to fluency experiences in individual work and collaboration, analyzed using the theory-based frameworks, are presented. Work-related factors are 'Work processes', 'Complexity of tasks', 'Activities in individual work', 'Activities in collaboration', and 'Types of interruptions'. Context-related factors are 'Workplaces'. Factors related to fluency experiences are examined here, across all cases.

Work processes. All the informants spent more working time on operational work processes than on managerial processes; on average, three quarters of the informants' tasks were related to operational processes and the rest to managerial processes (Figure 7). Three operational processes (production, client relationships, and delivery processes) took up more than half of the informants' working time. The rest of the processes took varying amounts of the informants' working time, depending on their work descriptions and delineations of tasks. Appendix 12 gives specific data on how emphasized processes differed, case by case.
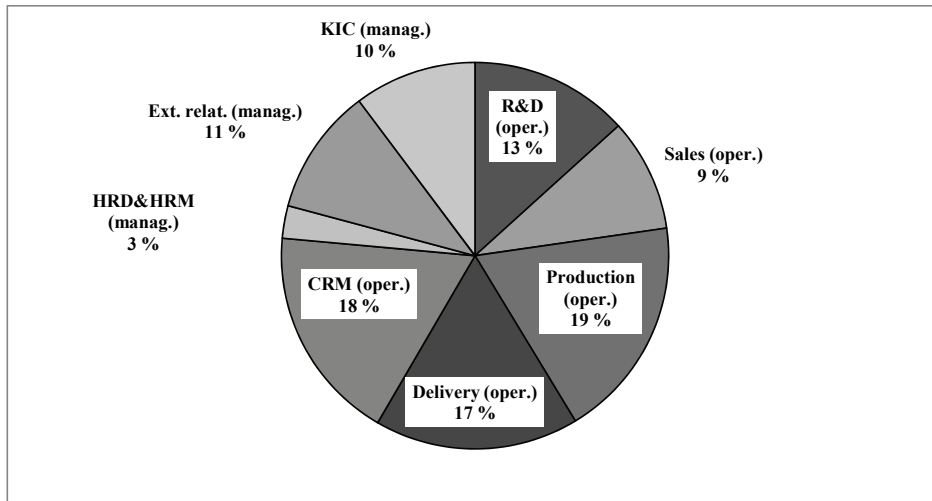
Figure 7. Work processes. Percentages indicate working time spent on processes. ('Oper.' = operational processes; 'manag.' = managerial processes; 'CRM' = client relationship management; 'HRD&HRM' = human resources development and management; 'Ext. relat.' = external relationships management; 'KIC' = knowledge, improvement and change; and 'R&D' = research and development.)

Complexity of tasks. The informants' individual tasks were categorized on a scale from routine to creative (Hacker, 2005, 239-250), showing their complexity, i.e., cognitive requirements of the tasks. Table 6 presents examples of individual tasks of the informants.

Table 6. Examples of individual tasks of the informants with required levels of cognitive regulation. Cognitive levels are based on Hacker (2005, 239).

Required level of cognitive regulation	Examples of the informants' individual tasks
Doing **routine** tasks	budgets & financial targets, reporting, memos, invoicing, CRM-follow-ups, system maintenance, meetings
Working based on **familiar rules** and guidelines	coaching, FAQs, project reporting, collaboration with social network, client service, quality follow-ups, project plans, client meetings, budgets & action plans, ordering medicine, maintenance of clients' environments
Applying rules and guidelines in many **familiar contexts**	identification of educational needs & planning, negotiations, contracts, recruitment, employment contracts, development discussions, project management & plans, process descriptions, implementation & updating of back-up systems
Combining familiar rules and guidelines in **new contexts**	planning & developing supportive services and development services for work life, quality management, solutions tailored for an unfamiliar client, implementation of new strategies, core of a project plan, results of projects & implementations, project innovations & roadmaps & business cases, virtualization surveys
Creating new plans and solutions	quality development projects, planning & designing new education, totally new solutions for a client - ideas & documentation, creating new strategies & pedagogical solutions, creating new services

The informants performed approximately a half of their work by applying familiar rules and guidelines. More than one third of the tasks included creativity demands; these tasks were classified into two categories: 'Combining familiar rules and guidelines in new contexts' and 'Creating new plans and solutions'. Rest of the work was doing routine tasks. Figure 8 illustrates this divi-

sion of tasks according to the cognitive requirements. Specific data on individual differences is shown in Appendix 13.
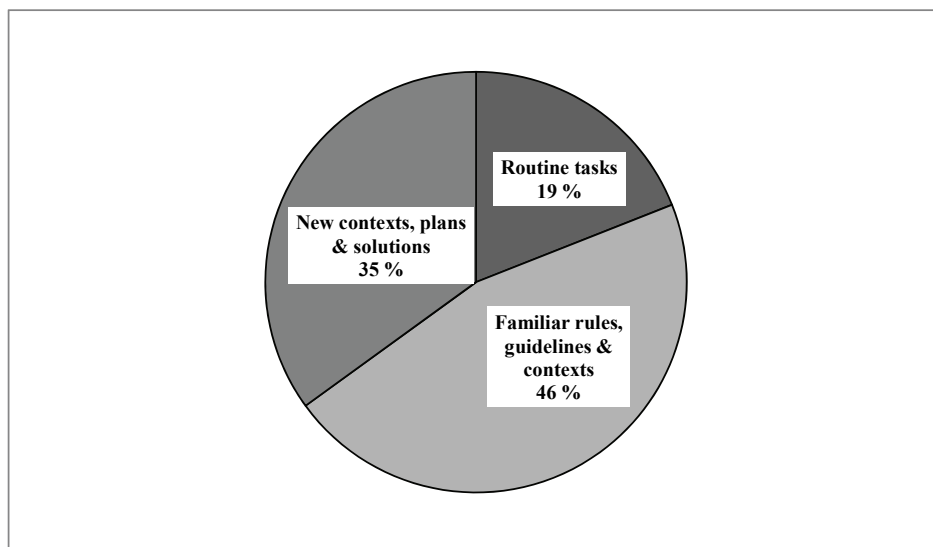
Figure 8. Group categories of cognitive requirements of the tasks. Groups consist of Levels of cognitive requirements presented in Table 6. Percentages indicate division of the tasks into group categories.

Activities in individual work. Solo tasks seem to indicate an informant's status in the organization and his primary work content. All the informants emphasized tasks that could be identified with their professional titles. For example, informants working as managers emphasized managerial tasks, and informants working more with issues related to clients and partners, emphasized tasks referring to them, such as production or delivery. The concept of 'management' as an individual work task refers to managerial tasks that are performed solo (see examples in Table 7). Management as a collaborative task requires presence of at least two individuals. Table 7 presents examples of activities in individual work (right column). Short descriptions of the informants' work content are presented in section 4.5.

Table 7. Examples of activities in individual work. Generic knowledge work categories are adapted from Harrison et al., (2004, 54-55).

Generic knowledge work categories	Examples of activities in the informants' individual work
Management (including project management, staff management and client/partner management)	project management, partner relationships, division of tasks & responsibilities, general management, technical project management
Collecting information	basic information from earlier projects, material for planning, internal guidance, information from client for new solutions
Informing others	product information, e-mail information to followers, internal meetings (invitations)
Analysis (examining elements of a complex entity and the relationship between them)	earlier utilized solutions, clients' processes and procedures, backround, project results, HR reports, current state of clients' environment
Evaluating and interpretation (assessing the significance and worth of the analysis)	earlier utilized solutions (suitability for the project), clients' processes, project results, HR reports, problem solving related to service delivery, proposals for new virtual environments
Production	production of contents, parametres & changes in system, ideas for solutions & documents related, new ideas & solutions
Documentation (recording and storing data, analysis and other documents)	reports, memos, project documentation, instructions for clients
Delivery	changes in systems, instructions for clients via e-mail, delivering drugs according to prescriptions, implementing new virtual environment or IT environment

The informants spent approximately one third of their solo working time with tasks related to production and delivery, a little less time with tasks related to information-sharing (categories 'collecting information', 'documentation', and 'informing others' were included in 'information-sharing'). Time spent on managerial tasks and tasks related to analysis and evaluating (categories 'analysis' and 'evaluating and interpretation' were included in 'analysis and evaluating'). Figure 9 illustrates the categorized groups of activities in individual work. Appendix 14 shows specific data on how much time each informant spent on each category group.
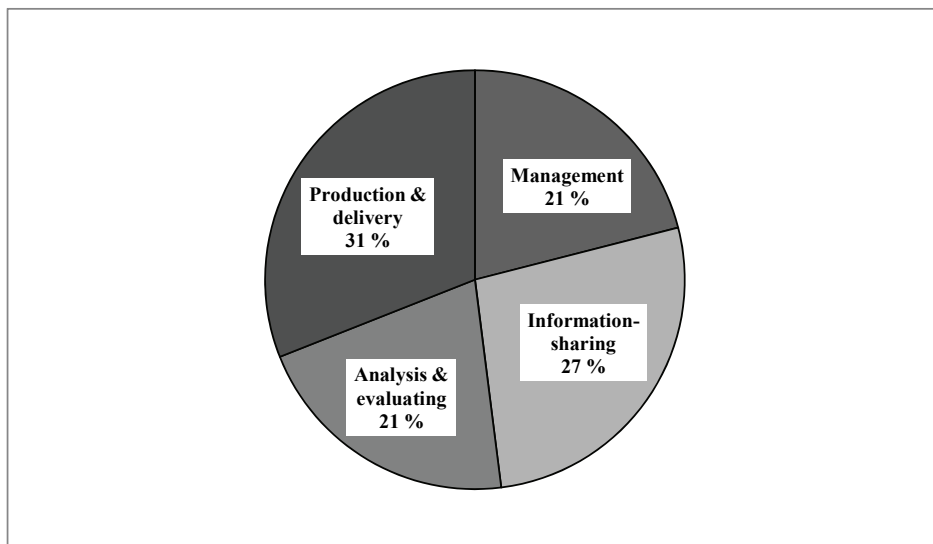
Figure 9. Group categories of activities in individual work. Percentages indicate working time spent on group categories of activities in individual work. Group categories consist of Generic knowledge work categories presented in Table 7.

Activities in collaboration. Collaborative knowledge work tasks of the informants were classified into four categories, as follows:

1) Approximately one third of tasks were *executional*, which includes performance/psychomotor tasks and competitive tasks. The categories 'executing performance tasks' (e.g., procedures, timing, quality) and 'persuasion' (e.g., resolving conflicts of power) were included in this category.

2) Around a quarter of tasks consisted of *generating*, which include planning and creative tasks. The categories 'generating ideas' (e.g., brainstorming) and 'generating plans' (e.g., goal-setting, agendas) were included in this category as well.

3) Less than a quarter of tasks consisted of *negotiating*, which includes mixed motive and cognitive conflict tasks. The categories 'bargaining/negotiating' (e.g., resolving conflicts of interest) and 'exchanging information' (e.g., resolving conflicts of viewpoint) were also included in this category.

4) Around a fifth of tasks consisted of *choosing*, which includes decision-making tasks and intellectual tasks. The categories 'resolving disagreement' (i.e., resolving disagreements by deciding issues with no correct answers) and 'problem solving' (i.e., problem solving with correct answers) were included in this category.

Figure 10 illustrates described categories of collaborative activities. Specific data on how categories consisted of task entities and how these entities differed case by case are shown in Appendix 15.
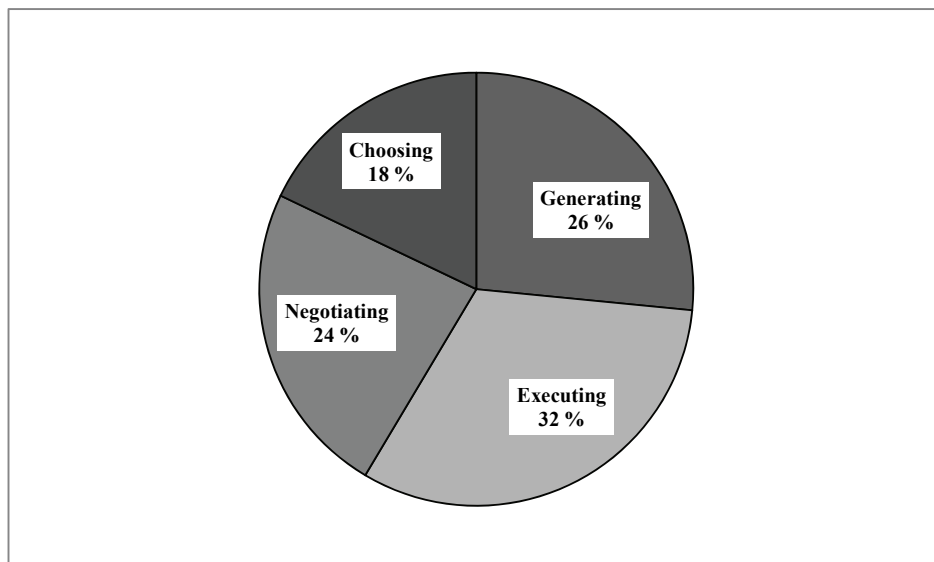
Figure 10. Activities in collaboration. Categories are based on McGrath (1984, 61) and McGrath and Hollingshead (1994, 67). Percentages indicate working time spent on categories of activities in collaboration.

Types of interruptions. Four informants were most frequently interrupted by the phone, three informants by other individuals, one by incoming e-mail, and one mainly interrupted his own work deliberately, meaning internal, self-initiated interruptions. It was quite surprising that only two informants related that they might interrupt their work themselves in order to add variety to work tasks or simply to take a creative break between or during tasks. None of the informants experienced interruptions as stressful; each of them related that they were able to manage interruptions in some way, or that in some situations, interruptions actually promoted their work. Figure 11 presents types of interruptions, by percentage, by case.

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
Phone	34 %	50 %	30 %	70 %	5 %	50 %	70 %	30 %	30 %
Other people	33 %	40 %	30 %	30 %	95 %	50 %	30 %	70 %	10 %
E-mail	0 %	10 %	40 %	0 %	0 %	0 %	0 %	0 %	30 %
Self-interrupted	33 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %	30 %
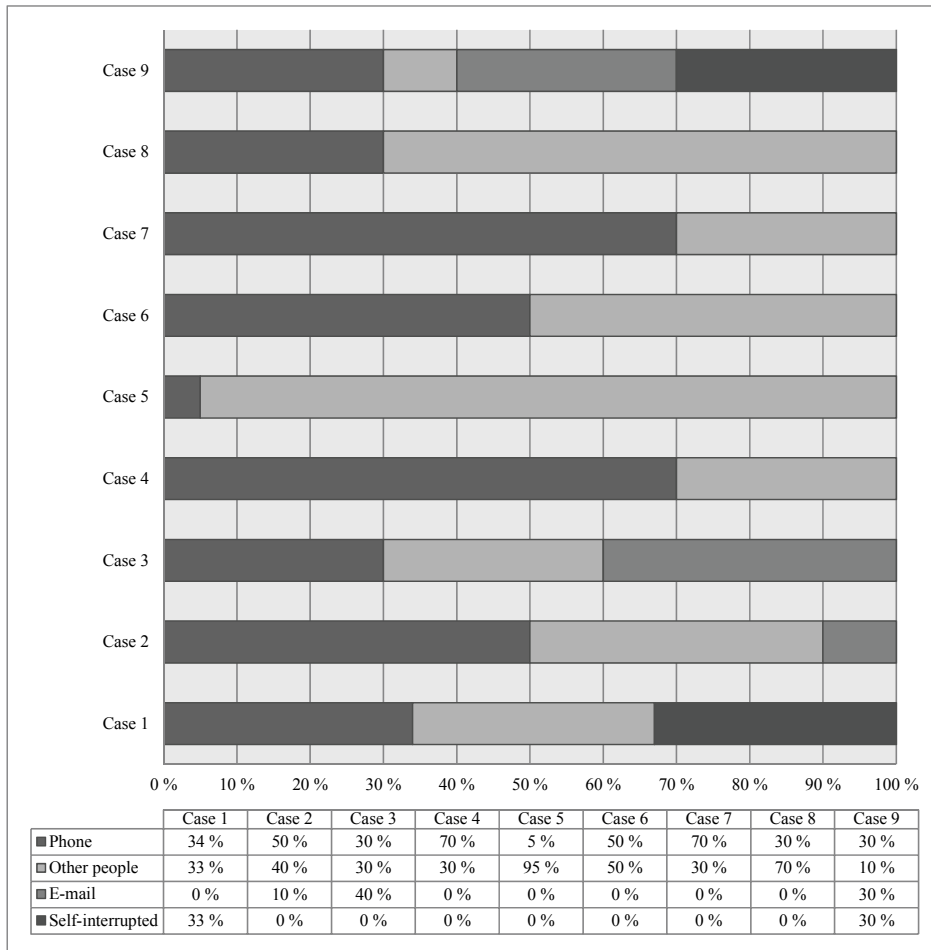
Figure 11. Types of interruptions. Percentages indicate total number of interruptions estimated by the informants. Key at bottom, chart reads from the left.

Workplaces. Main workplace of the informants was the office, i.e., company's premises. However, one informant worked primarily in clients' premises, because of the nature of his work. He also worked at home more than the other informants did, and only occasionally at the office. One of the reasons for this working mode was company policy, which encouraged employees to choose

their own alternative workplaces by eliminating individual permanent desks at the office. The rest of the informants worked at home with considerable variability, depending upon the nature or urgency of their tasks. Second workplaces (i.e., subsidiaries, clients', partners', or suppliers' premises), moving places (i.e., car, plane, train, ship, or bus), and third workplaces (i.e., hotels, cafés, conferences, or libraries) were used for work more equally, except in the case of the informant mentioned above. Figure 12 illustrates work time spent in different workplaces, by percentage, by case.

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
■ Home	30 %	5 %	10 %	20 %	2 %	12 %	15 %	20 %	40 %
▢ Main workplace (office)	35 %	60 %	70 %	65 %	86 %	70 %	55 %	75 %	5 %
▢ Moving places (car, plane, train, ship, bus)	10 %	15 %	0 %	5 %	4 %	5 %	10 %	50 %	5 %
■ Second workplaces (subsidiaries, clients' & partners' & suppliers' premises)	20 %	20 %	20 %	5 %	8 %	10 %	15 %	0 %	45 %
▢ Third workplaces (hotels, cafés, conferences, libraries)	5 %	10 %	0 %	5 %	0 %	3 %	5 %	0 %	5 %
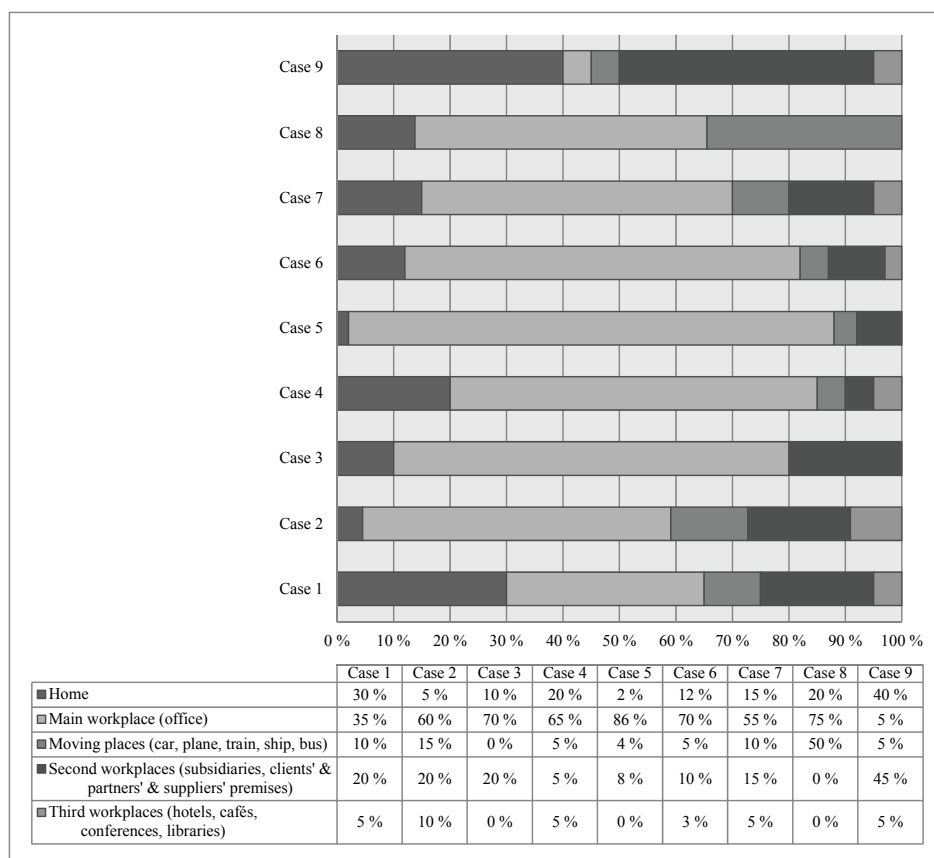
Figure 12. Working time spent in different places. Percentages indicate working time spent in each place when total working time is 100 percent. Key at bottom, chart reads from the left.

In order to achieve a more accurate picture of contextual factors related to different workplaces, the places in which the informants spent their working hours were analyzed from several viewpoints. Tables 8a-8e summarize the purposes of using different physical places for work, tool use, social contacts, and emotions related to each workplace. In addition, Tables 8a-8e show some randomly chosen and shortened quotations referring to enablers and/or hindrances.

The next subsection presents work and context factors related to fluency experiences revisited. They are presented as a part of 'Analytic framework for the cases', along with the most reliable fluency experiences.

Table 8a. Home as workplace. The purposes of using different physical places for work, tool use, social contacts, and emotions in the workplace. Some randomly chosen and shortened quotations referring to enablers and/or hindrances are presented in the last row of the table.

Place	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
Home									
Content of work or tasks	Drafts, tasks requiring creativity	E-mails and phone calls if urgent	E-mails and phone calls, preparing forthcoming week	E-mails, phone calls, on-call duties, urgent tasks	Tasks requiring concentration, tasks near deadline	E-mails, SMSs, preparing lectures, PP-presentations, offers, budgets	E-mails, tasks requiring thinking, planning, urgent issues	Preparing lectures, tasks requiring concentration	System configurations, documentation, reporting, problem solving
Tools in use	Laptop, mobile phone, internet	Laptop, mobile phone, internet	Mobile phone, laptop, internet	Laptop, mobile phone, internet (tools are indispensable)	Laptop, WLAN, internet	Laptop, WLAN, internet, mobile phone	Laptop, mobile phone, internet	Laptop, internet	Laptop, internet, mobile phone, WLAN
Social situations	Phone calls & e-mails / clients, partners & colleagues	Phone calls & e-mails / clients & partners	Phone calls & e-mails / clients, partners & colleagues	Phone calls & e-mail / colleagues, superior & clients	Occasional phone calls / clients & colleagues	Occasional phone calls / colleagues, clients & interest groups	E-mails & phone calls / colleagues, superior & suppliers	Usually none	E-mails, office communicator / colleagues, sales & superior
Emotions	Tranquility, creativity flourishes	Work related problems sometimes grieve in mind	Tranquility	Most comfortable, flexible & easiest as an environment. Easy to hold on thoughts because of tranquility & lacking duties related to socializing.	Tranquility. When tasks require deep concentration. Otherwise work and leisure time mixed.	Positive feelings, suitable design of premises, possibility to other activities, too.	Tranquility, easy to concentrate. Feelings of isolation would appear if working more at home.	Very tranquil environment, no interruptions	Effective as an environment because of working conditions and multitasking
Enablers/ hindrances	Environment clearly enables working	If urgent issues, working here enables. Sometimes takes too much time from leisure time.	Ability to prepare forthcoming work week enables	Positive feelings enable	Tranquility enables. Uncomfortability & lack of counseling hinder.	Freedom to choose how to work & idealistic conditions enable. Tempting hobbies may hinder.	Good place for working but not necessarily any new ideas	Doing issues that require concentration progresses	Tranquility and comfortability enable

Table 8b. Main workplace (office). Contents of the table, see Table 8a.

Place	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
Main									
Content of work or tasks	Meeting colleagues	Preparing client meetings, contacting partners	Project planning, inquiries, client & partner management, face-to-face meetings	Face-to-face meetings, e-mails, social relationships, phone calls, unofficial contacts	Almost all of the tasks, both solo tasks and collaborative tasks	Internal & external face-to-face meetings & routine tasks	Routine tasks, reporting, planning, project management, face-to-face meetings	Basic tasks (customer service), documentation, financial administration, personnel issues	Support, reporting, face-to-face meetings
Tools in use	Laptop, mobile phone, internet, printer, teleconference	Laptop, mobile phone, printers, internet, audiovisual devices	Laptop, mobile phone, internet	Mobile phone, laptop, internet (tools are necessary)	Laptop, internet, CRM, intranet, reporting tools, conference devices	Desktop, phone, mobile phone, internet, intranet, CRM, reporting & administrative tools	Laptop, mobile phone, internet	Desktop with software, delivery system	Laptop, internet, mobile phone
Social situations	Face-to-face; superior, colleagues	Face-to-face; clients, colleagues	Face-to-face; colleagues, superior, assistant, clients, internal social network	Face-to-face; colleagues, superior, clients, formal and informal socializing	Face-to-face; colleagues, sales, superior, technical support, occasionally clients	Face-to-face; colleagues, interest groups, clients	Face-to-face; colleagues, superior, project team & suppliers	Face-to-face; staff & customers	Face-to-face; colleagues, superior
Emotions	Mentally nothing happens here	Mentally not attractive environment	Design of premises affect positively	Socializing is emphasized, tacit knowledge is here, a lot of interruptions	Support is available here and social contacts are easier to take care of	Usually positive; negative feelings when solving other individuals' conflicts	Relaxed atmosphere, synergy of competences, cozy premises	Everything that is needed is available, constant interruptions	Neutral feelings; this is a place to keep oneself up-to-date
Enablers/ hindrances	Face-to-face enables, otherwise hinders	Co-worker & tranquility enables. Too small premises hinder.	Ability to face-to-face meetings, co-worker, design of premises and managerial support enable. Social load & lack of suitable premises hinder.	Social acceptance and being near to tacit knowledge enable. Unnecessary social load and social hazzling hinder.	Support of colleagues & ability to face-to-face contacts enable. Absence of colleagues hinder.	Tranquility of own room enables. Noise and social load may occasionally hinder.	Good place for working but not necessarily any new ideas. Too serene as an environment.	Ability to communicate with staff enables. Interruptions hinder.	Information may enable. Noise hinders.

Table 8c. Moving places as workplaces (car, plane, train, ship, and bus). Contents of the table, see Table 8a.

Place	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
Moving			Places not in use						
Content of work or tasks	Phone calls, preparing material	Phone calls		Phone calls, social relationships, off-line documents	Offline documents, occasional phone calls	Phone calls, reading documents	E-mails, writing & reading documents & reports	Reading documents	Phone calls
Tools in use	Mobile phone, laptop	Mobile phone		Mobile phone, laptop (offline)	Laptop, mobile phone	Mobile phone, laptop occasionally	Laptop, mobile phone, internet	Not in use in these premises	Mobile phone
Social situations	Phone calls. Strangers; security risk with documents.	Partner/colleague seldom, usually alone. Phone calls / partners & clients.		Colleagues, superior, clients. Unofficial and official socializing.	Colleagues & clients. Strangers; security risk.	Usually none, occasionally with colleagues. Strangers; security risk.	Usually none. Strangers; security risk.	Usually none	Phone calls / superior, colleagues & clients.
Emotions	Innovative as environments	Pleasant mental state; a place for relaxing		Frustrating places because of overestimated preassumtions towards these places	These environments are not designed for working. Feeling is uncomfortable.	Neutral environment	Very good place for writing or socializing	Plane is suitable for reading and thinking, unless there is a talkative co-traveler	Ability to think issues during long car rides. Sometimes takes too much time to reach destination.
Enablers/ hindrances	Confidentiality for phone calls & innovative environments enable	Confidentiality for phone calls enable		Work tasks may not progress. Good places for socializing.	A thought that working is possible, enables. Unpleasant as a working environment.	Ability to relax enables. Weather conditions and strangers may hinder.	Time for writing enables. Excessive noise hinders.	Reading and thinking enable. Sozializing hinders.	Tranquility enables. Long distances are sometimes waste of time.

Table 8d. Second workplaces (subsidiaries, clients', partners', and suppliers' premises). Contents of the table, see Table 8a.

Place	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
Second								Places not in use	
Content of work or tasks	Teleconferences & negotiations face-to-face	Negotiating, informing & advising face-to-face	Marketing & development of social network	Meetings, educations	Face-to-face meetings, education, consultation.	Face-to-face meetings	Coaching of managers & face-to-face meetings		Working with primary work tasks; implementations & consultation
Tools in use	Laptop, mobile phone, internet	Mobile phone	None	Mobile phone, internet	Laptop, mobile phone, internet connections	Mobile phone (e-calender)	Laptop, mobile phone, internet		Laptop, internet, mobile phone
Social situations	Colleagues & clients	Clients & partners	Clients, partners & colleagues	Clients & colleagues, mainly official socializing	Clients, occasionally colleagues.	Clients, partners & colleagues	Managers & colleagues, suppliers' project manager & staff		Clients
Emotions	Own space is lacking. Trustworthy atmosphere.	Mental state is integrated with the issue and depends on the intuition in the beginning	Good relationships with clients and partners are essential	Rigidity and unsecureness do not progress issues	Variation, usually suitable for working	Positive and good atmosphere usually	Refreshing to work in these premises, a lot of stimuli		Effective as an environment because other issues do not disturb. Positive feelings because of successfully solved problems.
Enablers/ hindrances	Too small conference rooms hinder. Not creative as environments.	Some places enable. Others hinder, even prevent working.	Face-to-face contacts enable. Too short time for meetings hinder.	Social norms and tools may cause reserveness and issues do not progress. Face-to-face contacts enable.	Face-to-face contacts enables because body language is essential. Disruptions may hinder.	Good preparation for meeting enables. Emotional struggles between co-negotiators may hinder.	Knowledge of suppliers and suitable premises enable		Positive feelings enable. Physical working conditions may hinder: noise, too cold or too hot, other individuals.

Table 8e. Third workplaces (hotels, cafés, conferences, and libraries). Contents of the table, see Table 8a.

Place	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
Third			Places not in use		Places not in use			Places not in use	
Content of work or tasks	Preparing materials & listening to or giving speeches	Listening to or giving speeches		Meetings, lectures, social relationships		Preparing for seminars	E-mails, tasks resulting from day or preparing for the next day		Attending courses, information sharing and demonstrations
Tools in use	Laptop, mobile phone, internet	Mobile phone		Mobile phone, laptop (offline)		Mobile phone, laptop	Laptop, mobile phone, internet		Laptop, internet, mobile phone
Social situations	Usually none	Clients & partners		Especially unofficial socializing		Usually none, occasionally colleagues	Usually none, e-mails		Colleagues from other companies
Emotions	Tranquility	Mentally refreshing situations		These places require attitude because of different starting points. More for informal socializing.		Sometimes too tired to work, then only relaxing	Tranquility, a lot of stimuli; time to think issues		Nice to work in these places sometimes. Issues of conferences are emphasized. Hotels are boring.
Enablers/ hindrances	Innovating and thinking enable	Networking & partnerships enable		Informal socializing enables		New contacts may enable. Use of foreign language and intensive seminar program may hinder other working.	Suitable and peaceful environments enable		Positive feelings enable. Otherwise quite a lot of idling which may hinder.

4.4.2   Analytic framework for the cases

Next is a description of the enriched framework used to analyze fluency experiences, and work and contextual factors. The framework integrates the model based on the literature to date shown in Figure 5 ('Analytic framework of the thesis') with the findings in the previous sections. The constructed framework includes: a) the most reliable fluency experiences, and b) the factors related to fluency experiences with relevant information and average percentages. The framework is used to describe each case in section 4.5. The framework (Figure 13) is divided into two main parts: contextual and work factors in the upper part of the framework, and fluency experiences with their enablers and hindrances in the lower part of the framework.

   Contextual factors include organizational and societal contexts that are important from the viewpoint of fluency experiences. *Company* refers to the operative field of the company in which the informants worked. *Workplaces* refer to two physical workplaces, which the informants primarily used during their workday; percentages show the time spent in each place with working time of the informants totaling 100 percent. Contextual factors in Figure 13 show that:

> *A knowledge worker works in an (international) organization that operates in the service sector. His main workplaces are the office, where he spends fifty-eight percent of his working time, and home, where he spends seventeen percent of his working time.*

   Work factors include work related issues that are important from the viewpoint of fluency experiences. *Content* refers to work content and briefly describes an informant's job. *Processes* refer to the two main processes followed by the informants. Percentage shows a share of the named process when all processes total 100 percent. *Complexity* refers to the main group category of cognitive requirements of the informants' tasks. Percentage shows a share of the chosen group category of complexity when all group categories total 100 percent. *Activities/individual work* refers to the main group category of activities in individual work that the informants performed when they worked in solitude. Percentage shows a share of the chosen group category of activities in individual work when all group categories total 100 percent. *Activities/collaboration* refers to the main category of activities in collaboration that the informants performed when they worked in interaction with other individuals. Percentage shows a share of the chosen category of activities in collaboration when all categories total 100 percent. *Mode* refers to the informants' main working mode. Percentage shows a share of the mode when both modes total 100 percent. *Interruptions* refer to main types of interruptions. Percentage shows a share of the type when total amount of interruptions is 100 percent. Work factors in Figure 13 show that:

> *A knowledge worker's work consists of project management and client relationships management. Thirty-six percent of his work is connected to production and delivery processes. Forty-six percent of his tasks include using familiar rules, guidelines, and contexts. When he works in solitude, thirty-one percent of his tasks consist of production*

and delivery. When he works in collaboration, thirty-two percent of his tasks consist of executing. He works in collaboration fifty-five percent of his working time. Other individuals cause forty-three percent of interruptions in his work.

Factors related to fluency experiences: contextual and work factors	
CONTEXT	
Company : service business	
Workplaces : office 58%, home 17%	
WORK	
Content : project management & client relationships management	
Processes : production & delivery 36%	
Complexity : familiar rules, guidelines & contexts 46%	
Activities/individual work : production & delivery 31%	
Activities/collaboration : executing 32%	
Mode : collaboration 55%	
Interruptions : other individuals 43%	

F L U E N C Y   E X P E R I E N C E S

Individual work / enablers		**Collaboration / enablers**	
enabler	*reasoning*	*enabler*	*reasoning*
suitable physical workplace	tranquility -> effectiveness -> positive emotions	suitable physical workplace	ergonomically suitable place for collaborative working & availability of face-to-face contacts -> motivating & positive atmosphere
positive attitude towards skills & abilities, working conditions, etc.	effectiveness -> positive emotions	managerial support	superior's positive approach/ attitude/understanding or trust -> independency & fluent collaboration
Individual work / hindrances		**Collaboration / hindrances**	
hindrance	*reasoning*	*hindrance*	*reasoning*
unsuitable physical workplace	poorly functioning devices or connections / negative attitude towards a certain physical place / interruptions, fragmentation or noise caused by other individuals in a certain place -> impossible to concentrate or do certain work tasks -> negative emotions	managerial problems	lack of managerial support / poorly performed management / poorly managed internal collaboration -> strong negative emotions -> motivation or productivity loss / lack of commitment / negative atmosphere
negative attitude towards work, society, or organization related issues	routines / bureaucracy / conflicting organizational culture -> negative emotions, delays, problems	unsuitable physical workplace	lack of physical space for confidential discussions/meetings/working -> security risks
		negative influence of co-workers	challenges with colleagues -> poorly functioning processes -> delays, unsuccessful projects, deficient decisions

Figure 13. Analytic framework for the cases: cross-case fluency experiences and factors related to them

Fluency experiences in individual work and collaboration are presented in Figure 13 as follows: a) enablers and hindrances *in individual work* are presented in left hand columns, and b) enablers and hindrances *in collaboration* are presented in right hand columns. Arrows in *reasoning* columns refer to

consequences (or results) of previous reasoning in the same reasoning pattern. Fluency experiences in Figure 13 show that:

> *The enablers affecting positive fluency experiences in knowledge worker's individual work are: <u>a suitable physical workplace</u> because it is tranquil, and <u>a positive attitude toward skills and abilities and working conditions</u>, etc., because they lead to experiences of effectiveness.*

> *The hindrances affecting negative fluency experiences in a knowledge worker's individual work are: <u>an unsuitable physical workplace</u> due to poorly functioning devices or connections in a particular place; because of a negative attitude towards a particular physical place; because of interruptions, fragmentation, or noise caused by other individuals in a particular place; and <u>a negative attitude towards work, society, or organizational issues</u> due to routines, bureaucracy, or conflicting organizational cultures.*

> *The enablers affecting positive fluency experiences in knowledge worker's collaboration are: <u>a suitable physical workplace</u> because it is ergonomically suitable for collaboration, or because face-to-face contacts are available in that place; and <u>a managerial support</u> because of a superior's positive approach, attitude, understanding, or trust.*

> *The hindrances affecting negative fluency experiences in knowledge worker's collaboration are: <u>managerial problems</u> because of the lack of managerial support, poorly performed management, or poorly managed internal collaboration; <u>an unsuitable physical workplace</u> due to a lack of physical space for confidential discussions, meetings, or work; and <u>the negative influence of co-workers</u> because of different kinds of challenges with colleagues.*

4.5.   Fluency experiences and factors related to them in studied cases

This section presents each informant's fluency experiences and factors related to them. They are described using the structure of Figure 13, presented in previous section. Although fluency experiences, factors related to them, and 'Analytic framework for the cases' were presented in previous sections, there was variation in individual contexts, work, and fluency experiences. Therefore, it is necessary to examine these issues case by case using the same logic as presented in subsection 4.4.2. Subsections in this section are presented as illustrative examples and adaptations of the 'Analytic framework for the cases' shown in Figure 13. Each subsection contains:

1) A general short presentation of the informant's context and work
2) Findings related to contextual and work factors related to the informant's fluency experiences, with possible additional information not presented in the figure
3) The informant's fluency experiences in individual work and collaboration
4) A figure that illustrates the informant's fluency experiences and factors related to them

Some enablers, hindrances, and reasoning chains not introduced earlier are included in Figures 14 through 22. In addition, some were modified to better correspond to the case in question. Additional issues are marked with asterisks (*) in Figures 14 through 22.

4.5.1 Case 1: Sales Manager

Sales Manager was working in an international organization operating in the service sector. Her work consisted of sales, business development, and partnership management, designed as a project, as it was a new business launch. Her work required a remarkable amount of collaboration with clients and partners. Sales manager felt that her position was one of great responsibility, because she was expected to self-manage her work within a matrix. She reported that she was motivated in her work; she considered her work itself to be perfect but circumstances not.

Contextual and work factors in Figure 14 show that Sales Manager's main workplaces were an office, where she spent thirty-five percent of her working time, and home, where she spent thirty percent of her working time. Fifty-five percent of her work related to external relationships and sales processes. Fifty-five percent of her work tasks required working in new contexts and planning. When she worked in solitude, seventy percent of her tasks consisted of management; her tasks did not include production or delivery related tasks. When she worked in collaboration, forty percent of her tasks consisted of negotiating. She worked in collaboration eighty percent of her working time. Phone caused thirty-four percent of interruptions to her work, with interruptions related to office premises.

Fluency experiences in Figure 14 show that the *enablers* affecting positive fluency experiences *in* Sales Manager's *individual work* were:

1) A positive attitude toward skills and abilities because of special knowledge (abilities to influence individuals) she possessed as a prerequisite for her work, and because it helped her to achieve her goals
2) A positive attitude in general toward work related issues (the most important of which related to her personal characteristics), which were needed in fluent collaboration with clients and partners
3) Home as a suitable physical workplace because it was tranquil, which led to experiences of effectiveness and creativity, and finally, to positive emotions

The *hindrances* affecting negative fluency experiences *in* Sales Manager's *individual work* were:

1) A negative attitude towards conflicting organizational cultures because they influenced her working conditions: operations were difficult to perform and, on the other hand, actions were performed without necessary human resources
2) The office as an unsuitable physical workplace because of interruptions caused by other employees that disturbed her concentration and led to experiences of negative emotions ("mentally nothing happens in the office")

3) <u>Poorly functioning reporting systems and processes,</u> because it was difficult to get reports from systems

Factors related to fluency experiences: contextual and work factors

CONTEXT

Company : international in service business
Workplaces : office 35%, home 30%

WORK

Content : sales, business development & partnership management
Processes : external relationships & sales 55%
Complexity : new contexts & plans 55%
Activities/individual work : management 70%
Activities/collaboration : negotiating 40%
Mode : collaboration 80%
Interruptions : phone 34%

F L U E N C Y   E X P E R I E N C E S

Individual work / enablers		**Collaboration / enablers**	
enabler	*reasoning*	*enabler*	*reasoning*
positive attitude: skills & abilities	special knowledge -> achievement of targets	suitable physical place: office	face-to-face communication -> social interactions -> positive atmosphere
positive attitude in general	some work related issues -> fluent collaboration with clients & partners	(*) positive atmosphere	mutual trust & confidentiality -> superior who trusts
suitable physical place: home	tranquility -> effectiveness, creativity -> positive emotions		

Individual work / hindrances		**Collaboration / hindrances**	
hindrance	*reasoning*	*hindrance*	*reasoning*
negative attitude: organization related issues	several cultures conflicting -> managerial problems: resources	lack of managerial support	managerial problems -> negative attitude -> lack of motivation
unsuitable physical place: office	interruptions caused by other individuals -> impossible to concentrate -> negative emotions	poorly managed internal collaboration	managerial problems -> lack of commitment
poorly functioning devices	problems with devices -> difficulties to do some tasks	lack of resources	lack of human resources -> lack of commitment -> negative attitude
		negative organizational culture	organizational hierarchy -> different policies -> managerial problems
		unsuitable physical place: clients' & partners' premises	lack of physical space for confidential discussions & meetings -> security risks
		negative influence of co-workers	challenges with colleagues: different interests, incapableness to collaborate -> poorly functioning processes -> unsuccessful projects
		negative cultural differences	different cultural backgrounds -> communication problems -> challenging situations

Figure 14. Sales Manager's fluency experiences and factors related to them

The *enablers* affecting positive fluency experiences *in* Sales Manager's *collaboration* were:

1) An office as a suitable physical workplace because face-to-face communication required by foreign cultures was available and because social interactions were more natural face-to-face

2) A positive atmosphere because of mutual trust between co-workers and superiors, and superior's trust in her

The *hindrances* affecting negative fluency experiences *in* Sales Manager's *collaboration* were:

1) A lack of managerial support, which she experienced because models she invented were not implemented and because her superior seemed not to handle managerial duties, which led to experiences of negative attitude towards management and lack of motivation

2) Poorly managed internal collaboration, which she experienced because personnel groups in the organization seemed not to follow similar rules, and levels of commitment between personnel groups seemed to vary

3) A lack of human resources because she needed additional resources in order to achieve her goals, which she did not receive because of lack of commitment of certain personnel groups and negative attitudes of some colleagues

4) A negative organizational culture because of different policies and courses of action in personnel groups due to merged companies, which led to managerial challenges

5) Clients' and partners' premises as unsuitable physical workplaces because lack of physical space for confidential discussions and meetings and problematic network connections in meeting rooms were considered security risks

6) Negative influence of co-workers because different interests of personnel groups and challenges in collaboration with some colleagues led to time-consuming ways of communication (poorly functioning processes), and because interests between individuals and groups could differ to such an extent that goals were not shared nor achieved (unsuccessful projects)

7) Negative cultural differences because of different cultural backgrounds in collaboration with foreign cultures, which manifested as different ways of processing issues and plans, leading to communication problems and challenging situations

4.5.2 Case 2: Education Specialist

Education Specialist was working in a public authority organization in the education sector. Her work consisted of planning and organizing educational services with a collaborative network, combining education and working life, and requirements and needs existing in this context. There were no personal goals, because it was a public authority with goals defined by a decree. She also had precisely defined geographic responsibilities. Her work required collaboration

with partners and clients, but also included solo work. Education Specialist considered her work socially responsible because she had an opportunity to influence clients' success by granting them educational opportunities. She reported that she found her work interesting, but she also reported that she was qualified for even more demanding work.

Contextual and work factors in Figure 15 show that Education Specialist's main workplaces were an office, where she spent sixty percent of her working time, and clients' and partners' premises, where she worked twenty percent of her working time. Forty-eight percent of her work was related to client relationships and delivery processes. Forty percent of her work tasks included using familiar rules, guidelines, and contexts. When she worked in solitude, forty percent of her tasks consisted of information sharing. When she worked in collaboration, thirty-two percent of her tasks consisted of negotiating. She worked in collaboration sixty percent of her working time. Phone caused fifty percent of interruptions in her work; interruptions happened on office premises.

Fluency experiences in Figure 15 show that the *enablers* affecting positive fluency experiences *in* Education Specialist's *individual work* were:

1) A positive attitude towards special knowledge (coaching and consulting abilities and the ability to approach different kinds of individuals) that she possessed as a prerequisite for her job, and because it helped her to collaborate with individuals, better perceive what was going on in her surroundings, and achieve her goals more easily

2) A positive attitude towards working conditions, which referred to creative space, which led to experiences of positive attitude and meaningful or energizing tasks, which led to experiences of effectiveness and productivity

3) A car as a suitable physical workplace because it was tranquil, and because confidential phone calls, relaxing, and thinking were possible, which led to experiences of innovativeness and positive emotions

The *hindrances* affecting negative fluency experiences *in* Education Specialist's *individual work* were:

1) A negative attitude towards routine tasks because she experienced them to be too low-level and energy-consuming, because fragmentation of work led to experiences of frustration and energy loss, and because changing situations and plans caused scheduling problems, which led to experiences of negative emotions because she had to abandon her own plans

2) Poorly functioning hardware or software because problems came up every third month, sometimes because of her deficient IT skills, making document management difficult

The *enablers* affecting positive fluency experiences *in* Education Specialist's *collaboration* were:

1) The positive influence of social networks, which referred to confidential and open relationships with partners and clients, which she experienced as rewarding, which led to experiences of fluent collaboration, which also meant that clients' success affected her own success

2) The positive influence of co-workers because supportive work done by her work pair helped her to manage some of her tasks more quickly and created experiences of fluent collaboration in the form of synergy of knowledge and skills

3) Clients' premises and conference facilities as suitable physical work-places because they were places for face-to-face communication. She experienced some of the clients' premises as sources of energy in which working was fluent, and, conference venues were places for networking and making new partnerships with individuals working in the same field. Education Specialist experienced conferences as "mentally satisfying and refreshing".

The *hindrances* affecting negative fluency experiences *in* Education Specialist's *collaboration* were:

1) A lack of managerial support, as her superior seemed not to appreciate her work and because her superior controlled her work too much, which led to experiences of negative emotions in the form of irritating managerial behavior, which led to experiences of energy and productivity losses

2) Poor management practices, which she experienced because instructions changed daily, and because superior was not available, which delayed her urgent tasks and caused additional administrative tasks, which led to experiences of negative emotions in form of motivation loss and confusing atmosphere

3) The office and partners' premises as unsuitable physical workplaces because there was no place for meetings and confidential discussions, which was considered a security risk, and because the psychological atmosphere in the office was experienced as isolating

4) Problems of clients and partners because disagreements between clients and partners caused additional administrative work, and legislation in some situations imposed limitations because it was not sufficiently comprehensive, and because clients and partners did not necessarily have enough knowledge about their responsibilities and roles, which led to experiences of challenging situations

5) Scheduling problems whenever it was difficult to find suitable time for meetings with clients and partners because tasks depending on those meetings did not proceed

6) A lack of information because it led to wrong decisions, which led to experiences of lost advantages and synergies

Factors related to fluency experiences: contextual and work factors

CONTEXT
Company : public authority in education business
Workplaces : office 60%, clients/partners 20%

WORK
Content : planning & organizing education services
Processes : client relationships & delivery 48%
Complexity : familiar rules, guidelines & contexts 40%
Activities/individual work : information-sharing 40%
Activities/collaboration : negotiating 32%
Mode : collaboration 60%
Interruptions : phone 50%

FLUENCY EXPERIENCES

Individual work / enablers		Collaboration / enablers	
enabler	*reasoning*	*enabler*	*reasoning*
positive attitude: skills & abilities	special knowledge -> achievement of targets	positive influence of social networks	good relationships with partners -> success of clients -> fluent collaboration -> own success
positive attitude: working conditions	creative space -> positive attitude -> meaningful tasks -> effectiveness	positive influence of co-workers	supportive work (work pair) -> synergy: knowledge & skills -> fluent collaboration
suitable physical place: car	tranquility -> innovativeness -> positive emotions	suitable physical place: clients' premises & conferences	face-to-face communication -> social interactions -> positive atmosphere

Individual work / hindrances		Collaboration / hindrances	
hindrance	*reasoning*	*hindrance*	*reasoning*
negative attitude: work related issues	routine tasks -> fragmentation -> frustration, disappearance of energy	lack of managerial support	managerial problems -> negative emotions -> productivity loss
poorly functioning devices	problems with devices, deficient IT-skills -> problems with document management	poorly performed management	managerial problems -> negative emotions -> confusing atmosphere
		unsuitable physical place: office & partners' premises	lack of physical space for confidential discussions & meetings -> security risks
		problems of clients/partners	disagreements between clients & partners, unclear responsibilities & roles -> extra work, challenging situations
		scheduling problems	difficult to find suitable time for meetings -> tasks depending on meetings do not proceed
		lack of information	wrong decisions -> lost advantages & synergies

Figure 15. Education Specialist's fluency experiences and factors related to them

4.5.3   Case 3: Project Manager

Project Manager was working in an organization operating in the education sector. Her work consisted of project management in network collaboration in a certain geographical area, and it required a considerable amount of collaboration. Project Manager considered her position as a responsible one because the project objective was socially significant. She reported that she was highly motivated in her work because the work was interesting, new, challenging, and nice.

Contextual and work factors in Figure 16 show that Project Manager's main workplaces were an office, where she spent seventy percent of her working time, and clients' and partners' premises, where she spent twenty percent of her working time. Forty-five percent of her work related to research and development, and client relationships processes. Fifty-five percent of her work tasks included using familiar rules, guidelines, and contexts. When she worked in solitude, thirty percent of her tasks consisted of information sharing. When she worked in collaboration, fifty percent of her tasks consisted of generating. She worked in collaboration eighty percent of her working time. E-mail caused forty percent of interruptions to her work; interruptions happened on office premises.

Fluency experiences in Figure 16 show that the *enablers* affecting positive fluency experiences *in* Project Manager's *individual work* were:

1) Home as a suitable physical workplace, because it was tranquil and free from interruptions and because she was able to prepare for the coming week's work on Sundays, which led to experiences of positive emotions because it was comfortable to start the next work week well-prepared

2) A well-functioning IT infrastructure and well-organized IT services in the office, which led to experiences of effectiveness

The *hindrances* affecting negative fluency experiences *in* Project Manager's *individual work* were:

1) An economic recession, because the changed social situation reflected in her work in the form of partners not employing her clients, because clauses in agreements allowed this, and due to budget shortages, she could not inform her clients about schedules, leading to dissatisfaction among clients, who voiced their opinions about her organization ("they don't understand the issues")

2) A negative attitude towards bureaucracy, due to inflexible and lengthy decision-making processes by public authority partners, which meant difficulties in finding information, which led to difficulties in finding correct solutions, which caused delays, and, seeking new educational solutions culminated in competitive situations in adult education business (since education was generally considered a solution to worsening unemployment)

3) Poorly functioning Internet connection at home, because it occasionally did not work and it was difficult to send files or communicate with clients and partners virtually, or because of her deficient IT skills as she was not interested in IT issues

4) A negative attitude towards too many roles and projects because they caused a scattering of her competences, which led to experiences of loss of energy

5) A negative interest towards problems of clients because they reminded her of her earlier work consisting of solving personal problems of clients, which led to experiences of loss of motivation

Factors related to fluency experiences: contextual and work factors

CONTEXT
Company : public in education business
Workplaces : office 70%, clients/partners 20%

WORK
Content : project management in network collaboration
Processes : research and development & client relationships 45%
Complexity : familiar rules, guidelines & contexts 55%
Activities/individual work : information-sharing 30%
Activities/collaboration : generating 50%
Mode : collaboration 80%
Interruptions : e-mail 40%

F L U E N C Y   E X P E R I E N C E S

Individual work / enablers		**Collaboration / enablers**	
enabler	*reasoning*	*enabler*	*reasoning*
suitable physical place: home	tranquility -> ability to concentrate on tasks -> positive emotions	managerial support	superior's positive attitude -> fluent collaboration
well-functioning devices	no disturbances -> effectiveness	positive influence of social networks	good relationships with partners -> fluent collaboration
		availability of face-to-face contacts	communication & decisions more fluent, answers easier & faster, fewer misunderstandings

Individual work / hindrances		**Collaboration / hindrances**	
hindrance	*reasoning*	*hindrance*	*reasoning*
economic recession	changed social situation -> partners: because of lack of funds cannot hire more staff, and cannot commit to agreements -> difficult to find solutions and perform work -> difficult to plan future solutions -> dissatisfaction among clients	negative cultural differences	different cultural backgrounds -> communication problems -> challenging situations
negative attitude: society related issues	bureaucracy: performance, competition -> difficult to find information -> difficult to find right solutions -> delays & problems, culminated competition	scheduling problems	difficult to find suitable time for meetings -> tasks depending on meetings do not proceed
poorly functioning devices	problems with devices, too slow or out-of-order internet connections, deficient IT-skills -> difficulties to do some tasks	negative influence of co-workers	challenges with colleagues: incapableness/unwillingness to collaborate -> (poorly functioning processes) -> outcome: delays
negative attitude: work related issues	too many roles/projects -> decentralization of competence -> disappearance of energy	unsuitable physical place: office	lack of physical space for confidential discussions -> security risks
negative interest: work related issues	factor behind negative interest: solving problems of clients -> outcome of negative interest: lack of motivation		

Figure 16. Project Manager's fluency experiences and factors related to them

The *enablers* affecting positive fluency experiences *in* Project Manager's *collaboration* were:

1) <u>Managerial support,</u> because superior's positive attitude and encouraging way of acting led to experiences of fluent collaboration

2) <u>Positive influence of social networks</u> due to good partner relationships, fast decision-making processes in private companies, and similar values in internal collaboration made fluent collaboration possible, which led to experiences of effectiveness

3) <u>The availability of face-to-face contacts,</u> because she preferred solving issues face-to-face and found face-to-face decisions and communication more fluent than virtual interaction, leading to fewer misunderstandings

The *hindrances* affecting negative fluency experiences *in* Project Manager's *collaboration* were:

1) <u>Negative cultural differences</u> in collaboration with individuals who had different religious backgrounds, because religious laws tended to lead to communication problems and challenging situations

2) <u>Scheduling problems,</u> because there was no suitable time for meetings, or individuals were difficult to reach, or they were unwilling or unable to concentrate on issues, which led to delays in tasks that depended upon meetings

3) <u>Negative influence of co-workers,</u> because some colleagues were experienced to be unable to collaborate because of their too precisely defined job descriptions, or because of their unwillingness to collaborate, which caused delays

4) <u>An office as an unsuitable physical workplace,</u> because there was no place for confidential discussions, which was considered to be a security risk

4.5.4 Case 4: Team Leader

Team Leader was working in an international company operating in the service sector. Her work consisted of team leadership, client relationship management, and project management. Her work was based on the needs of the company, employees, and clients. In the beginning, the work included change management, which had stabilized the situation. Her work involved approximately equal amounts of solo work and collaboration. Team Leader considered her work challenging because it consisted of three different kinds of task areas, which all required her concentration. She reported that she was motivated to do her work because there were opportunities for self-development.

Contextual and work factors in Figure 17 show that Team Leader's main workplaces were an office, where she spent sixty-five percent of her working time, and home, where she spent twenty percent of her working time. Forty-three percent of her work was related to client relationships and production processes. Forty percent of her work tasks included using familiar rules, guidelines, and contexts. When she worked in solitude, thirty-five percent of her tasks consisted of information sharing. When she worked in collaboration, twenty-five percent of her tasks were executional. She worked in collaboration fifty percent of her working time. Phone caused seventy percent of the interruptions to her work; interruptions were not specific to any particular place.

Fluency experiences in Figure 17 show that the *enabler* affecting positive fluency experiences *in* Team Leader's *individual work* was <u>home as a suitable physical workplace</u> because it was tranquil, which made concentration on tasks possible, which led to effectiveness because it was easy to reach a state of flow in an attractive environment, and results developed spontaneously.

The *hindrances* affecting negative fluency experiences *in* Team Leader's *individual work* were:

1) <u>Too slow or out-of order Internet connections</u> because they complicated sending of files, document management, and data warehousing, which led to experiences of an insecure information flow and IT infrastructure

2) <u>A negative attitude towards conflicting organizational cultures</u> because they influenced her work, i.e., managerial problems existed because leadership was performed in line, and management in matrix

3) Sometimes <u>home as an unsuitable physical workplace</u> because of unnecessary phone calls (constant availability), lack of immediate feedback, and because contacting individuals was more difficult from home

4) <u>The car as an unsuitable physical workplace</u> because only thinking could be done in a car and because poor weather conditions hindered thinking, which led to experiences of frustration, because expectations of the car as a workplace were high

The *enablers* affecting positive fluency experiences *in* Team Leader's *collaboration* were:

1) <u>Managerial support</u> because of superior's trust, appreciation, feedback, encouragement, and empowering manner, which she experienced as fluent collaboration

2) <u>The positive influence of co-workers</u> because a heterogeneous team meant professional richness and synergy of competencies, which enabled effective work, as issues and tasks could be taken care of in their entirety, rather than piecemeal, and because shared goals and values meant willingness to strive for the same goals, and social acceptance, which led to experiences of fluent collaboration

3) <u>Moving places and hotels as suitable physical workplaces</u> because they were places for informal face-to-face communication required in brainstorming, which needed broader contexts and a positive atmosphere, i.e., expectations of negotiating parties were easier to understand in non-traditional work and meeting places

The *hindrances* affecting negative fluency experiences *in* Team Leader's *collaboration* were:

1) <u>Poorly managed internal collaboration</u>, which manifested as struggles between certain personnel groups, which generally had negative attitudes towards internal clients

2) <u>Communication problems</u> because of different kinds of professional jargon, because negotiations with colleagues were time-consuming, and because needs of the clients were not understandable

3) <u>The office as an unsuitable physical workplace</u> because it increased dependence on other individuals' schedules, because there were too many opportunities for discussions about personnel issues, and because office premises were not up-to-date – inefficient ways of doing things were experienced in these situations

Factors related to fluency experiences: contextual and work factors

CONTEXT

Company: international in service business
Workplaces: office 65%, home 20%

WORK

Content: team leadership, client relationships management & project management
Processes: client relationships & production 43%
Complexity: familiar rules, guidelines & contexts 40%
Activities/individual work: information-sharing 35%
Activities/collaboration: executing 25%
Mode: collaboration 50%
Interruptions: phone 70%

FLUENCY EXPERIENCES

Individual work / enablers		Collaboration / enablers	
enabler	*reasoning*	*enabler*	*reasoning*
suitable physical place: home	tranquility -> ability to concentrate on tasks, effectiveness -> positive emotions, positive attitude	managerial support	trust -> fluent collaboration
		positive influence of co-workers	heterogeneous team, shared targets & values -> synergy: knowledge & skills, professional richness -> fluent collaboration
		suitable physical place: moving places & hotels	face-to-face communication -> social interactions -> positive atmosphere

Individual work / hindrances		Collaboration / hindrances	
hindrance	*reasoning*	*hindrance*	*reasoning*
poorly functioning devices	too slow or out-of-order internet connections -> difficulties to do some tasks, problems with document management	poorly managed internal collaboration	managerial problems -> negative emotions -> struggles
negative attitude: organization related issues	several cultures conflicting -> managerial problems -> leadership problems	communication problems	different kinds of professional slangs -> clients needs may remain unclear, problems in internal collaboration
unsuitable physical place: home	interruptions caused by other individuals (by phone) -> impossible to concentrate -> negative emotions	(*) unsuitable phycal place: office	dependence on other individuals' schedules, social waffling, office premises not up-to-date -> inefficient ways of action
unsuitable physical place: car	factor behind negative attitude: bad weather conditions -> outcomes of negative attitude: impossible to think, frustration		

Figure 17. Team Leader's fluency experiences and factors related to them

4.5.5   Case 5: HR Specialist

HR Specialist was working in an international company operating in the service sector. Her work required specialized knowledge in a certain field, consisting mainly of project management related to project implementation and, consultation related to her area of expertise. Due to the nature of the projects, and partly because HR Specialist preferred solo work, her work required extensive amount of solo work. She considered her work challenging because it was problem solving by nature. HR Specialist reported that she was motivated in her work because challenges, changing situations, and opportunities to learn new things motivated her.

Contextual and work factors in Figure 18 show that HR Specialist's main workplaces were an office, where she spent eighty-six percent of her working time, and clients' premises, where she spent eight percent of her working time. Fifty-eight percent of her work was related to production and delivery processes. Forty-five percent of her work tasks included using familiar rules, guidelines, and contexts. When she worked in solitude, fifty-five percent of her tasks consisted of production and delivery. When she worked in collaboration, fifty-five percent of her tasks were executional. She did individual work (i.e., in solitude) eighty-five percent of her working time. Other individuals caused ninety-five percent of interruptions in her work; interruptions happened on office premises.

Fluency experiences in Figure 18 show that the *enablers* affecting positive fluency experiences *in* HR Specialist's *individual work* were:
   1) A positive attitude towards the substantive knowledge she possessed as a prerequisite for her job, because it helped her to manage different situations, and because it was necessary in achieving goals
   2) Home as a suitable physical workplace because it was tranquil and concentration on tasks was possible. Organizational culture influenced the tranquility at home because colleagues working in the office did not disturb their teleworking colleagues.

The *hindrances* affecting negative fluency experiences *in* HR Specialist's *individual work* were:
   1) The office as an unsuitable physical workplace because of too slow or out-of-order devices and poorly organized document management, and because time management was difficult in the office
   2) Trains as unsuitable physical workplaces because they were not designed for work, and because her expectation of them as workplaces was too high. She experienced that even the thought of an uncomfortable environment prevented her from working.

The *enablers* affecting positive fluency experiences *in* HR Specialist's *collaboration* were:
   1) Managerial support because superior's encouraging and supporting behavior influenced her experiences of trust and fluent collaboration
   2) The office and clients' premises as suitable physical workplaces because they were ergonomically suitable places for working, and because they were places for face-to-face communication, which, in the

office, enabled meetings and counseling, and on clients' premises, wordless communication made understanding of clients' line of reasoning possible, which led to experiences of a motivating atmosphere

Factors related to fluency experiences: contextual and work factors	
CONTEXT	
Company: international in service business	
Workplaces: office 86%, clients 8%	
WORK	
Content: project management & consultation	
Processes: production & delivery 58%	
Complexity: familiar rules, guidelines & contexts 45%	
Activities/individual work: production & delivery 55%	
Activities/collaboration: executing 55%	
Mode: individual 85%	
Interruptions: other individuals 95%	

F L U E N C Y   E X P E R I E N C E S

Individual work / enablers		**Collaboration / enablers**	
enabler	*reasoning*	*enabler*	*reasoning*
positive attitude: skills & abilities	special knowledge -> achievement of targets	managerial support	trust -> fluent collaboration
suitable physical place: home	tranquility -> ability to concentrate on tasks	suitable physical place: office & clients' premises	ergonomically suitable places for working -> face-to-face communication -> motivating atmosphere, wordless communication
Individual work / hindrances		**Collaboration / hindrances**	
hindrance	*reasoning*	*hindrance*	*reasoning*
unsuitable physical place: office	too slow or out-of-order devices/connections -> impossible to do certain work tasks	lack of resources	lack of special knowledge -> productivity loss
unsuitable physical place: train	factors behind negative attitude: expectations too high, place not designed for working -> outcome of negative attitude: thoughts of an uncomfortable place	negative influence of co-workers	challenges with colleagues: unwillingness to collaborate -> poorly functioning processes -> outcome: delays, wrong decisions
		problems of clients/partners	client not capable to make decisions -> delays

Figure 18. HR Specialist's fluency experiences and factors related to them

The *hindrances* affecting negative fluency experiences *in* HR Specialist's *collaboration* were:

1) The lack of specialized knowledge, because she needed that hidden tacit knowledge in her work and because work time arrangements (teleworking) made information sharing difficult, which led to experiences of colleagues who were not willing to share information, which led to experiences of productivity loss

2) The negative influence of co-workers, because challenges with colleagues were related to colleagues' suspected unwillingness to help her as she experienced that there were hidden rules and that she had to make decisions without right answers

3) <u>Client problems,</u> if they were unable to make decisions, or if they did not have project resources, or if they had authorized their project resources in a wrong way, which caused delays in her projects

4.5.6   Case 6: Business Line Manager

Business Line Manager was working in an organization operating in the education sector. His work consisted of managing and developing a line of business according to the organization's business concept, goals, action plan, and strategies. His work was managerial, including both management and leadership, but the work also included project management tasks. His work required considerable collaboration, but solo work was also important. Business Line Manager considered his work challenging because it was multi-dimensional. He reported that he was motivated in his work because challenges and results motivated him; additional sources of motivation were good feelings of subordinates, and good feedback from former clients.

Contextual and work factors in Figure 19 show that Business Line Manager's main workplaces were an office, where he spent seventy percent of his working time, and home, where he spent twelve percent of his working time. Forty-three percent of his work was related to external relationships and research and development processes. Fifty percent of his work tasks included using familiar rules, guidelines, and contexts. When he worked in solitude, fifty percent of his tasks consisted of management. When he worked in collaboration, thirty-five percent of his tasks consisted of generating. He worked in collaboration sixty percent of his working time. Other individuals caused fifty percent of interruptions in his work; interruptions happened in office premises during office hours.

Fluency experiences in Figure 19 show that the *enabler* affecting positive fluency experiences *in* Business Line Manager's *individual work* was <u>the office as a suitable physical workplace</u> after office hours because it was tranquil place then and it was possible to concentrate on issues, which led to experiences of effectiveness and high productivity.

The *hindrances* affecting negative fluency experiences *in* Business Line Manager's *individual work* were:
1) <u>A negative attitude towards bureaucracy</u> because he experienced that laws, regulations, and certain standards were so complicated and restrictive that they presented obstacles to him getting the information and support he required from public authorities who were often legally prohibited from providing that necessary help or information, and because he experienced that legislation regarding competition restricted business opportunities in some contexts, which led to delays and problems
2) <u>A negative attitude towards solving tricky problems</u> because solving conflicts caused him experiences of negative emotions and discomfort
3) <u>The office as an unsuitable physical workplace</u> during office hours, because of interruptions by other individuals, which he could not avoid because his office door did not have "traffic lights". He experienced

that individuals caused fragmentation of his work because they needed his immediate attention, which led to experiences of irritation, because it was unclear whether the other individuals' issues were important or not. He described the office during office hours as a place with "constant flow of people".

4) A car as an unsuitable physical workplace if weather conditions were poor, because then it was impossible to think about work related issues deeply

5) Home as an unsuitable physical workplace because WLAN was too slow there and synchronization between devices did not work, and it was impossible to do certain tasks, or if his room was not clean, he experienced that his emotional state was not relaxed enough to work

The *enablers* affecting positive fluency experiences *in* Business Line Manager's *collaboration* were:

1) Availability of face-to-face contacts, because communication and decision-making were more fluent face-to-face than virtually, because body language could be observed in face-to-face meetings, which was important to him, and because face-to-face interruptions could also contribute to task because individuals might be able to question issues in a productive manner

2) A positive atmosphere among staff, because it enabled learning and group dynamics

3) An office as a suitable physical workplace because it was ergonomically suitable for working, because it was a place for face-to-face communication, and because it was important to him to have opportunities to share confidential issues with trustworthy colleagues, which led to experiences of a motivational organizational atmosphere

4) The positive influence of co-workers because shared goals and values were genuinely accepted in the organization and because he experienced organizational culture in a positive way, as professional work and good leadership were appreciated in the organization and it was possible to evaluate and reflect on one's own performance in a constructive way

5) Managerial support, because his superiors approached issues positively and supported independent work, because he had suitable budgetary limits and authority to enter into agreements independently, and because he experienced that he had common goals with his superiors and that he had professional and open relationships with his superiors (included in discussions in a constructive way). This led to experiences of fluent collaboration, professional synergy, and positive atmosphere.

Factors related to fluency experiences: contextual and work factors

CONTEXT

Company : public in education business

Workplaces : office 70%, home 12%

WORK

Content : management of strategies & development of business line

Processes : external relationships & research and development 43%

Complexity : familiar rules, guidelines & contexts 50%

Activities/individual work : management 50%

Activities/collaboration : generating 35%

Mode : collaboration 60%

Interruptions : other individuals 50%

FLUENCY EXPERIENCES

Individual work / enablers		Collaboration / enablers	
enabler	*reasoning*	*enabler*	*reasoning*
suitable physical place: office after office hours	tranquility -> effectiveness, ability to concentrate on tasks -> positive interest	availability of face-to-face contacts	communication & decisions more fluent, positive effect of interruptions: contribution to tasks
		(*) positive atmosphere	positive atmosphere among personnel -> suitable environment for learning
		suitable physical place: office	ergonomically suitable place for working -> face-to-face communication -> motivating atmosphere
		positive influence of co-workers	shared targets & values -> synergy: knowledge & skills, professional richness -> fluent collaboration
		managerial support	superiors' positive approach -> independency -> fluent collaboration, professional synergy, positive atmosphere

Individual work / hindrances		Collaboration / hindrances	
hindrance	*reasoning*	*hindrance*	*reasoning*
negative attitude: society related issues	bureaucracy: legislation, performance, competition -> difficult to find information -> difficult to find right solutions -> delays & problems, culminated competition	negative influence of co-workers	individuals requiring space in meetings -> delays, decisions without plans
negative interest: work related issues	factor behind negative interest: solving tricky problems -> outcome of negative interest: uncomfortableness	negative organizational culture	internal boundaries -> different policies -> communication problems
unsuitable physical place: office	interruptions caused by other individuals -> impossible to concentrate -> negative emotions	negative cultural differences	different cultural backgrounds -> communication problems -> challenging situations
unsuitable physical place: car	factor behind negative attitude: bad weather conditions -> outcome of negative attitude: impossible to think		
unsuitable physical place: home	too slow or out-of-order devices/connections -> impossible to do certain work tasks		

Figure 19. Business Line Manager's fluency experiences and factors related to them

The *hindrances* affecting negative fluency experiences *in* Business Line Manager's *collaboration* were:

1) The negative influence of co-workers, because some individuals in meetings took up a lot of space, which made meetings ineffective, because meetings tended to last too long, and because time ran out, decisions were made without implementation plans, which led to delays and experiences of tiredness and irritation

2) A negative organizational culture because internal boundaries were managerial challenges and finding synergy and common understanding might be difficult in multi-professional organizations because of different educational backgrounds and different policies between internal groups in the organization

3) Negative cultural differences if negotiating parties did not have required knowledge regarding cultural differences, or because professional jargon used in meetings with clients led to communication challenges and problems

4.5.7 Case 7: HR Analyst

HR Analyst was working in an international organization operating in the service sector. His work consisted of project management, development, analysis, coaching, and he was a power user of internal tools. His work was independent and he was allowed to determine how to perform his work. His job required more solo work than collaboration. HR Analyst considered his work challenging because he was able to work independently and was goal-oriented, although he had to follow certain rules. He reported that he was motivated to do his work; results and processing issues especially motivated him.

Contextual and work factors in Figure 20 show that HR Analyst's main workplaces were an office, where he spent fifty-five percent of his working time, and suppliers' premises, where he spent fifteen percent of his working time. Forty-eight percent of his work related to production and knowledge, improvement and change processes. Forty percent of his work tasks included using familiar rules, guidelines, and contexts. When he worked in solitude, forty-five percent of his tasks consisted of analysis and evaluation. When he worked in collaboration, thirty-five percent of his tasks were executional. He worked in individual work (i.e., in solitude) sixty percent of his working time. Phone caused seventy percent of interruptions in his work; interruptions were not related to any particular place.

Fluency experiences in Figure 20 show that the *enablers* affecting positive fluency experiences *in* HR Analyst's *individual work* were:

1) Well-functioning devices, because virtual connections were available even in public transportation vehicles; he saved time by handling e-mail on buses and trains, and because he experienced trains as effective workplaces, full of choices and places for socializing

2) A positive interest towards better ways of working, meaning, he made follow-up lists, which helped him to manage his time and resources, and he aimed for a certain level of automation and standardization,

which he experienced as facilitating internal collaboration and interpretation of internal documents

The *hindrances* affecting negative fluency experiences *in* HR Analyst's *individual work* were:

1) A negative attitude towards routine tasks and projects without roadmaps, because he experienced that routine tasks (i.e., e-mail, among other tasks) had a disruptive influence on project work and development work, as it was difficult to understand questions sent by e-mail because of limitations of e-mail communication (gestures and expressions could not be 'seen' in e-mails), and because he experienced that projects without roadmaps led to situations in which he confronted a conflict between desired results and use of his time – he might choose a coordinating role instead of developing his skills, which led to experiences of frustration

2) A negative interest towards solving individual problems because it was not motivating and because he was interested in long-range goals – the organization did not have clear goals, vision, or mission, which he experienced as uncertainty and which weakened his motivation and commitment to the organization

3) An office as an unsuitable physical workplace because of lack of stimulation, as he experienced the office as a sterile environment in which he had lower degree of stimulation and could not create any new ideas, or which was too ordinary a place for innovation

4) Sometimes the train as an unsuitable physical workplace because of noise caused by strangers and because of poor virtual connections, which led to a situation in which concentration on tasks was impossible

5) The lack of virtual project management tools and poor document management processes, which caused delays in service processes and added additional administrative work

The *enablers* affecting positive fluency experiences *in* HR Analyst's *collaboration* were:

1) Availability of face-to-face contacts, because working in the same space with colleagues was potentially full of creative innovations, because regular face-to-face meetings during projects decreased misunderstanding and enabled information flow, because it was easier and faster to ask and find answers face-to-face than virtually, and because face-to-face interruptions caused by colleagues were stimulating

2) Managerial support because of superior's positive understanding of his work and needs, because open communication helped him to prioritize his tasks, and superior supported him, especially in human resources related questions, and because he experienced that his goals were clearly defined and he could work independently, which led to experiences of fluent collaboration and professional synergy with his superior

Factors related to fluency experiences: contextual and work factors

CONTEXT
Company : international in service business
Workplaces : office 55%, suppliers 15%

WORK
Content : analyses, project management & coaching
Processes : production & knowledge, improvement & change 48%
Complexity : familiar rules, guidelines & contexts 40%
Activities/individual work : analysis & evaluating 45%
Activities/collaboration : executing 35%
Mode : individual 60%
Interruptions : phone 70%

FLUENCY EXPERIENCES

Individual work / enablers		Collaboration / enablers	
enabler	*reasoning*	*enabler*	*reasoning*
well-functioning devices	no disturbances -> effectiveness	availability of face-to-face contacts	communication & decisions more fluent, answers easier & faster, fewer misunderstandings, positive effect of interruptions: stimuli
(*) positive interest	way of working: templates -> automation of own work, easier to interpret documentations	managerial support	superior's positive understanding -> independency -> fluent collaboration, professional synergy

Individual work / hindrances		Collaboration / hindrances	
hindrance	*reasoning*	*hindrance*	*reasoning*
negative attitude: work related issues	routine tasks, projects without roadmaps -> fragmentation, wrong decisions -> frustration	communication problems	different kinds of professional slangs -> problems in internal collaboration
negative interest: work related issues	factor behind negative interest: solving single problems -> outcomes of negative interest: lack of motivation, weakening commitment	lack of resources	lack of human resources and time -> lack of commitment -> negative attitude -> productivity loss
unsuitable physical place: office	factor behind negative attitude: lack of stimuli -> outcome of negative attitude: no innovations	lack of information	wrong decisions -> lost advantages & synergies
unsuitable physical place: train	noise caused by other individuals -> impossible to concentrate		
poorly functioning devices	lack of a proper virtual project management tool -> additional administrative work -> delays in service processes		

Figure 20. HR Analyst's fluency experiences and factors related to them

The *hindrances* affecting negative fluency experiences *in* HR Analyst's *collaboration* were:
1) Communication problems due to different professional jargon, which caused problems in internal collaboration and because misunderstandings arose as he did not have colleagues who had work similar to his
2) The lack of human resources and time, because he experienced that the company's incentive policy did not support projects, which was seen as a major reason for lack of commitment of participants or their (un)willingness to participate in his projects, which led to experiences of negative attitude and productivity loss

3) The lack of information, because the lack of necessary project related information led to wrong decisions, frustration, and delays, and because the lack of horizontal communication processes in the organization and the lack of coordination (or indirect coordination) of resources led to lost advantages and synergies

4.5.8   Case 8: Entrepreneur

Entrepreneur was working in a private company operating in the pharmaceutical business. Her work consisted of managing her own knowledge-intensive organization as an entrepreneur, and acting as a knowledge worker along with her staff. The most important mission of her company was to manage the availability of drugs for local residents. Her work was strongly bound to legislation; the Finnish Medicine Agency defined her scope of authority. Her work required a significant amount of collaboration. Entrepreneur considered her work challenging because she had to balance between legislation and flexible customer service. She reported that she was extremely motivated in her work because it was variable, interesting, comfortable, and surprising.

Contextual and work factors in Figure 21 show that Entrepreneur's main workplaces were an office, where she spent seventy-five percent of her working time, and home, where she spent twenty percent of her working time. Forty-seven percent of her work was related to client relationships and delivery processes. Sixty percent of her tasks included using familiar rules, guidelines, and contexts. When she worked in solitude, thirty-five percent of her tasks consisted of production and delivery. When she worked in collaboration, forty-five percent of her tasks were executional. She worked in collaboration ninety percent of her working time. Other individuals caused seventy percent of interruptions to her work; interruptions happened on office premises during office hours.

Fluency experiences in Figure 21 show that the *enablers* affecting positive fluency experiences *in* Entrepreneur's *individual work* were:
1) A positive attitude in general because occasional acting against the law was worth the risk because it influenced positively on flexibility of customer service, which could be a differentiating factor in a competitive situation
2) An office as a suitable physical workplace after office hours because it was tranquil then and because well-designed premises and well-functioning IT systems made efficient working possible, which led to positive experiences

The *hindrances* affecting negative fluency experiences *in* Entrepreneur's *individual work* were:
1) Home as an unsuitable physical workplace because of too slow or out-of-order Internet connections, making it impossible to do certain tasks without access to required documents
2) A negative attitude towards routine tasks, schedules, and places because her work was strongly bound to a particular place and defined

schedules, and it was not possible to influence these issues, which led to experiences of fragmented work and interruptions
3) A negative attitude towards bureaucracy because of binding legislation and economic restrictions, which hindered business in the form of delays and problems

Factors related to fluency experiences: contextual and work factors
CONTEXT
Company: private in pharmaceutical business
Workplaces: office 75%, home 20%
WORK
Content: management of own business & delivering supplies
Processes: client relationships & delivery 47%
Complexity: familiar rules, guidelines & contexts 60%
Activities/individual work: production & delivery 35%
Activities/collaboration: executing 45%
Mode: collaboration 90%
Interruptions: other individuals 70%

F L U E N C Y   E X P E R I E N C E S

Individual work / enablers		Collaboration / enablers	
enabler	*reasoning*	*enabler*	*reasoning*
positive attitude in general	some work related issues -> independence, flexibility with customers	positive influence of co-workers	inspiring atmosphere -> synergy: knowledge & skills -> fluent collaboration
suitable physical place: office after office hours	tranquility -> effectiveness -> positive attitude	(*) positive atmosphere	common mentality in Northern Finland -> easy and fast to take care of issues
Individual work / hindrances		**Collaboration / hindrances**	
hindrance	*reasoning*	*hindrance*	*reasoning*
unsuitable physical premises: home	too slow or out-of-order devices/connections -> impossible to do certain work tasks		
negative attitude: work related issues	routine tasks, schedules and places, constant interruptions -> fragmentation, lack of concentration		
negative attitude: society related issues	bureaucracy: legislation -> delays & problems		

Figure 21. Entrepreneur's fluency experiences and factors related to them

The *enablers* affecting positive fluency experiences *in* Entrepreneur's *collaboration* were:
1) The positive influence of co-workers, because well-educated staff and well-designed work models led to experiences of synergy and fluent collaboration
2) A positive atmosphere, because a shared mentality in Northern Finland (i.e., an open communication culture), made handling of issues easier and faster because there was more time to meet with individuals

The *hindrances* affecting negative fluency experiences *in* Entrepreneur's *collaboration* were not quoted sufficiently to construct fluency experience chains.

4.5.9   Case 9: IT Expert

IT Expert was working in an international organization operating in the IT service sector. His work consisted of planning, delivery, installation and implementation of particular IT solutions, and surveying of virtual environments with proposals for virtualizations. His work was very independent and he was responsible for schedules, budgets, and project implementation results. The nature of his job required a considerable amount of solo work. IT Expert considered his work rewarding because he could see concrete results of his work: successful problem-solving and creative construction of well-running IT systems. He reported that he was highly motivated in his work because it was interesting and challenging, although it was sometimes heavy, both physically and mentally.

Contextual and work factors in Figure 22 show that IT Expert's main workplaces were clients' premises, where he spent forty-five percent of his working time, and home, where he spent forty percent of his working time. Fifty-eight percent of his work was related to delivery and production processes. Fifty percent of his work tasks included using familiar rules, guidelines, and contexts. When he worked in solitude, fifty-five percent of his tasks consisted of production and delivery. When he worked in collaboration, forty percent of his tasks were executional. He worked in individual work (i.e., in solitude) eighty percent of his working time. Interruptions were not specific to any particular place; he usually interrupted his own work intentionally (self-initiated, internal interruptions, accounting for thirty percent of interruptions to his work) in order to achieve variety in his work.

Fluency experiences in Figure 22 show that the *enablers* affecting positive fluency experiences *in* IT Expert's *individual work* were:
1) A positive attitude towards working conditions, which referred to independence, because working alone was effective and because he experienced his tasks as meaningful
2) A positive attitude towards technical development and changes in clients' organizational structure because they created new work opportunities
3) Home as a suitable physical workplace because it was tranquil and because versatile means of virtual connections that he needed for work were available at home – experiences of effectiveness and meaningfulness of work emerged from tranquility, independence, opportunities to multitask, and comfort of the premises
4) Clients' premises as suitable physical workplaces because working there was effective, because some tasks could be done only on clients' premises, and because essential information needed in his work was available there – experiences of positive emotions emerged from learning possibilities, seeing concrete results, and clients' satisfaction

The *hindrances* affecting negative fluency experiences *in* IT Expert's *individual work* were:
1) Poorly functioning, too slow or expensive Internet connections, because tasks could not be done without Internet connections

2) <u>An office as an unsuitable physical workplace</u> because of interruptions caused by other employees and because it was impossible to concentrate on tasks

3) <u>An office as an unsuitable physical workplace</u> because of absence of suitable premises and changed layout of the office (only mobile workstations)

4) <u>An economic recession,</u> because the uncertain social situation affected the organization in the form of lay-offs, which led to the lack of resources, and because of the insecure economic situation, managers were not able to present plans for the future, which affected the amount of information available about projects, and he could not plan his work for the near or distant future, which led to experiences of negative emotions

5) <u>A negative interest towards technical development</u> because too fast or continuous technical development required new certifications and education, which he experienced as mentally burdensome

The *enabler* affecting positive fluency experiences *in* IT Expert's *collaboration* was <u>managerial support,</u> because he experienced that a superior who was also an IT professional understood problems and requirements of his work better than a non-professional. Also because his superior supported the freedom and tranquility required in his work and made independent decisions possible, and because he experienced that his superior's main task was to enable independent work focused on problem solving – he experienced that positive, enthusiastic, and optimistic superiors create a positive atmosphere in the organization.

The *hindrances* affecting negative fluency experiences *in* IT Expert's *collaboration* were:

1) <u>The negative influence of co-workers</u> (sales people), because lack of communication in sales situations led to unsuccessful projects

2) <u>Clients' and partners' premises as unsuitable physical workplaces</u> because of intrusive individuals, because premises were too noisy or too small for several individuals working together, and because there was no place for confidential discussions, which was considered a security risk

3) <u>Scheduling problems</u> because it was difficult to find times for internal meetings, so tasks dependent upon those meetings did not proceed – a nonchalant attitude towards internal issues was prevalent in the organization

4) <u>Communication problems,</u> especially in meetings with clients and partners who were competing with each other, because clients' needs might have remained unclear in these situations, as security issues had to be taken into account in communication with clients and partners

5) <u>The lack of follow-up systems</u> because reporting needs were not supported, since goal setting and performance measurement were viewed as difficult in the organization, as the experts' work priorities were not clear or defined, which led to experiences of uncertainty

Factors related to fluency experiences: contextual and work factors

CONTEXT

Company : international in IT-service business

Workplaces : clients 45%, home 40%

WORK

Content : planning, implementations & surveys (IT environment)

Processes : delivery & production 58%

Complexity : familiar rules, guidelines & contexts 50%

Activities/individual work : production & delivery 55%

Activities/collaboration : executing 40%

Mode : individual 80%

Interruptions : personally 30%

F L U E N C Y   E X P E R I E N C E S

Individual work / enablers		**Collaboration / enablers**	
enabler	*reasoning*	*enabler*	*reasoning*
positive attitude: working conditions	creative space, independence -> positive attitude -> meaningful tasks -> effectiveness	managerial support	superior's positive understanding -> independency -> positive atmosphere
positive attitude in general	technical development & clients' needs increase work opportunities		
suitable physical place: home	tranquility -> effectiveness, ability to concentrate on tasks -> positive emotions, positive attitude, positive interest		
suitable physical place: clients' premises	effectiveness -> concrete results motivate		
Individual work / hindrances		**Collaboration / hindrances**	
hindrance	*reasoning*	*hindrance*	*reasoning*
poorly functioning devices	too slow or out-of-order internet connections -> difficulties to do some tasks	negative influence of co-workers	challenges with colleagues: lack of communication in sales situations -> poorly functioning processes -> outcome: unsuccessful projects
unsuitable physical place: office	interruptions caused by other individuals -> impossible to concentrate -> negative emotions	unsuitable physical place: clients' & partners' premises	lack of physical space for working and confidential discussions -> security risks
unsuitable physical place: office	absence of suitable premises -> impossible to do certain work tasks	scheduling problems	difficult to find suitable time for meetings -> tasks depending on meetings do not proceed
economic recession	uncertain social situation -> company: lay-offs & lack of resources, no visible plans for the future -> no information about future projects -> difficult to plan own work	communication problems	different kinds of professional slangs -> clients' needs may remain unclear, security issues in communication
negative interest: work related issues	factor behind negative interest: technical development -> outcome of negative interest: mentally heavy to keep oneself updated	lack of resources	lack of follow-up systems -> managerial problems -> uncertainty

Figure 22. IT Expert's fluency experiences and factors related to them

4.5.10 Variations in individual fluency experiences

In summary, the variations of the nine informants' fluency experiences in individual work and collaboration and, contextual and work factors were compared. Specific contexts affected fluency experiences of the informants. The

contexts defined external considerations in their working conditions, which, along with their personal approaches and attitudes, served as building blocks of fluency experiences. Enablers and hindrances affecting fluency experiences were the positive and negative approaches to incidents in which the contexts and personalities of the informants crossed.

In general, suitability or unsuitability of a physical place for working purposes was the most commonly cited enabler or hindrance. Both in individual work and in collaboration, informants emphasized particular places as enablers and/or hindrances. How or how strongly the place affected fluency experiences depended not only on the informant's preferences and prioritizations, but also on organizational culture, other individuals, and even societal factors influencing the organization.

Although the most common enablers and hindrances could be identified from the data, none of them arose in every case. For example, the most common enabler *in individual work*, the experience of suitable physical workplace because of tranquility, did not come up in HR Analyst's fluency experiences, because he was more interested in effective work due to well-functioning devices than tranquility, as such. Negative attitude towards a place, poorly functioning devices, or interruptions usually led to experiences of an unsuitable place for individual work. Sales Manager, Education Specialist, Project Manager, and IT Expert did not emphasize negative attitude towards a place or poorly functioning devices as strongly as the rest of the informants did. Likewise, Education Specialist, Project Manager, HR Specialist, and Entrepreneur did not emphasize interruptions as strongly as the rest of the informants did. Where interruptions were concerned, it seemed that male informants experienced interruptions in a more positive way than female informants did; male informants referred to the positive influence of interruptions.

Project Manager, HR Analyst, and IT Expert emphasized the economic recession and its influence on their work. Experiences were quite similar, despite two different fields of work. The difference between the experiences was that Project Manager (working in the education sector) approached the issue from organizational and societal viewpoints and the other two informants (working in the service sector) approached it more from organizational and individual viewpoints. HR Analyst and IT Expert reported that lay-offs and indefinite plans for the future clearly influenced their work.

In collaboration, ergonomics of the workplace and availability of face-to-face contacts usually led to experiences of a suitable place for collaboration. However, Project Manager, HR Analyst, Entrepreneur, and IT-Specialist did not appreciate ergonomic issues as much as the rest of the informants did. Lack of suitable premises for defined purposes usually led to experiences of an unsuitable place for collaboration. However, HR Specialist, Business Line Manager, HR Analyst, and Entrepreneur did not emphasize lack of suitable premises as strongly as the rest of the informants did.

Sales Manager, Team Leader, and HR Specialist, who were employed by the same organization, brought up the same problems, although from different viewpoints. Problems between personnel groups, influence of mergers, resource problems, and managerial problems, especially in internal collaboration,

were emphasized from a managerial viewpoint (Sales Manager), from an internal client's viewpoint (Team Leader), and from a consultant's viewpoint (HR Specialist). Although HR Specialist was a relatively new employee, she had already observed the same problems as Sales Manager and Team Leader had – but could not identify some of them specifically.

HR Specialist, HR Analyst, and IT Expert experienced both managerial support and managerial problems, depending upon the context. The rest of the informants (excluding Entrepreneur) experienced either managerial support or managerial problems; they gave clear examples for one or the other. The same phenomenon arose when co-workers were concerned: Business Line Manager experienced both positive and negative influence of co-workers, depending upon the context, and the rest of the informants (excluding HR Analyst) experienced either positive or negative influence of co-workers and gave clear examples for one or the other.

Project Manager and Business Line Manager strongly emphasized commitment to organization, but Education Specialist's commitment had suffered because of poor management. This detail emphasizes how important well-functioning management is from the viewpoint of knowledge workers well-being. Table 9 presents the most common enablers and hindrances in individual work and collaboration, based on the cases studied. Table 9 also shows the differences between the cases.

Table 9. The most common enablers and hindrances in individual work and collaboration

The most common enablers and hindrances	C1	C2	C3	C4	C5	C6	C7	C8	C9
Individual work / enablers									
Suitable physical workplace (tranquility)	x	x	x	x	x	x		x	x
Positive attitude (skills & abilities, in general)	x	x			x			x	x
Individual work / hindrances									
Unsuitable physical workplace (negative attitude, devices)				x	x	x	x	x	
Unsuitable physical workplace (interruptions)	x			x		x	x		x
Negative attitude (work/society/organization)	x	x	x	x		x	x	x	
Collaboration / enablers									
Suitable physical workplace (ergonomics, face-to-face)	x	x		x	x	x			
Managerial support			x		x	x	x		x
Positive influence of co-workers		x		x		x		x	
Collaboration / enablers									
Unsuitable physical workplace (lacking space)	x	x	x	x					x
Managerial problems (incl. managerial problems, resources/information)	x	x		x	x		x		x
Negative influence of co-workers	x		x		x	x			x

When factors related to fluency experiences are concerned, Table 10 presents the most common ***contextual and work factors*** based on the cases studied, and the differences between the cases, as well.

1) *Workplaces*. As earlier stated, the most common workplace was the office; nearly all the informants worked most of their working time (thirty-five to eighty-six percent) on office premises, excluding IT Expert who worked mainly on clients' premises.

2) *Company*. Excluding Entrepreneur, two types of organizations employed the informants: international privately owned companies in the service sector and public organizations in the education sector.

3) *Work content*. Excluding Education Specialist and Entrepreneur, the informants' work content and/or work processes primarily related to project management tasks. Excluding HR Specialist, HR Analyst, and IT Expert, the informant's work content and/or work processes also related to client or partner relationships.

4) *Activities/individual work*. Activities in individual work indicated most clearly the role of the informant in the organization; information sharing was main task in Education Specialist's, Project Manager's, and Team Leader's work, and, production and delivery related tasks were emphasized in HR Specialist's, Entrepreneur's, and IT Expert's work. Sales Manager and Business Line Manager concentrated more on managerial tasks and HR Analyst on analyses.

5) *Activities/collaboration*. Execution was the most common task group in collaboration. Sales Manager's and Education Specialist's collaborative activities consisted mainly of negotiating. Project Manager's and Business Line Manager's tasks primarily consisted of generating.

6) *Working mode*. The informants mainly worked in collaboration with other individuals (fifty to ninety percent of their working time), excluding HR Specialist, HR Analyst, and IT Expert, who emphasized individual work in solitude (sixty to eighty-five percent of their working time).

Table 10. The most common contextual and work factors

The most common contextual and work factors	C1	C2	C3	C4	C5	C6	C7	C8	C9
Contextual factors									
Company: international private company in service business	x			x	x		x		x
Company: public organization in education business		x	x			x			
Workplace: office	x	x	x	x	x	x	x	x	
Work factors									
Work content & processes: project management	x		x	x	x	x	x		x
Work content & processes: client/partner relationships	x	x	x	x		x		x	
Activities/individual work: information-sharing		x	x	x					
Activities/individual work: production & delivery					x			x	x
Activities/collaboration: executing				x	x		x	x	x
Mode: collaboration	x	x	x	x		x		x	

5   Discussion

This chapter contains the scientific contribution and the evaluation of the study. Scientific contribution (Section 5.1) includes the generic model illustrating enablers and hindrances affecting fluency experiences in knowledge-intensive individual work and collaboration. In addition, this section includes discussion about separate findings, in individual work and in collaboration. Practical implications suggest how the results of this thesis might be used in practice. Next, the thesis is evaluated through discussion of the reliability, validity, and generalization of the study (Section 5.2). Finally, some suggestions for future research are presented (Section 5.3).

5.1   Fluency experiences in knowledge-intensive individual work and collaboration

This thesis suggests that an individual's fluency experiences are partly independent of the environment, which means that an individual's experiences seem to emerge more from his personal emotions, or, more specifically, *experiences* of emotions, which are influenced by different kinds of external and internal triggers. How these triggers are emphasized in individual's work, depends on the content and goals of his work, the general nature of knowledge-intensive work, his co-workers, and his attitude towards the place in which the work is performed. Individual contexts seem to affect fluency experiences. The context defines external considerations in an individual's working conditions, which, along with the individual's personal approach and attitudes, serve as building blocks in his fluency experiences.

   Despite its limitations, this thesis makes an important contribution to the literature related to productivity and effectiveness of knowledge-intensive work, suggesting that *fluency is a core concept in producing positive results in knowledge-intensive individual work and collaboration*. Positive results refer to effectiveness and an optimal state of mind that seems to be connected to goal attainment. Fluency is also related to the mode of work that makes effectiveness possible, starting with flow of work and maintaining engagement in one's work. Therefore, this thesis suggests that *fluency should be considered as important a concept as productivity and effectiveness* in the evaluation of knowledge-intensive work. This thesis also suggests that *enablers and hindrances affecting fluency experiences in knowledge-intensive individual work and collaboration should be evaluated more thoroughly* than enablers and hindrances affecting productivity or effectiveness of knowledge-intensive work, because fluency as a part of work processes has an enormous influence on the effectiveness and quality of work.

   Figure 23 illustrates existing knowledge of the subject and new knowledge produced in this thesis. To emphasize the importance of new knowledge, input-process-output model with the context was included in Figure 23. As a result,

Figure 23 shows that input and output factors are well known, but that process factors in a specific context were unclear. This thesis filled that conceptual gap by expanding the thinking beyond just work outcomes (e.g., effectiveness and quality of work), to work process affected by fluency:

1) By emphasizing the concept 'fluency' as a part of the process factors in input-process-output model with the context
2) By constructing the generic model of fluency experiences in knowledge-intensive individual work and collaboration
3) By constructing categories, main categories, key categories, fluency experience chains, and reasoning patterns with which fluency experiences can be conceptualized
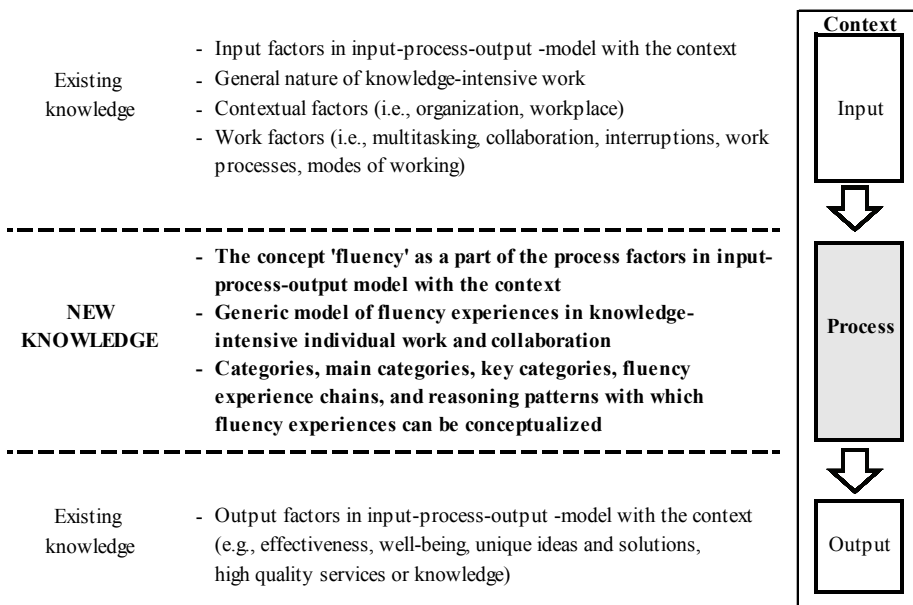
Figure 23. Existing knowledge and new knowledge produced in this thesis, and their relationship to input-process-output model with the context

The model shown in Figure 24 illustrates and summarizes the contribution of this thesis. It describes enablers and hindrances affecting fluency experiences in knowledge-intensive individual work and collaboration by introducing the most common fluency experiences of knowledge workers, and contextual and work factors related to fluency experiences. To answer the research questions, *what are fluency experiences in knowledge-intensive individual work and collaboration*, and, *what are the enablers and hindrances affecting fluency experiences in knowledge-intensive individual work and collaboration,* Figure 24 shows that fluency experiences, and the enablers and hindrances are as follows:

1) ***The enablers in individual work*** are a) *suitable physical workplace* because of tranquility; and, b) *positive attitude* towards skills and abilities, and, working conditions.

2) ***The hindrances in individual work*** are a) *unsuitable physical work-place* because of poorly functioning devices or because of negative attitude towards a certain physical place, or because of interruptions, fragmentation, or noise caused by other individuals; and, b) *negative attitude* towards work, society, or organization related issues.

3) ***The enablers in collaboration*** are a) *suitable physical workplace* because of ergonomic suitability of the place for collaborative working, and because of availability of face-to-face contacts; and, b) *managerial support* because of superior's positive approach, attitude, understanding, or trust.

4) ***The hindrances in collaboration*** are a) *managerial problems* because of lack of managerial support, or because of poorly performed management, or because of poorly managed internal collaboration; b) *unsuitable physical workplace* because of the lack of physical space for confidential discussions or meetings; and, c) *negative influence of co-workers* because of different kinds of challenges with colleagues.

The arrows in Figure 24 illustrate reasoning; main reasons are located in the circles labeled 'contextual factors', 'work factors' and 'individual's mind', or between these circles. However, the hindrance 'society' is located outside the circles, because it is determined to be at an external level that neither the organization nor the individual can influence. Similar external force was introduced by Kalliomäki-Levanto (2009, 127). The arrows start from reasons referring to enablers and hindrances, and end at fluency experiences. One arrow in Figure 24 stops and then continues in the 'individual's mind' sector, to emphasize the strong effect that managerial problems have on individuals' emotions.

Figure 24 illustrates how the subjective experiences of the informants are brought together with the theoretical explanations by scientific theories (reasons to fluency experiences offer the opportunity to argument the issue through the theory). Certain contextual aspects were not found in this study; this may attribute to the fact that certain factors are beyond the scope of what a single individual knowledge worker can perceive. The presented generic model is a summary constructed on bases of the issues that the informants brought up. Enablers and hindrances might have developed because of the contribution of the context, *but*, because the context as such was not in the focus of this thesis, and was therefore not studied, this supposition remains unclear. The found enablers and hindrances should be understood as variables rather than as stable factors. This is because the contexts in which they appear supposedly are changing as nature.
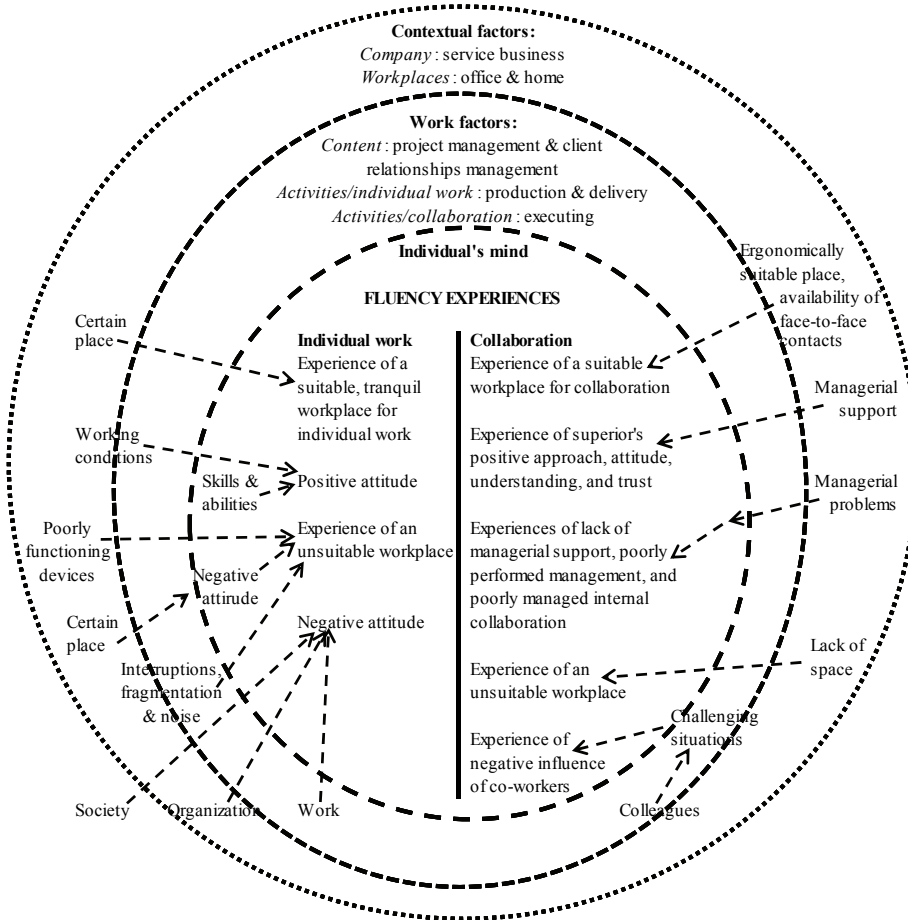
Figure 24. Generic model of fluency experiences in individual work and collaboration and factors related to them

Figure 24 also shows that contextual and work factors related to fluency experiences are as follows:

1) A knowledge worker works in a private (international) company operating in the *service sector*
2) He works most of his working hours in the *office* and at *home*
3) His work consists of *project management* and *client relationships management*
4) His work activities in individual work contain tasks related to *production* and *delivery*
5) His activities in collaboration contain tasks related to *execution*, i.e., procedures, timing, quality, and resolving power conflicts (performance/psychomotor tasks and competitive tasks)

The earlier literature usually presents the positive and negative aspects of issues without presenting a clear statement as to whether the identified issues are enablers or hindrances, or whether the issues concern individual work or collaboration, and sometimes even present contradictory interpretations. There-

fore, this thesis offers clear academic novelty in modeling the enablers and hindrances, with the reasons thereof, affecting fluency experiences in knowledge-intensive individual work and collaboration, in a systematic manner. The model presented in Figure 24 is novel in the sense that it has been developed systematically by identifying enablers and hindrances, and by constructing fluency experiences and reasoning patterns across and within the nine cases.

The basic presumption, on the bases of earlier literature, was that enablers and hindrances affecting fluency experiences in knowledge-intensive work emerge directly from the surrounding environment. This presumption has proven not to be valid, because it addressed only one aspect of a complex issue; there were other enablers and hindrances affecting fluency experiences, as well. In addition, the literature suggested that dispersed workplaces, multitasking, collaboration, and interruptions directly affect fluency (see Figure 4 in subsection 2.3.1). This thesis showed that *the named factors are relevant, but they influence fluency only through fluency experiences, not directly*. Therefore, experiences of an individual seem to affect fluency more than single factors as such. Contextual and work factors were found to relate to fluency experiences, and as such, seem to be a part of an individual's experiences that affect fluency. Because the basic presumption was proven to be somewhat incomplete, this thesis has emergent academic novelty in the sense that it suggests a new aspect.

What is not shown in Figure 24 are the categories according to which the enablers and hindrances identified in this thesis were categorized. Table 11 shows the key categories and the main categories constructed in this thesis, and categories found in earlier literature. As Table 11 shows, the main categories 'self', 'situation', and 'organization' of this thesis are similar to earlier classifications, although differences exist in enablers and hindrances that were included in these main categories. The main categories 'work', 'internal collaboration', and 'management' of this thesis have similar enablers and hindrances as earlier classifications, but there are many differences. For example, management in this context is not clearly classified in earlier literature. Instead, it was described with euphemisms, as Antikainen and Lönnqvist (2005) did when they referred to "process factors", or, it was commonly included under organizational or contextual factors (e.g., Antikainen & Lönnqvist, 2005; Bosch-Sijtsema et al., 2009). *The main categories equivalent to 'external collaboration', 'quality of collaboration', and 'society' were not found in earlier literature*. This means that enablers and hindrances included in these three main categories were not found in earlier literature, nor does that literature classify enablers and hindrances into key categories. Therefore, categorization constructed in this thesis also has emergent academic novelty; new categories were identified and hierarchical classification was constructed.

Table 11. Key categories and main categories constructed in this thesis and categories based on earlier literature

Categories according to which enablers and hindrances affecting fluency experiences in knowledge-intensive individual work and collaboration were classified	
In this thesis	**In earlier productivity/effectiveness of knowledge-intensive work related literature, which were interpreted to be similar enough to verify results of this thesis**
Key category: Self	
Main category: Self (= issues related to a person himself) - includes enablers/hindrances: positive/negative influence of (work) experience, positive/negative emotions, multitasking, positive/negative attitude, positive/negative interest, and positive/negative influence of skills & abilities	*Person related variables* (personality and style) by Mintzberg (1973); *personal factors* (career achievement home/work interface intrinsic to job) by Clements-Croome (2000); *employee attitude* (respondent's own attitude) by Sveiby & Simons (2002); *attitudes and emotions* (changes in attitudes, positive reactions, observed changes in performance) by Kemppilä & Lönnqvist (2003); *personal input factors* (motivation, job satisfaction, personal network, affairs in personal life, and physical condition) by Antikainen & Lönnqvist (2005)
Main category: Work (= issues related to human labor) - includes enablers/hindrances: fragmentation, interruptions, enabling or hindering characteristics of the work, and enabling/hindering task	*Work related variables* (level and function) by Mintzberg (1973); *task content* (complexity and interdependency of tasks) by Bosch-Sijtsema et al. (2009)
Key category: Collaboration	
Main category: External collaboration (= collaboration between the individual and individuals from other organizations) - includes enablers/hindrances: positive/negative cultural differences and problems of clients/partners	
Main category: Internal collaboration (= collaboration between individuals in the same organization by which the individual is employed) - includes enablers/hindrances: positive/negative influence of co-workers, synergy of knowledge and skills, and positive/negative influence of tacit knowledge	*Social factors* (relationships with others) by Clements-Croome (2000); *work group support* (knowledge sharing behavior of the individual's nearest colleagues) by Sveiby & Simons (2002); *team processes* (interpersonal, planning and action process) *and team structure/composition* (size, diversity, skills and knowledge) by Bosch-Sijtsema et al. (2009)
Main category: Quality of collaboration (= issues related to collaboration that may be a part of both external and internal collaboration) - includes enablers/hindrances: positive/negative atmosphere, communication problems, personal chemistry, availability of face-to-face contacts, scheduling problems, negative influence of social load, positive/negative influence of social networks, and trust	

Table 11, continued

Key category: Context	
Main category: Situation (= a particular condition or set of circumstances related to work) - includes enablers/hindrances: suitable/unsuitable physical place, well/poorly functioning devices, new/unexpected situations, noise, security issues, and tranquility	*Situational variables* (seasonal variations and temporary threaths) by Mintzberg (1973); *environmental factors* (indoor climate, workplace, indoor air quality) by Clements-Croome (2000); *physical working environment* (tidiness, ergonomics, routes, noise, lights) by Kemppilä & Lönnqvist (2003); *workplace* (physical location, virtual (IT) and social workplace) by Bosch-Sijtsema et al. (2009)
Main category: Management (= human action to facilitate the production of useful outcomes from a system or act of getting individuals together to accomplish desired goals) - includes enablers/hindrances: lack of feedback, lack of information, lack of resources, managerial problems, managerial support, and well/poorly functioning processes	*Immediate supervisor* (behavior of the immediate manager) by Sveiby & Simons (2002); *process factors* (organization of work, division of tasks, organization of decision-making, clarity of job descriptions, teamwork, knowledge sharing, delays and waiting, and ability to affect own work) by Antikainen & Lönnqvist (2005)
Main category: Organization (= a social arrangement, which pursues collective goals, controls its own performance, and has a boundary separating it from its environment) - includes enablers/hindrances: positive/negative organizational culture and positive/negative organizational structure	*Environmental variables* (organization, industry, and milieu) by Mintzberg (1973); *organizational factors* (managerial role, organizational structure) by Clements-Croome (2000); *organizational culture* (leadership factors outside the individual's nearest working environment) by Sveiby & Simons (2002); *organizational input factors* (human capital, innovative potential, organizational standards, practices and routines, information systems, quality of information, networks, time allocation, working environment, and aims) by Antikainen & Lönnqvist (2005); *contextual factors* (organizational structure, culture, strategy, leadership) by Bosch-Sijtsema et al. (2009)
Main category: Society (= economic, social or industrial infrastructure, made up of a varied collection of individuals) - includes enablers/hindrances: bureaucracy, competition, economic recession, and juridical problems	

5.1.1 Enablers and hindrances affecting fluency experiences in individual work

In addition to the most common enablers and hindrances shown in Figure 24, the rest of the identified enablers and hindrances affecting fluency experiences in individual work and collaboration are compared with enablers and hindrances found in earlier literature. Compared with enablers and hindrances found in earlier literature, the enablers and hindrances found in this thesis have systematically constructed fluency experience chains and reasoning patterns, and they are clearly denoted as being enablers or hindrances.

As can be seen in Table 12, where the enablers and hindrances affecting fluency experiences in individual work are concerned, earlier literature only clearly verifies the enablers 'suitable physical place' and 'positive attitude', and the

hindrances 'unsuitable physical place' and 'negative attitude'. This means that *the enablers 'well-functioning devices' and 'positive interest', and the hindrances 'poorly functioning devices', 'negative interest', 'negative emotions', and 'economic recession' are new findings.* Although earlier literature refers to other factors that may be interpreted to be enablers and hindrances affecting fluency experiences in individual work, the clear evidence remains weak. Issues presented in the left hand column of the table are derived from the reasoning chains presented in sections 4.1 and 4.2, some of them added with examples of the informants' fluency experiences. The right hand column includes citations from the relevant literature.

Table 12. Enablers and hindrances affecting fluency experiences in individual work in this thesis, and enablers and hindrances based on earlier literature

Enablers and hindrances affecting fluency experiences in knowledge-intensive individual work	
In this thesis	*In earlier productivity/effectiveness of knowledge-intensive work related literature, which were interpreted to be similar enough to verify results of this thesis*
Enablers	
Main category: Situation	
Suitable physical place: A tranquil place without interruptions was considered suitable for individual solo work, which led to experiences of effectiveness and positive emotions.	Workplace affects productivity (Clements-Croome, 2000). A mix of workplace settings and services are considered to be enablers for better performance (Mawson, 2002). Physical working environment affects performance: tidiness, ergonomics, routes, noise, lights (Kemppilä & Lönnqvist, 2003). Part-time telework could increase productivity (Pyöriä, 2005c).
Well-functioning devices: If there were no disturbances in internet or intranet connections, or devices themselves, devices were considered well-functioning, which led to experiences of effectiveness.	Improving efficiency and effectiveness of information environment increases productivity (Stewart, 1997/1999).
Main category: Self	
Positive attitude: Positive attitude towards skills and abilities needed in the work helped the informants to achieve their targets. Positive attitude towards working conditions led to experiences of meaningful tasks, which led to experiences of effectiveness. Positive attitude in general because of some work related issues led to experiences of independence and flexibility, fluent collaboration, etc.	Attitudes and emotions affect performance: changes in attitudes, positive reactions, and observed changes in performance (Kemppilä & Lönnqvist, 2003). Positive attitude towards e-mail (Davenport, 2005).
Positive interest: New situations and ways of organizing own work facilitate fluency in work.	

Table 12, continued

Hindrances	
Main category: Situation	
Unsuitable physical place: Too slow or out-of-order devices or connections in a certain physical place, or absence of suitable premises for certain work tasks led to situations in which the informants experienced that it was impossible to do certain work tasks. Negative attitude towards a certain workplace emerged from different reasons and led to outcomes as follows: lack of stimuli in a certain place prevented new innovations, bad weather conditions made thinking impossible, too high expectations towards a certain place led to frustration, and places that were not designed for working led to experiences of uncomfortable places. Interruptions, fragmentation, and noise caused by other individuals in a certain place made concentration in tasks impossible, which led to experiences of negative emotions.	Workplace affects productivity (Clements-Croome, 2000). Place mismatch = office environment does not support the work process undertaken in that environment (Mawson, 2002). Physical working environment affects performance: tidiness, ergonomics, routes, noise, lights (Kemppilä & Lönnqvist, 2003).
Poorly functioning devices: Too slow or out-of-order internet connections and problems with devices, <u>irrespective</u> of a physical place, led to difficulties to do certain tasks, problems with document management, and delays in service processes.	
Main category: Self	
Negative attitude: Negative attitude towards work related issues is two-fold: routine tasks, schedules, and places led to fragmentation and interrupted other tasks, which led to experiences of frustration; constrant interruptions, too many projects and roles, and projects without roadmaps led to lack of concentration, decentralization of competence, and wrong decisions, which led to experiences of frustration and disappearance of energy. Negative attitude towards society related issues emerged from bureaucracy, which led to difficulties in finding information, which led to difficulties in finding right solutions, which led to delays and problems. Negative attitude towards organization related issues emerged from several conflicting cultures, which led to managerial and leadership problems.	Negative attitude towards e-mail (Davenport, 2005). Negative belief of employees can hinder their productivity (Antikainen & Lönnqvist, 2005).
Negative interest: Negative interest towards work related issues emerged from different reasons and led to outcomes as follows: solving problems was considered uncomfortable and it led to lack of motivation; if an organization did not have clearly defined targets, this led to weakening commitment; changing situations or plans during a workday led to scheduling problems; and constant technical development led to continuous self-development, which was considered mentally heavy.	Vicious work-time cycle (Perlow, 1999).

Table 12, continued

Negative emotions: Mental absence disturbs working.	
Main category: Society	
Economic recession: Uncertain social situation had two kinds of consequences: a) partners could not hire more staff or commit to agreements, which led to difficulties in finding solutions or perform work, which led to difficulties in planning future solutions, which led to dissatisfaction among clients; and b) company had lay-offs, lack of resources, and no visible plans for the future, which led to a situation in which the worker had no information about future projects, which led to difficulties in planning own work, which led to dissatisfaction among clients.	

An important finding was that *social aspect of collaboration seems to be more important than hindrances caused by interruptions*; positive influence of interruptions (i.e., beneficial interruptions) seems to be bigger than negative influence of interruptions (i.e., disruptions). This came up because the informants did not emphasize the disruptive influence of interruptions, or they did not necessarily experience interruptions as hindrances, as had been expected, based on the earlier literature. Instead, informants experienced breaks in the middle of thinking or doing something as important interventions, because interruptions could actually facilitate the task they were working on. These beneficial interruptions also offered time for solving other tasks and having discussions with other experts. Informants also used internal interruptions to keep one's work meaningful and full of variety. Another finding related to interruptions was that *male informants seemed to experience interruptions in a more positive way than female informants did*. However, because of the small number of informants, generalization of this latter observation would be presumptuous.

5.1.2 Enablers and hindrances affecting fluency experiences in collaboration

Next, Table 13 compares the enablers and hindrances affecting fluency experiences in collaboration found in this thesis with enablers and hindrances found in earlier literature. As can be seen in Table 13, earlier literature clearly verifies the enablers 'availability of face-to-face contacts', 'suitable physical place', 'managerial support' and 'positive influence of co-workers', and only the hindrances 'problems of clients/partners' and 'negative organizational culture'. This means that *the enablers 'positive atmosphere' and 'positive influence of social networks', and the hindrances 'managerial problems', 'lack of resources', 'lack of information', 'unsuitable physical place', 'unexpected situations', 'scheduling problems', 'communication problems', 'negative cultural differences', and 'negative influence of co-workers' are new findings*. Although earlier literature refers to other factors that might be interpreted as enablers and hindrances affecting fluency experiences in collaboration, the clear evidence

remains weak. Issues presented in the left hand column of the table are derived from the reasoning chains presented in sections 4.1 and 4.2, some of them added with examples of the informants' fluency experiences. The right hand column includes citations from the relevant literature.

Table 13. Enablers and hindrances affecting fluency experiences in collaboration in this thesis, and enablers and hindrances based on earlier literature

Enablers and hindrances affecting fluency experiences in knowledge-intensive collaboration	
In this thesis	*In earlier productivity/effectiveness of knowledge-intensive work related literature, which were interpreted to be similar enough to verify results of this thesis*
Enablers	
Main category: Quality of collaboration	
Availability of *face-to-face contacts* : Availability of face-to-face contacts led to more fluent communication and decisions, easier and faster decisions, and fewer misunderstandings. Positive effect of interruptions was linked with face-to-face contacts; interruptions caused by colleagues were either experienced stimulating or as a contribution to one's work tasks.	Interactions affect productivity/effectiveness of knowledge-intensive work (Festinger et al., 1950; Mintzberg, 1973; Kraut et al., 1990; Perlow, 1999).
Positive atmosphere : Mutual trust and confidentiality among staff, and organizational culture that supported learning and aimed at synergies were considered sources of positive atmosphere.	
Positive influence of social networks : When collaboration with partners progressed well, it resulted in clients' success, which led to experiences of fluent collaboration and informant's own success.	
Main category: Situation	
Suitable physical place : A physical place was considered suitable for collaborative working if it was ergonomically suitable and if face-to-face communication was available in that place, which led to experiences of motivating and positive atmosphere.	Communication and collaboration technologies make the working contexts of knowledge workers dynamically changing and complex (Davenport, 2005). Physical environment influences the possibilities to realize the work tasks at hand (Chan et al., 2007). The physical workspace is known to affect productivity (Haynes, 2007; Heerwagen et al., 2004).
Main category: Management	
Managerial support : Superior's positive approach, attitude, and understanding were sources of experiences of managerial support and independency, which led to experiences of fluent collaboration, professional synergy, and positive atmosphere. Experience of trust was another reason to experiences of supporting superior and fluent collaboration.	Management issues are important for team productivity and effectiveness (Janz et al., 1997). Immediate supervisor influences knowledge sharing and effectiveness of knowledge-intensive work (Sveiby & Simons, 2002). Leadership influences the ability to realize the work tasks at hand (Chan et al., 2007). Leadership supports sharing and re-using of knowledge, and productivity of knowledge-intensive work (Bosch-Sijtsema et al., 2009).

Table 13, continued

Main category: Internal collaboration	
Positive influence of co-workers: Supportive work done by work pair, heterogeneous team, inspiring atmosphere, and shared targets and values were considered reasons for experiences of positive influence of co-workers, which led to experiences of synergies (knowledge and skills) and professional richness, which led to experiences of fluent collaboration.	Work group support influences knowledge sharing and effectiveness of knowledge-intensive work (Sveiby & Simons, 2002). Group size and proximity to team members affect productivity of the group (Scott, 2005). Support from co-workers influences the ability to realize the work tasks at hand (Chan et al., 2007).
Hindrances	
Main category: Management	
Managerial problems: Lack of support was first reason why managerial problems were experienced; lack of support led to experiences of negative attitude and negative emotions, which led to experiences of lack of motivation and productivity loss. Another reason why managerial problems were experienced was poorly performed management and poorly managed internal collaboration which led to experiences of negative emotions, which led to experiences of confusing atmosphere, struggles, and lack of commitment.	
Lack of resources: Lack of special knowledge, human resources, follow-up systems, and time led to lack of commitment and motivation, which led to experiences of negative attitude, which might lead to productivity loss.	
Lack of information: Lack of information led to wrong decisions, which led to lost advantages and synergies.	
Main category: Situation	
Unsuitable physical place: Lack of physical space for confidential discussions, meetings, or working led to experiences of unsuitable physical place for collaboration, which also was considered to be a security risk.	
Unexpected situations: Unexpected situations in collaboration with clients and in internal collaboration led to delays.	
Main category: Quality of collaboration	
Scheduling problems: Difficulties in finding suitable time for meetings led to scheduling problems, and tasks depending on meetings did not proceed.	
Communication problems: Different kinds of professional terminology might have led to communication problems, which led to problems in internal collaboration and unclear needs of clients.	

Table 13, continued

Main category: External collaboration	
Negative cultural differences: Different cultural backgrounds led to experiences of negative cultural differences and communication problems, which led to experiences of challenging situations.	
Problems of clients/partners: Disagreements between clients and partners, unclear responsibilities and roles, and clients not capable to make decisions led to experiences of problems of clients and/or partners, and resulted extra work, challenging situations, and delays.	Clients can cause delays with their actions (Antikainen & Lönnqvist, 2005).
Main category: Internal collaboration	
Negative influence of co-workers: Different kinds of challenges with colleagues connected to poorly functioning processes led to different kinds of outcomes: different interests between personnel groups led to delays; space requiring individuals in meetings led to decisions without plans; lack of communication in sales situations led to unsuccessful projects; and incapableness or unwillingness to collaborate led to wrong decisions.	
Main category: Organization	
Negative organizational culture: Organizational hierarchy and internal borders led to experiences of negative organizational culture and different policies, which led to managerial problems.	Organizational culture influences the ability to perform the work tasks at hand (Chan et al., 2007).

Unique enablers and hindrances that did not exist in individual work were identified in collaborative work. Only the enabler 'suitable physical place' and the hindrance 'unsuitable physical place' were common in both individual work and collaboration. A similar finding appeared in DeShon, Kozlowski, Schmidt, Milner, and Wiechman (2004) concerning individual and team regulatory processes. DeShon et al. (2004) also emphasized the importance of situational factors, although they only referred to "feedback sources in the environment" (their point being that managers should direct their feedback to the individual if they expect efforts in individual work and to teams if they expect efforts in collaboration).

Managerial problems that emerged from the informants' fluency experiences indicate that managerial issues are important from the viewpoint of the knowledge worker's well-being. This is because it appears that managerial problems have a strong effect on individuals; managerial problems clearly influence individual emotions. This finding strengthens the presumption that managing is not only an individual or not only a collaborative action; when two or more individuals are present at the same time, managing is a collaborative action, but as stated, managerial actions and managerial behavior even then may have surprisingly strong effects on individuals.

5.1.3   Practical implications

As a practical implication, this thesis suggests that since evaluation of productivity and effectiveness in knowledge-intensive work has been considered problematic, managers should consider implementing the evaluation of fluency into organizational measurement systems. This would complement and diversify the information used for decisions when developing the working conditions of knowledge workers.

Another practical implication emphasizes the importance of identifying enablers and hindrances affecting fluency experiences in individual work and collaboration. Taking a more subjective view into consideration and allowing the knowledge workers themselves to express enablers and hindrances, managers may concretely put a more individually oriented management method into practice. If knowledge workers are allowed to evaluate their own work and working contexts themselves in this way, they learn to develop their own reasoning and understand how the surrounding environment affects them and their work.

A third practical implication suggests that managers should assure that organizational goals are visible to all of their knowledge workers. This is because inadequate knowledge of goals erode commitment, motivation and work outcomes. Information policies and processes should also be followed during an economic recession, when the importance of information flow is heightened. Well-functioning communication processes between management and staff can greatly benefit management, in the form of useful ideas emerging from the staff, and in the form of effectiveness. In other words, managers should remember that poorly functioning processes are invisible reasons for negative outcomes, i.e., if processes are functioning well, the outcomes are more likely positive because processes control the actions and direct them to alternative solutions. Managers should also remember that effectiveness can be improved by facilitating work fluency.

5.2   Evaluation of the study

As Alkula, Pöntinen and Ylöstalo (1995, 21) stated, a researcher has to be familiar with the phenomenon that she is going to study to prevent her from getting lost when analyzing the data. It is not enough that the researcher is familiar with the phenomenon; informants must also be familiar with the phenomenon (Burns & Grove, 1993; Eisenhardt & Graebner, 2007). The author of this thesis has worked as a knowledge worker, a developer, and a manager in knowledge-intensive organizations for fifteen years, and is therefore familiar with the phenomenon from different viewpoints. Work experience and educational background of the author may have influenced the results; a researcher with a different background might have emphasized different issues in the analysis. The informants for this thesis were knowledge workers and they worked in knowledge-intensive organizations. Informants were recruited from diverse work settings to ensure a variety of fluency experiences. Therefore, one may

conclude that the knowledge prerequisites for the researcher and the informants were satisfied in this thesis.

The three main viewpoints for assessing research studies are reliability, validity, and generalization. *Reliability* refers to the credibility of data gathering and data analysis. The reader must be able to both follow and criticize the reasoning and conclusions that the researcher has drawn, based on the data. Credibility means that the contents of a research report allows the reader to have confidence in the results (Anttila, 2001). *Validity* is attained by documentation of the research phases, data gathering methods, and conclusions in such a way that the reader can assess the reliability of the research (Grönfors, 1982, 178; Hämäläinen, 1987, 65-66). *Generalization* refers to validity of the study's interpretations in real life (Pyörälä, 1995, 15).

Chapter 3 and Appendices 7 and 8 fully describe data gathering methods, data analysis, and phases of the study. There were two data gathering phases, to ensure a rich variety of data. Acquiring data via texts written by the informants was a means of orienting the informants to the phenomenon, and at the same time, their writing of the narratives gave them an opportunity to reflect upon issues related to the phenomenon. Interviews were semi-structured, because it was important to give the informants freedom to describe their fluency experiences as fully and freely as possible. Informant-oriented data gathering methods were the clear methods of choice because of the nature of the phenomenon. Alternative possible methods included observation and self-reflection diaries, but both were determined to have more disadvantages than advantages for this kind of a study. However, observation and diaries usually require enormous time resources, both from the researcher and the participants, and time limitations were the key disadvantage leading to the rejection of these methods. Had those methods been used, interviews still would have been indicated, to avoid possible false interpretations.

Data was analyzed systematically from two major viewpoints to ensure triangulation. Both inductive and abductive reasoning were used to make fluency experiences visible; to construct categories, chains, and patterns to interpret fluency experiences. The 'Analytic framework of the thesis' was constructed on the basis of earlier literature. The framework was further developed by combining cross-case fluency experiences and factors related to them into the 'Analytic framework for the cases'. Finally, the framework was developed into a generic model that illustrates the core results of this thesis. Although abductive reasoning is usually connected with Grounded Theory, it was chosen as one of the reasoning methods in this multiple-case study because of its appropriate nature and because it complements inductive reasoning. While abductive reasoning emphasizes the best possible explanation based on the empirical data (e.g., Richardson & Kramer, 2006) and helps illuminate latent patterns in use in the informants' explanations (e.g., Hallberg, 2006), inductive reasoning expands existing knowledge by making room for new knowledge to emerge from the data. Constructing a strong theory-based framework for analysis was considered at the beginning of the research process. However, the author rejected this idea as being too restrictive; the chance of missing valuable details was too great if a strong theoretical framework was used and strictly followed. Induc-

tive and abductive reasoning proved to be good options, as they helped to systematically achieve rich results.

When abduction is concerned, there are always certain problems related to the data and conclusions derived from it. These problems refer firstly to a methodological problem, and secondly to a circle of conclusions inside the data. Methodological problem refers to high-handed conclusions that abduction allows, and to a weakness that abductive reasoning has, namely that it does not tell how the phenomenon is made visible (Niiniluoto, 1999). The latter problem means that the researcher has to keep her abductive interpretations separate from the conclusions made by the study participants. These problems were taken into consideration in this study. Section 3.4 and appendices 7 and 8 explain thoroughly, how the author of this thesis worked with the data: on what basis the quotations referring to enablers and hindrances were chosen, how the quotations were coded, how they were categorized, how the chains were constructed, and how the patterns were constructed. The thorough description of data analysis was an attempt to overcome the inherent weakness of the methodology, in the search for the best explanation possible. The guiding principle, according to the literature, can be indefinite and intuitive, or, defined and designed hypothesis (Grönfors 1982, 33). In this thesis, there are no hypotheses – rather, there are intuitively, yet defined, factors and variables emerged from the empirical data that were tried to conceptualize during the research process. In this way, this thesis combines abductive and inductive reasoning.

From the author's viewpoint, analytic frameworks, chains, and patterns were suitable because they were systematic, logical, and flexible. Analytic frameworks made systematic analysis and reporting of results possible, chains showed the details and frequencies, and patterns helped to visualize the informants' manner of thinking. There naturally are some disadvantages, as well: analytic frameworks focused on certain details may leave other possible details out; fluency experience chains did not follow any defined pattern, but rather, emerged intuitively from the data; reasoning patterns likewise emerged intuitively. Constructing a theoretical model inductively requires a certain flexibility, so the data may be optimized to produce versatile results.

To summarize, an attempt to improve the reliability and validity of this thesis was addressed in three ways (terms: Eskola & Suoranta, 1998, 119): 1) *Data triangulation*, which was achieved by using data from earlier studies, texts written by the informants, and semi-structured interviews. 2) *Theory triangulation* was achieved by using different theories to analyze the data related to contextual and work factors, and by evaluating the similarity in the findings of this thesis (enablers and hindrances constructed on basis of the data, etc.) as compared to the findings of previous studies. 3) *Method triangulation* was achieved by using a blend of inductive and abductive reasoning, although both reasoning approaches are considered qualitative in this thesis.

Generalization is always a difficult point to prove. Generalization of this thesis may be weak from an objective viewpoint, because the informants' contexts are always unique, and can rarely be identically replicated. This is because it is a matter of the informants' unique self-perceptions and feelings related to their situations, although the situations may appear identical. This

means that the results of this thesis may in part be uniquely applicable, and that they are valid, at least in the precise contexts that were described, although the highly systematic analysis was employed to compensate for the inevitable subjectivity. However, for example, also Mark et al. (2005; 2008) reported participants' subjective views in their research articles. This means that, in this kind of a study, one cannot obtain results or make conclusions if subjectivity is totally forbidden. In this study, the research process was actually enriched by subjectivity because the generated model is a created 'reality', constructed through a transactional process involving the researcher and the data (e.g., Hallberg, 2006).

Without a doubt, more study participants would have increased the generalizability of this thesis. It would have been possible to reach a more visible saturation, although saturation was not the goal of this thesis. However, when comparing a multiple-case study with a single case study, multiple cases are still more illuminating than a single case, and thus produce more reliable results than a single case study. As Eisenhardt and Graebner (2007) stated, case number are typically small in multiple-case studies.

A systemic approach was chosen for construction of fluency experiences because of better generalizability. As Senge (1990, 68-69) stated, "systems thinking is a discipline for seeing wholes or structures that underlie complex situations, and, systems thinking offers a language that begins by restructuring how individuals think." In this thesis, explanation patterns helped in understanding the individuals' thinking, whereas Senge (1990, 73-92) described causalities with the help of circles, and Kalliomäki-Levanto (2009) used chronological chains of events in order to construct categories in her thesis.

Despite its methodological limitations, this thesis has achieved its goal: it has produced new information. The contribution to the relevant literature complements and expands existing knowledge and suggests new approaches.

5.3   Future research

The field of knowledge-intensive work is interesting and there still are many areas that may be addressed in future research. Regarding enablers and hindrances affecting fluency experiences in knowledge-intensive work, the enablers and hindrances found in this thesis and the analytic framework herein might be tested in a broader context, perhaps by including several fields that involve knowledge-intensive work and comparing the differences between the fields, or by conducting a study with many more cases.

An interesting consideration not addressed in this thesis is coping methods. Data included material on how informants coped with challenges that they confronted in everyday work life, from the perspective of fluency experiences. For example, an analysis of methods for coping with hindrances affecting fluency experiences of knowledge workers in individual work (and/or, in collaboration), could be a well-defined subject for a further study, since understanding is very limited in this particular area.

Productivity measurement is a relatively well-discussed topic, and measurement methods have been developed for knowledge-intensive work, although there are some somewhat conflicting proposals for them. As the results of this thesis indicate, there still is work to do in the area of measurement design for knowledge-intensive work because organizations that implement these methods do not necessarily have resources to adopt methods to address the specific needs of particular personnel groups. One specific inadequacy in the design of these measurements is that fluency is not identified as a factor that influences effectiveness and work quality. Therefore, future research should also focus on developing measurement methods that include the fluency aspect.

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Appendices

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APPENDIX 1. Field-neutral classification of processes

Implementing processes implementation as a part of an organization's performance is a consequence of a client-centered way of thinking. A client-oriented operational style is essential in today's knowledge-intensive organizations because their product is often the 'invisible' skills of their knowledge workers, who solve clients' problems with these skills and try to produce value for their clients. The author organized the most common (field-neutral) business processes into two main groups, operational processes and managerial processes, as the process framework for this thesis (Figure 1). In addition, Figure 1 illustrates the philosophy according to which processes are defined in this thesis. According to Davenport (1993b), processes are defined as "structured, measured sets of activities designed to produce a specific output for a particular client or market". They "imply a strong emphasis on how work is done within an organization", and they are "specific orderings of work activities across time and space, with beginnings and ends, and clearly defined inputs and outputs". *Operational processes* are defined as core processes of an organization; they follow each of their own defined sub-processes. *Managerial processes* are defined as supportive processes, and their role is to enable the functioning of operational processes. In Figure 1, operational processes are presented in columns and managerial processes are presented in rows.
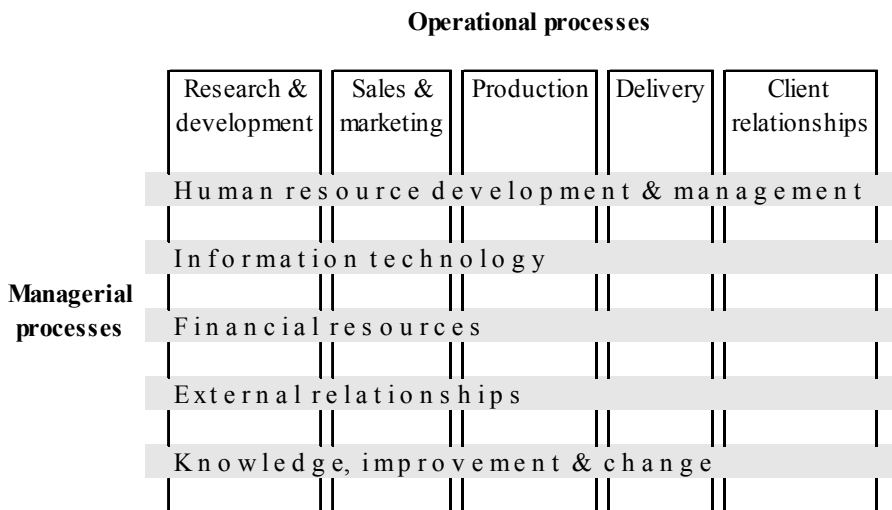
Figure 1. Field-neutral process framework

APPENDIX 2. Data gathering, phase 1: Questions to answer in writing

Thank you for participating in my doctoral dissertation study concentrating on fluency in knowledge-intensive work. I am conducting this study at Helsinki University of Technology (Faculty of Information and Natural Sciences, Department of Industrial Engineering and Management, Laboratory of Work Psychology and Leadership). Professor Matti Vartiainen acts as my supervisor and instructor.

Please answer the questions below. You can either write your answers using this Word template or create a presentation of your own. You can also enclose your job description, but it is not compulsory. I hope you will e-mail your answers back to me. After analyzing your responses, I will send interview questions to you so that you can prepare for the interview.

All of your answers will be handled confidentially. Your identity or organization cannot be recognized in the report. Please do not hesitate to ask for additional information.

Enjoy your writing!

1) Describe the content of your work: what are your main tasks, goals, responsibilities and areas of authority?

2) Fluency in work: what kinds of factors affect fluency in your work, so that you are able to achieve your goals? Please itemize both enabling and hindering factors.

3) Working environments: in what kind of physical environments (i.e., places) do you work? You will find Table 1 enclosed and more detailed instructions for this question.

   a) Please estimate how much time you spend in each working environment.
   b) What kind of tasks do you perform in each working environment?
   c) What kind of (information technology) devices are there in each working environment and how do they work?
   d) With whom do you work in each environment and what kind of social situations does each environment include?
   e) What kind of positive and negative thoughts and emotions does each working environment arouse in you?

Appendix 2, continued

Table 1. Working environments and spaces (based on Vartiainen, 2007a, 31)

Physical spaces - Settings - Arenas - Environments - Tasks	Home	Main workplace(s) 'Office'	Moving places, i.e. trains, airplanes, ships	Second workplaces', e.g., clients' and suppliers' places	Third workplaces', e.g., hotel, café, congress venue
Virtual spaces - Connections - Devices - Services - Purposes - Functionality					

Social spaces
- G & O
  (management)
  and HRM issues					

Mental spaces
- Cognitions and
  emotions, self-
  regulation					

Please use Table 1 when you answer question 3:

1) Physical working environments (i.e., home, main workplace, moving places, etc.) are shown on the top row of the table (physical spaces); examples of such spaces are given, as well. In sub-question 3a, you are asked to assess how much time you spend in each physical working environment. Please report time spent in each working environment, using percentages, so that your total working time totals 100 percent.

2) In sub-question 3b, you are asked to describe what kind of tasks you perform in each physical environment. Please give a short description of the arrangement of each work environment (do you have own room/space for working or do you work with laptop on your lap, etc.).

3) In sub-question 3c, you are asked to describe what kind of information technology and devices are at your disposal in each environment and how they work (connections, devices, services, purposes, functionality, etc.).

4) In sub-question 3d, you are asked to describe who you work with in each environment and what kind of social situations each of the working environments include (government, organization, management, HRM, etc.)

5) In sub-question 3e, you are asked to report what kind of positive and negative thoughts and emotions surface in each working environment.

APPENDIX 3. Data gathering, phase 2: Interview questions

TOPICS FOR INTERVIEW

Content of the work

1) Assess, with the help of Table 1, your division of tasks, by different task levels. Please also give some examples of tasks included in each level.

2) Do you work more solo or in collaboration with other individuals?

3) Assess, with the help of Figure 1, how your solo knowledge work tasks divide into different task entities.
   a) What kinds of factors enable or hinder your solo working?
   b) Do you notice interruptions during solo working? If you do, what kind of interruptions are these?
   c) Is your work a discrete entity or does it appear fragmented to you?
   d) Do you perform several tasks at the same time?

4) Assess, with the help of Figure 2, how your collaborative work tasks divide into different task entities.
   a) What kinds of factors enable or hinder your collaborative working?
   b) Are there differences between collaboration inside the organization and collaboration outside the organization?

5) Does your work include foreign contacts? If so, how do cultural differences influence your work?

Organizational factors

6) How are your goals defined and how is your success measured?
   a) Has your organization implemented any of the known performance measurement frameworks (Balanced Scorecard, Performance Prism, etc.)?
   b) Do you use development discussions?

7) How are your goals defined (i.e., are you allowed to participate in definition of your goals)? How is success for these goals measured?

8) What is the atmosphere of your main workplace and how does that atmosphere influence your work?

9) Do you make independent decisions in your work? If so, in what situations and related to what issues?
   a) What factors enable or hinder independent decision-making?
   b) What issues related to your work require decisions by your superior?

Appendix 3, continued

10) Can you mention examples of situations in which your superior has positively influenced the success of your work?

Working environments (Table 2) and fluency/success in work

11) How do (information technology) devices in each physical environment enable fluency and success in your work? What kinds of factors related to (information technology) devices hinder or prevent your work?

12) How do other individuals in each physical environment enable fluency and success in your work? What factors related to social situations hinder or prevent your work?

13) How does each physical environment affect fluency and success in your work?
   a) In what working environments you get more done than in others, and why?
   b) In what working environments you get less done than in others, and why?

Mental resources

14) How do thoughts and emotions related to each physical environment enable fluency and success in your work? How do thoughts and emotions related to each physical environment hinder or prevent your work?

15) Do you have too much or too little work?
   a) Are you busy?
   b) Are you overloaded or stressed? If so, for what reasons?

16) What coping methods do you have (in order to be able to perform your work / in order to stay motivated / in order to achieve your work goals / in order to succeed in your work)?

17) What kinds of mental resources do you need in order to succeed in your work? How do these resources enable your work?

Appendix 3, continued

Table 1. Division of tasks within different task levels (based on Hacker, 2005, 239-250)

Doing routine tasks (examples of tasks)	
Working based on familiar rules and guidelines (examples of tasks)	
Applying rules and guidelines in many familiar contexts (examples of tasks)	
Combining familiar rules and guidelines in new contexts (examples of tasks)	
Creating new plans and solutions (examples of tasks)	
Total	100%

Please estimate, with the help of Table 1, how your tasks are divided among the different task levels; routine work, creative work, and tasks between these two points on the continuum. First, distribute your tasks among the categories presented in Table 1, and then, estimate what percentage of your time you spend in each category, with your time adding up to 100 percent. Please also give examples of tasks included in each level.

Appendix 3, continued

Figure 1 illustrates generic knowledge work task categories that are usually performed solo. First, group those of your tasks that you perform solo into the categories presented in Figure 1. Then, estimate how much time you spend on each task category. Here, 100 percent indicates your total solo working time. Are there some categories that take up more of your time? If so, why do they take up so much of your time?
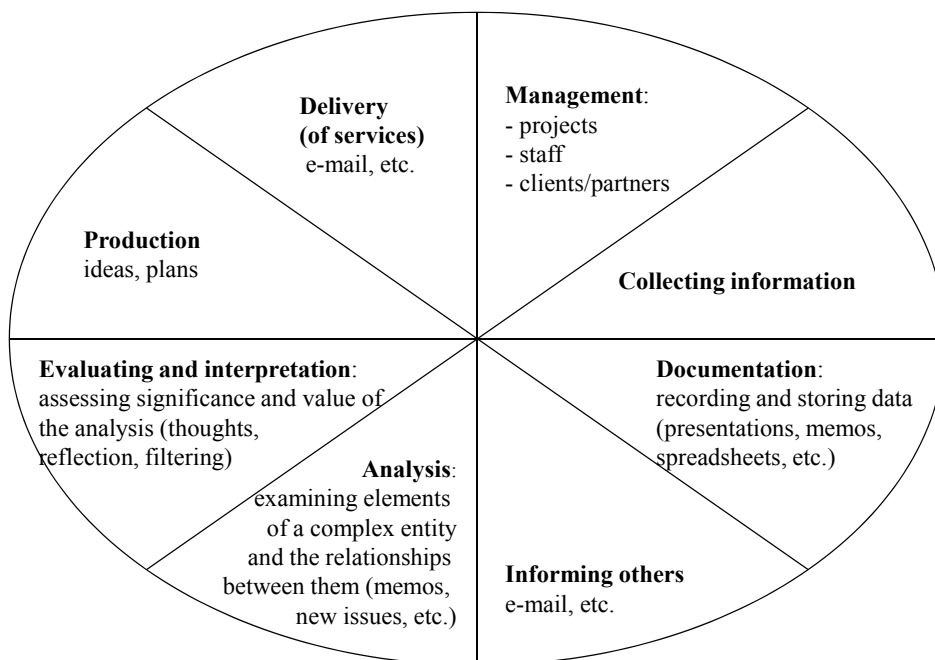
Figure 1. Solo knowledge work tasks (based on Harrison et al., 2004, 54-55)

Appendix 3, continued

   Figure 2 illustrates most general collaborative knowledge work task categories that are usually performed in collaboration with other individuals. First, distribute your collaborative tasks among the categories presented in Figure 2. Second, estimate how much time you spend on each task category. Here, 100 percent indicates your total collaborative working time. Are there some categories that take up most of your time? If so, why do they take up so much of your time?

Generating ideas (brainstorming, etc.)

Generating plans (goal-setting, agendas, etc.)

Problem solving (with right answers)

Executing performance tasks (procedures, timing, quality, etc.)

Resolving disagreement (deciding without right answers)

Persuasion (resolving power conflicts)

Exchanging information (resolving conflicting viewpoints)

Bargaining/ negotiating (resolving conflicts of interests)
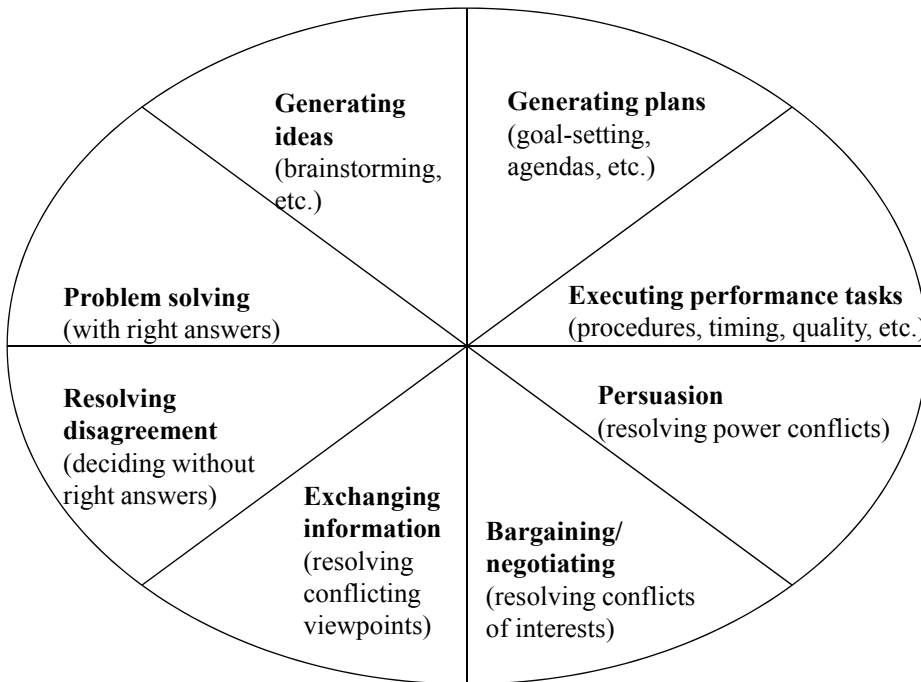
Figure 2. Collaborative knowledge work tasks (based on McGrath, 1984, 61; McGrath & Hollingshead, 1994, 67)

Appendix 3, continued

Table 2. Working environments and spaces (based on Vartiainen, 2007a, 31)

Physical spaces - Settings - Arenas - Environments - Tasks	Home	Main workplace(s) 'Office'	Moving places, i.e. trains, airplanes, ships	Second workplaces', e.g., clients' and suppliers' places	Third workplaces', e.g., hotel, café, congress venue
Virtual spaces - Connections - Devices - Services - Purposes - Functionality					
Social spaces - G & O (management) and HRM issues					
Mental spaces - Cognitions and emotions, self-regulation					

Please estimate, with the help of Table 2, how each physical environment influences fluency and success in your work. In what kind of physical environments you get more or less done than in others, and why? How do (information technology) devices enable or hinder your work in each physical environment? How do other individuals in each physical environment and social situations related to them enable or hinder your work? How do thoughts and emotions related to each physical environment enable or hinder your work?

APPENDIX 4. Categories with descriptions

Key category	Main category	Category	Description
Self			A person.
	Self		Issues related to a person himself.
		Positive/negative influence of (work) experience	Positive/negative influence of knowledge and/or skills gained through involvement in work related issues.
		Positive/negative emotions	Complex positive/negative psychophysiological experiences of an individual's state of mind.
		Multitasking	Doing several tasks at the same time.
		Positive/negative attitude	Positive/negative view of an individual that represents individual's degree of like/dislike for something.
		Positive/negative interest	Positive/negative state of curiosity, or concern about, or attention to something that an individual finds rewarding or meaningful.
		Positive/negative influence of skills & abilities	Positive/negative learned capacities to carry out defined results & the quality of being able to do something.
	Work		Issues related to human labor.
		Fragmentation	Break in continuous work activity.
		Interruptions	Gaps or discontinuities in the flow of work that may be beneficial/detrimental.
		Enabling or hindering characteristics of the work	Enabling/hindering distinguishing trait or quality aspect of work.
		Enabling/hindering task	Part of a set of actions which enable/hinder accomplishment of a job.
Key category	**Main category**	**Category**	**Description**
Collaboration			A recursive process in which two or more individuals or organizations work together in an intersection of common goals.
	External collaboration		Collaboration between the individual and individuals from other organizations.
		Cultural differences (positive/negative)	Distinction between organizations, fields, or countries that influence on behavior of an individual in a positive/negative way.
		Problems of clients/partners	Personal or organizational problems of an individual's external collaborative partner.
	Internal collaboration		Collaboration between individuals in the same organization by which the individual is employed.
		Positive/negative influence of co-workers	Positive/negative influence of individuals that work in the same organization with the individual.
		Synergy of knowledge and skills	An emotion that an individual may feel when experts in organization work for mutual targets and share knowledge and skills.
		Positive/negative influence of tacit knowledge	Positive/negative influence of hidden knowledge in the organization; knowledge that individuals do not 'see' or even know that they posses it because it is invisible and difficult to share.

Table continues….

APPENDIX 4, continued

Key category	Main category	Category	Description
Collaboration			
	Quality of collaboration		Issues related to collaboration that may be a part of both external and internal collaboration.
		Positive/negative atmosphere	Invisible space that emerges from an individuals' collaboration in organizations; it indicates how well/poor different kinds of personalities collaborate.
		Communication problems	Problems that may arise when two or more individuals with different kinds of, e.g., educational or cultural backgrounds communicate.
		Personal chemistry	Indicates how well/poor two or more individuals get along with each other.
		Availability of face-to-face contacts	Conditions that allow an individual to work physically together with another individual.
		Scheduling problems	Problems that may arise, e.g., when two or more individuals with different kinds of prioritizations try to find mutual time.
		Negative influence of social load	Influence of overload of social interactions during a work day.
		Positive/negative influence of social networks	Positive/negative influence of network of individuals that the individual collaborates with, irrespective of their geographical location.
		Trust	Feeling of confidentiality that may exist between two or more individuals, i.e., that an individual has faith in another individual or that he believes in him.
Context			Surroundings, circumstances, environment, background, or settings which determine, specify, or clarify the meaning of an event.
	Situation		A particular condition or set of circumstances related to work.
		Suitable/unsuitable physical place	Good/poor suitability of a workplace for solo/collaborative work.
		Well/poorly functioning devices	Well/poorly functioning physical and virtual tools that are used during working, e.g., PC, mobile phone, internet, software, WLAN, Skype, Adobe Connect Pro.
		New/unexpected situations	New situations refer to previously not familiar but interesting occasions. Unexpected situations refer to occasions that appear suddenly and they usually have a negative emphasis.
		Noise	Unwanted sound.
		Security issues	Things or conditions that improve or weaken safety of individuals, documents, or organizations.
		Tranquility	Quality of calm experiences in places without disturbances.

Table continues…

APPENDIX 4, continued

Key category	Main category	Category	Description
(Context)			
	Management		Human action to facilitate the production of useful outcomes from a system (i.e., organization), or act of getting individuals together to accomplish desired goals.
		Lack of feedback	Missing response to work-related event/phenomenon.
		Lack of information	Missing work-related knowledge.
		Lack of resources	Missing employees or assets.
		Managerial problems	Obstacles which make it difficult for superiors to achieve desired goals, objectives, or purposes.
		Managerial support	Mental back-up of superior(s).
		Well/poorly functioning processes	Well/poorly functioning routine set of procedures.
	Organization		A social arrangement which pursues collective goals, controls its own performance, and has a boundary separating it from its environment.
		Positive/negative organizational culture	Positive/negative ideas which describe the psychology, attitudes, experiences, beliefs, and values of an organization, or, the specific collection of values and norms that are shared by individuals and groups in an organization and that control the way they interact with each other and with stakeholders outside the organization.
		Positive/negative organizational structure	Positive/negative hierarchical concept of subordination of entities that either collaborate and contribute to serve one common goal (positive) or divides resources and internal forces apart from each other (negative).
	Society		Economic, social or industrial infrastructure, made up of a varied collection of individuals.
		Bureaucracy	Bureaucracy is where an individual interfaces with an organization such as a government etc., which has standard procedures and rules that guide the execution of processes.
		Competition	A contest between organizations for a niche in the market or intangible assets.
		Economic recession	A business cycle contraction, a general slowdown in economic activity over a period of time.
		Juridical problems	Obstacles related to law.

APPENDIX 5. Frequencies for quotations referring to enablers

Quotations	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	total	total	%
Quotations referring to enablers	23	33	32	49	44	62	53	34	44	**374**		
Self												
Positive influence of (work) experience	1	11			3	5	1	2	1	**24**		
Positive emotions	6	6		3		12	5	1	2	**35**		
Positive influence of multitasking				1	1				2	**4**		
Positive attitude	4	10	3	10	10	22	20	6	10	**95**		
Positive interest	5	6	4	6	7	10	11	4	9	**62**		
Positive influence of skills & abilities	3	9		8	4	8	2	2	5	**41**		
Quotations referring to self	**19**	**42**	**7**	**28**	**25**	**57**	**39**	**15**	**29**	**261**		
Work												
Positive influence of interruptions				1		1	2	2	1	**7**		
Enabling characteristics of the work	2	2			1	6			1	**12**		
Enabling tasks	1	1							3	**5**		
Enabling work design			1	2	2		2	2	5	**14**		
Quotations referring to work	**3**	**3**	**1**	**3**	**3**	**7**	**4**	**4**	**10**	**38**	**299**	**44,23**
External collaboration												
Positive influence of cultural differences						3	1	2		**6**		
Quotations referring to external collaboration	**0**	**0**	**0**	**0**	**0**	**3**	**1**	**2**	**0**	**6**		
Internal collaboration												
Positive influence of co-workers		5	4	3	1	2	6	5	3	**29**		
Social acceptance				1	3					**4**		
Synergy of knowledge and skills		1		5	3	5	2	2		**18**		
Positive influence of tacit knowledge				2		1				**3**		
Quotations referring to internal collaboration	**0**	**6**	**4**	**11**	**7**	**8**	**8**	**7**	**3**	**54**		
Quality of collaboration												
Positive atmosphere		1	1	5	4	9	3	3	3	**29**		
Positive personal chemistry		1	1			1	3			**6**		
Availability of face-to-face contacts	5	1	3	2	5	5	6	1	1	**29**		
Positive influence of social networks		5	4	1	3	4	4	2	3	**26**		
Trust	2	2		7	2	4	2			**22**		
Quotations referring to quality of collaboration	**7**	**10**	**9**	**15**	**14**	**23**	**18**	**6**	**10**	**112**	**172**	**25,44**
Situation												
Suitable physical place	1		3		2	4	3	5	6	**24**		
Well-functioning devices	1	1	4	3	10	7	5	6	11	**48**		
New situations	2					2				**4**		
Tranquility	4	3	5	7	4	4	5	7	5	**44**		
Quotations referring to situation	**8**	**4**	**12**	**10**	**16**	**17**	**13**	**18**	**22**	**120**		
Management												
Positive influence of challenges/learning/development		1		1	2	4	1		6	**15**		
Managerial support	1	1	6	6	4	2	6		3	**29**		
Well-functioning processes						4	4			**8**		
Quotations referring to management	**1**	**2**	**6**	**7**	**6**	**10**	**11**	**0**	**9**	**52**		

Table continues…

APPENDIX 5, continued

Quotations	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	total	total	%
Organization												
Positive organizational culture			2	2	5	11	5	1	4	30		
Positive organizational structure								1		1		
Quotations referring to organization	0	0	2	2	5	11	5	2	4	31		
Society												
Positive influence of economic recession									2	2		
Quotations referring to society	0	0	0	0	0	0	0	0	2	2	205	30,33
Amount of quotations referring to enablers	38	67	41	76	76	136	99	54	89	676	676	100,00

APPENDIX 6. Frequencies for quotations referring to hindrances

Quotations	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	total	total	%
Quotations referring to hindrances	57	48	34	46	44	44	49	20	49	391		
Self												
Negative emotions	6	7	1	1		6	5	1	2	29		
Negative influence of multitasking		3	1	1		2			1	8		
Negative attitude		5	1	5	5	5	8	1	6	36		
Negative interest		3			1	4	7	1	4	20		
Negative influence of skills & abilities		2	3			3	2		1	11		
Quotations referring to self	6	20	6	7	6	20	22	3	14	104		
Work												
Fragmentation						2	1	3	1	7		
Negative influence of interruptions	1		3	2	3	3	4	5	4	25		
Hindering characteristics of the work		3		1	2	9			1	16		
Hindering tasks	3	1		2			2		2	10		
Hindering work design		2					4		1	7		
Quotations referring to work	4	6	3	5	5	14	11	8	9	65	169	23,18
External collaboration												
Negative influence of cultural differences	3	2	3	4	1	4	1		1	19		
Problems of clients/partners		8	7	1	3	2			3	24		
Quotations referring to external collaboration	3	10	10	5	4	6	1	0	4	43		
Internal collaboration												
Negative influence of co-workers	6		2	4	2	5	6		7	32		
Lack of counseling					13					13		
Negative influence of tacit knowledge				1	6		1			8		
Quotations referring to internal collaboration	6	0	2	5	21	5	7	0	7	53		
Quality of collaboration												
Negative atmosphere		4		2	1	3	1			11		
Communication problems		2	1	3	4	5	7		5	27		
Negative personal chemistry						1	2		2	5		
Scheduling problems	1	5	3	2	7	1	1	3	5	28		
Social load			1	5		4				10		
Quotations referring to quality of collaboration	1	11	5	12	12	14	11	3	12	81	177	24,28
Situation												
Unsuitable physical place	5	8	1	1	5	3	3	4	6	36		
Poorly functioning devices	3	2	2	6	12	3	4	2	8	42		
Unexpected situations		5	2	4		3			2	16		
Noise							2	1	5	8		
Security issues	2	2	2	3	6	1	2		2	20		
Quotations referring to situation	10	17	7	14	23	10	11	7	23	122		

Table continues…

APPENDIX 6, continued

Quotations	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	total	total	%
Management												
Negative influence of challenges/learning/development						1			5	**6**		
Lack of feedback				2						**2**		
Lack of information		1	2	2	6	1	2	1	2	**17**		
Lack of resources	6		1	2	4		6		3	**22**		
Managerial problems	15	12		5	5	3	19		4	**63**		
Poorly functioning processes	2		1	1	1	1	2		4	**11**		
Responsibilities not meeting authorities	2	1								**3**		
Quotations referring to management	**25**	**14**	**3**	**12**	**16**	**6**	**29**	**1**	**18**	**124**		
Organization												
Negative organizational culture	13	8	4	8	8	6	18		3	**68**		
Negative organizational structure	12	1	1	5		1			1	**21**		
Quotations referring to organization	**25**	**9**	**5**	**13**	**8**	**7**	**18**	**0**	**4**	**89**		
Society												
Bureaucracy		2	2			4				**8**		
Changed social situation			5							**5**		
Competition			2			2			2	**6**		
Negative influence of economic recession			6			1	1	1	5	**14**		
Juridical problems		5	1			4		2		**12**		
Negative influence of quarter economy	1		2							**3**		
Quotations referring to society	**1**	**7**	**18**	**0**	**0**	**11**	**1**	**3**	**7**	**48**	**383**	**52,54**
Amount of quotations referring to hindrances	**81**	**94**	**59**	**73**	**95**	**93**	**111**	**25**	**98**	**729**	**729**	**100,00**

APPENDIX 7. Example 1 of data analysis: construction of categories

Analysis began with the informants' quotations. An example of an informant's quotation follows:

> "Abilities to collaborate and interact are my basic skills and they *affect fluency in my work*. This is because individuals can be persuaded to do different kinds of things with help of these skills. Individuals are busy, they have a lot of work to do and each of us has our most important issue. How and how fast I can influence my colleague as to the issue being funny, important and profitable, *affects fluency, goals and achievements in my work*. … My work also requires abilities to motivate and to coach. … I also have been rewarded on basis of these skills."

In the first phase of data analysis, the previous text unit was viewed a reasonable entity that could be analyzed as a fluency experience, because the informant remarked on something that affects fluency in her work (marked with italics in the quoted text). This quotation refers to an enabler because the informant describes the issue in a positive way showing her contentment with the issue; the first clause in the first sentence and the last sentence of the quotation indicate this (underlined in the quoted text). This quotation was coded in Atlas.ti with a code 'enabler'. Altogether 374 quotations referring to enablers and 391 quotations referring to hindrances were identified in this way.

In the second phase of data analysis, quoted texts were divided into sentences. First, each quotation was coded with a consecutive number and with a letter 'C', which refers to word 'case', i.e., the informant (below, C1 in the beginning of each code refers to Case 1). Then, the main sentence of the fluency experience was coded with a consecutive number and with a letter 'E', which refers to words 'fluency experience' (below, C1E1 in the beginning of each code refers to the first fluency experience that the author extracted from the data of Case 1). After that, the rest of the sentences that explained the main sentence of the fluency experience were coded with a consecutive number and with the letters 'RQ,' or 'reasoning quotation for fluency experience' (below, e.g., C1E1RQ3 refers to the third sentence that gives reasons for first fluency experience abstracted from the data of Case 1). Altogether 676 quotations rationalizing those 374 quotations referring to enablers and 729 quotations rationalizing those 391 quotations referring to hindrances were coded in this way.

> **C1E1**: "Abilities to collaborate and interact are my basic skills and they affect fluency of my work." **C1E1RQ1**: "This is because individuals can be persuaded to do different kinds of things with help of these skills." **C1E1RQ2**: "Individuals are busy, they have a lot of work to do and each of us has our own most important issue." **C1E1RQ3**: "How and how fast I can influence my colleague as to the issue being funny, important and profitable, affects fluency, goals and achievements of my work." **C1E1RQ4**: "My work also requires abilities to motivate and to coach." **C1E1RQ5**: "I also have been rewarded on basis of these skills."

APPENDIX 7, continued

Next, the coded sentences (Table 1, column 'Quotation of the informant') were coded in Atlas.ti with titles that described contents of the sentences, i.e., views of the informants (see Table 1, column 'Category'). These titles became *categories*. For example, C1E1 refers to 'positive attitude' because the informant states that abilities to collaborate and interact affect fluency in her work; this was considered to be a fluency experience which emerges from her positive appreciation of her skills and abilities (the informant's personal viewpoint, which the author cannot witness). Furthermore, e.g., C1E1RQ1 refers to 'positive attitude' because the informant claimed that she can persuade individuals to do things with the help of these skills (this is also her personal viewpoint, which the author cannot witness), and, C1E1RQ5 refers to 'managerial support,' because the informant stated that she has been rewarded on the basis of these skills (there is clear evidence of this reward). Initially, 70 categories were thus identified, but after combining categories with similar meanings, 41 categories remained. Categories of the reasons appear in Appendix 4.

Table 1. An example of coding of the quotations

Quotation of the informant	Category	Main category	Key category
C1E1: "Abilities to collaborate and interact are my basic skills and they affect fluency of my work." **C1E1RQ1**: "This is because individuals can be persuaded to do different kinds of things with the help of these skills." **C1E1RQ2**: "Individuals are busy, they have a lot of work to do and each of us has our own most important issue." **C1E1RQ3**: "How and how fast I can influence my colleague as to the issue being funny, important and profitable, affects fluency, goals and achievements of my work." **C1E1RQ4**: "My work also requires abilities to motivate and to coach." **C1E1RQ5**: "I also have been rewarded on basis of these skills."	**C1E1**: Positive attitude. **C1E1RQ1**: Positive attitude. **C1E1RQ2**: Positive attitude. **C1E1RQ3**: Positive attitude. **C1E1RQ4**: Enabling characteristics of the work. **C1E1RQ5**: Managerial support.	**C1E1**: Self. **C1E1RQ1**: Self. **C1E1RQ2**: Self. **C1E1RQ3**: Self. **C1E1RQ4**: Work. **C1E1RQ5**: Management.	Self

In the third phase of data analysis, categories were grouped into *main categories* that present reasonable entities, according to the meaning and nature of the categories. This means that, for example, all categories referring to an individual himself or to his characteristics (e.g., positive/negative attitude, positive/negative interest, positive/negative influence of experience, positive/negative influence of skills and abilities) were grouped into the main category 'self'. Each of the nine main categories constructed in this way (self, work, external collaboration, internal collaboration, quality of collaboration, situation, management, organization, and society), included two to eight categories (see the paragraph below), and any single category could belong only to one main category.

APPENDIX 7, continued

Example in Table 1 shows that, e.g., the category 'positive attitude' was grouped into the main category 'self' because it characterizes the informant herself, and the category 'enabling characteristics of the work' was grouped into the main category 'work' because it describes the content and/or the nature of the work.

Next, main categories were grouped into *key categories* that, again, present reasonable entities, according to the meaning and the nature of the main categories. Three reasonable entities ('self', 'collaboration', and 'context') were constructed in this way: 1) the key category 'self' includes main categories 'self' and 'work'; 2) the key category 'collaboration' includes main categories 'external collaboration', 'internal collaboration', and 'quality of collaboration'; 3) the key category 'context' includes main categories 'situation', 'management', 'organization', and 'society'. All of these three key categories act as umbrella-like concepts that can be described with help of main categories and categories. Contents of key categories, main categories, and categories were explained in Appendix 4. These same contents were also organized as a chart when coded sentences were categorized and grouped into main categories and key categories. Table 1 shows that this example of fluency experiences has one prevailing key category: 'self'. This is for two reasons: first, all of the main categories, except one, refer to the key category 'self', and second, the author decided to categorize fluency experiences into main and key categories according to the leading sentence of the quotation. If the main category 'management' had been emphasized as well, the key category would have been 'self-context', which in this example would have been unnecessarily complex and a bit misleading, because the quoted entity referred to the informant's individual emotions. The author strove to keep all categories as simple as possible, and therefore, all of the quoted sentences have only one key category, but they may have several main categories and categories.

APPENDIX 8. Example 2 of data analysis: chains of fluency experiences

In the fourth phase of data analysis, fluency experiences were arranged in chains that embody situations, events, and emotions that led to the informants' fluency experiences. These chains were constructed on the basis of the quoted and coded texts. The example presented in Appendix 7 is used here to illustrate construction of the chains:

> **C1E1**: "Abilities to collaborate and interact are my basic skills and they affect fluency of my work." **C1E1RQ1**: "This is because individuals can be persuaded to do different kinds of things with the help of these skills." **C1E1RQ2**: "Individuals are busy, they have a lot of work to do and each of us has our own most important issue." **C1E1RQ3**: "How and how fast I can influence my colleague as to the issue being funny, important and profitable, affects fluency, goals and achievements of my work." **C1E1RQ4**: "My work also requires abilities to motivate and to coach." **C1E1RQ5**: "I also have been rewarded on basis of these skills."

As categorized, C1E1 was chosen for the leading sentence of this fluency experience and the rest of the sentences are rationalizing the leading sentence. Next, the sentences were arranged into a chain according to the order in which they appeared in the quotation. Naturally, rationality of the chains was controlled during the construction of the chains, in order to avoid illogicalities. Fluency experiences that did not include any rationalization, or, fluency experiences that included only one reason, were not included in the chains. This resulted in each constructed chain including at least two reasons for a fluency experience. In total, 137 chains of fluency experiences were constructed in this way and included for further analysis.

Table 1. An example of fluency experience with its chain

	Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5
Coded quotations	C1E1: "Abilities to collaborate and interact are my basic skills and they affect **fluency** of my work."	C1E1RQ1: "This is because individuals can be persuaded to do different kinds of things with the help of these skills."	C1E1RQ2: "Individuals are busy, they have a lot of work and each of us has our own most important issue."	C1E1RQ3: "How and how fast I can influence my colleague about the issue being funny, important and profitable, affects **fluency**, goals and achievements of my work."	C1E1RQ4: "My work also requires abilities to motivate and to coach."	C1E1RQ5: "I also have been rewarded on basis of these skills."
Category	C1E1: Positive attitude	C1E1RQ1: Positive attitude	C1E1RQ2: Positive attitude	C1E1RQ3: Positive attitude	C1E1RQ4: Enabling characteristics of the work	C1E1RQ5: Managerial support
Main category	C1E1: Self	C1E1RQ1: Self	C1E1RQ2: Self	C1E1RQ3: Self	C1E1RQ4: Work	C1E1RQ5: Management
Key category	**C1E1: Self**					

After all of the fluency experiences of each informant were arranged into chains as shown in Table 1, attention was paid to categories, main categories, and key categories. Chains were then arranged by theme, in two phases.

APPENDIX 8, continued

First, chains were arranged according to key categories, main categories and categories (of leading sentences) so that all chains referring to the same key category were in line, then all chains referring to the same main category were in line, and finally, all chains referring to the same category were in line. Second, themes to which categories referred were arranged so that all chains referring to the same theme were in line. After these two phases the chains lined up, as shown in Table 5 in subsection 3.4.1 and Appendices 10a-10d.

In the fifth phase of data analysis, each chain was translated into common terminology by inventing as few core words as possible to describe the contents of the chains. This was done in order to find regularities and patterns that the chains might have included. At the same time, whenever there was more than one category linked with a rationalization, only one of the categories was chosen. Finally, each reason had only one category so that the author could compare the chains. Reasoning patterns identified in this comparison appear in sections 4.1 and 4.2. 'Reasoning patterns' refer to the informants' ways to rationalize their views about fluency and factors affecting them. Appendices 10a-10d present lists of common language chains in the order that they are interpreted, in sections 4.1 and 4.2. Previously used example (C1E1) is used here to show how the author translated chains from the informants' quotations into chains described using common language.

Table 2. An example of transferring quotations into common language chains

	Fluency experience (FE)	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5
Coded quotations	C1E1: "Abilities to collaborate and interact are my basic skills and they affect **fluency** of my work."	C1E1RQ1: "This is because individuals can be persuaded to do different kinds of things with the help of these skills."	C1E1RQ2: "Individuals are busy, they have a lot of work and each of us has our own most important issue."	C1E1RQ3: "How and how fast I can influence my colleague about the issue being funny, important and profitable, affects **fluency**, goals and achievements of my work."	C1E1RQ4: "My work also requires abilities to motivate and to coach."	C1E1RQ5: "I also have been rewarded on basis of these skills."
Category	C1E1: Positive attitude	C1E1RQ1: Positive attitude	C1E1RQ2: Positive attitude	C1E1RQ3: Positive attitude	C1E1RQ4: Enabling characteristics of the work	C1E1RQ5: Managerial support
Main category	C1E1: Self	C1E1RQ1: Self	C1E1RQ2: Self	C1E1RQ3: Self	C1E1RQ4: Work	C1E1RQ5: Management
Key category	**C1E1: Self**					

Enabling factor	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5
Positive attitude: skills & abilities	**Positive attitude:** special knowledge	**Positive attitude:** busy individuals, need for persuasion	**Positive attitude:** special knowledge, abilities to influence individuals, achievement of goals	**Enabling characteristics of the work:** requirements of the work	**Managerial support:** rewarded skills

APPENDIX 8, continued

As a result of translating chains into common language chains, each chain is presented as is shown in the lower section of Table 2. First, 'category' is presented in the beginning of the reasoning, with common language core words following the category. This presentation style helped the author to discover similarities and differences in reasoning patterns.

APPENDIX 9. Frequencies for chains

Table 1. Reasons per chain and per case. Numbers in the matrixes show how many chains including 2, 3, 4, or 5 reasons per chain each of the cases had.

Reasons per chain / enablers	C1	C2	C3	C4	C5	C6	C7	C8	C9		
2	5	1	1	0	3	1	1	1	1	**14**	28 %
3	2	5	1	2	2	3	1	2	1	**19**	38 %
4	0	1	3	3	0	2	0	1	3	**13**	26 %
5	1	0	0	0	0	1	2	0	0	**4**	8 %
	8	**7**	**5**	**5**	**5**	**7**	**4**	**4**	**5**	**50**	100 %
Reasons per chain / hindrances	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**		
2	2	5	3	1	0	4	4	2	5	**26**	30 %
3	6	2	6	4	3	3	4	0	3	**31**	36 %
4	2	6	0	2	3	2	2	1	2	**20**	23 %
5	3	1	2	0	0	2	1	0	1	**10**	11 %
	13	**14**	**11**	**7**	**6**	**11**	**11**	**3**	**11**	**87**	**100 %**
Reasons per chain / total	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**		
2	7	6	4	1	3	5	5	3	6	**40**	29 %
3	8	7	7	6	5	6	5	2	4	**50**	36 %
4	2	7	3	5	3	4	2	2	5	**33**	24 %
5	4	1	2	0	0	3	3	0	1	**14**	10 %
	21	**21**	**16**	**12**	**11**	**18**	**15**	**7**	**16**	**137**	**100 %**

Table 2. Reasons per chain and per key category. Numbers in the matrixes show how many chains including 2, 3, 4, or 5 reasons per chain each of the key categories included.

Reasons per chain	2	3	4	5	total
Key category					
Self	14	9	5	1	**29**
	48 %	**31 %**	**17 %**	**3 %**	**100 %**
Collaboration	7	14	8	3	**32**
	22 %	**44 %**	**25 %**	**9 %**	**100 %**
Context	19	27	20	10	**76**
	25 %	**36 %**	**26 %**	**13 %**	**100 %**

APPENDIX 10a. Chains: Self – Enablers. Key category: Context – Main category: Situation

Enabler	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Suitable physical place: home	**Tranquility:** creativity flourishes	**Tranquility:** effective to work without interruptions	**Positive emotions:** better feeling, things get done quickly			1
	Tranquility: ability to prepare next week	**Tranquility:** no clients behind the door	**Positive emotions:** nice to start the next week			3
	Tranquility: no interruptions, abibility to concentrate	**Positive attitude:** no social load, energy savings	**Positive attitude:** attractive place, flexible and easy	**Positive emotions:** easy to reach state of flow, results develop spontaneously		4
	Tranquility: no interruptions	**Positive emotions:** ability to concentrate				5
	Tranquility: no interruptions, ability to finish a lot of tasks	**Positive emotions:** unofficial place, easy to switch between work and leisure time - positive mood				6
	Well-functioning devices: versatile means of virtual connections	**Tranquility:** effective working, no disruptions, independence	**Positive interest:** ability to multitask, time savings, meaningful work	**Positive attitude:** good social premises, unofficial place, effective working time		9
Suitable physical place: office	**Positive attitude:** productivity after office hours	**Tranquility:** interruptions, ability to concentrate	**Positive interest:** analytical nature, need of tranquility when planning new			6
	Tranquility: fluent solo work and fast decisions after office hours	**Suitable physical premises:** well-designed premises	**Well-functioning devices:** IT functions well and fast, all tools and documents are there	**Positive attitude:** concrete results can easily be seen		8
Suitable physical place: moving places (car, plane)	**Tranquility:** confidential phone calls without disturbances	**Positive emotions:** places for innovating & thinking (plane, car)				1
	Tranquility: confidential phone calls	**Positive emotions:** place for relaxing, time for thinking (car)	**Positive emotions:** place for clearing mind and moving to another emotional state			2

APPENDIX 10a, continued. Chains: Self – Enablers. Key category: Context – Main category: Situation

Enabler	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Suitable physical place: hotels	**Tranquility:** ability to concentrate on work tasks	**Positive emotions:** ability to innovate and work through thinking processes	**Tranquility:** no interruptions			1
Suitable physical place: clients' premises	**Positive attitude:** effective place, no other issues disturbing	**Positive emotions:** some tasks have to be done there, seeing concrete results motivates	**Positive interest:** essential information, ability to learn new things from client's key person	**Positive emotions:** motivating to see client's satisfaction		9
Well-functioning devices: IT technology	**Well-functioning devices:** no disturbances in IT network in the office	**Well-functioning processes:** help available, IT issues ok				3
Well-functioning devices: virtual connections	**Positive emotions:** feeling of not wasted time, ability to work with emails in public vehiches	**Positive attitude:** trains full of choices, effective as workplaces, places for socializing				7

APPENDIX 10a, continued. Chains: Self – Enablers. Key category: Self – Main category: Self

Enabler	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Positive attitude: skills & abilities	**Positive attitude:** special knowledge	**Positive attitude:** busy individuals, need of persuasion	**Positive attitude:** special knowledge, abilities to influence on individuals, achievement of targets	**Enabling characteristics of the work:** requirements of the work	**Managerial support:** rewarded skills	1
		Positive attitude: special knowledge, coaching & consulting, approaching individuals	**Positive interest:** collaboration, perceiving what was going on in her surroundings	**Positive interest:** goals are achieved easier		2
		Positive attitude: special knowledge, projects & processes, knowledge of human nature, managing situations, achievement of goals				5
Positive attitude: working conditions	**Positive interest:** creative space, meaningful tasks, productivity	**Positive emotions:** energizing tasks				2
	Positive attitude: working alone, effectiveness, independence	**Positive influence of skills & abilities:** ability to work alone, economic recession does not decrease tasks	**Positive emotions:** meaningful tasks, clients' satisfaction motivates			9
Positive attitude: positive attitude in general	**Positive interest:** risk taking, acting against legislation	**Positive interest:** independent decisions, flexibility in customer service				8
	Positive attitude: personal characteristics	**Positive attitude:** more fluent collaboration with clients and partners				1
	Positive attitude: technical development leads to work opportunities	**Positive attitude:** changes in clients' organizational structure leads to work opportunities				9

APPENDIX 10a, continued. Chains: Self – Enablers. Key category: Self – Main category: Self

Enabler	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Positive interest: new situations	**New situations:** all parts in the work are new	**New situations:** newly agreed contract				1
Positive interest: way of working	**Positive interest:** time management, follow-up lists, motivating to conclude tasks	**Positive interest:** templates for emails, automation	**Well-functioning processes:** standard document templates help collaboration and interpretation of documents			7

APPENDIX 10b. Chains: Self – Hindrances. Key category: Context – Main category: Situation

Hindrance	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Unsuitable physical place: office	Fragmentation: changing agendas, tasks remain to be done at home	Interruptions: other people and phone	Negative organizational culture: common culture and course of action are lacking	Negative emotions: stimulus threshold is overdrawn easily	Negative emotions: mentally nothing happens in the office	1
	Poorly functioning devices: too slow or out-of-order devices	Poorly functioning processes: poor document management	Negative attitude: time management is difficult	Negative organizational culture: occupancy rate weakens when helping others, challenges in internal collaboration		5
	Interruptions: lack of traffic lights, unavoidable visitors interrupt work	Negative emotions: irritation, are issues important or not	Fragmentation: individuals cause fragmentation, need of concentration/attention	Interruptions: are issues important or not	Negative influence of social load: constant flow of people during a workday	6
	Negative emotions: sterile environment, lowel amount of stimuli, no new ideas	Negative emotions: too ordinary environment for innovations				7
	Unsuitable physical place: absence of a demo center, cannot test ideas	Noise: too much noise and individuals, no ability to concentrate	Unsuitable physical place: changed layout of the office, only mobile workstations			9

APPENDIX 10b. Chains: Self – Hindrances. Key category: Context – Main category: Situation

Hindrance	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Unsuitable physical place: home	**Poorly functioning devices:** too slow WLAN	**Poorly functioning devices:** synchronization between devices do not work	**Negative emotions:** if room is not cleaned, emotional state is not relaxed enough for working	**Negative interest:** football game instead of work		6
	Poorly functioning devices: no connections or documents	**Negative attitude:** ergonomic issues are not well, sometimes problems with starting the work				8
	Interruptions: unnecessary phone calls	**Negative influence of social load:** constant availability also at home	**Negative attitude:** lack of feedback, contacting individuals is more challenging	**Negative attitude:** household tasks need attention		4
	Negative attitude: required knowledge is difficult to approach, decisions must be made alone	**Poorly functioning devices:** devices and connections do not necessarily work	**Negative emotions:** no clear difference between work and leisure time			5

APPENDIX 10b, continued. Chains: Self – Hindrances. Key category: Context – Main category: Situation

Hindrance	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Unsuitable physical place: moving places	**Negative attitude:** waste of time, difficult to work in a car	**Negative attitude:** waste of time, difficult to multitask				9
	Security issues: only some tasks can be done	**Negative attitude:** bad weather conditions hinder thinking	**Negative emotions:** frustration, expectations towards the place are big			4
	Negative attitude: not designed for work, already a thought of an uncomfortable environment may prevent working	**Poorly functioning devices:** internet connections are insecure, lack of resources	**Security issues:** strangers in public transportation media			5
	Negative attitude: bad weather conditions hinder thinking	**Security issues:** strangers in public transportation media				6
	Noise: impossible to concentrate in trains	**Poorly functioning devices:** poor connections	**Security issues:** co-workers may discuss work related issues			7

APPENDIX 10b, continued. Chains: Self – Hindrances. Key category: Context – Main category: Situation

Hindrance	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Poorly functioning devices	**Poorly functioning processes:** reporting systems, reporting processes	**Poorly functioning devices:** difficult to take proper reports				1
	Poorly functioning devices: hardware/software problems every third month	**Negative influence of skills & abilities:** deficient IT skills may cause problems				2
	Poorly functioning devices: internet connections	**Poorly functioning devices:** documents cannot be sent or received	**Negative interest:** deficient IT skills may cause problems, new IT solutions are challenging			3
	Poorly functioning devices: too slow or out-of-order devices and connections, documents cannot be sent	**Poorly functioning devices:** too many systems in use in the organization	**Security issues:** problems in document management and data warehousing, insecure information flow			4
	Poorly functioning devices: lack of proper virtual project management tool, poor document management processes	**Poorly functioning processes:** delays in service processes in form of additional administrative work				7
	Poorly functioning devices: network connections too slow/expensive	**Poorly functioning devices:** connections and devices may be problematic in any place				9

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APPENDIX 10b, continued. Chains: Self – Hindrances. Key category: Self – Main category: Self

Hindrance	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Negative attitude: work	**Negative emotions:** too modest tasks cause laziness	**Negative attitude:** routine tasks, thoughts elsewhere	**Negative emotions:** energy consuming situations, tiredness			2
	Negative interest: routine tasks cause fragmented project work and development work	**Negative interest:** inaccurately defined questions are not good use of time	**Negative attitude:** limitations of e-mail communication prevent understanding of questions	**Negative interest:** no patience to explain same issues over and over again		7
	Negative attitude: work characteristics, lack of time, brainstorming is impossible	**Interruptions:** constant interruptions prevent concentration	**Fragmentation:** work is strongly bound in schedules	**Hindering characteristics of the work:** work is strongly bound in a certain place		8
	Negative influence of experience: too many roles, too many projects	**Negative emotions:** decentralization of competence tears oneself to pieces				3
	Negative interest: certain situations, a conflict between desired result and use of time if the issue is not familiar	**Negative interest:** project without a roadmap results in coordinating instead of developing own skills				7

APPENDIX 10b, continued. Chains: Self – Hindrances. Key category: Self – Main category: Self

Hindrance	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Negative attitude: society	**Bureaucracy:** inflexible and too slow decision making processes of public authority partners	**Bureaucracy:** difficult to find information	**Bureaucracy:** the project does not proceed without information, decisions, and money			3
	Bureaucracy: laws, enactments, standards, etc., are too meticulous	**Bureaucracy:** difficult to find information, legally disqualified public authorities	**Bureaucracy:** competition legislation cause delays and problems	**Juridical problems:** competition legislation restrict business opportunities		6
	Competition: needs versus resources	**Economic recession:** is education a solution to the worsening unemployment	**Competition:** searching for solutions leads to a culmination in some competitive situations			3
	Negative attitude: legislation, economic restrictions	**Juridical problems:** orders and legislation hinder business				8
Negative attitude: organization	**Negative organizational culture:** working conditions, a quarter-based culture	**Lack of resources:** operations are difficult to put into action	**Negative organizational culture:** actions without prerequisites			1
	Negative organizational culture: merger, many cultures conflicting	**Managerial problems:** leadership in line, management in matrix	**Negative attitude:** burnouts, leadership problems bothering in individuals' minds			4

APPENDIX 10b, continued. Chains: Self – Hindrances. Key category: Self – Main category: Self

Hindrance	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Negative interest: work	**Negative interest:** some tasks take too much time	**Hindering tasks:** planning and defining targets, managing documents				1
	Negative interest: personal problems of clients	**Negative interest:** outburst of feelings of clients	**Negative interest:** not interested in recalling previous work tasks			3
	Negative interest: solving single problems is not motivating, no long-range goals	**Negative attitude:** lacking organizational goals weaken commitment	**Economical recession:** uncertain situation in the organization, no goals, vision, or mission			7
	Negative emotions: solving tricky problems is uncomfortable, challenging situations need immediate attention	**Negative emotions:** solving conflicts cause negative feelings				6
	Unexpected situations: changing situations during a workday	**Negative interest:** changing plans	**Multitasking:** scheduling problems	**Negative emotions:** rejected plans cause negative feelings		2
	Negative attitude: too fast or continuous technical development requires education and new certificates	**Negative emotions:** to keep oneself updated all the time is mentally heavy				9

APPENDIX 10b, continued. Chains: Self – Hindrances. Key category: Self – Main category: Self

Hindrance	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Negative emotions	**Negative emotions:** analytical nature cause delays and deadlines get closer	**Negative emotions:** difficulties to know when to start working to get ready in time				6
	Negative attitude: mental absence of a discussion partner makes concentration difficult, effectiveness suffers	**Negative emotions:** mental absence of oneself or of a discussion partner disturbs				6

APPENDIX 10b, continued. Chains: Self – Hindrances. Key category: Context – Main category: Society

Hindrance	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Economic recession	**Economic recession:** partners are not able to commit to agreements	**Economic recession:** without money partners cannot employ and project does not continue	**Bureaucracy:** agreements may prevent the project from proceeding	**Bureaucracy:** no information about future educations	**Bureaucracy:** clients are dissatisfied	3
	Economic recession: changed social situation, employers cannot hire more staff	**Bureaucracy:** traineeships are difficult to agree	**Bureaucracy:** without employers there is no professional education	**Bureaucracy:** without money there is no professional training	**Bureaucracy:** if public authorities do not have money, they cannot grant it	3
	Economic recession: lay-offs, lack of resources, uncertain situations	**Managerial problems:** uncertain situation/feeling managerial decisions not known	**Negative emotions:** no information about future projects, no ability to plan own work	**Managerial problems:** unclear/uncertain situation, no plans for the future		9

APPENDIX 10c. Chains: Collaboration – Enablers. Key category: Collaboration – Main category: Quality of collaboration

Enabler	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Availability of face-to-face contacts	**Availability of face-to-face contacts:** decisions and communication are more fluent and reduce misunderstandings	**Positive influence of co-workers:** fast answers and help	**Availability of face-to-face contacts:** solving issues by walking around the office	**Suitable physical place:** renovated office premises, enough space for negotiations		3
	Positive influence of social networks: new environments and new people inspire	**Availability of face-to-face contacts:** clients' and partners' key individuals participating in the meeting	**Positive cultural differences:** cultural differences are enriching, collaboration is interesting	**Positive influence of co-workers:** positive effect of interruptions, contribution to the tasks	**Positive influence of co-workers:** challenging people question issues	6
	Synergy of knowledge and skills: working in the same space with colleagues is like an ideafactory	**Availability of face-to-face contacts:** easy in the office with colleagues	**Availability of face-to-face contacts:** regular face-to-face project meetings decrease misunderstandings and enable information flow	**Synergy of knowledge and skills:** internal collaboration is easy and trustworthy, easy to ask and get answers	**Positive influence of co-workers:** interruptions caused by the colleagues are usually stimulating, stimuli develop in collaboration	7
Positive atmosphere	**Positive atmosphere:** spirit is essential, positive atmosphere among personnel, a conflict solving culture	**Positive influence of co-workers:** experts and specialists representing different fields enable learning	**Personal chemistry:** group dynamics	**Synergy of knowledge and skills:** client centered service business		6
	Positive atmosphere: mutual trust and confidentiality	**Trust:** superior who trusts				1
	Positive atmosphere: common mentality in Northern Finland, an open communication culture	**Positive cultural differences:** smaller population means more time to meet individuals	**Positive influence of social networks:** easy and fast to take care of issues			8

APPENDIX 10c. Chains: Collaboration – Enablers. Key category: Collaboration – Main category: Quality of collaboration

Enabler	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Positive influence of social networks	**Positive influence of social networks:** good relationships with partners are rewarding	**Positive influence of social networks:** client's success affects own success	**Positive atmosphere:** confidential and open collaboration			2
	Positive influence of social networks: good relationships with clients and partners, effective working	**Positive influence of social networks:** work is informal	**Positive influence of social networks:** decision making in private companies is fast	**Positive organizational culture:** similar values in internal collaboration		3

APPENDIX 10c, continued. Chains: Collaboration – Enablers. Key category: Context – Main category: Situation

Enabler	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Suitable physical place: office	**Availability of face-to-face contacts:** social contacts are easier	**Suitable physical place:** face-to-face contacts required by a foreign culture				1
	Suitable physical place: ergonomically suitable premises for working	**Positive influence of co-workers:** meetings and counseling are available, internal collaboration is natural	**Positive atmosphere:** motivating atmosphere			5
	Suitable physical place: physical working conditions are relative good, ergonomic issues are ok	**Well-functioning devices:** internal IT services work well, software is up-to-date	**Availability of face-to-face contacts:** possibility to mirror thoughts with trust worthy colleagues			6
Suitable physical place: clients' premises	**Positive atmosphere:** homes for elderly persons are sources of energy	**Positive atmosphere:** fluent working, progressing issues	**Positive atmosphere:** physical environment has an enormous impact on fluency			2
	Suitable physical place: ergonomic issues are ok	**Availability of face-to-face contacts:** wordless communication is available	**Positive atmosphere:** line of reasoning of the client becomes visible			5
Suitable physical place: moving places, third places	**Positive influence of social networks:** conference venues are places for networking and making new partnerships	**Availability of face-to-face contacts:** interesting people working in the same field	**Positive atmosphere:** conferences are mentally satisfying and refreshing			2
	Suitable physical place: informality creates natural atmosphere for social interactions in moving places, needs and expectations of negotiating parties are easier to understand	**Suitable physical place:** brainstorming opens broader contexts in cafés and hotels	**Positive atmosphere:** non-traditional work and meeting places, becoming aware of new issues			4

APPENDIX 10c, continued. Chains: Collaboration – Enablers. Key category: Context – Main category: Management

Enabler	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Managerial support	**Positive influence of co-workers:** superior's positive attitude, fluent collaboration	**Managerial support:** quick answers, consideration	**Managerial support:** supporting and encouraging, natural and problem-free collaboration	**Positive organizational structure:** superior's responsibility area is partly the same		3
	Managerial support: appreciation, trust, regular discussions	**Managerial support:** encouraging and empowering feedback	**Positive atmosphere:** open and constructive collaboration, managerial style suits	**Managerial support:** resources and boundaries are clearly defined		4
	Managerial support: trust, support, encourage	**Managerial support:** supporting decisions, acting openly and relaxed				5
	Managerial support: positive approach on issues	**Trust:** agreements are allowed to conclude independently, suitable monetary boundaries	**Synergy of knowledge and skills:** common goal with superiors, open and professional relationships, discussion in a constructive way	**Trust:** high working morale, no need to control		6
	Managerial support: support needed in project related decisions, finding resources is difficult	**Managerial support:** open communication helps prioritizing of tasks	**Synergy of knowledge and skills:** coaching-like relationship, information sharing is easy	**Trust:** clearly defined goals, independency	**Trust:** trustworthy, easy, and straight relationship	7
	Managerial support: professional superior understands problems and requirements of the work	**Managerial support:** main task of the superior is to enable independent work concentrating on problem-solving	**Trust:** superior supports the freedom and tranquility required by the work, independent decisions are possible	**Positive atmosphere:** positive, enthusiastic, and optimistic superiors create positive atmosphere		9

APPENDIX 10c, cont. Chains: Collaboration – Enablers. Key category: Collaboration – Main category: Internal collaboration

Enabler	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Positive influence of co-workers	**Positive influence of co-workers:** supportive work done by an assistant	**Positive influence of co-workers:** assistant capable to act as a substitute	**Synergy of knowledge and skills:** good collaboration means synergy			2
	Positive influence of co-workers: heterogeneous team	**Synergy of knowledge and skills:** professional richness enables taking care of tasks in their entirety	**Managerial support:** strengths and weaknesses, professionalism supported			4
	Positive atmosphere: inspiring atmosphere among personnel	**Synergy of knowledge and skills:** well-educated staff means synergy and fluent internal collaboration	**Well-functioning processes:** models of working			8
	Positive influence of co-workers: synergy of knowledge and competences, and transformation of tacit knowledge are available by participating in communication	**Positive organizational culture:** willingness to aim at the same goal	**Social acceptance:** shared important issues, positive social comparison	**Positive influence of co-workers:** social acceptance in collaboration		4
	Positive organizational culture: strategies, values, etc., shared and accepted by the personnel	**Positive organizational culture:** appreciation of professional work, good leadership	**Positive influence of co-workers:** abilities to evaluate and reflect, to interact in a constructive way			6

APPENDIX 10d. Chains: Collaboration – Hindrances. Key category: Context – Main category: Management

Hindrance	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Managerial problems	**Managerial problems:** lack of support, superior does not take care of duties	**Negative attitude:** waste of time	**Managerial problems:** rewarding models not implemented			1
	Managerial problems: lack of support, the work is not appreciated	**Managerial problems:** control, orders, no flexibility	**Negative emotions:** irritating managerial behavior, decrease of productivity	**Negative emotions:** orders and routines lead to energy lost	**Negative emotions:** negative feelings	2
	Managerial problems: red traffic lights hinder urgent duties	**Managerial problems:** unnecessary additional tasks	**Negative emotions:** irrelevant managerial behavior nible motivation	**Communication problems:** lacking justification leads to negative feelings about measuring and development discussions		2
	Managerial problems: bouncing managerial style, changing instructions daily	**Communication problems:** no clear answers	**Negative emotions:** responsibilities and authorities not in line	**Negative atmosphere:** confusing atmosphere in the office		2
	Negative influence of co-workers: poorly managed internal collaboration, struggles	**Negative influence of co-workers:** 'only external client is profitable' -attitude	**Negative organizational culture:** getting help only in the name of external client			4
	Managerial problems: authorities and responsibilities not in line, difficulties in matrix	**Managerial problems:** no managerial support, persuasion required	**Managerial problems:** lacking commitment and recources	**Managerial problems:** too much control in some personnel groups	**Negative organizational culture:** only line organization is familiar	1

APPENDIX 10d, continued. Chains: Collaboration – Hindrances. Key category: Context – Main category: Management

Hindrance	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Lack of resources	**Managerial problems:** lacking resources	**Managerial problems:** lacking commitment	**Managerial problems:** negative behavior of a colleague	**Negative influence of co-workers:** negative attitude of a colleague		1
	Lack of resources: lack of specialized knowledge, hidden tacit knowledge	**Managerial problems:** hidden tacit knowledge, waste of time	**Managerial problems:** work time arrangements	**Negative influence of co-workers:** colleagues not willing to help		5
	Managerial problems: lack of time for certain work tasks	**Lack of resources:** internal clients have to help themselves	**Negative attitude:** not productive from the organizational viewpoint			7
	Managerial problems: lacking project resources, challenging project start-ups	**Managerial problems:** lack of information leads to not committed project members	**Negative organizational culture:** hidden knowledge, informal social networks, fragmentation of resources	**Managerial problems:** rewarding policy does not support projects, lack of motivation of project members	**Negative organizational culture:** not enough time resources, lack of information	7
	Lack of resources: lack of colleagues, no discussion partners	**Communication problems:** misunderstandings between individuals doing different kind of work				7
	Lack of feedback: follow-up systems and processes do not support reporting needs	**Managerial problems:** setting goals and measurement are difficult	**Managerial problems:** where is the emphasis of the work, uncertainty			9
Lack of information	**Lack of information:** lack of information leads to wrong decisions	**Negative emotions:** work related problems need information	**Negative interest:** work related problems at home mean time away from family			2
	Lack of information: lack of necessary project related information leads to wrong decisions, frustration, and delays	**Negative organizational culture:** no horizontal communication	**Managerial problems:** lack of coordination leads to lost advantages and synergies	**Negative emotions:** indirect supervision is not comfortable		7

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APPENDIX 10d, continued. Chains: Collaboration – Hindrances. Key category: Context – Main category: Situation

Hindrance	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Unsuitable physical place: office	**Unsuitable physical place:** lack of physical space, too many documents	**Security issues:** lack of confidentiality during phone calls	**Unsuitable physical place:** client meetings in the kitchen	**Negative atmosphere:** psychic atmosphere cause feeling of isolation		2
	Unexpected situations: lack of private room for confidential discussions, emotional situations with clients	**Negative organizational culture:** meeting room serves as a coffee room for office people				3
	Scheduling problems: dependence on other individuals' schedules	**Negative influence of co-workers:** unnecessary social waffling on personal issues	**Unsuitable physical place:** office premises are not up-to-date	**Negative influence of co-workers:** inefficient ways of action		4
Unsuitable physical place: clients' and partners' premises	**Unsuitable physical place:** too small meeting rooms	**Poorly functioning devices:** network connections in meeting rooms	**Unsuitable physical place:** open office, no confidential phone calls	**Negative cultural differences:** face-to-face contact required by foreign culture can be performed only here	**Negative atmosphere:** creativity suffers	1
	Unsuitable physical place: lack of meeting rooms	**Security issues:** challenging security risks				2
	Unexpected situations: critical first meetings	**Communication problems:** lacking key individuals	**Problems of clients/partners:** problems between negotiating parties, difficult to conclude meetings in mutual understanding			6
	Unsuitable physical place: unsuitable space for working	**Unsuitable physical place:** ergonomic issues, climate, noise	**Problems of clients/partners:** no key individuals	**Problems of clients/partners:** intrusive individuals	**Security issues:** no place for confidential phone calls	9

APPENDIX 10d, continued. Chains: Collaboration – Hindrances. Key category: Context – Main category: Situation

Hindrance	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Unexpected situations	**Unexpected situations:** people in the field are challenging, humanity and organizational targets	**Negative cultural differences:** changes in the field, changing factors inside the system				2
	Problems of clients/partners: necessary professionals not available	**Scheduling problems:** outsourced services, schedules	**Scheduling problems:** poor time management of internal colleagues	**Scheduling problems:** waiting for help cause delays		9

APPENDIX 10d, cont. Chains: Collaboration – Hindrances. Key category: Collaboration – Main category: Quality of collaboration

Hindrance	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Scheduling problems	**Negative atmosphere:** impatience of clients	**Scheduling problems:** different prioritizing of time, challenges with meeting schedules	**Problems of clients/partners:** canceled contracts	**Negative atmosphere:** mentally heavy situations in front of clients/partners		2
	Lack of resources: not enough time resources for projects	**Scheduling problems:** project schedules versus client service needs				2
	Scheduling problems: unattainability of individuals, no suitable time for meetings	**Economic recession:** restricted time for meetings, unwillingness/inability to concentrate				3
	Scheduling problems: no time for internal planning meetings	**Negative organizational culture:** nonchalant attitude towards internal issues				9
Communication problems	**Communication problems:** negotiations with colleagues are time-consuming	**Communication problems:** needs of clients may not be understandable				4
	Negative organizational culture: difficulties in internal communication, different targets of internal IT services	**Lack of resources:** too few experts in IT services	**Negative organizational culture:** rewarding policies differ between personnel groups			7
	Security issues: communication with partners and clients, partners are competing with each others	**Security issues:** negotiations with clients, whose representant in different situations				9

APPENDIX 10d, cont. Chains: Collaboration – Hindrances. Key category: Collaboration – Main category: External collaboration

Hindrance	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Negative cultural differences	**Negative cultural differences:** foreign culture versus domestic culture	**Communication problems:** challenges with foreign cultures	**Negative cultural differences:** different ways of progressing with issues and plans			1
	Negative cultural differences: different cultural backgrounds	**Negative cultural differences:** differences between religions	**Negative cultural differences:** challenging situations, influence of a religion on individual may be remarkable			3
	Communication problems: lack of knowledge about cultural differences	**Negative cultural differences:** communication with foreign language	**Communication problems:** challenges with professional terminology in negotiations with clients			6
Problems of clients/partners	**Problems of clients/partners:** disagreements between clients and partners mean extra work	**Scheduling problems:** finding solutions in a hurry	**Juridical problems:** in some situations, legislation may impose limitations because it is not sufficiently comprehensive	**Scheduling problems:** several tasks at a same time		2
	Problems of clients/partners: insufficient knowledge of clients and partners, unclear responsibilities and roles	**Communication problems:** different cultural backgrounds hinder understanding				2
	Negative organizational culture: use of mobile phone in clients' premises is prohibited	**Problems of clients/partners:** clients not making decisions	**Problems of clients/partners:** wrong authorization of a service producer, lack of information	**Problems of clients/partners:** clients' absent project resources		5

APPENDIX 10d, cont. Chains: Collaboration – Hindrances. Key category: Collaboration – Main category: Internal collaboration

Hindrance	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Negative influence of co-workers	**Communication problems:** challenges with colleagues	**Managerial problems:** different interests of personnel groups	**Managerial problems:** time-consuming ways of communication	**Managerial problems:** targets not implemented		1
	Negative influence of co-workers: challenges with some colleagues	**Negative influence of co-workers:** male-female setting	**Negative influence of co-workers:** strange situation with gender roles			1
	Negative influence of co-workers: internal meetings are ineffective	**Negative influence of co-workers:** space-consuming individuals in meetings	**Managerial problems:** too long meeting agendas	**Managerial problems:** decisions without implementation plans	**Poorly functioning devices:** delayed meetings	6
	Negative influence of co-workers: empty promises given by salespersons are challenging	**Negative influence of co-workers:** lack of communication in sales situations leads to unsuccessful projects	**Poorly functioning processes:** sales process, delivery process, embarrassing situations			9
	Negative organizational culture: office people's incapableness to collaborate cause delays	**Negative influence of co-workers:** unwillingness to help or too exactly defined job descriptions	**Negative influence of co-workers:** some office people wandering around the office and gossiping			3
	Negative influence of tacit knowledge: colleagues' unwillingness to help, hidden rules, challenging decisions without right answers	**Poorly functioning processes:** managerial processes (introduction), hidden rules	**Negative organizational culture:** cautiousness in division of work tasks			5

APPENDIX 10d, continued. Chains: Collaboration – Hindrances. Key category: Context – Main category: Organization

Hindrance	Reasoning 1	Reasoning 2	Reasoning 3	Reasoning 4	Reasoning 5	Case
Negative organizational culture	**Negative organizational culture:** different interests in personnel groups, hierarchical organization	**Negative organizational culture:** traditional course of action	**Negative organizational culture:** several companies merged			1
	Negative organizational culture: managerial challenges, boundaries in internal collaboration	**Communication problems:** finding synergy and common understanding may be difficult in a multi-professional organization	**Communication problems:** different educational backgrounds			6
	Negative organizational culture: new matrix organization	**Negative organizational culture:** traditionally oriented management versus new matrix organization	**Managerial problems:** organization of personnel groups, managerial roles			1

APPENDIX 11. Collaborative knowledge work task categories

McGrath (1984, 61; see also McGrath & Hollingshead, 1994, 67) developed a well-known classification of collaborative tasks called *Group Task Circumplex* based on social psychological theories. It is based on the combination of two dimensions along which tasks can differ, i.e., collaboration versus competition and cognitive versus behavioral activities. According to the classification, the following four tasks are distinguished: creative tasks, problem solving and de-cisionmaking, conflict resolution, and execution of activities (Andriessen, 2003, 111). Figure 1 illustrates McGrath's classification system. This figure was presented to the informants without dimensions, as shown in Appendix 3. Work tasks conducted during face-to-face collaboration were classified as 'collaborative knowledge work tasks' in this thesis.
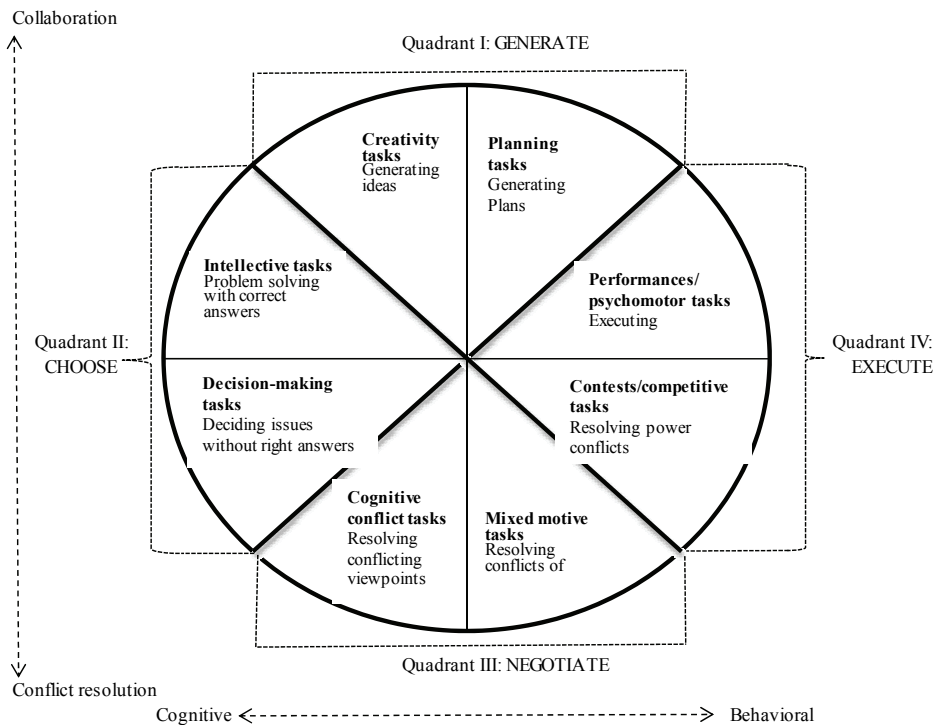
Figure 1. Collaborative knowledge work task categories according to Group Task Circumplex by McGrath (1984, 61)

Percentages of time spent on each collaborative knowledge work task category per case, based on Figure 1, are shown in Appendix 15.

APPENDIX 12. Processes per case. Categories are based on the framework presented in Appendix 1. Percentages indicate working time spent on processes.

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
operational	58 %	83 %	78 %	78 %	90 %	60 %	71 %	84 %	89 %
managerial	43 %	18 %	23 %	23 %	11 %	41 %	29 %	16 %	11 %
	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
■R&D (oper.)	10 %	9 %	25 %	13 %	14 %	18 %	15 %	8 %	10 %
▫Sales (oper.)	20 %	12 %	5 %	10 %	5 %	9 %	10 %	8 %	8 %
■Production (oper.)	8 %	15 %	10 %	20 %	33 %	13 %	25 %	23 %	23 %
■Delivery (oper.)	3 %	23 %	18 %	13 %	25 %	10 %	6 %	23 %	35 %
▫CRM (oper.)	18 %	25 %	20 %	23 %	14 %	11 %	15 %	24 %	14 %
▫HRD&HRM (manag.)	3 %	5 %	3 %	8 %	1 %	4 %	2 %	1 %	0 %
▫Ext. relat. (manag.)	35 %	8 %	5 %	5 %	3 %	25 %	5 %	8 %	3 %
▫KIC (manag.)	5 %	5 %	15 %	10 %	7 %	12 %	23 %	8 %	9 %
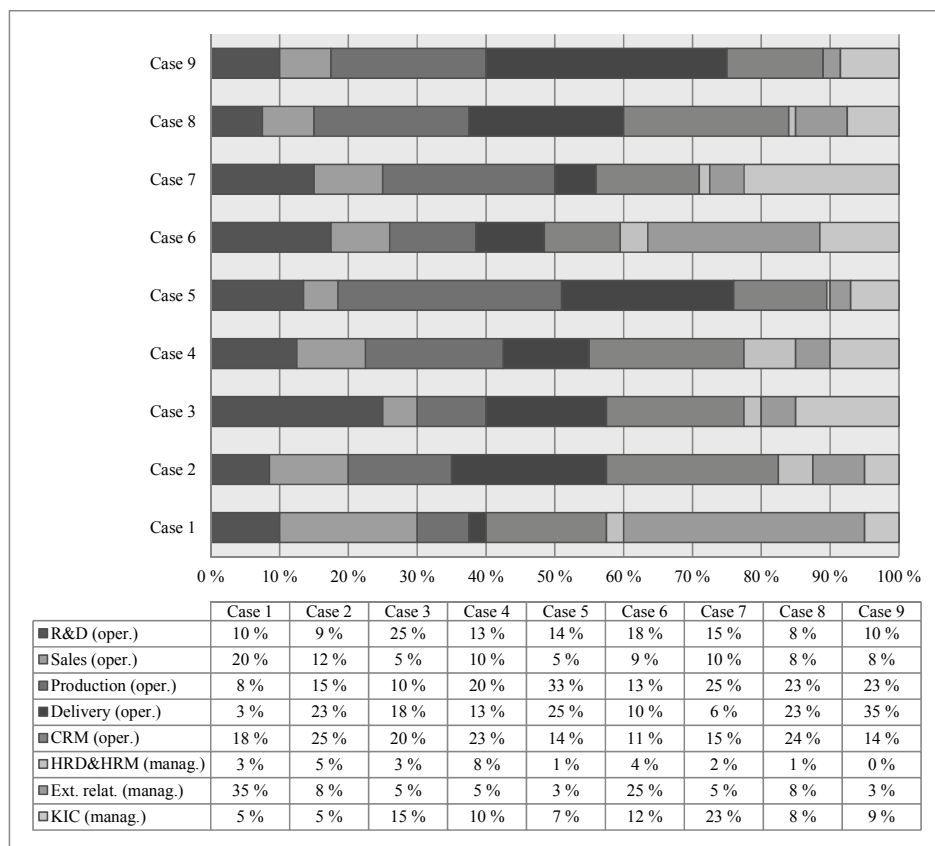
Explanations for abbreviations:
KIC = knowledge, improvement & change
Ext.relat. = external relationships
HRD & HRM = human resource development & human resource management
CRM = client relationship management
R&D = resource & development.

Key at bottom, chart reads from the left.

APPENDIX 13. Cognitive requirements of tasks per case. Levels are based on cognitive levels defined by Hacker (2005, 239-250). Percentages indicate division of tasks into the levels.

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
■ Doing routine tasks	10 %	30 %	10 %	20 %	35 %	10 %	30 %	15 %	10 %
□ Working based on familiar rules and guidelines	10 %	20 %	30 %	20 %	20 %	20 %	20 %	40 %	20 %
■ Applying rules and guidelines in many familiar contexts	25 %	20 %	25 %	20 %	25 %	30 %	20 %	20 %	30 %
■ Combining familiar rules and guidelines in new contexts	30 %	20 %	20 %	20 %	13 %	25 %	10 %	15 %	30 %
■ Creating new plans and solutions	25 %	10 %	15 %	20 %	7 %	15 %	20 %	10 %	10 %
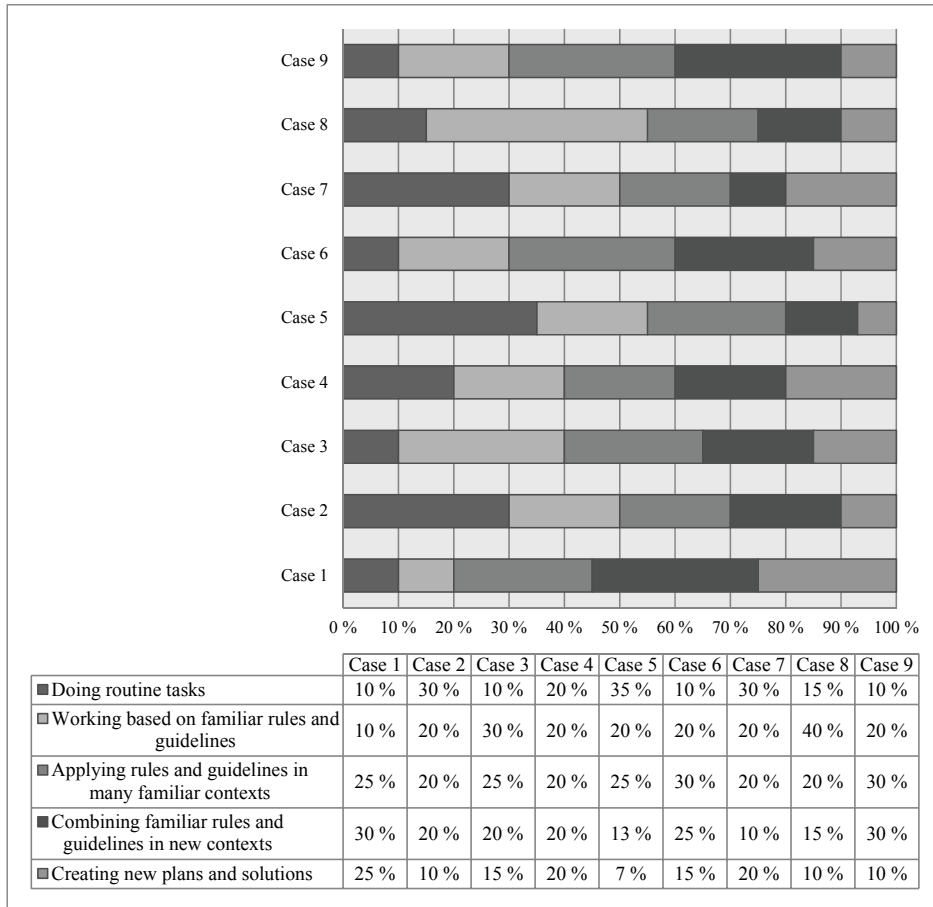
Chart reads from the left.

APPENDIX 14. Solo knowledge work tasks per case. Categories are based on Harrison et al. (2004, 54-55). Percentages indicate working time spent on categories of activities in individual work.

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
■ Management	70 %	15 %	10 %	10 %	6 %	50 %	10 %	15 %	5 %
▫ Collecting information	5 %	5 %	5 %	10 %	5 %	7 %	10 %	5 %	10 %
▪ Documentation	10 %	25 %	5 %	10 %	15 %	5 %	5 %	10 %	3 %
■ Informing others	5 %	10 %	20 %	15 %	5 %	5 %	5 %	20 %	10 %
▪ Analysis	5 %	5 %	15 %	10 %	10 %	10 %	30 %	5 %	7 %
▫ Evaluating and interpretation	5 %	5 %	15 %	10 %	4 %	13 %	15 %	10 %	10 %
▫ Production	0 %	0 %	15 %	20 %	15 %	5 %	20 %	5 %	5 %
▫ Delivery	0 %	35 %	15 %	15 %	40 %	5 %	5 %	30 %	50 %

Chart reads from the left.

APPENDIX 15. Collaborative knowledge work tasks per case. Categories are based on McGrath (1984, 61) and McGrath & Hollingshead (1994, 67). Percentages indicate working time spent on categories of activities in collaboration.

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
Generating plans	10 %	15 %	30 %	15 %	20 %	20 %	10 %	10 %	15 %
Executing performance tasks	15 %	30 %	5 %	20 %	50 %	20 %	30 %	40 %	40 %
Persuasion	15 %	1 %	0 %	5 %	5 %	2 %	5 %	5 %	0 %
Negotiating	25 %	22 %	10 %	15 %	5 %	15 %	15 %	10 %	15 %
Exchanging information	15 %	10 %	10 %	10 %	2 %	5 %	10 %	13 %	5 %
Resolving disagreement	5 %	10 %	5 %	15 %	1 %	8 %	3 %	2 %	0 %
Problem solving	5 %	10 %	20 %	10 %	10 %	15 %	7 %	15 %	20 %
Generating ideas	10 %	2 %	20 %	10 %	7 %	15 %	20 %	5 %	5 %

Chart reads from the left.

Collaborative knowledge work task group categories	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9
Generating (= generating ideas + generating plans)	20 %	17 %	50 %	25 %	27 %	35 %	30 %	15 %	20 %
Executing (= executing performance tasks + persuasion)	30 %	31 %	5 %	25 %	55 %	22 %	35 %	45 %	40 %
Negotiating (= bargaining/negotiating + exchanging information)	40 %	32 %	20 %	25 %	7 %	20 %	25 %	23 %	20 %
Choosing (= resolving disagreement + problem solving)	10 %	20 %	25 %	25 %	11 %	23 %	10 %	17 %	20 %
%	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %

BUSINESS +
ECONOMY

ART +
DESIGN +
ARCHITECTURE

SCIENCE +
TECHNOLOGY

CROSSOVER

**DOCTORAL
DISSERTATIONS**