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Facilitating Experience-based Learning in Groups: A Method for Capturing Lessons Learned

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Abstract

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An increasing number of the organizations use projects and working in teams to achieve their strategic objectives, and to adapt to the changing business environment. When the project teams cannot exploit previously established, organizationally embedded routines and operating practices, they need to develop new ways of working. If the projects do not analyze their experiences to see what worked, what did not, what can be changed and what must be managed, most likely, the group routines remain unchanged and inconsistent with the changed operating environment. Usually, the projects do not engage in the learning by themselves, e.g. due to lack of time and the other responsibilities having a higher priority. Therefore, the learning process needs to be prompted and structured, to be meaningful and useful for the project teams.

In this study, a facilitation method is designed for capturing the lessons learned in a group of 5-20 persons, to improve the group routines. The method structures the experiential learning process so, that the group members' experience and knowledge can be articulated, captured and prepared for the use in the own group, or for the transfer to the other group. The method is based on the causal relations of the elements affecting knowledge creation and sharing in the groups. These elements are identified in the theoretical part of the study, and the causal relations of the selected elements are assessed with the case studies in the empirical part of the study.

This dissertation contributes to the theory by illustrating the causal relations of the elements affecting knowledge creation and sharing in the groups, and by modifying the 4i framework of organizational learning. Practical implications are twofold. Understanding the causal relations of the elements, helps the organizations plan actions to support the learning activities. The created facilitation method offers a simple and easy to implement tool for capturing experience-based learnings in the groups, thus providing an opportunity for the groups to modify their routines to better match their operating environment. Additionally, the group members' involvement in defining the group routines increases their motivation to follow the routines in the daily work.

Tiivistelmä

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Asiasanat: Kokemuksellinen oppiminen, tiedon luominen, tiedon jakaminen, fasilitointi, työryhmät, projektitiimit

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Useat organisaatiot ovat järjestäneet toimintansa projekteihin, jotta ne pystyisivät paremmin saavuttamaan strategiset tavoitteensa sekä mukautumaan muuttuvaan liiketoimintaympäristöönsä. Jos projektitiimit eivät pysty hyödyntämään organisaation olemassaolevia rutiineita ja toimintatapoja, niiden pitää kehittää uusia tapoja työskennellä. Projektin rutiinien muuttaminen edellyttää sitä, että projektin jäsenet analysoivat aiempia kokemuksiaan nähdäkseen mikä toimi, mikä ei, mitä pitää muuttaa ja mitä pitää hallita. Yleensä ajanpuute ja työtehtävien priorisointi estävät projekteja ryhtymästä tällaiseen oppimiskokemukseen oma-aloitteisesti, joten oppimisprosessi pitää tietoisesti käynnistää. Lisäksi oppimisen pitää olla projektitiimin kannalta merkityksellistä sekä hyödyllistä.

Tässä tutkimuksessa suunnitellaan 5-20 hengen ryhmille soveltuva fasilitointimenetelmä opittujen asioiden keräämiseksi. Opittuja asioita voidaan käyttää parantamaan ryhmän rutiineja. Menetelmä jäsentää kokemuksellisen oppimisen prosessin siten, että ryhmän jäsenten kokemukset ja tieto voidaan artikuloida, kerätä ja valmistella joko oman ryhmän käyttöön tai siirrettäväksi toiselle ryhmälle. Menetelmän perustana ovat ryhmissä tapahtuvaan tiedon luomiseen ja jakamiseen vaikuttavat elementit sekä elementtien väliset kausaaliset suhteet. Vaikuttavat elementit tunnistetaan työn teoreettisessa osassa. Valittujen elementtien kausaalisia suhteita arvioidaan työn empiirisessä osassa.

Väitöskirjan teoreettinen kontribuutio koostuu sekä ryhmissä tapahtuvaan tiedon luomiseen ja jakamiseen vaikuttavien elementtien kausaalisten suhteiden kuvauksesta, että organisaation oppimista kuvaavan 4i-viitekehyksen muokkaamisesta. Käytännön kontribuutio on kaksijakoinen. Elementtien kausaalisuhteiden ymmärtäminen auttaa organisaatioita suunnittelemaan toimenpiteitä, joilla oppimistapahtumia voidaan tukea. Fasilitointimenetelmä tarjoaa yksinkertaisen ja helppokäyttöisen työkalun kokemuksesta opittujen asioiden keräämiseen ryhmissä. Menetelmän avulla ryhmät voivat muokata rutiineitaan vastaamaan toimintaympäristöään. Lisäksi, ryhmän jäsenten osallistuminen rutiinien määrittelyyn lisää heidän motivaatiotaan noudattaa rutiineita päivittäisessä työssä.

Acknowledgements

It took a while, but now it is done, finally. I started my doctoral studies back in 2001, but it took several years to find the right approach to the theme and, most of all, to find the motivation to write the dissertation.

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Tampere, August 2012

Miia-Johanna Kopra

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1 Introduction

The first chapter of the dissertation is an introduction to the study. The background and the motivation for the research are introduced. The chapter presents the research problem and the questions the dissertation aims to answer. Also, it explains how the research questions and the empirical data are connected to each other. Additionally, the scope of the study is defined and the research strategy, applied in this dissertation, is introduced. The structure of the dissertation is presented in the end of the chapter.

1.1 Motivation for the research

The key driver for superior performance in the organization, is the ability to change when the environment calls for it (Lubit 2001). In the fast changing business environment, the organizations which do not learn, will not survive (Popper and Lipshitz 2000). The organizations need learn to adapt also their routines to the changed circumstances (Jashapara 2004), because the persistence in the same operating routines quickly becomes hazardous (Zollo and Winter 2002). The routines define who is going to perform what, and when (Christensen 2007). Adjusting the organizational routines to match the changed environment, takes time. Also, it is possible, that the new routines do not meet the needs of the environment any more, when they are finally institutionalized (Kim 1993).

An increasing number of the organizations, use projects and working in teams to achieve strategic objectives, and to adapt to the changing business environment. The projects are found to be rich and fertile sites for learning, and the individuals will learn while being assigned to challenging and varied projects (Goffin et al. 2010). Project work generates learning through the intensive integration of the different forms of knowledge, within a novel or uncertain and temporally bounded task setting (Scarbrough et al. 2004). Learning significantly enhances the project team's ability to innovate and bring products faster to market (Sarin and McDermott 2003). Also, unlearning is critical, because many pieces of knowledge, intuitions and opinions depend on the assumptions about the world, which are simply no longer true.

Especially, the multi-project organizational setting allows the organization to respond quickly to the changes in the environment (Eskerod 1996). In a multi-project organization, several projects are being performed simultaneously, and there is competition between the projects. The project portfolio management balances the

portfolio and decides which projects are stopped to allow the other, more important projects, to be carried out (Elonen and Artto 2003). The project routines tend to be non-repetitive and time-bound, and they are often loosely coupled to multiple organizational contexts by subcontracting or supply chain relations (Swan et al. 2010). Where the project teams cannot exploit previously established, organizationally embedded routines and operational practices, they need to develop new ways of working (Scarbrough et al. 2004).

When the project finishes, there is a risk that the created knowledge and experience gained will be lost (Brady and Davies 2004). Everyone benefits from reviewing past activities and decisions, to learn what worked, what did not, what can be changed and what must be managed (Jeon 2009), but the group members usually have little time or motivation to reflect on their experience and document their lessons learned (Brady and Davies 2004). Also, people tend to hide mistakes, rather than report and evaluate them (Abdel-Hamid and Madnick 1990). Lessons learned is any form of knowledge, gained from direct experience, successful or otherwise, to improve the performance in the future (Jeon 2009). It is learned on specific situations in business operations, which exist in the organizational boundary. Much of the lessons learned is tacit in nature and, therefore, it is difficult to articulate, capture and disseminate (Newell and Edelman 2008). Especially, the project management experience and related lessons learned need to be disseminated in the organization, to avoid repeating the same mistakes (Busby 1999). Additionally, sharing knowledge helps people understand the widespread effects of their actions and each other's work (Lubit 2001).

The challenge in the organizations is not just to create new knowledge, but find ways to use the existing knowledge (Smith 2001). The project-based learning tends to be context dependent and difficult to transfer to other projects or to the organization (Scarbrough et al. 2004). The context dependency relates to the characteristics of the project work: temporary nature, specific end-result, non-recurrent character, complexity and significance (Koskinen et al. 2003). Knowledge from one project to another flows through direct and detoured transfers (Jeon 2009). The mediums of direct transfers are mainly employees, who directly move to the next project with knowledge achieved from the previous project. Detoured transfers occur through several different mediums, e.g. knowledge repositories, company manuals, training programs, work processes and employee minds. Even when the databases are used, much of the key learnings generated by the project teams, is lost (Goffin et al. 2010).

The organization cannot learn from the projects, unless the group members' knowledge is articulated and transferred to the others (Riege 2005). The organizations have

institutionalized structural and procedural learning mechanisms to facilitate learning, or to disseminate what the individuals and the groups learn through the organizations. However, even in the project-based organizations, where the projects embody most of the business functions, there seldom are any organizational mechanisms for knowledge acquired in one project, to be transferred and used by other projects (Prencipe and Tell 2001). Also, learning in the projects only occasionally leads to the organizational learning (Swan et al. 2010). Therefore, the organizations should focus on stimulating the individual learning and running project reviews to generate and transfer tacit knowledge, based on the experience of the project teams.

The project teams do not necessarily engage in learning by themselves (Anbari et al. 2008). Especially, in the multi-project setting, the project members are engaged in various projects, which makes them less able to focus on specific work items and to find time to improve the routines (Zika-Viktorsson et al. 2006). Therefore, the project reviews for capturing the lessons learned, require a management commitment to include the process in the organizational routines (Anbari et al. 2008). Additionally, the projects require an intervention by a skilled coach or a trained group member, to engage in the learning process. The learning process needs to be structured to be meaningful and useful for the individuals (Busby 1999). If the project team needs to modify its routines, the project review can help the group capture and analyze the lessons learned related to the current routines.

According to the experiential learning theory, the groups learn from experience, when the group members talk about their experience, come up with new ideas and experiment them (Kayes et al. 2005). To learn from the experience, the project team must create a conversational space where the members talk about and reflect on their experience together (Abdel-Hamid and Madnick 1990). The way the learning process is facilitated, is crucial to its success (Goffin et al. 2010).

Facilitation is a process in which a person, known as the facilitator, helps others complete their work, and improve the way they work together (Farrell and Weaver 1998). In the business environment, facilitation is mainly introduced in contexts, such as organizational change, organizational learning and organizational performance (Kato 2010). Facilitation is also recognized as a form of leadership, and it is regarded as an important characteristic of the leaders. A true facilitator is not concerned about the issues under discussion by the group, nor has he a vested interest in the outcome (Kolb 2004). The facilitator guides the individuals to reflect on, intensify and generalize their own and other group members' experience (Kato 2010). He also builds a secure

environment for the participants to interact, and maintains or transforms the flow of interactions between the group members.

This dissertation provides a practical facilitation method for capturing the lessons learned in the project teams, to improve the group routines. The facilitation method takes into account the various elements affecting the way the group members create and share knowledge together, thus improving the learning process in the group. The method structures the experiential learning process so that, in face-to-face interaction, the group members' experiences and knowledge can be articulated, captured and prepared for the use in the own group or to the transfer to the other group. The method consists of a selection of distinctive facilitation tools, used in a predefined order in the workshop. It also includes a tool for codifying tacit learnings into explicit format. The workshop is managed by a facilitator, external to the group, who builds a secure environment for the group members to interact and manages the interaction between the group members.

1.2 Research objectives and questions

The purpose of this study is to understand how the project teams learn from their experience and modify the group routines to match the changes in the operating environment. Especially, the author of the study is interested in how the individual group members, the group itself and the organization affect the process of knowledge creation and sharing in the groups. The first research question (RQ) is

> **RQ1: What elements affect knowledge creation and sharing in the groups, to enable experience based learning?**

To answer the first research question, the author of the study identifies elements affecting knowledge creation and sharing in the groups from the literature. However, identifying the elements is not enough to generate the required understanding related to the experience based learning in project teams, which aim to modify the group routines. Also, it is essential to understand how the identified elements relate to each other. The author of the study acknowledges, that it is not possible to analyze the causal relations of all the elements, within the scope of the study. Therefore, the focus is in the elements related to the group itself. The second research question (RQ) is

RQ2: What are the causal relations of the group related elements affecting knowledge creation and sharing in the groups, thus enabling experience based learning?

Also, the implications of the causal relations can be found from the literature. Both the selected elements and their causal relations are assessed in the empirical study.

Usually, the projects do not engage in the learning by themselves, e.g. due to lack of time and the other responsibilities having a higher priority. If the projects do not analyze their experiences to see what worked, what did not, what can be changed and what must be managed, most likely, the group routines remain unchanged and inconsistent with the changed operating environment. Therefore, the learning process needs to be prompted and structured to be meaningful and useful for the project teams. An effective learning process allows the group members to capture and share the lessons learned related to the group routines, fast and with relatively small amount of effort. The third research question (RQ) is

RQ3: How the process of experiential learning to modify the group routines, can be made more effective?

The answers for the first two research questions provide the basis for answering the third research question. The third research question is answered by designing a facilitation method for capturing the lessons learned in the groups. The initial method is based on the experiential learning theory, the model of single-loop and double-loop learning, the 4i framework of organizational learning and the theory of organizational knowledge creation. The method is built and assessed in the empirical study.

The *scope of the research* defines the area of study. This dissertation focuses on experience-based learning in groups, which aim to modify their group routines. Term ‘group’ refers to a group of diverse people, who are assigned to a project team, a formal group created by the organization, with the purpose to create a specific end-result within a given time. Informal work groups, like communities of practice, are not in the scope of the study.

The theoretical part of the study focuses on organizational learning and working in projects. Also, the theories forming the base for the facilitation method and small group facilitation, are discussed. The empirical study assess the selected elements affecting knowledge creation and sharing in the groups and their causal relations, as well as, the facilitation method. The focus is on the project teams, operating in the multi-project

setting in the product development context, but also manufacturing and research contexts are briefly assessed. Even though the projects are operating in a global environment, the differences in the national cultures of the group members are not discussed.

In this study, the learning groups take an active role in changing their actions, by analyzing the experience in face-to-face-interaction, to modify the group routines. Therefore, both the experiential and the social constructive approach on learning, are used. In experiential learning theory, learning is seen as an experience-based process, with the purpose of creating knowledge (Kolb 1984). Learning happens, when the analysis of the experience changes the potential behavior or the actions. According to the social constructive view, meaningful learning occurs when the individuals are engaged in the social activities (Siljander 2005). This approach emphasizes the learner's active role in knowledge creation and modification.

As such, individual level and organizational learning are not in scope of the study, but the author of the study acknowledges that learning in the groups cannot happen without the individuals or the organization. The individuals need to be capable of creating and sharing knowledge, as well as, discussing and reflecting their experience. The organizations need to provide certain conditions for the group learning, and to be able to change the organizational routines also. Learning from the design object, i.e. the end-result of the project work, is not in the scope of the study. Also, Kolb's (1984) Learning Style Inventory, related to the experiential learning, is excluded from this study.

In this study, knowledge refers to a well justified true belief, which is relational and context dependent (Nonaka and Takeuchi 1995). Knowledge is created social interaction. The individuals create knowledge from the observations, by seeing, absorbing and concluding (Davenport and Prusak 1998). Knowledge sharing refers to the individuals (or the groups) sharing information, ideas, suggestions and expertise (Bartol and Srivastava 2002). Sharing happens in interaction with other people and through experience and exercises (Haldin-Herrgard 2000). By sharing knowledge, the individuals either create new knowledge by differently combining existing knowledge, or attempt to exploit the existing knowledge better (Christensen 2007).

The explicit form of knowledge is objective and rational, whereas the tacit form is actionable, subjective and experiential (Leonard and Sensiper 1998). Tacit and explicit knowledge are complementary. Explicit knowledge without the tacit insight, quickly looses its meaning (Subashini 2010). Tacit knowledge, or knowing, is a prerequisite for the application of the explicit knowledge (Nonaka and von Krogh 2009). There exists

two types of knowledge in the organizations: personal and social. Personal knowledge is a combination of the individuals' apprehensions of experience (Kolb 1984). Social knowledge is used, when the individuals explain their experience and guide their actions.

The facilitation model is based on the argument that the group routines can evolve based on the analyzed experiences of the group members. The group routines refer to planning, designing, implementing, monitoring and controlling the group work. Evolving means changes in the cognitive and social capabilities. The project teams are not willing to invest much time in the learning activities. Therefore, capturing the lessons learned should happen relatively fast, approximately in 3-4 hours. The author of the study estimates that within the given timeframe, the workshop participants could be divided into maximum of three small groups, conducting the analysis. The optimum group size for a small group discussion is 5-7 persons (Weisbord and Janoff 2007). Therefore, the facilitation method is focused on the groups consisting of 5-20 persons.

In the facilitation method, a group external person facilitates the groups capturing the lessons learned. Most likely, the group members do not have the needed skills to facilitate the activity, and it is easier for a non-group member to stay out of the meeting content and concentrate on the meeting process (Hogan 2002). Also, the results have more credibility, with both the participants and the outsiders, if the facilitator is not a member of the group.

The external facilitator needs to have experience in both facilitating and working with groups. Reviewing the experiences, especially failures, can be embarrassing for the group members (Anbari et al. 2008) and it is hard to deal with the awkward behavior in a small group (Hogan 2002). Experience is needed to be comfortable with the anger and the conflicts possibly arising in the group. An experienced facilitator is able to identify the reasons for the conflicts and act accordingly, to quickly address the issues.

The facilitator's influence on knowledge creation and sharing in the groups, is not analyzed in the empirical study. Although, the author of the study acknowledges, that the effect of the facilitator can be seen in the interaction between the group members. The facilitator encourages the participants to keep talking and shows that he is listening and understanding. He also reflects on what he hears and summarizes it, to pull important ideas and facts together, thus establishing a basis for the further discussion (Farrell and Weaver 1998). When the discussion comes across a difficulty, the facilitator intervenes the meeting (Bens 2005), thus influencing the group.

1.3 Research approach

Every researcher approaches his subject through his own assumptions, regarding the nature of the knowledge (ontology) and the possibilities of creating scientific knowledge regarding the research topic (epistemology) (Burrel and Morgan 1979). Also, the researcher makes assumptions regarding the relationship between the human beings and their environment. Burrel and Morgan (ibid) present a scheme for analyzing the assumptions about the nature of the social science (see Figure 1). This widely used approach is useful also for this study.

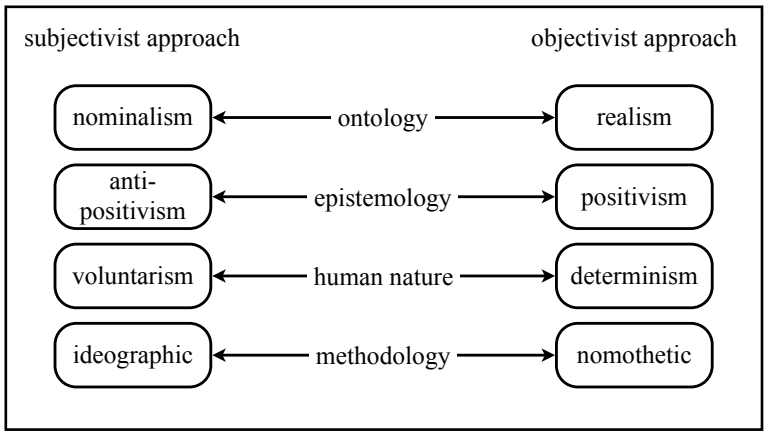

Figure 1 Subjective-objective dimensions of the research in social science (Burrel and Morgan 1979, p. 3)

The basic ontological question is whether the reality to be investigated is subjective or objective (Burrel and Morgan 1979). The nominalists position revolves around the assumption that the social world, external to the individual cognition, is made up of names, concepts and labels used to structure the reality. There is not any 'real' structure to the world, and the used names are artificial creations for describing, making sense of and negotiating the external world. The opposite position, realism, postulates that the social world is a real world made up of hard, tangible and relatively immutable structures. The individual does not create the social world but it exists independently, regardless of the individual's appreciation of it.

The assumptions of the epistemology entail ideas about what forms of knowledge can be obtained, and whether knowledge is something which can be acquired, or is it something which has to be personally experienced (Burrel and Morgan 1979). Also, how can someone sort out what is to be regarded as 'true', from what is to regarded as 'false', is determined. The positivist epistemologies seek to explain and predict what happens in the social world by searching for regularities and causal relationships between its constituent elements. Gummeson (1993) and Olkkonen (1994) summarize

that the positivists stick to the quantitative data and the measures invented by natural sciences, i.e. numbers, statistics and mathematics. They aim to provide clear and unambiguous relationships, which are stated in formulas and tables. Also, they expect general applicability of their results. New information is created based on the proven facts. The observations are processed with objective means, independent from the researchers' subjective interpretations (Yin 2009).

In the anti-positivist view, also called as the hermeneutic view, the social world is relativistic and it can be understood only from the point of view of the individuals, who are directly involved in the activities under study (Burrel and Morgan 1979). The anti-positivist reject the standpoint of the observer, and maintain that the social world can be understood from the inside, by occupying the frame of reference of the participants in action. The research aims to understand phenomena better, especially why and how something happens. The data is of qualitative nature and it is strongly related to people's experience (Olkkonen 1994). Processing the observations is based on the researchers' interpretation. The research objects are usually unique (Yin 2009). Therefore, the anti-positivist claim that science cannot generate objective knowledge of any kind (Burrel and Morgan 1979).

The third set of assumptions concerns the relationship between the human beings and their environment (Burrel and Morgan 1979). The determinist view regards man and his actions as being determined by the situation or the environment, in which he is located. The voluntarist view that man is completely autonomous and free-willed. An intermediate standpoint allows for the influence of both, situational and voluntary factors, account for the activities of the human beings.

Different ontologies, epistemologies and models of the human nature are likely to incline the researcher towards different methodologies. The ideographic approach to the methodology claims that the researcher can understand social world only by obtaining first hand knowledge of the subject under investigation (Burrel and Morgan 1979). The researcher needs to get close to the research subject, get involved in the daily life, and explore also the background and the history of the research subject. The nomothetic approach emphasizes basing the research upon systematic protocol and technique.

With respect to Burrel and Morgan's (1979) subjective-objective dimension, this study is subjective. It is not aiming to describe the phenomenon perfectly, but to understand the defined phenomenon better, especially how something happens. Additionally, the study aims solve a practical real-life problem with a simple and easy to use solution. The study collects evidence from the observations of the unique research objects in the

real world. The research data is of qualitative nature, and the processing is based on the author of the study's interpretation. The analysis is mainly inductive, starting with specific observations and aiming to make broader generalizations and theories. Therefore, the author of the study does not expect general applicability of the results. However, the study can offer novel themes for new studies, conducted with a more positivistic approach.

The author of the study had two possible research approaches to choose from: constructive and action-analytical, especially in the form of the action research. The instant and practical empirical coupling has an important role in both research approaches, and they both rely on empirical data, usually in the format of cases (Kasanen et al. 1991). Also, the researcher has to have an in-depth understanding of the organizational processes when using either one of the approaches. The difference between the approaches is in the way the results are used. The action-analytical research is more focused on the empirical aspect of the study. In the constructive research, the development of the construction, is mandatory.

In this study, the constructive research approach is used. The starting point of any constructive research project, is a problematic situation, which has appeared in a real life (Kasanen et al. 1991). The problem is solved by designing e.g. a model, a pattern, a plan, an organization or a machine. The aim of the construction is to be relevant, easy to implement and simple. Also, it is essential to connect the research problem to the previous knowledge, and to demonstrate the novelty and the functionality of the created construction.

In this study, the practical problem is to find a simple way for the project teams, to learn from their experience to be able to modify the group routines to match the changes in the operating environment. The construction is built by identifying from the literature the elements affecting knowledge creation and sharing in the groups and their causal relations, and using them as a basis for designing a facilitation method for capturing lessons learned in the groups. The novelty value of the study is to make the elements and their relations visible, and to combine known facilitation tools and techniques in a unique way. The functionality of the construction is demonstrated in the empirical study.

The constructions clearly demonstrate which kind of solutions work, and which do not (Kasanen et al. 1991). Usually, the most simple and the effortless option will prove to be the most suitable one. It is common that the constructions reveal new problems, and lead to new questions. The main limitation of the constructive approach is in the difficulty of generalizing the results. The observations are usually only made in a few

case organizations. The validity of the construction could be evaluated best by a strong market test. However, the authors (ibid) suggest that it is enough if the real-life managers accept the construction and decide to try it. Maintaining the chain of evidence is important for the validity of the construction. Also, having key informants reviewing the study reports helps building the construct validity.

It is not possible for another person to conduct an identical study, using the constructive approach, because of the human factors affecting the implementation of the construction and its success. The reliability of the construction comes from following the constructive research process, which is described in Figure 2.

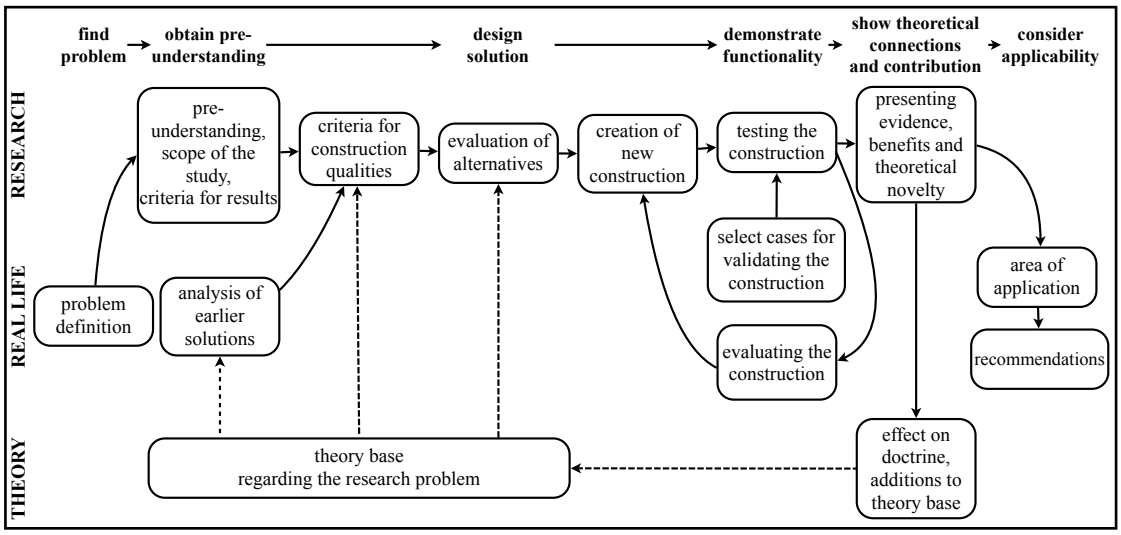

Figure 2 Constructive research as a process
(based on Olkkonen 1994, p. 78 and Kasanen et al. 1991, p. 306)

After the problem definition, the researcher obtains comprehensive pre-understanding related to the problem area, and defines the scope of the study and the criteria for the results. The qualities and the alternatives for the construction are influenced by the theories. The functionality of the construction is demonstrated with cases. After each case, the construction is evaluated and modified if needed. The presented theoretical connections and contribution can be seen as additions to the theory base. Also, the real life applicability of the construction is considered.

The constructive research, along with similar interpretive research traditions, can accept simultaneously researching and facilitating the experience of a group of people. However, combining the roles of the researcher and the facilitator creates challenges, because of their different interests. Herbert (2010) introduces the metaphors of politician, magician, trader/traitor and ventriloquist, to explain how the roles of the facilitator and the researcher can be combined. The politician metaphor emphasizes the

variety of the stakeholders and the power relations, which need to be managed, as each comes to bear on the research project. The magician metaphor leads to the consideration of all the practical things, which need to be juggled, to ensure that the research process proceeds smoothly. The idea of the trader/traitor emphasizes the issue of trust, and the likely tradeoffs to be made between the roles of the facilitator and the researcher, and the participants' needs and expectations. The ventriloquist metaphor suggests that, while making room for many voices to speak, the researcher must choose which voices to represent, and be mindful of the effects of the choice.

1.4 Research strategy

The selected research approach influences the research strategy of a particular study. The research strategy is a procedure for achieving the research objectives, and it determines what kind of information will be produced in the research. The strategy also describes how the evidence is acquired and processed, i.e. the research methods. The research strategy, together with the research methods, affect the data collection and the analysis techniques used in the study.

In this study, both theoretical and empirical research is needed to answer the research questions. The theoretical study focuses on identifying different elements affecting knowledge creation and sharing in the groups. Also, alternative ways to facilitate experience-based learning, aiming to modify the group routines, are looked for. The objective of the empirical study is to assess the causal relations of the selected elements affecting knowledge creation and sharing in the groups, as well as, to design and validate a facilitation method, with multiple case studies. The first research question is answered by identifying the elements affecting knowledge creation and sharing in the groups. The answer to the second question, is an illustration of the causal relations of the selected elements. The designed and validated facilitation method is the answer to the third research question. The research strategy of this study is illustrated in Figure 3.

This study starts with a literature review, which helps the author of the study gain the overall picture of the prior research, direct the study further and select the theory base for the facilitation method. The literature review is conducted to summarize the prior research in the field of organizational learning, the context of project work and small group facilitation. In the literature review, the author of the study used the search functions in Elsevier, EBSCOHost and Emerald databases. Also, small group facilitation and the alternative facilitation approaches and methods, are explored.

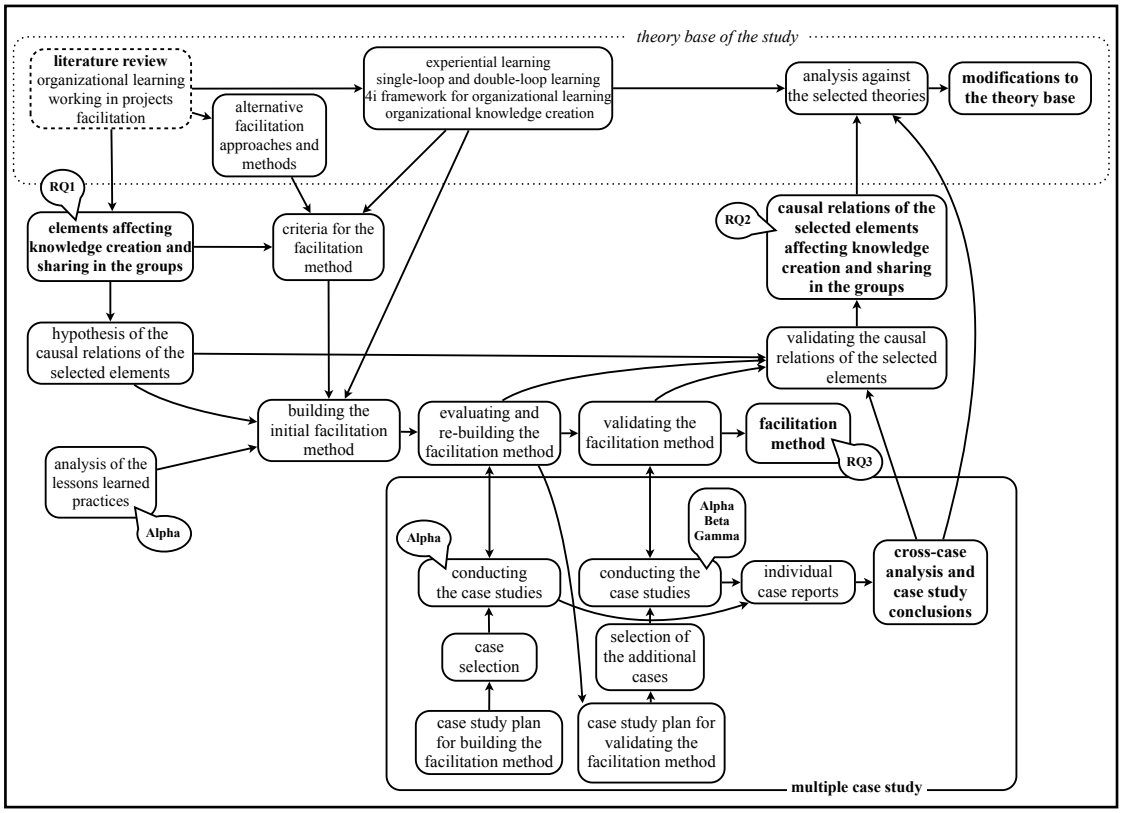

Figure 3 Research strategy of the study

Based on the literature review, the author of the study identifies the elements affecting knowledge creation and sharing in the groups, and makes the hypothesis regarding the causal relations of the selected elements. Also, the theories, forming the base for the facilitation method, are selected. The criteria for the facilitation method are defined based on the identified elements affecting the knowledge creation and sharing in the groups, the alternative facilitation approaches and methods, and the selected theories. Additionally, the author of the study analyzes the lessons learned practices in Organization Alpha.

Considering the gained pre-understanding, the author of the study designs the initial facilitation method and plans the case studies for building the method in Organization Alpha. During the first set of case studies, she evaluates and revises the facilitation method. To validate the facilitation method, the author of the study plans and selects additional cases from Organization Alpha, Organization Beta and Organization Gamma.

All case studies are also used to validate the causal relations of the selected elements affecting knowledge creation and sharing in the groups. From each case, the author of the study writes a case specific report, and these reports are concluded into a cross-case analysis. The cross-case analysis and the case study conclusions contribute to the validation of the causal relations, and the findings are analyzed against the selected

theories, to modify the theory base of the study. Also, the validated causal relations of the selected elements affecting knowledge creation and sharing in the groups, are compared with the selected theories.

As a theoretical result of the study, the author of the study presents the causal relations of the selected elements, affecting knowledge creation and sharing in the groups, and the suggested modifications to the theory base. The facilitation method and the related document template for capturing the lessons learned in the groups, to modify the group routines, is a more practical result from this study. Also, understanding the causal relations of the elements, helps the organizations plan actions to support capturing and using the lessons learned to modify the group routines.

1.5 Research methods

When selecting the research approach, the researcher also selects the possible methods to be used in the research. In this study, the theoretical part requires a literature review. The literature review is used to generate pre-understanding about the organizational learning, working in projects and facilitation. This pre-understanding is needed for building the construction. The literature review also helps the researcher find previously explored areas of research, and develop more focused research questions (Yin 2009). Also, the author of the study analyzed lessons learned practices in Organization Alpha by observing the workshops and following the implementation of the created action plans.

In this study, the construction consists of both the causal relations of the selected elements affecting knowledge creation and sharing in the groups, and the facilitation method to capture the lessons learned. The construction is built and validated with case studies, which are generally used to contribute knowledge of individual, group, organizational, social, political or related phenomena. The purpose of the case study is to describe in a real life context how and why contemporary complex social phenomena work, or to describe them extensively and in-depth, without controlling the behavioral events (Yin 2009).

In this study, the cases used for building the construction are theory generating. The purpose of the cases is to generate ideas, concepts, categories, models and theories (Gummeson 1993). Theory testing cases are used to validate the construction. The case studies provide similar results than the experiments and the histories. However, the

experiments require controlling the behavioral events and the histories focus on past events. In this study, it is not possible to control the groups' behavior, although, the studied events are structured with the facilitation method. The research problem did not encourage focusing on past events, which makes the histories irrelevant for the study.

Single case studies can be used for interpreting how and why things happened in one specific company (Yin 2009). However, a multiple-case design is considered to be more compelling, and the multiple-case study is regarded to be more robust than with the single case design. A large number of the cases may improve the generalizability, although, they are not necessary, if each the research finding is considered as the best available knowledge for the present (Gummeson 1993). The stronger the rival theories explaining the phenomenon are, the more additional cases are needed.

In the multiple case study, each individual case consists of a whole study, in which the evidence is sought regarding the facts and conclusions for the case. Therefore, the multiple-case design offers the possibility of the direct replication, better analytic conclusion and contrasting finding, i.e. it reduces the possible criticism of the study. In this study, multiple cases are needed to build and validate the construction in the product development context. Single-case studies are used to assess the construction in the manufacturing and the research contexts.

In the multiple case study, the theory development is done before data collection (Yin 2009). The theories can be illustrative (e.g. organizational theories), or they can be used as a template with which to compare the empirical results. In this study, the theory generation was done as a literature review. The literature review provided the basis for the construction. Also, the results were compared to the selected theories.

The case selection requires careful consideration. The case candidates should be evaluated using a predefined operational criteria, and in a single case study, the selected case should be likely to be the best fit for replication (Yin 2009). In this study, the theory generating cases, used to build the facilitation method, were defined prior the case study. For the theory testing cases, the author of the study conducted several case studies and decided afterwards which ones were to be used in this study, based on their fit to the selection criteria. Only, if there was an intention to use the facilitation method and the group size was acceptable, the case was used to validate the facilitation method.

In most case studies, the data is generated with qualitative methods (Yin 2009). In this study, the author of the study collected the qualitative data by facilitating several lessons learned workshops for the project teams in three organizations. Data contains the

workshop meeting minutes, including all presentations and the documented conversations, as well as, the author of the study's own notes regarding the groups, the facilitation method and the elements affecting knowledge creation and sharing in the groups.

The analysis of the case study evidence should show, that the research relied on all the relevant evidence, dealt with all the major rival interpretations, addressed the most significant issues of the study, and that the researcher brought prior expert knowledge to the study (Yin 2009). For the case study data analysis, Eisenhardt (1989) recommends searching for cross-case patterns and comparing the results with conflicting and similar literature. Searching the cross-case patterns helps going beyond the first impressions, and seeing the evidence through multiple lenses. The comparison enhances the quality of the research. Within-case analysis can be used to get familiar with each case as independent entities.

In this study, the cases are analyzed individually after each workshop. Naturally, the analysis in theory building cases focuses on evaluating the construction. Still, all cases are analyzed to identify the effect of the elements affecting knowledge creation and sharing in the case groups. In the cross-case analysis, the author of the study searches for the cross-case patterns, and identifies similarities and differences between the cases. Pattern matching with the existing literature is used to find similarities and differences between the construction and existing theories. The new facilitation method is also compared to known methods for capturing the lessons learned.

Reporting the case study results, followed the guideline defined by Yin (2009). The author of the study compiled case specific reports, including the case data and the analysis. Case specific reports were concluded into cross-case analysis, which was contributing to the validation of the causal relations of the selected elements affecting knowledge creation and sharing in the groups. Therefore, the cross-case analysis is used to modify the theory base of the study.

1.6 Outline of the study

This study consists of four parts. First, there is the introduction to the study, which is followed by the theoretical framework. Then, the facilitation method and the empirical study are presented. Finally, the study is concluded. The outline of the study is illustrated in Figure 4.

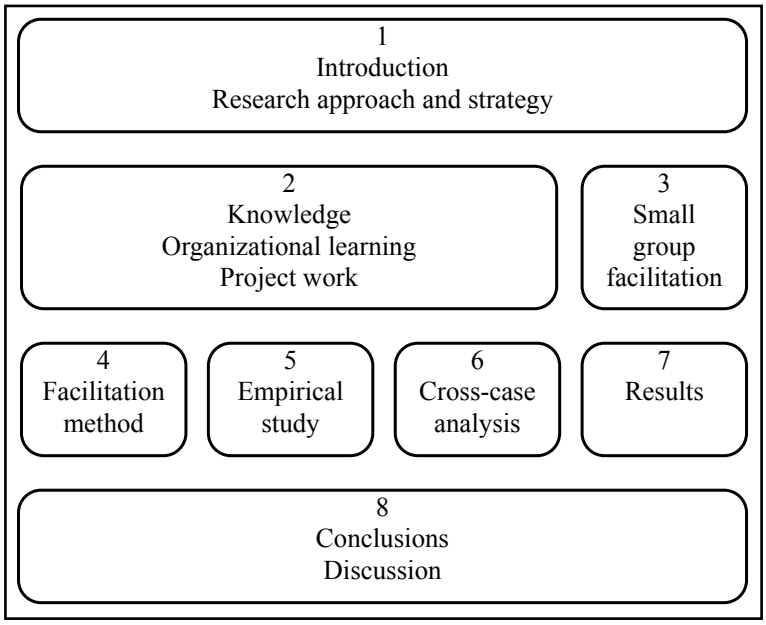

Figure 4 Structure of the thesis

Chapter 1 ‘Introduction’, describes the research object and the motives for the study, as well as, the research approach, design and methods. The theoretical framework is divided in two parts. The second chapter describes knowledge, organizational learning and project work. Also, the elements affecting knowledge creation and sharing in the groups, are presented. Chapter 3 focuses on small group facilitation.

The theoretical framework provides the foundation for building and validating the new facilitation method. Chapter 4 describes how the facilitation method was designed, built and validated. The empirical tests of the construction, i.e the individual cases, are illustrated in Chapter 5. The following chapter, Chapter 6, discusses the empirical results as a whole. The seventh chapter presents the results of the study.

The final part of the study consists of Chapter 8, which concludes, discusses and summarizes the study and its contribution. The assessment of the study discusses the results, the research process and the way the roles of the researcher and the facilitator were combined. The new facilitation method is evaluated concerning the business requirements. The scientific requirements for the whole study are assessed also. At the end of the dissertation, the author of the study provides ideas for further research.

2 Organizational learning

In this chapter, the concept of knowledge is discussed from various viewpoints. Organizational learning, as well as, the main theories or models, influencing the facilitation method, are presented. The final part of the chapter focuses on the elements affecting knowledge creation and sharing in the groups.

2.1 Concept of knowledge

Organizational knowledge consists of the employees' industry experience and education, as well as, of the diverse information and knowledge the employees hold (Kogut and Zander 1992). Knowledge is invested in practice, i.e. in the methods, the ways of doing things and successes, which demonstrate the value of knowledge as it develops (Carlile 2002). The organization's success depends on how well it can enhance its own knowledge base by either creating new knowledge or obtaining existing knowledge (Kessler et al. 2000). However, Davenport and Prusak (1998) claim that many organizations fail to use their internal knowledge resources and even waste them.

In the organizations, knowledge can be viewed from several perspectives. It can be an accumulated resource, which underlies the capabilities and makes some type of performance possible. In most organizations, knowledge is produced because it is expected that someone will use it as a resource (Tuomi 1999). The value and the worth of the individual, the group and the corporate intellectual assets grow exponentially when shared, and their value increase with use (Smith 2001; Anantatmula 2009). The organizations can use knowledge to create sustained competitive advantage by internally spreading knowledge, which the other organizations will find almost impossible to copy, and by creating superior knowledge management capabilities and, thereby, foster ongoing innovation (Lubit 2001).

Knowledge can be seen also as a competence, a basis for creating competencies by combining knowledge, and as an input for innovation (Dinur et al. 2009). Smith et al. (2005) claim that the organizational knowledge reflects the current viewpoints on how the existing resources should be configured and exploited for advantage. A third view to knowledge in the organizations, is to consider knowledge as a structure, which constrains activity and makes some actions effective. Additionally, knowledge can be viewed as a product (Tuomi 1999). Knowledge as a product, can change the existing

constraints for actions and lead to development. Knowledge can be externalized to documents, embedded in tools, or be acted in the organizational activity.

Initially, knowledge management was considered as an extension to the artificial intelligence, which considers knowledge as information. Knowledge was a commodity which could be codified, stored and transmitted (Hildreth and Kimble 2002). Knowledge assets were considered tangible, structurable and codifiable objects, such as patents, trademarks and documents. Later on, it has been recognized that knowledge has aspects, which cannot be articulated, abstracted, codified, captured and stored. Currently, the concepts of information and knowledge are distinguished in the area of knowledge management. Their definitions vary, but there is an agreement regarding the concept hierarchies. Usually, the hierarchy is seen as a pyramid, ascending from data to wisdom. Data can become information, which can then become knowledge, and further be refined into wisdom.

Data means a disconnected collection of facts (Subashini 2010), i.e. text, numbers, code or other symbols, which may not include any meaning, as such (Thierauf 2001). Data is acquired from the external world through people's senses, and people try to make sense of the signals through their experience (Jashapara 2004). The external data becomes an internal fact, but to inform, the data needs to be organized.

Structured data is considered as information (Thierauf 2001). People transform data into information by adding value to it in a various ways (Davenport and Prusak 1998). Data can be contextualized into information by acknowledging the purpose to which the data was gathered. By categorizing data, it becomes information, as the individual defines the units of analysis or the key components. Also, data can analyzed mathematically or statistically. Correcting the errors from data, or summarizing it into a more concise form, makes it information. In other words, information is data with added value, thus put in context (Davenport and Prusak 1998; von Krogh et al. 2000). Data has been given a meaning through the relational connection (Subashini 2010). Alternatively, Nonaka (1994) sees information as an interpretation of the events or the objects, which provides a new point of view. Knowledge committed to paper or other medium is also information, as it is a transferable presentation (Bierly et al. 2000; Hildreth and Kimble 2002).

When information is understood and its suitability to other situations is compared, it becomes knowledge (Bierly et al. 2000; Bratianu and Orzea 2010; Davenport and Prusak 1998). According to Jashapara (2004), knowledge can be considered as actionable information, which allows people to make better decision and to provide

effective input to dialogue and creativity in the organization. Knowledge consists of information, experience, mental models, relations, values, principles, believes and commitments (Bratianu and Orzea 2010) and technology, know-how and skills (Nonaka et al. 2000). Therefore, there are both tacit (know how) and explicit (know about) elements in knowledge (Nonaka 1994; Bierly et al. 2000).

Knowledge is created in social interaction (Nonaka 1994). The values and beliefs of the knower determine what he sees, absorbs and concludes from the observation (Davenport and Prusak 1998), thus making the process of knowledge creation unpredictable (von Krogh et al. 2000). Due to its personalized nature, knowledge needs to be expressed for it to be useful for the others (Alavi and Leidner 2001). The authors (ibid) argue that for the individuals to arrive at the same understanding of data or information, they must share a certain knowledge base.

When knowledge is synthesized from existing knowledge, it becomes understanding (Subashini 2010). Wisdom refers to the ability to use knowledge (Bierly et al. 2000), to act critically or practically, in a given situation (Jashapara 2004) and to judge (Thierauf 2001). It is a personal capacity, which is acquired through experience and thinking. Wisdom is often captured in famous quotes, proverbs and sayings (Jashapara 2004).

Some authors disagree with the presented concept hierarchy. Nissen (2002) argues that there should be a distinction in the transition between the knowledge seekers and the creators. From the seeker's point of view, data is put into context to create information, and actionable information, becomes knowledge. However, from the creator's perspective, knowledge is needed to create information, which in turn, is needed to create data. Also, Tuomi (1999) suggests that there needs to be knowledge first, to be able to create data.

Faucher et al. (2008) claim that there is no hierarchy among data, information, knowledge and wisdom at all, and the individuals do not need to obtain them in a specific order. Depending on the situation, the individuals may not even need to have all of them. The authors (ibid) argue that it seems sensible that the general hierarchy of data, information, knowledge and wisdom, should permit the transition in both directions.

2.1.1 Tacit and explicit knowledge

The most common notion of knowledge in the current knowledge management literature, has its roots in the ideas of logical behaviorism (Jashapara 2004). From this perspective, knowledge exists along a continuum between tacit knowledge (know-how) and explicit knowledge (know-what). The explicit form of knowledge is objective and rational, whereas the tacit form is actionable, subjective and experiential (Leonard and Sensiper 1998). Common examples of tacit knowledge include the ability to ride a bicycle, the knowledge of an expert baseball player and the debugging skill of a computer programmer (Yang and Farn 2009).

Explicit knowledge can be expressed clearly, fully and it leaves nothing implied. It has a universal character, thus supporting the capacity to act across the contexts (Nonaka and von Krogh 2009). Hildreth and Kimble (2002) use term 'hard knowledge' to describe explicit knowledge, because it can be managed with many tools and techniques. However, just because information is explicit, it does not necessarily mean it is easy accessible (Falconer 2006). Access to knowledge depends upon the efficiency and the effectiveness of the organization's communication systems.

Understanding explicit knowledge requires a certain level of academic knowledge or understanding, which is gained through formal education or structured study (Smith 2001). Explicit knowledge assets can be reused to solve many similar type of problems, or to connect people with valuable, reusable knowledge. The acts of gathering and using explicit knowledge assume a predictable and a relatively stable environment.

Tacit knowledge is more practical and action oriented knowledge, and it is acquired by personal experience (Smith 2001). Tacit knowledge is tied to the senses, tactile experience, movement, skills, intuition, unarticulated mental models or implicit rules of thumb. When tacit knowledge comes to action, the person acts concentrating on the activity, not on how it is done (Mladkova 2007). Tacit knowledge, as such, is neither positive nor negative (Falconer 2006). Its usefulness results from the insights it can give to the organization.

Several authors have defined different dimensions to tacit knowledge. The author of the study summarizes the definitions of Nonaka and Konno (1998), Alavi and Leidner (2001), Lubit (2001), Smith (2001), Hildreth and Kimble (2002) and Christensen (2007) in Chart 1.

Chart 1 Dimensions of tacit knowledge

coordinating knowledge (organizational routines)	ways of doing things
	policies
	priorities
	procedures
professional knowledge	experiences
	technical knowledge - skills - know-how
cognition	beliefs
	ideals
	values
	mental models
	ways of approaching problems
cultural knowledge	
know-who	

Nonaka and Konno (1998), as well as, Alavi and Leidner (2001), divide tacit knowledge into technical and cognitive dimensions. Technical dimension encompasses the kind of informal personal skills or crafts, often referred to as know-how. Technical tacit knowledge is demonstrated when the person masters a specific body of knowledge, or uses skills. The cognitive dimension of tacit knowledge shapes the way people perceive the world (Smith 2001). Cognitive dimension consists of the beliefs, the ideals, the values and the mental models of the individual. Mental models describe how people understand the causal connections, and what meaning they give to events (Lubit 2001). Mental models help people make sense of the masses of data they are faced with, extract those parts which are relevant, formulate an understanding of the problems and find solutions. The ways of approaching problems, derive from the habit and the mental patterns.

Much of the tacit knowledge of an organization is stored in its routines (Lubit 2001), as coordinating knowledge (Christensen 2007). The routines solidify as standard operating procedures, and they allow the organizational roles to be developed and enforced (Lubit 2001). The routines include the ways of producing things, hiring and firing personnel, handling the inventory, and the procedures for decision-making, advertising and operations. The tacit knowledge embedded in the routines include an intuitive grasp of what data to focus on, and the relative priority of the competing demands. The coordinating knowledge may only be effective when it is embedded in a particular organization culture, structure and a set of processes and routines. Coordinating knowledge guides the application of the professional knowledge, i.e. the routines shape who is going to perform what and when (Christensen 2007).

Professional knowledge combines experience and the technical dimension of tacit knowledge (Christensen 2007). Professional knowledge describes knowledge, which

enables the individual to perform his job. It is limited to the practice of the particular job, and it can be referred also as know-how. Professional knowledge originates from the individual's formal education, in combination with his experience in performing his job. This type of knowledge is a prerequisite for being able to contribute as a specialist to the organizational activities, but as such, it does not produce any outcome. The author (ibid) also adds a dimension of know-who, to tacit knowledge. Know-who knowledge is about where knowledge exists. This type of knowledge enables the identification who might be able to help solve a specific problem.

Tacit knowledge is difficult for the organizations to exploit. It only resides in people, and it is impossible to quickly spread or share it within the organization (Stenmark 2001). Nearly two-thirds of the work related information, which is transformed into tacit knowledge, comes from the face-to-face contacts, like casual conversations, stories, mentoring, internships and apprenticeships (Smith 2001). The problem of knowing who knows what, grows with the size of the organization. Additionally, tacit knowledge can foster antagonism and aggression, if the nature of the knowledge creation experience is negative.

Another troublesome aspect of tacit knowledge, is its elusiveness (Stenmark 2001). Originally, tacit (implicit) knowledge was considered being inexpressible. Implicitness implies that a person can articulate what he knows, but he is unwilling to do that, because of specific reasons under a certain setting (Li and Gao 2003). There may not be effective ways in the organization to elicit tacit knowledge from the individuals, or the organization's culture might actively discourage knowledge sharing, either deliberately or incidentally (Falconer 2006). People may not be fully aware of their tacit knowledge or they do not have any personal need to make it explicit on the individual level, or there is a potential risk of losing power and competitive advantage, when making tacit knowledge explicit (Stenmark 2001). If knowledge remains tacit, it vanishes when the organization reorganizes, merges or downsizes its operations (Smith 2001).

It is hard, if not even impossible, to distinguish conceptually between explicit and tacit knowledge, because they are not separate and discrete in practice (Lam 2000). Nonaka et al. (2000) claim that tacit and explicit knowledge are complementary. Explicit knowledge without the tacit insight, quickly looses its meaning (Subashini 2010). Tacit knowledge, or knowing, is a prerequisite for the application of explicit knowledge (Nonaka and von Krogh 2009).

Alavi and Leidner (2001) remind that also other than tacit-explicit classifications exist for knowledge. The authors (ibid) summarize different knowledge types and their examples as in Chart 2.

Chart 2 Summary of knowledge types (Alavi and Leidner 2001, p. 113)

knowledge type	definition	example
tacit	knowledge is rooted in actions, experience and involvement in a specific context	best means of dealing with a specific customer
- cognitive	mental models	individual's beliefs on cause-effect relationships
- technical	know-how applicable to a specific work	surgery skills
explicit	articulated, generalized knowledge	knowledge of major customers in a region
individual	created by and inherent in an individual	insights gained from a completed project
social	created by and inherent in collective actions of a group	norms for inter-group communication
declarative	know-about	what drug is appropriate for an illness
procedural	know-how	how to administer a particular drug
causal	know-why	understanding why the drug works
conditional	know-when	understanding when to prescribe the drug
relational	know-with	understanding how the drug interacts with other drugs
pragmatic	useful knowledge for an organization	best practices, business frameworks, project experiences, engineering drawings, market reports

In Alavi and Leidner's (2001) summary, tacit knowledge is divided into cognitive and technical elements. Cognitive tacit knowledge means the individual's beliefs, and technical tacit knowledge refers to skills. Additionally, knowledge can be individual or social. Individual knowledge is created by and inherent in the individual, whereas social knowledge is related to the collective actions of the group. Knowledge can also be categorized as declarative, procedural, causal, conditional and relational. Declarative knowledge is knowledge about something, while procedural knowledge means knowledge how to do something. Causal knowledge explains why something happens, and conditional knowledge describes the causal relationships. Relational knowledge describes how things relate to each other and pragmatic knowledge is knowledge useful for an organization.

Also, Blackler (1995) provides a more detailed framework for five types of knowledge found in the organizations. Embrained and encoded knowledge correspond with 'knowing how' and 'knowing that' respectively. The three further forms of knowledge, embodied, encultured and embedded knowledge, are forwarded to exist along the continuum of knowledge.

2.1.2 Personal and social knowledge

Kolb (1984) argues that there are two kinds of knowledge in the organizations: personal and social knowledge. Personal knowledge is a combination of the individuals' apprehensions of experience. Apprehension refers to a personal, subjective process which cannot be known by others, but it can be communicated. Lam (2000) divides personal knowledge further into embrained and embodied knowledge. Embrained knowledge is explicit and conscious, dependent on the individual's conceptual skills and cognitive abilities. It is formal, abstract or theoretical knowledge, which enjoys privileged social status within the Western culture. Embodied knowledge is action oriented. It builds upon bodily or practical experience, and its generation cannot be separated from its application.

Social, or collective, knowledge refers to the ways, in which knowledge is distributed and shared among the members of the organization (Lam 2000). The individuals use social knowledge to explain the experience and to guide their actions (Kolb 1984). Social knowledge is stored in the organization's rules, procedures, routines and shared norms, which guide the problem solving activities and the patterns of the interaction among its members (Lam 2000). Encoded knowledge facilitates centralization and control in the organizations. It is collective, simplified and selective, and fails to capture and preserve the tacit skills and the judgement of the individuals. Collective form of tacit knowledge is called embedded knowledge. It is based on shared beliefs and understanding within the organization, and it makes effective communication possible. Embedded knowledge is rooted in the organization's informal groups, and knowledge is tacit, relation-specific, contextual and dispersed.

2.2 Organizational learning

2.2.1 Organizational learning frameworks

There is considerable fragmentation in the field of organizational learning, and no single framework has successfully encapsulated the diversity of its offerings (Jashapara 2004). The rational action approach sees organizational learning as changes in the management's assumptions. This approach, including Senge's (1990) theory of systems thinking, focuses on the obstacles of the rational action and collective learning. Kolb (1984) claims that the rationalist and other cognitive theories, tend to give primary emphasis to the acquisition, the manipulation and the recall of the abstract symbols.

Once the obstacles of the rational discussion and learning are recognized and removed, the managers and the whole organization will begin to act more rationally and learn effectively (Virkkunen and Kuutti 2000). In the behavioral framework, the organizations learn by encoding inferences from the history into the routines, which guide the individuals' behavior. Levitt and March (1998) maintain that the action in the organization, is based on the historically formed routines, which are incrementally developed. These theories deny any role for consciousness and subjective experience in the learning process (Kolb 1984).

In social learning theories, learning is situated, contextual and closely tied to the situation, in which knowledge is being created (Lave and Wenger 1991). Learning is more about becoming a practitioner, through the social interaction with others, than learning about the practice. Therefore, organizational learning can be seen as a process in the communities of practice (CoPs). Learning does not involve just the acquisition of the facts about the world. It also means acquiring the ability to act in the world, in socially recognized ways (Brown and Duguid 2001). The participants in the CoPs learn in cooperation, where different interests, points of view and power relations are at stake, challenged and under consideration (Liepe and Sakalas 2008). Newcomers are moved to the status of the full practitioners, through the social process of scaffolding by experienced practitioners, shrinking the zone of the proximal development, to enable the novices to become contributing members of the community (Brown and Duguid 1991).

The social constructive approach on learning views learning as a social process. Meaningful learning occurs when the individuals are engaged in the social activities (Siljander 2005). This approach emphasizes the learner's active role in knowledge creation and modification. The learner is a goal oriented, information seeking subject, who is accountable for his own learning process. Learning does not mean knowledge transfer, but constructing and creating knowledge. According to this view, the process of creating knowledge can be facilitated. Also in action learning, the individual learns when he is involved in an activity. Action learning is a dynamic process, which involves a small diverse group of people solving real problems, while, at the same time, the group focuses on what they are learning, and how their learning can benefit each group member, the group itself and the organization as a whole (Marquardt 2006). Action learning emphasizes questions and reflection, above statements and opinions. By focusing on the right questions, rather than the right answers, action learning emphasizes what the individual does not know, as well as, what he does know.

Experiential learning theory defines learning as a process whereby knowledge is created through the transformation of experience (Kolb 1984). Immediate personal experience

is the focal point of learning. The theory emphasizes here-and-now concrete experience to validate and test abstract concepts. According to Roth and Senge (1996), the experiential learning processes often involve making mistakes, and then learning from those mistakes.

2.2.2 Three levels of learning in organizations

Learning takes place in the organizations, during the dynamic interaction among the individuals, the groups and the organization itself (Wellman 2007). Therefore, *individual learning* is seen as the point of departure for organizational learning. The traditional goals of the individual's learning process, are knowledge acquisition, skill development and the change in attitudes (Jashapara 2004). Falconer (2006) note that many theoretical models concerning effective individual learning, concentrate upon its experiential, cyclic and/or iterative nature. A common approach to view learning, is a cycle of experience, observation and reflection, formation and then testing the concepts (see Figure 5).

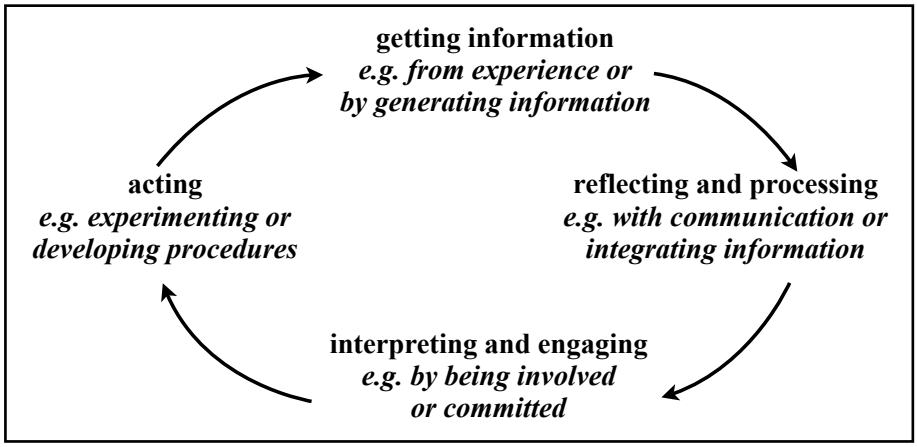

Figure 5 Cyclic construct model of organizational learning (Falconer 2006, p.145)

Falconer (2006) explains that the learning cycle theory is useful to better understand the formation process of knowledge. The effectiveness of the model depends upon moving information and knowledge around the cycle, encouraging the members of the organization to engage with it, and to change as a result. To enable sharing of tacit knowledge and its movement around the organizational learning cycle, tacit knowledge has to be made explicit. The most effective methods to extract tacit knowledge, is offering scenarios which encourage the participants to apply their experience and skills, and thereby reveal it.

Organizational knowledge is created through communication of the individual learning among the co-workers (Kogut and Zander 1992). This implies, that organizational learning is dependent on the organization members exchanging and combining existing information, knowledge and ideas (Kogut and Zander 1992), as well as, internalizing and applying what they have learned (Anantatmula 2009). The individual's personal knowledge has to be transformed into information, which the other members of the organization can use in their accumulation of knowledge, to apply it and to create new values for the organization (Popper and Lipshitz 2000). The organization supports the individuals, or provides a context for the individuals to create knowledge (Senge 1990).

Senge (1990) argues that individual learning, at some level, is irrelevant for the organizational learning because the individuals learn all the time and, yet, there is no organizational learning. Much of the knowledge transfer and learning in the organization, take place in *group level* (Hedlund 1994). Therefore, the groups are in an important position in organizational learning (Senge 1990; Leonard and Sensiper 1998). Creative ideas are born out conscious, semiconscious and unconscious mental sorting, grouping, matching and melding (Leonard and Sensiper 1998) while the group members share their tacit knowledge to complete the group's task, and to perform on a sufficient level (Yang and Farn 2009). Often, learning occurs as an unintended byproduct of the group activity (Senge 1990).

Group learning has three critical dimensions. First, there is a need to think insightfully about the complex issues (Senge 1990). The group members need to learn how to tap the potential for many minds, and to be more intelligent than one mind. The interpersonal interactions at the conscious level, stimulate and enhance knowledge creation and learning. The author (ibid) divides the conversations into discussion and dialogue. In discussion, there is a free and creative exploration of the complex and subtle issues, a deep listening to one another and suspending of one's own views. In dialogue, the different views are presented and defended, and there is a search for the best view to support the decision, which must be made this time. The purpose of the dialogue is to go beyond any individual's understanding. Dialogue allows a space to examine how the individual and the collective cultures, habits and histories influence and constraint thought processes. The group explores complex difficult issues from many viewpoints, and the individuals gain insights which simply could not be achieved individually.

Second, there is a need for innovative coordinated action. Outstanding groups in the organizations, develop operational trust between the group members. It means that each group member remains conscious of the other members, and can be counted on to act in

ways, which complement each others' actions. Building trust between the group members, involves a repeated dialogue among the members (Nonaka 1994). The individuals tend to trust people they know and, therefore, people usually get knowledge from their organizational neighbors (Koskinen et al. 2003). This implies that in many groups, knowing how to find and apply relevant knowledge efficiently, is more practical than trying to master a large amount of knowledge.

The third dimension in group learning, is the role of the group members in other teams. The learning group continually fosters other learning groups, through inculcating the practices and skills of the group learning more broadly. However, learning within the group may not translate into learning from the group, which can enhance organizational learning (Swan et al. 2010). Scarbrough et al. (2004) remind that the conditions which promote group learning, may be balanced against the conditions facilitating organizational learning.

Learning organization can analyze, reflect, learn and change, based on the experience (O'Dell and Grayson 1998). The process can be unpredictable and difficult to foster, and there is no consensus among the researchers on how to best encourage effective organizational learning (Falconer 2006). Levitt and March (1998) remind, that despite the problems, the organizations learn. Learning needs to compared with the serious alternatives, not with the ideal of perfection.

The organizations learn by the learning of their members (learning in organizations) or by ingesting new members, who have knowledge which the organizations did not previously have (learning by organization) (Popper and Lipshitz 2000). Some of the individuals' learning is embedded in the organizational systems, structures, strategy, routines and investment in the information systems and the infrastructure (Crossan et al. 1999). Learning is reflected as changes in the collective knowledge, value base and behavior, which subsequently affects the organization's performance (Senge 1990). Learning can be acknowledged through improved decision making, because the organization gradually adapt those routines, procedures or strategies, which lead to favorable outcomes.

Zollo and Winter (2002) identified three mechanisms of organizational learning. Informal experience accumulation is the lowest level mechanism. It refers to tacit accumulation of experience by the individuals over time, and to the use of that experience to improve the practice in an incremental fashion. Experience accumulation is essential for the individuals' trial and error learning process, which accounts for the

learning curve. Prencipe and Tell (2001) describe the outcomes of the knowledge accumulation as local experts and experiential knowledge in the individuals.

Knowledge articulation is a more effective mechanisms for learning (Zollo and Winter 2002). Articulation is a deliberate process, through which the individuals and the groups figure out what works and what does not, in the execution of an organizational task. Knowledge articulation occurs when the individuals make a cognitive effort to enhance their understanding of the causal links between the actions and the outcomes. Articulation allows knowledge to be accessed and used by others, sometime in the future, and not dependent on the personal network. The outcomes of the articulation mechanism are symbolic representations and communication, as well as, improved understanding of the action-performance relation.

Knowledge codification is an extension of the articulation process, and it allows the creation of externalized knowledge. Codification refers to the process of knowledge being transformed into information, a form of message or sets of identifiable rules and relationships, which can be transmitted (Kogut and Zander 1992). The outcome is in form of the codified manuals and procedures (Prencipe and Tell 2001). Knowledge articulation is required to achieve knowledge codification, while the opposite is not true. In most cases, articulated knowledge is never codified. Codification can facilitate the generation of the new proposals to change the currently available routines, as well as, the identification of the strengths and the weaknesses, in the proposed variations to the current set of routines (Zollo and Winter 2002). Knowledge codification activities become superior mechanisms for the expertise accumulation as the frequency and the homogeneity of the tasks are reduced.

The benefits of the effective organizational learning are improved innovation, achieving and sustaining change and in developing competence (Wellman 2007). However, the pursuit for learning can be a double-edged sword, and the possible results should be considered cautiously. Levitt and March (1988) note that the same processes which yield experiential wisdom, produce also superstitious learning and erroneous inferences, in which the subjective feeling of learning is powerful, but misleading. Superstitious learning occurs when positive results are interpreted as learning outcomes, in spite of little or no association, and the subjective experience of learning, as such, is compelling.

Erroneous inference refers to a situation, in which the organization becomes committed to a particular set of routines, and the routines are more determined by the earlier actions than by information gained from the learning situation. If a failure is experienced, the routines are changed frequently, in a fruitless search for something that

works. Due to organizational learning, also competence traps can occur. A favorable performance with an inferior procedure, leads the organization to accumulate more experience with it, and to keep the experience with a superior procedure as inadequate to make it rewarding to use (Levitt and March 1998). In practice, the organization refuses to adopt superior procedures or technology despite its availability (Liepe and Sakalas 2008).

Organizational learning also creates tension between assimilating new learning (feed forward) and exploiting what has already been learned (feedback) (Crossan et al. 1999). Feed forward processes move the new ideas and actions bottom-up, from the individual to the group, and then further to the organizational level, thus translating the ideas and actions into products, procedures, structures and strategy. What has already been learned, feeds back topdown, from the organization to the group and the individual level, thus affecting how people act and think.

Unlearning can occur as a result of the loss of memory, but often it happens as a result of learning something new, which makes old learning obsolete (Tuomi 1999). Due to learning, the amount of knowledge and skills increases. The learner needs to be able to reevaluate and challenge the current knowledge and skills and, if necessary, unlearn or discard those, which were previously held to be true or important (Hogan 2002). Superficial learning can be caused by the complexity or the lack of information (Shimizu 2007). The learning process can covert and overt political behavior, such as hiding information. This initiates finger-pointing, and valid learning will be unachievable and the morale of the entire organization may be torn down.

Individual learning and organizational learning are similar in a way, that they both involve the same phases of information processing: collection, analysis, abstraction and retention. Organizational learning involves also an additional phase, dissemination, i.e. the transmission of information and knowledge among the different persons and organizational units (Popper and Lipshitz 2000). Kim (1993) claims that, in the early stages of an organization's existence, organizational learning is synonymous with individual learning. Learning in the individual and the group level dominate, because of the organization's small size and open communication, and because the formation of the organization is based on the common interest and dreams (Crossan et al. 1999). As the organization matures, the individuals begin to fall into patterns of interaction and communication. The organization attempts to capture the patterns of interaction by formalizing them.

Individual learning is also emphasized in an organization, if there is gap between what the organization needs to do, and what is has learned to do (Kim 1993). The gap can be caused by, for example, a change in the business environment. In such situation, the organization places more reliance on the individual learning and initiative. However, it takes time to transfer learning from the individuals to the organization. As the environment changes, the transferred learnings may not fit the context. Investment in individual learning may become stockpiled, if the organization has a limited capacity to absorb learning. The individuals may become frustrated and disenchanted, and may even leave the organization.

2.2.3 Knowledge acquisition, sharing and distribution

The organizations are looking for the opportunities to transform themselves with the new ideas (Leonard and Sensiper 1998). They want to stimulate the development of the new ideas, and to motivate their members to become more responsive to the changes. Innovation is predicted based on the ability to integrate new information with existing knowledge, to create something new.

The organizations *acquire new knowledge* through the process of congenital learning, experiential learning, vicarious learning, grafting and noticing (Jashapara 2004). Congenital learning is learning influenced by the founding fathers of the organization. The inherited knowledge can affect the way the organization acts and interprets new knowledge. Experiential learning is acquired from the direct experiences. Experiential learning is discussed more in the Chapter 2.2.4. Vicarious learning adopts imitation or mimic of other organizations, e.g. by benchmarking. Knowledge can be acquired by grafting, or by employing new members with the knowledge and skills lacking in the organization. The organizations also acquire new knowledge through intentional search and unintentional noticing behaviors.

Knowledge sharing refers to the activities through which knowledge is exchanged among the individuals or the groups or the organizations. The goal of knowledge sharing is either to create new knowledge by differently combining existing knowledge, or to become better at exploiting existing knowledge (Christensen 2007). Better and purposeful sharing of useful knowledge translates into accelerated individual, group and organizational learning and innovation (Riege 2005). However, the main challenge in the organizations' knowledge sharing practices, is to protect and maximize the value

derived from tacit knowledge held by the employees, customers and external stakeholders.

Shared knowledge can be both explicit and tacit. Tacit knowledge cannot be taught, trained or educated, it can be only learnt (Haldin-Herrgard 2000). To learn tacit knowledge, it requires active contribution of the learner, and the learning process takes time. Those organizations, which excel in tacit knowledge sharing, will also enhance their members' decision making skills and personal development (Saban et al. 2000). The more people work together and the more time they spend socializing and casually talking about their experience, sharing anecdotes and impressions of each others experience, the more tacit knowledge they will share (Edmondson and Nembhard 2009). Tacit knowledge is usually shared by observation, participation or combination of them (Haldin-Herrgard 2000). Direct observation increases potential to act in a similar situation, and it is a basis for imitation. If observation is combined with narrations, it is possible to get additional explanations regarding the actions. Experimentation and comparison allow comparing the person's own performance to the expert's. In joint execution, the more experienced person can help the less experienced one, by offering hints to improve the performance (von Krogh et al. 2000).

One important aspect of tacit knowledge sharing is apprenticeship. Apprenticeship is all about sharing knowledge, through nonverbal personal practical experience of the apprentice, who is carefully monitored by the master (Mladkova 2007). The process is slow, and it is based on some social obligation, which entails both parties to cooperate. The apprentice is obliged to learn, and the master is obliged to pass on his knowledge. The same process is replicated to the mentoring and coaching processes in the current organizations.

Some authors (e.g. Nonaka 1994) think that tacit knowledge needs to be made explicit for sharing, thus making codification an essential step in leveraging the value of knowledge in the organization. Knowledge codification allows knowledge to be accessed and used by some others, sometime in the future, and it is not dependent on the personal networking (Newell and Edelman 2008). Tacit knowledge can be made to be more explicit also by building models (Davenport and Prusak 1998). Explicit knowledge can be shared through oral communication, and codification gives permanence to knowledge, which may otherwise exist only inside an individual's mind. Documents or manuals facilitate the transfer of explicit knowledge to other people, and helps others indirectly experience the experience. Nonaka (ibid) also claims that it is easier to convert explicit knowledge to tacit, if knowledge is verbalized and

documented. This helps the individuals internalize what they have experienced and enrich their tacit knowledge.

Structured explicit knowledge needs to be evaluated and made accessible to the individuals, who can do something with it, to benefit the organization. However, this increases the risk that knowledge will be copied by other (competing) organizations (Lubit 2001). The challenge is to codify knowledge, and still leave its distinctive attributes intact. The codification structures change as rapidly and flexibly as knowledge itself. The codification process is generally limited to locating someone with the needed knowledge, pointing the seeker to it and encouraging them to interact. Stories and rhetorical strategies provide the richest and most flexible approach to this task (Davenport and Prusak 1998).

Bartol and Srivastava (2002) identified four major mechanisms for the individuals to share their knowledge in the organizations. The individuals contribute their ideas, information and expertise to the organizational databases. Usually, the shared knowledge is first recorded and then validated, before it becomes part of the database. Sharing knowledge in formal interactions within, or across, the teams or the work unit, could take place when the teams or the departments hold their periodic meetings. Informal knowledge sharing includes informal coffee table or water cooler chats. This communication is usually not recorded, and the contributions of knowledge are based on the premise of social exchange. Another option is to share knowledge within information communities, in which the individuals can communicate on topics of their interest in a non-routine, personal and unstructured way. The idea of the communities of practice is described later in Chapter 2.3.1.

The organizations want to be able to transfer knowledge and routines, which they have found to work well, to the other parts of the organization. *Knowledge transfer* means identifying existing and accessible, i.e. explicit, knowledge, and then transferring and applying this knowledge to solve specific tasks better, faster and cheaper than they would otherwise have been solved (Smith et al. 2007). The goal is not to generate new knowledge, but to reuse what others have already learned. Therefore, the process of knowledge transfer is more like knowledge re-creation. The transferred knowledge should be seen as a source of inspiration and insights for the local operation, not as a direct order to be followed.

Knowledge transfer matters most when knowledge creation and knowledge utilization are separated in time and place. The transfer highlights the role of the organizational communication and the nature of the internal political environments, which may aid or

hinder communication (Jashapara 2004). Also, the technological aspects of the knowledge storage and retrieval, as well as, the social capital aspect, such as the relationships between the employees, will have an impact on the knowledge transfer processes in the organization. Most knowledge transfers takes place informally between the individuals (Smith et al. 2007). This implies that the effectiveness of the knowledge transfer is largely dependent on the factors which encourage or inhibit the interpersonal relationships.

The process of knowledge transfer can be divided into three phases: preparation, transfer and integration. The process is described in Figure 6.

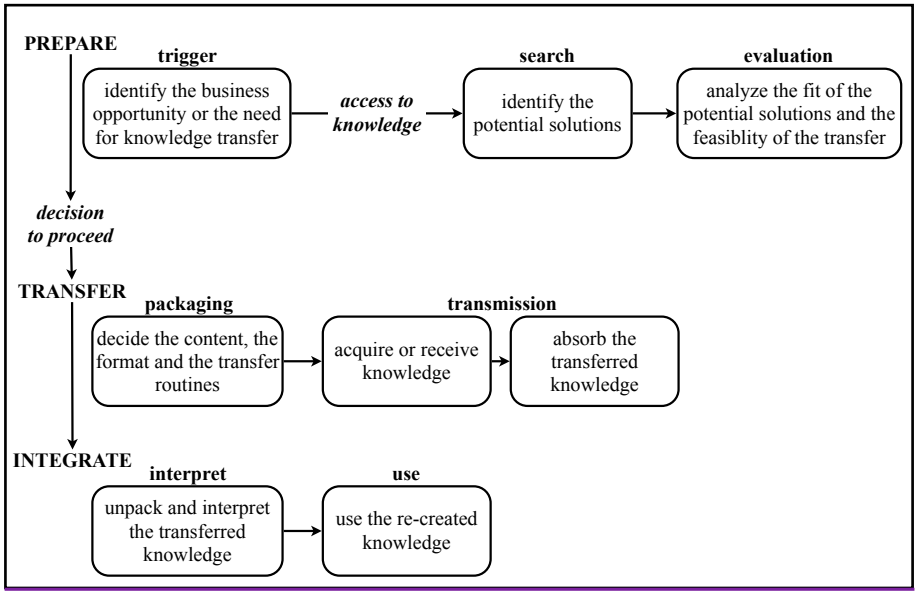

Figure 6 Knowledge transfer process
(based on Szulanski 1996, Davenport and Prusak 1998 and von Krogh et al. 2000)

The knowledge transfer process begins when both the need and the knowledge to meet that need, coexist in the organization. The first step is to trigger the process, through the recognition of the business opportunity or the need (Szulanski 1996). Those who have created knowledge, must come to the attention to those, who need knowledge (von Krogh et al. 2000). The discovery of the need, may trigger the search for the potential solutions. Alternatively, the discovery of a superior knowledge, may reframe as dissatisfaction in a hitherto satisfactory situation. The discovery may be followed by a more focused inquiry into how those superior results are obtained.

Once the need and the potential solutions are identified, the fit of the potential solutions and the feasibility of the transfer is explored (Szulanski 1996). The potential recipient must be evaluated across the five critical contextual variables: culture, strategy, decision making structures and processes, environment and technology as well as operations

(Dinur et al. 2009). Units with the high level of similarity across the contextual variables, should be chosen for the transfer. The similarities in the contextual variables will raise the probability that the knowledge transfer is completed without any major problems. The actual knowledge transfer begins with the decision to continue. Then, the sender and the receiver need to decide, what explicit knowledge is transferred. Also, the format of storing the knowledge, as well as, the knowledge exchange policy are decided. In the transmission phase, the recipient acquires knowledge or knowledge is sent, or presented to the recipient, and the receiving person or group absorbs the transferred knowledge (Davenport and Prusak 1998).

The seventh step in the knowledge transfer process, is interpreting the transferred knowledge by re-creating it at the local level. Re-creation includes unpacking the transferred explicit knowledge, interpreting what is seen, and sharing tacit knowledge about the observations (von Krogh et al. 2000). Then, the transferred knowledge is ready for use. At first, the recipient is likely to use the new knowledge ineffectively, but he gradually improves the performance, ramping up towards a satisfactory level (Szulanski 1996).

The organizations commonly use four mechanisms to foster the knowledge integration (Sarin and McDermott 2003). The rules and the directives aim to convert tacit knowledge to explicit knowledge, which can be understood by others. Sequencing means directing the integration of knowledge, through controlling the order in which the individuals interact. Routines are a series of repeatable activities and patterns of responses, created and implemented to specific situations or tasks. Group problem solving means coordinating the problem solving activities, through interaction.

Especially, the organizations are interested in transferring *best practices* to, or within, the organization. Best practice is any practice, knowledge, know-how or experience, which has proven to be valuable or effective within one organization or organizational unit, and which may have applicability to other organizations or organizational units (O'Dell and Grayson 1998). Many organizations pursue knowledge and best practices by benchmarking. O'Dell and Grayson (ibid) describe benchmarking as a process of identifying, understanding and adapting outstanding practice from an organization. Internal benchmarking focuses on knowledge and practices inside the own organization. External benchmarking seeks to find useful knowledge and practices from other organizations.

When engaging in best practice transfer, the organization attempts to take knowledge from one context, and replant it in a new, different context at the recipient (Szulanski

1996). The effective transfer of the best practices, can help the organizations identify and replace poor practices, raise the performance of the poor performers closer to the level of the best performers, and avoid reinventing the wheel. Also, it can minimize the rework caused by the poor methods, thus help saving costs through better productivity and efficiency, and improve services to customers.

Much of the best practice knowledge is tacit, held in people's heads, and not always easy to document. Common ways of sharing best practice knowledge include communities of practice, improvement groups or quality circles, in which a team within the organization meet regularly to discuss the ways of improving a process (Reddy and McCarthy 2006). Tacit best practices can also be transferred by assigning key members from a successful team to a new team, or keep the members of the successful team together and assign them as a whole team to a new task (Brady and Davies 2004). The individuals with valuable knowledge and experience, can be acting as consultants in new teams. Best practices can be shared also in visits to the other organizational units or to an organization with good performance, or organized learning events (Dinur et al. 2009). For example, share fairs bring people together to share specific knowledge and experience. Also, job exchange is an efficient was to share best practices.

In reality, transferring best practices is difficult to do. Szulanski (1994) found out that a practice would linger unrecognized for years in the organizational level. Even, when it was recognized, it still took more than two years, on average, before the other organizational units began actively to try to adopt the practice, if at all. The author (ibid) found out that the biggest barrier to the transfer of the best practices, was ignorance on both ends of the transfer. Neither the source, nor the recipient, knew that someone else had knowledge they required, or someone would be interested in knowledge they had. The second biggest barrier was the absorptive capacity of the recipient. The recipient had neither resources, nor enough practical details to implement the better practice he was aware of. The third reason was the lack of the relationships between the source and the recipient of knowledge. A credible and strong personal tie, which would have justified listening to or helping each other, was missing.

The best practices in the explicit form, can be transferred in short-term visits, IT based mechanism, manuals and technical trainings (Dinur et al. 2009). However, getting the best practices into the explicit format, is not easy. Smith et al. (2007) claim that people do not want to take time to write down what they have done, do not want to use the materials made available to them, or do not want to copy the work of others. The individuals fear of losing superiority, arising due to ownership of that knowledge, because of a perception of not being adequately rewarded for the knowledge sharing

action (Szulanski 1996). Even if the best practices are documented, the documents may not be helpful. The documents leave out mistakes and mishaps, from which people might learn (Kleiner and Roth 1997). Also, they exclude the hidden reasoning and struggling, which made the visible breakthroughs possible. If the reports are made by consultants, the reports are usually aimed at the senior management, and are rarely embraced by those, who lived through the experience. Another problem related to the best practices, is their situation-specific nature, which makes it hard to evaluate the applicability of the best practice (O'Dell and Grayson 1998).

Most best practice programs combine explicit knowledge, such as best practice database, with the methods of sharing tacit knowledge, such as communities of practice (Reddy and McCarthy 2006). The face-to-face contact helps the recipient dig beneath the explicit knowledge, and gain more in-depth insights. It can also provide a two-way benefit, because the dialogue between the conveyor of the best practice knowledge and the recipient, can enrich the knowledge of both.

2.2.4 Experiential learning

Experiential Learning Theory (ELT) provides a holistic model of the learning process, and a multilinear model of the adult development (Kolb et al. 2000). ELT differs from cognitive learning theories, which tend to emphasize cognition over affect, and from behavioral learning theories, which deny any role of the subjective experience in the learning process. In ELT, learning is conceived as a process, not for the outcomes (Kolb 1984). Knowledge is continuously derived from and tested out in experience. The learner and learning involves transactions between the person and the environment.

In this learning theory, experience refers both to the person's internal state (the experience of joy and happiness) and to the objective and environmental experience (someone has 20 years of experience in this job) (Kolb 1984). Learning is a process for creating knowledge, and knowledge is a result of the transactions between social and personal knowledge, i.e. objective and subjective experience, in a process called learning. The process of learning requires resolution of the conflicts between dialectically opposed modes of adaption to the world. To learn new knowledge, skills or attitude, the individuals must be able to reflect on and observe their experience from many perspectives. They need also be able to create ideas, which integrate their observations into logically sound theories, and to use those theories to make decisions and solve problems.

In Kolb's (1984) experiential learning cycle (Figure 7), experience needs to be acted upon to be learned. The model has been used to explain individual, group and organizational learning, in a context where the process of learning is distributed in time and among people.

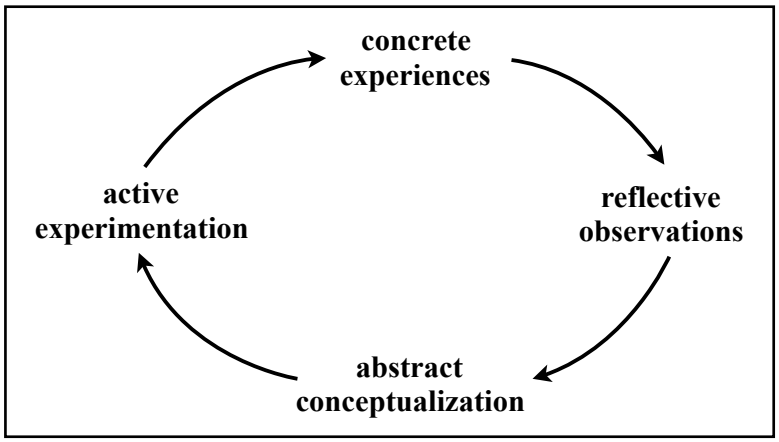

Figure 7 Kolb's experiential learning cycle (Kolb 1984)

Kolb et al. (2000) describe the four stage learning cycle as following: Immediate or concrete experience are the basis for the observations and the reflections. These reflections are assimilated and distilled into abstract concepts, from which the new implications for action, can be drawn. These implications can be actively tested, and they serve as guides in creating new experience. Ideally, the learning model represents a learning cycle where the learner goes through all the stages, i.e. experiencing, reflecting, thinking and acting. In practice, learning requires abilities which are polar opposites, and the learner must continually choose which set of the learning abilities he will use in a specific learning situation. Each dimension of the learning process presents him with a choice.

Kayes et al. (2005) claim, that the experiential learning theory provides a framework for understanding and managing the way the groups learn from their experience. The groups learn from experience, by having members who are involved and committed to the group and its purpose, and who are creating new knowledge and identifying challenges. This refers to the concrete experience phase in the experiential learning cycle. Reflective observation, in practice, means that the group members need to engage in reflection and conversation about the experience, and make observations to ensure that all the available knowledge has been addressed. To learn, the group members have to think critically about how the group works and to come up with new theories, devise plans or modes, and to explain the abstract events in a simple way. This is the abstract conceptualization phase in the learning cycle. The fourth stage, i.e. active experimentation, means that the group makes decisions, takes action and experiments

different approaches and strategies for problem solving. To learn from their experience, the group members must create a conversational space where the members can reflect on and talk about their experience together.

Even if the learner wants to go through all the four stages in the learning cycle, it may not be possible. According to Kolb (1984), not everyone can be strong in all four stages, and most people tend to develop particular strengths in one or two. If the activities are routine, ritualistic or predictable, learning has barriers in the experiencing phase (Hogan 2002). Some individuals may prefer distance and detachments, and do not want to get their hands 'dirty'. The reflection is jeopardized by poor communication, inadequate feedback systems and a fast paced and present-oriented culture. If the individual or the group emphasizes the results and the short time-scales, they may not be able to conceptualize their learnings. These individuals may discard information and models provided by the academic research, as irrelevant for them. The prescribed methods and procedures, especially in the areas of high cost of failure, prevent learners from experimenting their conceptualized knowledge.

When confronted with a new learning situation, the individual internally decides how he approaches the task, i.e. whether he wants to act or watch (Hogan 2002). He also decides what is his emotional response to the situation. These responses define the individual's learning style. Different learning styles are illustrated in Figure 8.

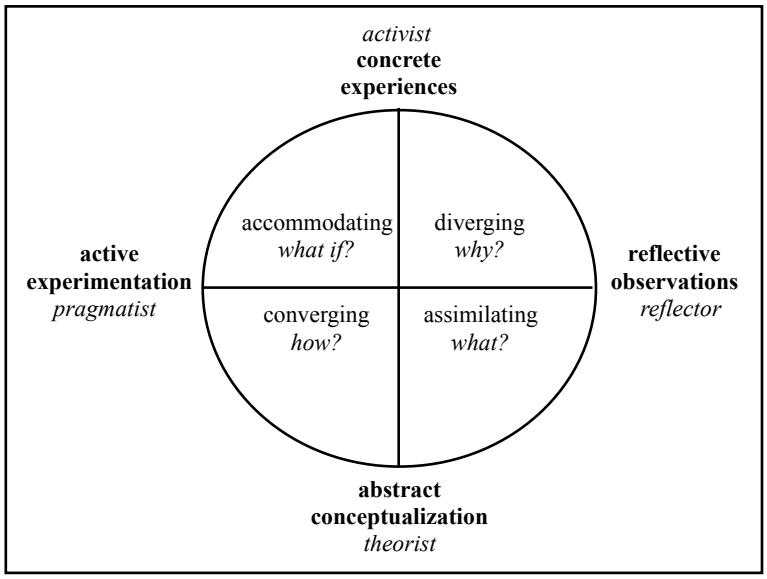

Figure 8 Kolb's learning styles
(based on Kolb 1984, Hogan 2002 and Kayes et al. 2005)

The individuals, who respond emotionally, are activists. They are enthusiastic about the new situations and jump in immediately (Hogan 2002). These persons want to try new

things. The theorists have an opposite emotional response in the learning situation. They analyze, think logical and create models, theories and principles. The pragmatists start experimenting and try out different alternatives. The reflectors prefer watching, and they ponder and need time to think the new ideas. In grasping the experience, some individuals perceive new information through experiencing the tangible qualities of the work. Others tend to perceive, grasp or take hold of new information through symbolic presentation or abstract conceptualization. Similarly, in transforming or processing the experience, some people watch others who are involved in the experience and reflect on what happens. Others choose to jump right in and start doing things.

People with the diverging learning style, are best at viewing concrete situations from many different points of view (Armstrong and Mahmud 2008). They facilitate the generation of the ideas and like to gather information (Kayes et al. 2005). The divergers are interested in other people, tend to be imaginative and emotional. They have broad cultural interests and they may have specialized in arts. In the learning situations, the divergers prefer to work in the groups, listening with an open mind and receiving personalized feedback. The assimilators are best at understanding a wide range of information and putting it into concise, logical form. The strength of the assimilators lies in the inductive reasoning and their ability to create theoretical models (Kolb et al. 2000). They are less focused on people and more interest in the ideas and the abstract concepts. These people prefer learning by reading, lectures, exploring analytical models and by having time to think things through (Kayes et al. 2005).

The convergers are best at finding practical uses for the ideas and the theories (Kayes et al. 2005). They prefer dealing with the technical tasks and problems, rather that with the social and interpersonal issues. In learning situations, the convergers prefer to experimenting with new ideas, simulations, laboratory assignments and practical applications. People learning with the accommodating style, learn primarily from the hands-on experience, and they are good at doing things (Kolb et al. 2000). They enjoy carrying out plans and involving themselves in new and challenging experience. The accomodators tend to act on gut feelings, rather than on logical analysis. They prefer solving problems in a trial-and-error manner, thus relying on their own intuition or other people for information, rather than their own analytical ability. In the learning situations, people with this learning style prefer to work with others to get the assignments done, to set goals, to do field work and to test the different approaches to complete the project (Kayes et al. 2005).

The learning styles result from the individual's preferred ways for adapting in the world. Kolb et al. (2000) claim that the individual learning styles are shaped by the educational

experience, especially in the early adulthood, their professional career choices, the current job role and the adaptive competence of matching the task demands and the personal skills. Matching the learning context and the learning style will lead to enhanced learning performance (Kolb 1984). Conversely, a mismatch between the learning style and the learning context, is likely to impede the process of learning and knowledge acquisition.

Despite the popularity of Kolb's (1984) experiential learning model, it has received also critical scrutiny. The criticism is related to the empirical validation of the theory, its instrumentation in the Learning Style Inventory[1] and the theoretical limitations of the experiential learning theory (Kayes 2002). The criticism suggests that the emphasis on the centrality of the individual's experience has come at the expense of the psychodynamic, the social and the institutional aspects of learning. The critics call for greater emphasis on the reflective practices in the learning process. They also emphasize the social activity over emotions, to counteract perceived cognitive bias in the experiential learning theory. The institutional critics propose two solutions: either to eliminate or integrate the experiential learning theories. Kayes (2002) claims that much of the criticism arises from the fundamentally different assumptions about the nature of the learning. The author (ibid) sees that an alternative approach, preserving the dialectic nature of the experience, is needed to broaden the theoretical base of the experiential learning theory.

Miettinen (2000) claims that Kolb does not give an adequate interpretation of the Dewey's original concept of the experience and the reflective thought. Kolb is describing experiential learning, but Dewey speaks about the experimental thought and action. These terms are theoretically and epistemologically quite far apart. In Kolb's model, the experience and the reflection occur in isolation, but there is the necessity for the individual to interact with other humans and with the environment, to enhance the reasoning and the conclusions. Miettinen (ibid) further argues that Kolb's learning cycle does not illustrate the fact that empirical, i.e. experiential thinking based on the actions, has limitations. Such thinking may result in false conclusions, and it may not help the individual understand and explain changes and new experiences. The empirical thinking may results in mental laziness and dogmatic thinking.

According to Jashapara (2004), one of the criticisms against the Kolb's experiential learning model is that the it ignores the learner's motivation to learn. Without the

[1] Learning Style Inventory (LSI) is a self-report instrument designed as a self-diagnostic tool for the students and the managers, to assess their learning along the four dimensions of experiential learning. LSI is out of the scope of the study.

motivation, it is unlikely that the individual will have any incentive to learn. Also, the learning model assumes, that feedback and reflection are central to the learning process. However, in many organizations, there can be a tendency to ignore the reflection stage. People do not necessarily have time to think and reflect, because they are being involved in more urgent problems and pressing deadlines.

2.2.5 Single-loop and double-loop learning

In the cognitive approach, organizational learning may be viewed as a distinction between the development of cognition and behavior (Fiol and Lyles 1985). Organizational learning as a mental process, is described by Argyris (1977) as single-loop and double-loop learning. Both learning types are illustrated in Figure 9.

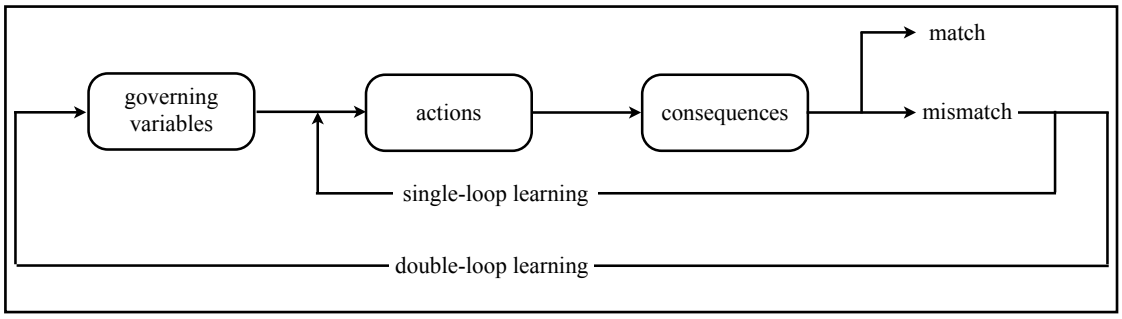

Figure 9 Single-loop and double-loop learning (Argyris 1999, p. 68)

Single-loop learning refers to a process, which maintains the central features of the organization's theory-in-use by detecting and correcting errors within a given system of rules, i.e. governing variables (Jashapara 2004). Theory-in-use refers to the ways for dealing with emotional or threatening issues in the stressful situations (Argyris 1976). Error, in this context is any feature of knowledge or knowing which inhibits learning (Argyris 1977).

Regardless of the problem, the organization is likely to act in a similar way in single-loop learning, because the governing variables in the organization are target orientation, maximizing winning and minimizing losing, as well as, suppressing negative feelings and rationale behavior (Argyris 1999). Single-loop learning can be seen as exploitation behavior (Jashapara 2004). The organization is concerned with the refinement of the existing processes, and it emphasizes the efficiency goals. This approach works well if the efficiency is the driving force in the competitive environment.

Double-loop learning occurs when the governing variables, i.e. the current organizational norms and assumptions, are questioned, to establish a new set of norms (Jashapara 2004). The organization does not continue with the old patterns, but questions their assumptions and values. The governing variables in the double-loop learning are valid information, free and informed choice and internal commitment (Argyris 1999). The goal is to produce positions, which are based on as complete valid information as possible, and to which the participants can become internally committed. Power is shared with anyone who has competence, and with anyone who is relevant in deciding or implementing the action, defining the task or controlling the environment. Also, every action is evaluated based on the degree it helps the participants generate valid and useful information (Argyris 1976). This information includes also feelings.

Double-loop learning represents exploratory behavior in the organization. The organization engages in risk taking, plays with ideas, experiments, discovers and innovates. This leads to insights about why a solution works, and it aims at adjusting the overall rules and norms, rather than specific activities or behaviors (Argyris 1977). The results have long term effects and they impact the organization as a whole (Saban et al. 2000; Liepe and Sakalas 2008). However, the outcome of the double-loop learning is uncertain.

The values in the double-loop learning are similar to the ideals in the Western society (Anderson 1997). Still, changing from single-loop learning to double-loop learning, as well as, cultivating double-loop learning is difficult (Argyris 1999). Moving to double-loop learning means that the individuals need to become aware of their present theory-in-use, and then alter them. Exposing actions, thoughts and feelings can make people vulnerable to the reaction of others.

2.2.6 4i framework of organizational learning

Crossan et al. (1999) claim that it is the individuals and the social processes and the group dynamics, through which the individuals interact, which may facilitate or inhibit organizational learning. Knowledge created by the individuals needs to be shared, actions taken and common meaning developed. Some of the individual learning and shared understandings, developed by the groups, become institutionalized organization artifacts. The 4i framework of organizational learning builds on the tension between the exploration and the exploitation in the organization, and it considers organizational learning at three levels: individual, group and organizational. However, the framework

does not elaborate on these processes to assist the organizations to find the balance between the exploration and the exploitation (Jashapara 2004).

The 4i framework contains four related subprocesses: intuiting, interpreting, integrating and institutionalizing, which occur over individual, group and organizational levels (see Figure 10).

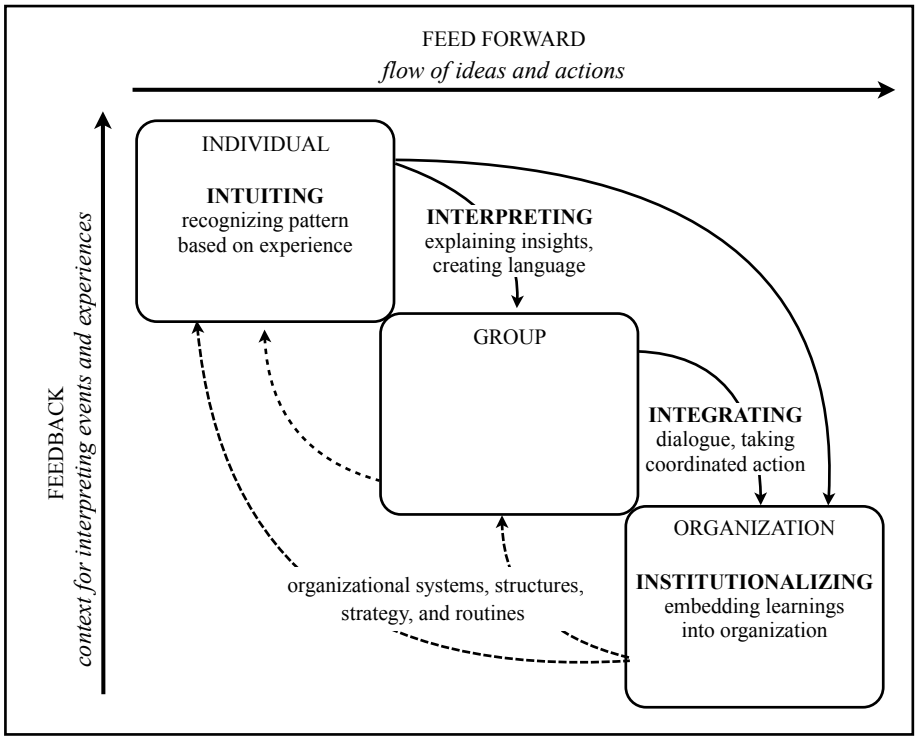

Figure 10 Organizational learning as a dynamic process (based on Crossan et al. 1999, p. 532)

Intuiting refers to the recognition of the patterns and/or possibilities, inherent in the personal stream of experience (Crossan et al. 1999). It is an individual process, which occurs in the group or in the organizational context. Organizations do not intuit. Intuiting affects the individual's action, and it can affect also other persons, if they attempt to interact with the individual. In this framework, the intuitive insights are seen as possibilities and as a beginning of new learning. The authors (ibid) have two views on intuition: expert and entrepreneurial. The expert view is related to the individual's experience and recognizing the patterns. It is past oriented and it supports exploitation (Jashapara 2004). What once required conscious, deliberate and explicit thought, no longer does (Crossan et al. 1999). Due to having been in the same, or similar situations, the expert knows almost spontaneously what to do. The entrepreneurial view on intuition is oriented to the future possibilities. It refers to the ability to make novel connections and to discern possibilities, meaning new learning.

Interpreting, in this 4i framework, means explaining the insights or the ideas to oneself or to others, through words and/or actions (Crossan et al. 1999). This process links individual and group level learning, and results in the development of language. Language enables the individuals to name and begin to explain, what originally was feelings, hunches or sensations. Language helps the individuals learn, but it also preserves, for better and for worse, what has been learned. Even high quality information may hold multiple and conflicting meanings, and the individuals will interpret the same stimulus differently. Equivocal situations are often resolved through a group interpretive process. Interpretation focuses on changes in the individual's understanding and actions. As the process moves beyond the individual and becomes embedded within the workgroup, it becomes integrative.

The integrating process links group and organizational learning. It means developing a shared understanding among the individuals, and taking a coordinated action through mutual adjustment (Crossan et al. 1999). The individuals need to able to communicate, as the process requires dialogue and joint actions. Judgement about which actions will be replicated, is made by the group. Group dialogue and story telling are seen as major tools for developing new and deeper shared understanding (Jashapara 2004). Those who have participated in the process, make mutual adjustments to their actions (Crossan et al. 1999). Eventually, the group establishes formal rules and procedures, and the routines become embedded, i.e institutionalized, in the organizational level. What becomes institutionalized in the organization, has received a certain degree of consensus, or shared understanding, among the influential members of the organization. Once something is institutionalized, it usually endures for some time.

According to Crossan et al. (1999), the 4i framework provides a context for the interactions in the organization. The embedded prior learning guides the actions and the individuals' learning in the organization. The context may facilitate and/or impede the organization's ability to reinterpret and respond to its environment. This implies that institutionalization can easily drive out intuition, as it impedes the assimilation of new learning. The rules and the routines, which once captured the logic of learning or how to facilitate learning at the individual level, may no longer apply in the changed circumstances. Still, the institutionalized learning is needed to capture the ongoing benefits of what has already been learned in the organization.

2.2.7 Theory of organizational knowledge creation

The theory of organizational knowledge creation comes from the studies of social knowledge processing. Instead of learning being the critical success factor in the organizations, Nonaka and Takeuchi (1995) argue that knowledge is the primary and the lasting source of the competitive advantage. The authors' (ibid) idea of the knowledge creating company is based on the continuous innovation through knowledge creation. The attention is directed to the socially constructed, distributed and embedded nature of knowledge, and the processes through which knowledge is created and developed (Virkkunen and Kuutti 2000). This view is close to the social constructive approach on learning, and it views learning as a social process, which emphasizes the learner's active role in knowledge creation and modification.

The idea of tacit knowledge is the cornerstone in the theory of organizational knowledge creation. Tacit knowledge covers knowledge which is unarticulated and tied to the senses, movement, skills, physical experience, intuition or implicit rules of thumb. Explicit knowledge is uttered and captured in drawings and writings. The major contribution in this theory is the SECI model (see Figure 11). The model describes the transformation process of tacit knowledge to explicit knowledge (and vice versa) to create new knowledge (Jashapara 2004). The four modes of knowledge conversion are called socialization, externalization (or articulation), combination and internalization.

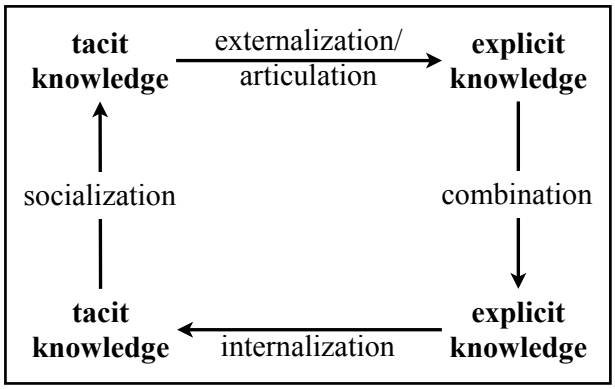

Figure 11 Four modes of knowledge conversion
(based on Nonaka 1994 and Jashapara 2004)

The socialization process allows tacit knowledge from one person to be passed to the others. Tacit knowledge can be acquired from others without using language, e.g. as an apprentice through observation, imitation and practice, or by participating on-the-job training (Nonaka 1994). The key to acquiring tacit knowledge is experience. Without some form of shared experience, it is difficult for a person to project himself into another individual's thinking process. In the socialization process, knowledge does not

become explicit and, hence, cannot be leveraged and used by the whole organization (Jashapara 2004). In the externalization (or articulation) process, tacit knowledge is articulated into explicit concepts. Knowledge takes a form of metaphor, analogy, concept, hypotheses or a model (Nonaka 1994). The expressions are often inadequate, inconsistent and insufficient, but these discrepancies and gaps between the images and the expressions help promoting the reflection and the interaction between the individuals. Externalized knowledge can be shared around the organization (Jashapara 2004).

The combination process is about combining discrete pieces of explicit knowledge, held by the individuals. The individuals exchange and combine knowledge through different media (Nonaka 1994) but the process does not expand the organization's knowledge base (Jashapara 2004). The reconfiguration of the existing knowledge, through sorting, adding, combining and categorizing, can lead to new knowledge (Nonaka 1994). Formal education and training usually takes the form of combination. Explicit knowledge is converted to tacit knowledge in the internalization process, which is closely related to learning by doing. Explicit knowledge, such as documents or manuals, help the individuals internalize what they experienced. Explicit knowledge may facilitate the transfer of explicit knowledge to other people, and help them indirectly experience the experience of the others.

The knowledge conversion can also be illustrated as a process of organizational knowledge creation (Figure 12).

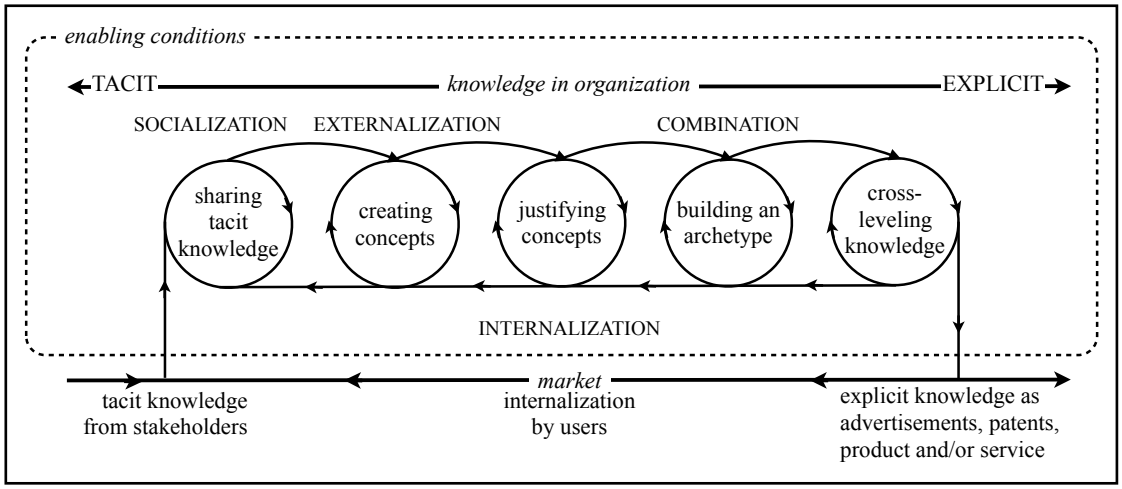

Figure 12 Organizational knowledge creation process
(based on Nonaka and Takeuchi 1995, p. 84)

The process consists of sharing tacit knowledge (socialization), creating concepts (externalization) and justifying them, building an archetype (combination) and cross-

leveling knowledge to allow internalization (Nonaka and von Krogh 2009). The outcome of the knowledge conversion are the product and process innovations, as well as, an enhanced capacity to act, define and solve problems.

The phases in the organizational knowledge creation process are influenced by enabling conditions, such as creative chaos, redundancy and requisite variety (Nonaka and Takeuchi 1995). Creative chaos is generated naturally when the organization faces a real crisis, but it can also be generated intentionally, when the leaders of the organization try to evoke a sense of crisis by proposing challenging goals. Redundancy means consciously overlapping the company information, business activities and management responsibilities. It promotes sharing of the individual tacit knowledge and enables all members of the organization to participate in knowledge creation and problem solving, based on consensus and equal preparation. The third enabler, requisite variety, means in practice, that everyone is given access to necessary information with the minimum effort. For this purpose, the organizational members should know who owns what information.

Nonaka and Konno (1998) introduced the concept of ba as a platform for the knowledge conversion. Ba is a shared space for emerging relationships. This space can be physical (office, dispersed business space), virtual (email, teleconference), mental (shared experience, ideas, ideals) or any combination of them. Ueki et al. (2011) argue that ba is a dynamic knowledge community, which generates wisdom and vision from the shared data, information and knowledge. Knowledge is embedded in ba, where it is then acquired through the persons' own experiences, or through the reflections on the experience of others (Nonaka et al. 2000). If knowledge is separated from ba it turns into information, which can then be communicated independently from ba (Nonaka and Konno 1998).

Nonaka and Konno (1998) defined four types of ba, based on the dimensions of interaction and media. The ba types correspond to the four stages of the SECI, knowledge conversions process. Originating ba is a place where the individuals share feelings, emotions, experience and mental models. It represents the socialization phase in the SECI model. Interacting ba is more consciously constructed. Selecting people with the right mix of specific knowledge and capabilities for a group, a task force or a cross-functional team, is critical. Cyber ba is place of interactions in the virtual world, instead of real space and time. Exercising ba facilitates the conversion of explicit knowledge to tacit knowledge. The internalization of knowledge can be enhanced by the use of formal knowledge (explicit) in real life or simulated applications.

The theory of organizational knowledge creation has raised much discussion. Li and Gao (2003) see that the theory succeeds in elucidating how Japanese manufacturing companies create and sustain the dynamics of continuous innovations on working process, product development and organizational adaptation. The quintessence of the theory is that the organization infuses learning and knowledge sharing consciousness into all members, and drives organizing endeavors towards the relentless exploitations of the every potential resource indwelling in the individual, the collective, the organization and the society. The dynamic organization activities, which aim at mobilizing the personal tacit knowledge, becomes a powerful engine of the incremental innovation, thus generating ensuing competitive advantage for the organization. However, if the external environment is dominated by the need for efficiency, the model of knowledge conversion does not apply (Jashapara 2004).

The theory has also faced criticism. McAdam and McCreedy (1999) suggest that the knowledge transfer in the organizations is much more complicated and convoluted than the SECI matrix suggests. According to Li and Gao (2003), the idea of SECI is derived from accounting to the product innovation activities in Japanese manufacturing industry. For the most ordinary knowledge acquiring cases, the idea of knowledge transfer works. However, knowledge transfer is not knowledge creation. Transfer relates to the emulation and continuous learning from the competitors in the market or licensed from the inventors. The competitiveness of the company is improved, not mainly via knowledge creating processes, but through continuous learning.

Tuomi (1999) notes that the role of communication is difficult to discuss within the SECI model. He also suggests that the model should be augmented by adding an element of a communally shared stock of knowledge, which makes socialization, articulation and externalization possible. The author (ibid) reconstructed the knowledge creation process to look like a learning model (Figure 13).

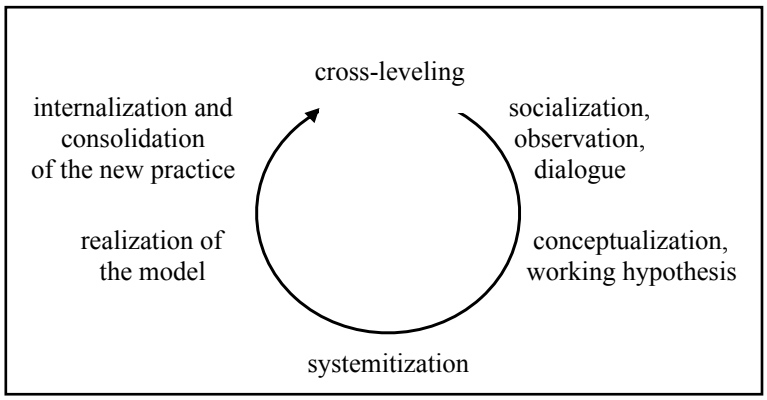

Figure 13 Nonaka and Takeuchi's SECI model as a learning model (Tuomi 1999, p. 331)

According to Tuomi (1999), the SECI model defines new knowledge as a collectively created novel design or fact, but it does not see the knowledge in relation to the social practice. Knowledge creation process is social but the result is not. The author (ibid) also rejects the idea that there are two different types of knowledge. Additionally, he argues that the SECI model does not include the concept of a motive, a need or a problem. This implies that the criterion for success in learning, comes from outside the learning process.

Virkkunen and Kuutti (2000) claim that the theory of organizational knowledge creation does not explicate and explain the relation of the knowledge processes to the productive processes in the organization. It is unclear why and what kind of knowledge is needed in the productive processes, and how knowledge is created and used in these processes. Neither does the theory explain how the need for creating new knowledge emerges and how the problem is identified. The authors (ibid) suggest that the knowledge creation cycle should be based on the phases of problem identification, solution generation and application, as well as, generalization of the solution in practice. In these phases, the cognitive content is typically represented in different combinations of tacit and explicit, individual and collective elements.

Hildreth and Kimble (2002) argue that there is a flaw in the tacit-to-explicit stage in the spiral of knowledge. They claim that if tacit knowledge is inarticulable, the stage cannot work. Augier et al. (2001) criticize the concept of ba. According to the authors (ibid), it is unclear what ba exactly is, how does it emerge and what happens inside ba.

Johnson (2002) studied knowledge creation in collaborative research and development (R&D) projects and he found out that one of the enablers for the organizational knowledge creation, the idea of creative chaos, is not generally used in the project management. Also, many collaborative R&D projects are designed to eliminate unnecessary duplication, i.e. redundancy mentioned in the organizational knowledge creation model.

2.3 Organizational groups

2.3.1 Formal and informal groups

A group is a recurring pattern of dynamic relations among people, tools and tasks (Arrow and McGrath 1995). The most basic feature of a group, which makes it

recognizable as a particular group at work, is its membership. The members of the formal group are selected by the organization, based on the individuals' unique ability to contribute to the particular task. Informal groups are spontaneously formed among the coworkers. People join informal groups, such as clubs or communities of practices, to fulfill their emotional, intellectual and other needs (Mladkova 2007). The boundary between the group and its organization defines the group's identity as distinct from the rest of the organization (Arrow and McGrath 1995). These external boundaries create the categories of the insiders and the outsiders, in-group and out-group. A group with underdeveloped boundaries, has low cohesion, a fragile identity and poor survival skills. Such a group may quickly dissolve under pressure. Further divisions may develop within the group, if some members form cliques.

Membership dynamics of a particular formal group, is strongly affected by the features of the organization which created it. Arrow and McGrath (1995) argue that the groups are apt to react differently to the member change, depending on who initiated the change, what their rationale was, and how acceptable the rational is to the group as a whole. Membership changes, negotiated jointly by the group and its external supervisors, have most positive and fewest negative effects. Member subtractions have more predictable effects than member additions. A group, which loses a member, will lose the member's contribution to the group process, whereas a group gaining a new member may, or may not, experience changes in its interaction process, depending on the level of participation of the new member. However, the loss of a few key members may have dramatic and unpredictable results on the group wellbeing, especially if the loss in unexpected.

The membership change can take a variety of forms, ranging from the temporary adjustments in relative members standing, to major changes in the group composition (Arrow and McGrath 1995). The groups which undergo substantial internal or external membership change, will experience perturbation in their habitual routines. The membership change is likely to affect member production and, in turn, group production. The change also affects the member support from the group, modifies the group interaction patterns and, hence, affects the group well-being. Changes may disrupt the efficient group functioning but, at the same time, it may keep the group flexible and better able to make the big adjustments, necessary in a time of crisis.

Arrow and McGrath (1995) divide groups into standing groups and acting groups. Most work groups in the organizations, are standing groups, which work together regularly as acting groups. A standing group exists even when it is not actively in session, and it can operate without all of its members present. An acting group consists of all persons

involved in the particular work session. Changes in the standing group are relatively permanent, and they involve the renegotiation of the group and the member identity and the boundaries. Changes in the acting group are transitory and have little impact on the established group structure. Changes in member attendance will alter the current configuration of the acting group, but in standing group, the changes will alter the basic configuration of the group.

A work group can be both an acting and a standing group, or operate as an acting group only (Arrow and McGrath 1995). The authors (ibid) divide formal work groups into three types: task forces, teams and crews. A task force is formed to address a particular project or purpose, and the life of the task force is defined by the life of the project. Usually, the task force is not the primary work group of the members. The members are not laid off when the job is done, but they return their attention to their regular jobs. For the task force, the member composition is vital. The members may be assigned primarily based on their task-relevant knowledge, skills and abilities, but still attention needs to be paid to the particular member-member matches. A team refers to a set of people with specific skills and abilities, who are provided with certain tools and procedures, and are then assigned to a project. The team is usually intended to be a long-term group, with an indefinite future. The selection of the particular people to be members of the team is significant. If the members do no get along, this may be serious barrier to the high team productivity.

A task force assigned to a product development project, is likely to have a fixed membership and infrequent traffic across the standing group boundaries. The longer the task force continues without a significant change in the membership composition, the more team like it will become. When the task force of a longer duration carry out its work, considerable role differentiation may occur. In such case, the membership change is likely to have a substantial impact, and the task force will have difficulty adapting to the change. The member's knowledge, skills and abilities which need to be replaced, are not explicitly recognized, and the norms about who does what are informal, not clearly described.

A crew refers to a group of people assigned, as the need arises, to an existing set of tools, designed for a specific purpose for a given time. The crew structure is determined in advance by a clear role or position assignment, and the relations between the members require minimal development. People may be assigned to a work crew as though they were interchangeable. The relations among the members are primarily defined by their function in the group. The crew is designed to withstand a constant substitution of the members, and the well-articulated and explicit task definitions

provide the basis for adapting to this change. The status positions are fixed, and it is not easy for the crew members to move between them.

An *informal group* consists of people, who establish the relations among themselves, and then take up projects and tools as needed (Arrow and McGrath 1995). In communities of practice (CoPs), the different patterns for the participation develop over time, and they can either facilitate or constrain expansive learning in work (Desouza 2003). Acquiring access to participate in the activities and the interactions, can depend on several interacting factors, varying from the way the work is organized to more interpersonal relationships. However, the physical proximity is a good predictor of the friendship ties, and the membership of a informal group may overlap with membership of a formal work group (Arrow and McGrath 1995).

In informal networks, people trust each other, share voluntarily knowledge and insights with each other, and collaborate actively and willingly. The individuals exchange ideas and share narratives in informal settings more readily, thereby building a shared understanding out of the conflicting and confusing information (Desouza 2003). Although, Gustavsson (2009) argues that communities of practices (CoPs) are not as harmonious as the seem, because of the power and the hierarchy. More active CoP participants tend to gain more access to various learning situations than the passive participants.

The communities of practice (CoPs) differ from the project teams in that, the participants roles are not formally assigned nor defined regarding the CoP's tasks (Wenger and Snyder 2000). The CoPs can create value by providing their members access to ideas, knowledge and best practices shared among the community members, thus increasing the members' job performance (Hemmasi and Csanda 2009). According to Wenger and Snyder (2000), the CoPs' progress is measured by the quantity of the practices, developed and exchanged within the CoPs, which enable the organization to improve its performance. The project teams may cease existing once they have achieved their initial objectives but the CoPs will not. The CoPs last as long as their members continue to find the communities beneficial for the cultivation of the business relations, which meet their professional needs (Probst and Borzillo 2008).

The communities of practice (CoPs) are vulnerable, because they lack the legitimacy and the budgets of the formal groups. Usually, successful CoPs are found in an organizational context in which the experts enjoy total freedom regarding network collaboration across their respective units (Probst and Borzillo 2008). The authors (ibid) claim that a failing CoP usually lacks a group of the core members, who actively engage

in the activities. The members rarely contact one another regarding the practices which they use in the respective units, or to help one another solve common problems. The reluctance to learn from others, impedes the members' capacity to absorb new competences. In a failing CoP, the members do not view participation as meaningful for their daily work. They do not perceive the other members as their peers, who could assist them with useful knowledge and practices. Also, the practice intangibility can cause a CoP to fail. Practice intangibility occurs when the members fail to engage with one another in a way, which allows them to illustrate the practice, to make it concrete enough for other members to understand and visualize its function.

Some authors have compared the concept of ba with the concept of the communities of practice (CoPs). Ueki et al. (2011) argue that a CoP is a place for learning, and ba is a place for knowledge creation. The CoP is a living place, where the members learn knowledge, which is embedded in the community (Nonaka et al. 2000). Learning occurs in every CoP, but ba needs energy to become active. The boundary of the CoP is firmly set by the task, the culture and the history of the community. Consistency and continuity are important for the CoP, because it needs an identity. However, the boundary of ba is fluid. It can be changed quickly, because the boundary is set by the participants. Ba has a 'here and now' quality and it is constantly moving as it is created, functioning and disappearing according to the need. In a CoP, the changes mainly take place at the individual level, as new participants learn to be full participants. In ba, the participants change both themselves and ba itself. The membership of the CoP is fairly stable and it takes time for a new participant to learn about the community. The membership of ba is not fixed and the participants come and go. The members of the CoP belong to the community and the participants of ba relate to the ba.

Both formal and informal groups can operate virtually. *Virtual teams* are temporary, communication mediated formal work groups, and they often consist of members, who have diverse backgrounds and areas/levels of expertise (Sarker et al. 2005). The remote members in the virtual team may have a history of working together, and there is no universally adopted hierarchical status of the members, because of the temporary and diverse nature of the team membership. Also, the social cues, traditionally associated with competence and reputation, are filtered out in the electronic communication channels.

A *virtual community of practice* (VCoP) is a community where the members share and co-create knowledge in online discussions and other format of knowledge exchange (Ardichvili 2008). Ardichvili et al. (2003) argue that the VCoP's are based on the prior personal networks, and the participants know what to expect from the community

members. This separates the VCoPs from the virtual teams, which also operate with online tools. Virtual teams are created by the organization to achieve specific goals. Wenger et al. (2002) claim that the geographical distance creates problems for the distributed communities, because the members do not meet by chance and the face-to-face contact is rare. It takes time to build the virtual informal network, because the participants are often from different cultural and organizational backgrounds. The authors (ibid) also suggest that trust building in the virtual communities is unlikely. However, Gammegaard and Ritter (2005) argue, that the use of the electronic communication technology can raise the frequency of the contacts among the individuals, and increase the opportunity for dialogue among the organizational parts, which otherwise would not be in contact.

2.3.2 Projects and team working

In this study, the focus is on the project teams, operating in a multi-project organizational setting. An increasing number of the organizations use projects and team working to achieve the defined strategic objectives, and to adapt to the changing business environment. Project work confers a relatively high degree of decision autonomy and discretion on those performing the specific tasks (Swan et al. 2010). The characteristics of the project work include temporary nature, specific end-result, non-recurrent character, complexity and significance (Koskinen et al. 2003). The projects' goals are not always clear at the outset of the work. Also, the means and the procedures needed during the project implementation are often unclear, and the possibilities to foresee the future results and the success of the project, are rather poor.

The project team performs tasks, which require interdependence between the members (Rasmussen and Jeppesen 2006). Each member is given an equal responsibility and power to solve the problems (Argyris 1999), but the project manager has the full authority and the responsibility for the completion of the project (Koskinen et al. 2003). According to Argyris (1999), the members are expected to work as a cohesive unit and once the problem is solved, that team is given a new assignment or disbanded. If the problem is a recurring one, the project team remains active.

Edmondson and Nembhard (2009) argue that the popularity of the teams is due both to the interdisciplinary nature of the work, and to the industry trends, which require fast-paced schedules. According to the authors (ibid), two related trends have increased the need for teamwork in the new product development. First, knowledge and expertise

evolve rapidly, which requires people to invest considerable time just to stay current. The professionals need to collaborate to carry out the integrative development projects, because the explosion of new knowledge in the technical fields have led to a greater specialization. Technical knowledge and specialized jargon make it difficult to keep up with other fields of inquiry. Second, the shorter product life-cycle is reducing the lead time for getting a new product to the market. The work on related tasks has to be coordinated and negotiated.

A number of theoretical arguments have been developed to explain why teamwork may lead to improved organizational performance. According to Delarue et al. (2008), some theories focus on the effort and the motivation of the individual workers, and claim that people work harder in the teams. The group dynamics can also play a role: the team members may feel stimulated by working together, towards a common goal.

Teams are introduced for various reasons:

- to simplify the organizational structure, and to reduce the need for coordination (Delarue et al. 2008)
- to reduce administration costs and salaries for the middle level managers
- to reduce repetitive tasks, to strengthen job rotation, and to increase employee autonomy
- to stimulate employee commitment, and to facilitate creativity and innovation (Rasmussen and Jeppesen 2006).

The implementation of the teamwork can also be seen as part of a participatory strategy in the organization.

The employee acceptance of the team working and other workplace initiatives, requires employment security (Bacon and Blyton 2003). For many employees, teamwork is associated with certain positive changes, such as increased skill, variety and influence over quality. Working in teams includes broader jobs and devolved responsibilities, but it also increases the amount of training to facilitate those changes in responsibility. People working in teams are observed to have more responsibility and autonomy. The variety of the tasks in teams encourages the members to learn and use different skills, and to rotate between the jobs to reduce the boredom of the repetitive work. According to Rasmussen and Jeppesen (2006), the team members' job satisfaction is related to the perceived discretion and employment security, team efficacy, organizational commitment, team interdependence, as well as, information, training and resources in the organizational context.

Teamwork does not automatically lead to growth in the organizational effectiveness and the employee well-being and motivation (Rasmussen and Jeppesen 2006). It can also be associated with negative outcomes, such as strain, lower cohesiveness, uncertainty, lower job satisfaction and turnover. Bacon and Blyton (2003) note that team working can also be seen as a mechanism of increased control. Heightened peer pressure leads the team members to be more active in their own work intensification, and to develop normative rules to monitor their own behavior in the team. Rasmussen and Jeppesen (2006) argue that the outcome of teamwork may be in part dependent of the context, in which the teamwork was introduced (e.g. restructuring or downsizing the organization), the leadership style and the individual factors, like personality and educational level. The employees with different occupational backgrounds and hierarchical levels have differential experience (Bacom and Blyton 2003). Working as a team may exacerbate existing differences and create even more marked polarization of the job experiences.

In a *project-based organization*, the organizational tasks are performed in parallel projects (Eskerod 1996). The competition between the projects allows the organization to respond quickly changes in the environment. One project can be stopped to allow the other, more important projects to be carried out. As several projects are being performed simultaneously, the need for planning and control are obvious (Zika-Viktorsson et al. 2006). The projects have to be selected and placed carefully to fit neatly with each other (Eskerod 1996). In the project portfolio management, the projects are linked to the organization's strategy (Elonen and Artto 2003). The objective is to maximize the value of the portfolio, as well as, to balance the portfolio.

From the managerial perspective, the multi-project organizational setting is characterized by the competition of the resources (Kaulio 2008). Usually, the employees are working in more than one project at the time. From the employee point of view, the work entails a complicated situation characterized by tight schedules, multitasking, increased coordination expenditures and a large amount of set-up time, when alternating between the tasks (Zika-Viktorsson et al. 2006). Sharing time between several projects, may result in perception of work as disrupted and fragmented, in elevated levels of time pressure and fewer opportunities for recuperation between the periods of intense and strenuous work. Also, sharing time between many projects decreases competence development and improvements in work routines. However, multi-project setting can provide opportunities for increased learning and a rich work content.

Problems in the multi-project organization arise, when the project members perceive the given situation as a win/lose game (Eskerod 1996). The relation between the projects could be often be characterized by competition, thus leading to sub-optimization and an

insufficient level of knowledge exchange, caused partly by the intense pressures, i.e. there is no time to learn from the others, and partly because the competitive environment does not stimulate coordination. At the individual level, the project members are engaged in allocating efforts to the various projects, in attempt to satisfy many, different project managers at the same time (Zika-Viktorsson et al. 2006). Project overload makes the individuals less able to focus on specific work items in a way that makes them efficient. It may have negative impact on both well-being and personal development.

2.3.3 Learning in projects

Projects are found to be rich and fertile sites for learning, and the individuals will learn a lot while being assigned to challenging and varied projects (Goffin et al. 2010). Especially in the new product development, the projects generate a vast amount of knowledge on the organizational processes, as well as technical knowledge on the products. The project work generates learning through the intensive integration of the different forms of knowledge, within a novel or uncertain and temporally bounded task setting (Scarbrough et al. 2004). Learning significantly enhances the project team's ability to innovate and faster bring products to market (Sarin and McDermott 2003). Also, unlearning is critical, because many pieces of knowledge, intuitions and opinions depend on the assumptions about the world, which are simply no longer true.

Project based learning encompasses intra-project learning (or exploration) and inter-project learning (or exploitation). Inter-project learning refers to the attempts to capture and transfer the experience and insights of the participants in the learner project, to the subsequent project teams, which can benefit from them (Brady and Davies 2004). Goffin and Koners (2011) claim that it can difficult to capture and share lessons learned across the projects. Lessons learned is any form of knowledge, gained from the direct experience, successful or otherwise, to improve the performance in the future (Jeon 2009). It is learned on the specific situations in the business operations, which exist in the organizational boundary. Each project goes through its own cycle of intra-project learning to solve problems, rather than exploit knowledge, which is already potentially available in the organization Goffin and Koners 2011).

Even in the project-based organizations, there seldom are any organizational mechanisms for the knowledge acquired in one project, to be transferred and used by the other projects (Prencipe and Tell 2001). Knowledge from project to project flows

through direct and detoured transfers (Jeon 2009). The mediums of direct transfers are mainly employees, who directly move to the next project with knowledge achieved from the previous project. Detoured transfers occur through several different mediums, e.g. knowledge repositories, company manuals, training programs, work processes and employee minds. The mediums of detoured transfers can function either has a knowledge losing hole, or as a value adding mechanism.

According to Zollo and Winter (2002), when compared to organizational learning, project based learning is distinctive in several respects. The project practices tend to be non-repetitive, time-bound and often loosely coupled to multiple organizational contexts through subcontracting or supply chain relations. They are also linked to the specific nature of each new task and to the composition of the project team. Due to the context dependency, project-based learning is difficult to transfer to other projects or to the organization (Scarbrough et al. 2004). Consequently, learning in the projects only occasionally leads to the organizational learning (Swan et al. 2010). At end of this subchapter, the author of the study provides an example how project learnings can be incorporated in the organizational level.

When a project finishes, there is a risk that knowledge created and experience gained during the project work, will be lost (Brady and Davies 2004). The project team is dissolved and its members move on to other projects, or are reabsorbed into the organization, and they have little time or motivation to reflect on their experience and to document transferable knowledge. Unless the lessons learned, especially related to the project management experience, are communicated to the subsequent projects, there is a risk that the same mistakes will be repeated (Busby 1999). Also, sharing learnings helps people understand the widespread effects of their actions and each other's work (Lubit 2001). Lessons learned are volatile regarding time. Therefore, it is important to capture, store and use them in a timely manner (Jeon 2009).

Much of the projects' learning is tacit in nature, and it is difficult to articulate, capture and disseminate (Newell and Edelman 2008). Written reports capture the explicit knowledge, thus failing to convey much of the key learnings from the project teams. Codifying knowledge facilitates the sharing of learnings within the project team, and provides an opportunity for sharing the lessons learned across the projects. However, the effort to reduce tacit knowledge nearly always skews knowledge and separates it from its vital context. Much of the key learnings, generated by the project teams, is lost even when the databases are used (Goffin et al (2010). Learnings are often inaccurately captured, and the context relevant to the learning, is too often captured incompletely, inaccurately, or not at all (Wellman 2007). For example, Goffin et al. (2010) noted that

lessons, which are discussed using metaphors and stories, will not be included in the reports. They might be hard to distill into a written report, not being considered serious enough, or considered to be too hard for others to understand. Therefore, the organizations should focus on stimulating individual learning and running *project reviews* to generate and transfer tacit knowledge. Everyone benefits from reviewing past activities and decisions, to learn what worked, what did not, what can be changed and what must be managed (Jeon 2009).

According to Busby (1999), the project reviews should be conducted because people do not always learn automatically from their professional experience. The learning process needs to be prompted and structured, to be meaningful and useful for the project teams. The experience and the lessons learned need to be captured from several people, before it can be disseminated to other projects. Goffin et al. (2010) see that the way the project reviews are facilitated is crucial. An experienced facilitator can create the right atmosphere and guide the discussion.

The project reviews can be structured chronologically or by categories (Busby 1999). Even though, the intended structure of the reviews is easily sidetracked. The participants move often from one topic to another, because they realize that the another topic is more important. The review participants learn by dialectical argumentation, event replay and mental simulations. The argumentation reflects the fact that there are several sides to an event, and no one person has enough information to consider all sides of the argument. Event replays help infer why things happened the way they did. Mental simulations are similar to the replay, but they involve hypothetical events.

Newell and Edelman (2008) found out that the project reviews are clearly important as a precursor to knowledge codification, but mere knowledge articulation alone appears to be insufficient. The project reviews do not always happen in a systematic manner, despite the formal process, because of the time pressure and perceptions that such reviews and forums are a distraction to the project work. Also, insufficient time or motivation, the lack of standard project review method, or not having useful or helpful reviews in the past, affect the reviews (Anbari et al. 2008). Additionally, the projects fail to learn because the output is not used correctly (McAvoy 2006).

McAvoy (2006) found out that the hierarchical groupthink is having a detrimental effect on the project team's view of the project reviews. The group think appears to be directed by the project manager, and it has a negative impact on the group members' desire to conduct or to be involved in the project reviews. Busby (1999) notes that the review participants tend to overemphasize the role of the environment and

underemphasize their own involvement when explaining the results. There is a strong tendency to explain problems by referring to other parties. The author (ibid) also suggests that the review participants are too narrowly specific in their diagnoses and miss the bigger problems. This results in an incremental learning, i.e. learning by small revisions to current knowledge, which can lead to inability to react to large changes in the environment.

Another unfortunate characteristics of the project reviews, is the absence of the deep diagnosis. The participants prefer causal reasoning to diagnostic, and are reluctant to ask others for diagnoses. Busby (1999) recommends inviting outsiders to the project reviews to assist in dissemination of the learnings. He did not find evidence that the presence of the outsiders (like a manager from a new project attending the review) inhibit the review work. By attending the review, the outsiders are able to obtain profound understanding of what had succeeded and failed in the project. They also see the reasoning that lead up to the conclusions, and get a sense of the project context.

The project reviews also have potential drawbacks. They are time consuming, can be embarrassing and potentially damage the social and the project team relationships. Some people reject the reviews because they believe that their professional experience, as such, is sufficient to acquire lessons learned from the project. There is also a tendency to underestimate the knowledge transfer function of the project reviews. Therefore, the project reviews require commitment from the organizational leaders, to include the process into organizational routines.

Schindler and Eppler (2003) divide project reviews into process-based and documentation-based methods. The process-based methods are summarized in Chart 3 and, of them, the Post-Project Appraisals are presented in details. Documentation-based methods (Chart 4), and especially the learning histories, are presented later in the chapter.

The Post-Project Appraisals (PPAs) and the After Action Reviews were created to record experiences, and to foster project learning. The project reviews and audits, as well as, postcontrol, focus on the status analysis of the projects.

Chart 3 Process-based methods for project reviews
(based on Schindler and Eppler 2003, p. 222)

parameter	method			
	project review/audit (walkthrough)	**postcontrol**	**Post-Project Appraisal**	**After Action Review**
origion			British Petroleum	developed by U.S. Army; used by British Petroleum
purpose	status classification, early recognition of the possible hasards; team-internal focus	delimitation/in addition to a more formal project end, which focuses on the sole improvement of the future projects' goal conformity	learning from mistakes; knowledge transfer to third parties	learning from mistakes; knowledge transfer inside the team
benefits	improvement of the team discipline; prevention of the weak points and validation of the strategies	formal document as a result; considers the project aims, goals, milestones, checkpoints, budget goals; contains evaluation of the project results, as well as, the recommentations for the future improvements	best practice generation for the large-scale projects; improvements of the forecasts and proposals	immediate reflection of the own activity to improve the future action
timing	after the project completion, or in the course of the project	exclusively at the project's end	appr. two years after the project completion	during the work process
carried out by	review: moderators audit: project external people	project manager	external PPA unit, project homework group	facilitator
participants	project team and third parties involved in the project	project manager (inclusion of the project team is not neglected)	project team and third parties involved in the project	project team
interaction	face-to-face meetings	non-cooperative form of recording experiences and analyzing them	document analysis; face-to-face meetings	cooperative team meeting
knowledge codification and transfer	partly in reports; usually no predefined circulation with knowledge transfer as a primary goal (except predefined distribution lists)		both general and personalized booklets	flip charts

Gulliver (1987) describes the Post-Project Appraisals (PPAs) in British Petroleum (BP). The PPA unit examines the thinking behind the selected investments, as well as, their management and results. The unit mission is to help the BP worldwide learn from the mistakes and repeat its success. The PPA unit members have no affiliation with the projects they appraise. The unit is a centralized department, and it can transmit information from one site to another. The evaluations are seen more objective than project reviews, which are completed by the project personnel. Also, the lessons identified by the PPA, will reach the people who need them most. The unit selects carefully the projects for the appraisal and it does not investigate a project if its lessons will duplicate those drawn from a previous appraisal. Nor does it evaluate a project that the BP is unlikely to do again. The PPA process is described in Figure 14.

Each appraisal is approved by a corporate review committee. During a 6 months time, the PPA team examines the selected project, from its conception, usually until two years after it has become operational. The team tries to determine systematically how the project was handled, and the important factors which contributed to the project's problems or success. The PPA team tries to interview everyone involved in the project. Usually, the project has ended two years prior the PPA team starts its investigations, so not all the project members are available for the interviews. Full reports are collated into three booklets, which information the project planners are expected to use when writing new investment proposals.

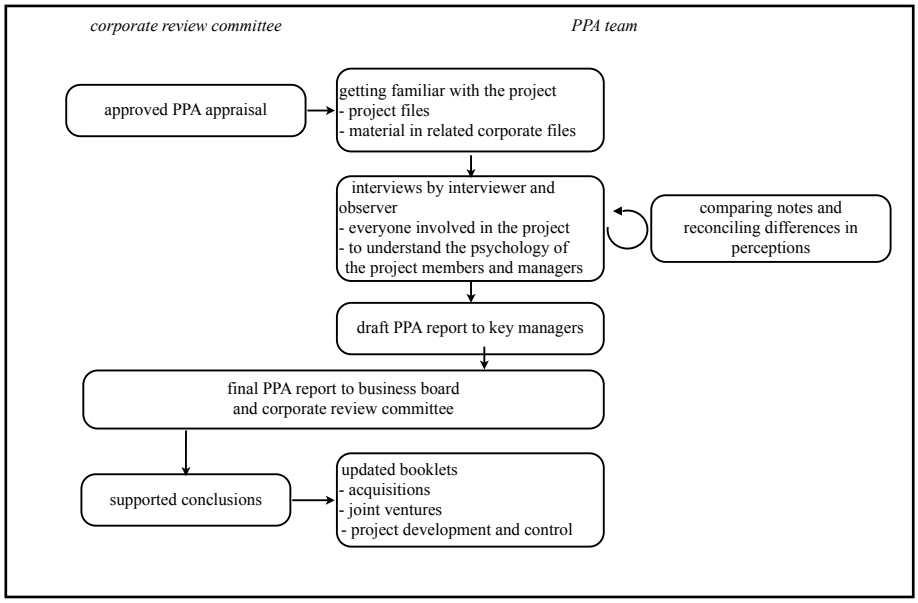

Figure 14 Post-Project Appraisal process (based on Gulliver 1987)

According to Gulliver (1987), the PPA teams have found out that people genuinely want to help the company grow more profitable, by joining in an examination of the project performance. The PPA unit has a consistent reputation for digging out the truth, and the unit enjoys the full confidence of the BP's senior managers and directors. The conclusions in the PPA reports are considered to be accurate, based on the investigating team's thoroughness, its understanding of the technical issues, fairness in evaluating the evidence, and sensitivity to psychological forces motivating the staff.

In addition to the process-based methods, Schindler and Eppler (2003) describe some documentation-based methods for the project reviews. These are described in Chart 4.

Chart 4 Documentation-based methods for project reviews
(based on Schindler and Eppler 2003, p. 225)

parameter	**method**		
	micro article	**learning histories**	**RECALL**
origion			National Aviation and Space Agency (NASA)
scope	half ... one page	20 ... 100 pages	several screens
IT support	possible, but not required unless multimedia is used	not required	mandatory due to database interface
participants	not explicitly stated; focus on one author	individuals and teams; depending on the process step	individual user
supporting roles	author, reviewer	learning historian necessary for all process steps	work group for reviewing
frequency	on demand, but regularly	max. one per project; after completion	on demand
anonymity	no	yes	no
embedding/ distribution	paper-based, databases/intranet	cases with accompanying workshops	databases/intranet

Micro Articles focus on making experience explicit, in the form of a small informal article. The purpose of the RECALL system is to facilitate and automate the capture and retrieval of lessons learned.

The learning histories are written narratives of the critical events in the organization, and they deal with the mistakes which have been made, and the logic and the assumptions, which underlay the decisions (Lubit 2001). The insights people gain by studying and discussing the events, help them make better decisions. In the right hand column, the relevant events are described by the people who took part in them, were affected by them, or observed them from a close distance (Kleiner and Roth 1997). Each person is quoted directly and identified only by a title. The left hand column contains analysis and commentary by the learning historians. Learning historians are a small team comprised by the trained outsiders, along with concerned and knowledgeable insiders. The team identifies recurrent themes in the narrative, poses questions about its assumptions and implications, as well as, raises 'undiscussable' issues from the below of the surface of the quotations.

The learning histories are used as a basis for the group discussions for those involved in the event, and who might learn from it. According to Kleiner and Roth (1997), the goal of these meetings is to get a better understanding of the critical choices, faced in planning the new actions. The authors (ibid) claim that the learning history is as much a process, as it is a product. The learning history as a product, is based on an ancient practice of community story telling. The group hears a multifaceted tale, but with one directed purpose. They have re-experienced an event together and learned collectively of its meaning.

Kleiner and Roth (1997) observed the effects of the learning histories. First, they seem to build trust. People feel validated by the presence of the opinions in the document, no matter who expressed them, and get a feeling that they are not alone in their efforts to improve themselves and the organization. The small group discussions help people clear air about their own concerns, fears and assumptions, thus developing a higher level of confidence in each other. As trust grows, it creates an environment more conductive to learning. The learning histories have proven to be successful at transferring knowledge from one part of an organization to another. Besides lessons learned, the readers of the learning histories can read about the reasoning and impulses, which had led to those lessons, and apply the insights to their own implementation. The learning histories also help building a body of generalizable knowledge about management, what works and what does not.

Developing a clear understanding of what happened when things go wrong, requires consistently reporting *failures*, systematically analyzing them and proactively searching for opportunities to experiment (Edmondson 2011). The author (ibid) has created a spectrum of reasons for the failure (see Figure 15).

praiseworthy	EXPLORATORY TESTING an experiment, conducted to expand knowledge and investigate a possibility, leads to an undesired result
	HYPOTHESIS TESTING an experiment, conducted to prove that an idea or a design will succeed, fails
	UNCERTAINTY a lack of clarity about future events causes people to take seemingly reasonable actions that produce undesired results
	PROCESS COMPLEXITY a process composed of many elements breaks down when it encounters novel interactions
	TASK CHALLENGE an individual faces a task too difficult to be executed reliably every time
	PROCESS INADEQUACY a competent individual adheres to a prescribed but faulty or incomplete process
	LACK OF ABILITY an individual does not have the skills, conditions or training to execute a job
	INATTENTION an individual inadvertently deviates from the specifications
blameworthy	DEVIANCE an individual chooses to violate a prescribed process or practice

Figure 15 Spectrum of reasons for failure (based on Edmondson 2011, p. 50)

Failures fall into three categories: preventable, complexity related and intelligent. Only part of the failure reasons are blameworthy, like deliberate deviance and the lack of effort (Edmondson 2011). Most preventable failures usually involve deviations from the specifications in the closely defined processes. With proper training and support, the individuals can follow those processes consistently. If they do not, deviance, inattention or the lack of ability is usually the reason. The causes can be identified and the solutions developed, like checklists or a system of continual learning from small process deviations. A failure, resulting from thoughtful experimentation, which generates valuable information, may be praiseworthy. The author (ibid) argues that approximately 2-5% of the failures in the organizations are truly blameworthy, but still 70-90% of the failures are treated as such. This causes that many failures remain unreported and their lessons are lost. A sophisticated understanding of the failure's causes and contexts, will help avoiding the blame game, and institute an effective strategy for learning from the failures.

In basic research, it is understood that every failure conveys valuable information, and the researchers are eager to get the information before the competition does. However, in most business organizations, failure and fault are virtually inseparable, and examining failures in depth is emotionally unpleasant and can chip away the

individual's self-esteem (Edmondson 2011). Analyzing the operational failures, requires inquiry and openness, as well as, patience and tolerance for the causal ambiguity. The way the managers respond to failures, and whether they encourage open discussions of them, welcome questions and display humility and curiosity, affects the most to the project team members' willingness to speak about the failures. Failing development projects are often kept going much longer than it is scientifically rational or economically prudent. Intuition may tell an engineer or a scientist that the project has fatal flaws, but the formal decision to call it a failure, may be delayed for months by the managers.

To demonstrate that learning in the projects can lead to organizational learning, Alloo (2011) provided an *example of incorporating project learnings into organizational level* in Toyota manufacturing. Toyota's organization culture emphasizes that every employee is responsible for his own success. The leadership team wants the employees to develop their own work, and the employees have a need to do so.

The corner stones in Toyota's organizational learning are standardized work and job rotation. All work routines in the manufacturing are standardized, and the standards are applied also to the supplier network. All employees are entitled to develop or suggest improvements to the standardized work procedures. They are also responsible for following the procedures in their work. Standardization consists of three elements: the time needed for producing a component on one vehicle, the sequence of the operations in a single process, and the minimum quantity of the parts always on hand. Variation to the standardized work indicates a problem, and it triggers the problems solving process (see Figure 16).

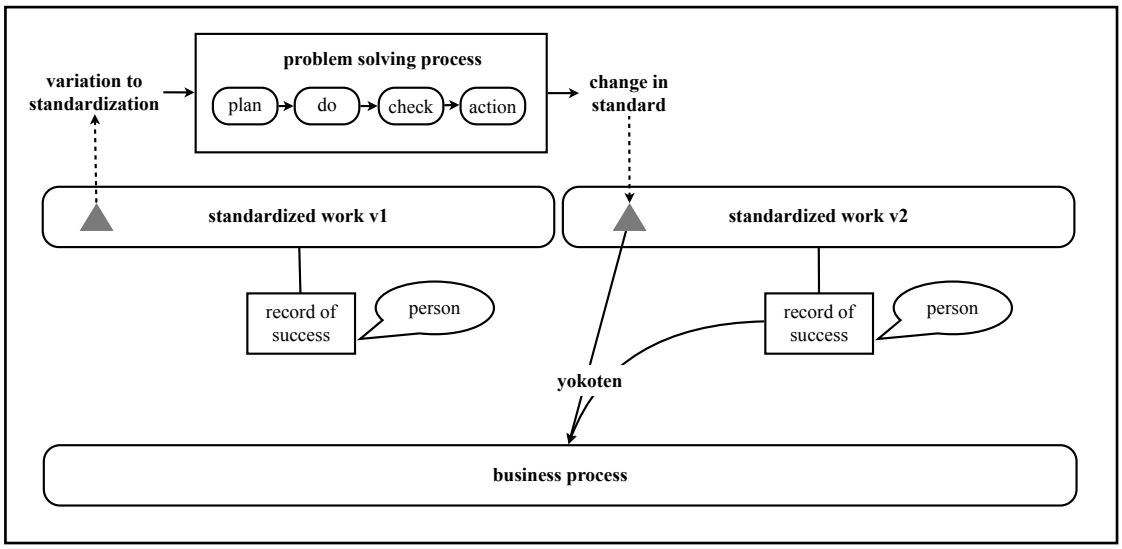

Figure 16 Incorporating learnings to work processes in Toyota manufacturing (Alloo 2011)

Problems solving is also standardized. It is a fact based process, which has been developed and used for years in the organization. Problem solving leads to process improvements, and the problem solving process itself ensures that all the changes are followed completely and the implemented change is standardized. The Record of Success (RoS) document, related to the process version, captures the knowledge created in the problem solving process. The RoS describes the standardized work and the procedures related to it, as well as, the reasoning behind the change and, therefore, makes communication easier. The document is tied to a person, but not dependent on him, and the responsible person can change.

The problem solving process requires that the Record of Success (RoS) is communicated within the organization. Communication ensures that similar processes are able to use the new standard. Yokoten describes the idea of the horizontal transfer of information and knowledge, across the organization. Yokoten includes meetings where the RoS documents and made improvements are presented. Additionally, yokoten means manager level communication, which increases the awareness of the created knowledge. Knowledge is also stored in the organization's databases.

Toyota as a company, provides its employees employment security, rather than job security (Alloo 2011). The employees' ability to change is constantly tested, because their jobs are rotated. Job rotation gives employees experience in the work the others do, thus increasing their interest and motivation to improve the work tasks. Also, it creates a need to learn and develop on the individual level, and enables personal knowledge accumulation. Additionally, job rotation acts as an employee back-up system in the production. The team leaders are expected to master all the jobs in his own team and one task in the neighbor team. In the higher level of the organization, horizontal job rotation is required. One example of the job rotation and project based learning is illustrated in Figure 17.

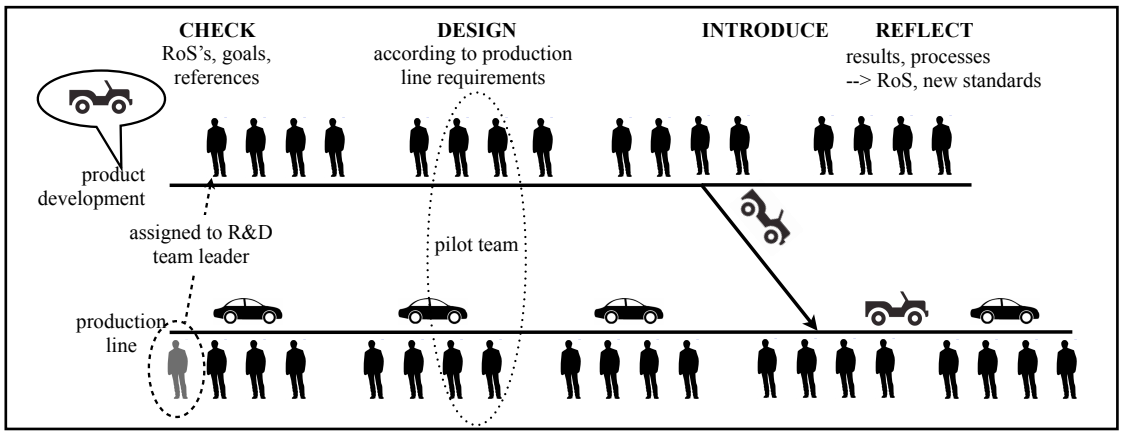

Figure 17 Example of job rotation and project based learning in Toyota (Alloo 2011)

When it is time to start a new research and development project in Toyota, a team leader from the production line, is assigned to the product development project as a team leader. At the project kickoff phase, the project reflects on the last projects, analyzes the Record of Success (RoS) documents and identifies what are the areas needing improvement. The project team will also study what is currently happening in the production line. The purpose is to identify whether similar processes are already used. The team will receive goals and targets from the management.

All information received in the check phase, will be used as input for the new design. The production engineer acts as a link between the manufacturing and the other functions. During the design phase, a pilot team, consisting of the members from both product development and production line, check the developed product against the production line requirements. When the new product is introduced, it is time to reflect the results and the processes used in the project. The reflection creates a Record of Success document, which serves as input for the next projects, as well as, for the new standards of the work processes.

2.4 Elements affecting knowledge creation and sharing in groups

The author of the study divides the elements affecting knowledge creation and sharing in the groups, into three categories. Some elements are related to the group members as individuals. Another set of the elements, affects the individuals when they are cooperating with other individuals in the formal work group. The third type of elements describe how the organization affects knowledge creation and sharing in the groups.

2.4.1 Effect of the individuals on knowledge creation and sharing in groups

The author of the study summarizes the elements affecting knowledge creation and knowledge sharing of the individual group members into Chart 5.

Chart 5 Elements related to the individuals affecting knowledge creation and sharing in groups

ELEMENT	EFFECT		REFERENCES
	knowledge creation	knowledge sharing	
experience	x	x	Argyris 1994; Bierly et al. 2000; Cohen and Levinthal 1990; Crossan et al. 1999; Davenport and Prusak 1998; Dinur et al. 2009; Halding-Herrgard 2000; Nonaka et al. 2000; Senge 1990; Smith et al. 2007;
ability to change behavior	x		von Krogh et al. 2000; O'Dell and Grayson 1998
emotions	x	x	Gustavsson 2009; Jashapara 2004
motivation (incl. organizational commitment and accountability	x	x	Ardichvili 2008; Ardichvili et al. 2003; Argyris 1994 and 1999; Lin 2007; Lubit 2001; Newell and Edelman 2008; Osterloh and Frey 2000; Popper and Lipshitz 2000; Zollo and Winter 2002
trust (incl. psychological safety)		x	Argyris 1976; Becerra et al. 2008; Davenport and Prusak 1998; Glenn et al. 2012; Kayes et al. 2005; Lin 2007; Newell and Swan 2000; Riege 2005;
defensive routines	x	x	Anderson 1997; Ardichvili et al. 2003; Argyris 1976, 1994 and 1999; Bens 2005; Halding-Herrgard 2000; von Krogh et al. 2000; Lubit 2001; O'Dell and Grayson 1998

In the organizations, the individuals specialize or localize around different problems (Smith et al. 2007), and the experts are evaluated by the extent to which they master and keep abreast of the knowledge pertinent to their field (Halding-Herrgard 2000). Much of what the individuals know, is learned by experience. Experience accumulation refers to the tacit accumulation of experience over time, and the use of that experience to improve a practice in an incremental fashion (Smith et al. 2007). Experience accumulation also means the reliance of the individuals moving from project to project, taking their accumulated experience with them (Senge 1990). Developing expertise takes a long time, and it requires practicing the skills in a variety of situations, and then being able to apply and adapt them appropriately to achieve successful outcomes (Crossan et al. 1999).

According to Argyris (1994), the experience of the individuals, within and specific to the organization, provides a historical perspective from which to view and understand new situations and events. Therefore, the personal experience provides the individuals an intuitive ability to assess the relative salience of events, to detect changing patterns, to judge the importance of the development, and to make decisions (Bierly et al. 2000).

Experience helps the individuals internalize what they have learned (Nonaka et al. 2000). Cohen and Levinthal (1990) described the ability to evaluate and use external knowledge as a function of the level of prior related knowledge. Prior related knowledge confers an ability to recognize the value of new information, assimilate it and apply it. These abilities are called as absorptive capacity. Experience also aids knowledge transfer. A person with a greater reservoir of expertise has a potential to transfer more knowledge to a recipient with a limited knowledge base (Davenport and Prusak 1998). Dinur et al. (2009) note that experience with knowledge transfers helps identify problems ex-ante and find effective solutions.

Knowledge creation and learning require that the individual is able to change his behavior, and he is able to deal with new situations, events, information and contexts (von Krogh et al. 2000). Knowledge is tied to the person's self-image and the individuals often resist anything new and breaking away from the known habits. The authors (ibid) define accommodation as a process in which the individual gives a meaning to new input signals, information, and distinguishes them as something that he does not already know. If the individual has to react in such a situation, he has to try some new actions instead of the old known ones. Sometimes, accommodation becomes too challenging and the individual can feel trapped. The situation creates a strong mental barrier to new knowledge.

The individuals' resistance to new, externally generated ideas might be high, especially if the ideas challenge the accepted status quo. The Not-Invented-Here (NIH) syndrome describes the bias against using knowledge from other sources. The individual is hesitant both to share what he has, and to use knowledge which is developed by an another group than his own (O'Dell and Grayson 1998). Using external knowledge and changing own knowledge base means that the individual will have to face the cost of altering what he does. There is also a need to develop new ways of dealing with the problems the he faces. In such a situation, the individual might withdraw or reduce collaboration with the colleagues to a minimum. The NIH restricts knowledge sharing of the individuals or between the groups, rejects new ideas or innovations from the outsiders, and results in the resistance or the lack of cross-functional and inter-organizational knowledge sharing across the subsidiaries.

The opportunities for learning in daily work may be used or remain unused (Gustavsson 2009). The group members' emotions affect their behavior. At an individual level, positive emotions are more likely to support learning, by leading to greater self-expression in discussions and dialogue with the other group members (Jashapara 2004). On the other hand, anxiety-driven emotions are more likely to result in communication difficulties, where the individual knowingly colludes, censors and subverts the organizational processes to meet his own goals.

Motivation for creating and sharing knowledge is based on the considerations of personal benefit, community related expectations and normative beliefs (Ardichvili 2008). Without a strong motivation for implementing the best available knowledge, people gather the best knowledge and talk about it, but fail to take the steps necessary to implement it (Lubit 2001). Especially, learning from mistakes and failures inherently involves a process in the context of negativity and responsibility. Pursuing such learning, may increase uncertainty, and decrease motivation among the individuals. The

benefits of capturing and sharing learnings might be hard for the group members to recognize. The activity may not be considered helpful because of the uniqueness of the task on which they are engaged (Newell and Edelman 2008). Yet, Zollo and Winter (2002) argue that knowledge articulation and codification are more likely to be helpful in rare situations, because in such situations, relying on memory is problematic.

Ardichvili et al. (2003) and Ardichvili (2008) argue that the individuals contribute knowledge, because of their desire to establish themselves as experts, through multiple contributions to the community. Some individuals think that they have reached a stage in their lives when it is time to start giving back by sharing their expertise. According to Osterloh and Frey (2000), such motivation is intrinsic, as the activity is undertaken for the individual's immediate need satisfaction. Intrinsic motivation is always voluntary, and it is valued for its own sake. Intrinsic motivation appears to be self sustained. It is a form of identification with the organization's strategic goals, shared purposes and the fulfillment of the norms for its own sake. Tacit knowledge sharing can be facilitated only by intrinsic motivation, such as sociability and friendship. The individuals are extrinsically motivated if they are able to satisfy their needs indirectly, especially through monetary compensation. Opportunism is a strong form of extrinsic motivation, when the individuals are not constrained by any rules.

Osterloh and Frey (2000) note that specific problems arise with relying on intrinsic motivation in the organization. Changing intrinsic motivation is difficult, and the outcome is more uncertain than relying on extrinsic motivation. Intrinsic motivation can have an undesirable content, because intrinsically motivated individuals do not always work to the benefit of their organization. Envy, vengeance and the desire to dominate are equally intrinsically motivated as altruism, conscientiousness and love. All of these motives contribute to the immediate satisfaction, rather than to achieving the externally set goals.

Osterloh and Fray (2000) identify a tradeoff between the two types of motivation. An individual, who is initially enthusiastic about a task, looses part of his interest when he is promised a reward for fulfilling the task. In the long run, the crowding effect sets in and the person will perform the certain task only when he receives the reward. A spill-over effect occurs when the person does not do any tasks unless he is rewarded. Argyris (1999) claims that the leaders in the organization embrace the intrinsic motivation, but fail to see how their communication focuses on the extrinsic motivation. They deal with the fears of the individuals by reassuring that everything will turn out for the best. Therefore, the leaders are expected to take the responsibility for the challenges the

individuals are facing. The individuals base their motivation on extrinsic factors, i.e. the leaders' promises.

Under specific conditions, intrinsic motivation is superior to extrinsic (Osterloh and Frey 2000). Intrinsic motivation is needed for tasks which require creativity. According to Argyris (1999), extrinsically motivated people are less likely to take chances, question established policies and practices, or to explore the territory beyond the company vision. In other words, they are less likely to learn. Extrinsically motivated people tend to produce stereotyped repetition of what already works (Osterloh and Frey 2000). Intrinsic motivation helps overcome so called 'multiple task problems', where contracts cannot completely specify all the relevant aspects of the individual's behavior and its desired outcome (Argyris 1999). However, the most important advantage of intrinsic motivation is that it enables the creation and transfer of tacit knowledge. Participation and personal relationships foster the individuals' intrinsic motivation because their perceived self-determination is raised, and the psychological contracts are established. The so called team spirit is enabled.

The individual's organizational commitment is closely related to the intrinsic motivation. Organizational commitment refers to the individual's willingness to invest extra effort in his job, and to donate and receive knowledge. Intrinsically motivated individuals think constantly and creatively about the needs of the organization (Lin 2007). Commitment is likely to facilitate the individual's intentions of tacit knowledge sharing with the other members, which may benefit their organization in the long-run. Externally committed individuals believe that the leaders manipulate them, and they see loyalty as allowing the manipulation to take place (Argyris 1994). These individuals will give honest responses to direct questions, but they are unlikely to examine the issues surrounding their dependence, their ambivalence and their avoidance of the personal responsibility. External commitment harnesses extrinsic motivation. Externally committed people depend on their managers to give them the incentive to work.

Accountability is also related to the individual's motivation. Accountability means holding oneself responsible for one's actions and their consequences, and for learning from these consequences (Popper and Lipshitz 2000). Accountability facilitates overcoming obstacles to effective learning.

Exposing actions, thoughts and feelings can make people vulnerable to the reaction of the others (Argyris 1976). Most individuals are unlikely to share their knowledge without the feeling of trust, trust that others do not misuse the shared knowledge, or

trust that knowledge is accurate and credible due to the information source (Riege 2005).

Glenn et al. (2012) summarize trust as

> a belief about a party trustworthiness and one's relationship thereto,
> a decision to actually trust that party, the intention to act and
> an action of trust.

Trust does not require regular contact and it can form between the individuals with infrequent ties, drawing on different experience of knowledge base (Glenn et al. 2012). Especially in temporary working groups, like projects, trust needs to be form very quickly (Newell and Swan 2000).

Davenport and Prusak (1998) argue that performance has an important surrogate of reputation, which is used as a basis to determine whether a person can be trusted. According to Glenn et al. (2012), the individual's intention to trust is largely determined by perceived ability, benevolence, as well as, the integrity and the predictability of the trustee. Each of these components are considered fundamental to trust, with trust potentially failing on the loss of any one. Trusting people's competences is important, especially where there is a lack of knowledge. Benevolence means reflecting benign motives and a personal degree of kindness toward the other party, and a genuine concern for their welfare. Benevolence-based trust needs receptivity and strong ties to develop. Integrity based trust is based on the perceptions that the trustee adheres to a set of principles, acceptable to the truster, and their values are compatible. Predictability relates specifically to consistency, credibility of reputation and consistency of past behavior.

Trust may reduce perceived uncertainty, facilitate risk-taking behavior and foster constructive orientation, which consequently enhances the group members' willingness to share tacit knowledge with each other (Lin 2007). Knowledge transfer is associated with the willingness to take risks. Hight trustworthiness is more critical when knowledge is tacit and, consequently, transferable only through direct contacts. This type of knowledge transfer is highly related to the perceptions of the partner's trustworthiness. In the case of explicit knowledge, knowledge can be effectively transferred independently of the individuals involved in the exchange and the level of trust between them (Becerra et al. 2008).

Trust relates also to psychological safety, which is a feeling that it is safe to make mistakes, or to express views which differ from the majority opinions (Kayes et al.

2005). The groups with low psychological safety tend to have early disturbing incidents, which limit conversations and make conversations flow turbulent and conflict filled.

Defensive routines are habitual ways of interacting, which protect people from threat or embarrassment (Argyris 1999). The routines are activated when the individual is dealing with any business or human problem which is embarrassing or threatening. Defensive routines are overprotective and anti-learning. They consist of all the policies, practices and actions which prevent the individuals from having to experience embarrassment or threat and, at the same time, prevent them from examining the nature and the causes of the embarrassment or the threat (Argyris 1994).

In the early phase of life, all individuals develop mental models for dealing with emotional or threatening issues (Argyris 1976). Argyris (ibid) distinguishes mental models into 'espoused theory of action' and 'theory-in-use'. Espoused theory is based on the principles and the precepts, which fit the individual's intellectual background and commitments. Theory-in-use represents the mental models which are used in the stressful situations. The individual's action may, or may not, be consistent with his espoused theories, but it is always consistent with his theories-in-use.

Defensive routines discourage reflection, and they can cripple the ability of the individuals to look at problems, discuss them and act on them (Argyris 1994). Lubit (2001) claims that the individuals not only avoid discussing the painful issues, but also they avoid looking at them, by engaging in defensive reasoning, such as accepting premises with questionable validity, inferences which do not follow from the premises, and untested conclusions. When painful issues are brought up, the individuals tend to push them out of their awareness soon, and fail to act on them. Argyris (1999) claims that people use their criticism of others to protect themselves from the potential embarrassment of having to admit to their mistakes, or from discovering embarrassing truths about their own behavior and intentions. The individuals are often involved in the distortion of the facts, attributions and evaluations, as well as, face-saving (Anderson 1997). Usually, these individuals are unwilling to accommodate new knowledge, which undermines or contradicts their existing knowledge (von Krogh et al. 2000).

The principles of defensive reasoning encourage the individuals to leave their own behavior unexamined, and to avoid any objective test of their premises and conclusions (Argyris 1994). The individuals focus primarily on controlling the others, and on making sure that they are not themselves controlled. Control as a behavioral strategy, tends to produce defensiveness and closedness. The groups composed of defensive individuals, will create a defensive group dynamics, reduce the production of valid

information and reduce free choice (Argyris 1976). As a consequence, the group leaders receive little valid feedback, and solving the technical or interpersonal issues is ineffective.

O'Dell and Grayson (1998) note that people may potentially hoard their knowledge, rather than share it with others. Sharing knowledge requires that time is taken away from other responsibilities, which have a higher priority. People naturally focus on those tasks which are more beneficial to them (Lubit 2001). If an individual can gain power within the organization by hoarding knowledge, the organization will be a battlefield for exploiting knowledge of colleagues (Halding-Herrgard 2000). Bad habits and obsolete behavior tend to be hard to stop.

According to Ardichvili et al. (2003), people hesitate to contribute mainly out of fear of criticism or misleading the community members. In other words, the most important barriers for sharing knowledge has nothing to do with the individuals' selfish attempts to hoard information. In many cases, people are afraid of that their contribution may not be important, completely accurate or relevant to the specific discussion, or they do not believe they have earned the right to contribute on the organization wide system. According to Bens (2005), people withhold they opinions because they feel insecure about their industry and their jobs, there is a history of conflict in the group, or there are old unresolved interpersonal conflicts between the members. One possible reason is having little or no experience with creative thinking or problem solving activities, i.e. the group members do not know how they are expected to behave. To avoid embarrassment, the individuals avoid discussions of the important issues, give ambiguous messages and distort information (Ardichvili et al. 2003).

2.4.2 Group related elements affecting knowledge creation and sharing in groups

Different elements of the group, affect how the group members create and share knowledge together. The author of the study summarized the group level elements affecting knowledge creation and sharing in Chart 6.

The group leaders exert considerable influence over group learning and knowledge application, and they are able to explain much of the variance therein (Sarin and McDermott 2003). Also, the stories the group leaders tell, the directives they give and the example they set by their own behavior, have a powerful impact on the group (Lubit 2001). They can create and reinforce a group culture that counteracts the blame game,

and makes the group members feel both comfortable with and responsible for surfacing and learning from failures (Edmondson 2011). The group leaders are also in a critical position to encourage the application of newly learned information to the current and future activities (Goffin and Koners 2011). The best opportunity to influence the learning which will take place within a group, is at the start of a new task (Goffin et al. 2010).

Chart 6 Group related elements affecting knowledge creation and sharing in groups

ELEMENT	EFFECT		REFERENCES
	knowledge creation	knowledge sharing	
group leader (incl. behavior, target setting, position in organization)	x	x	Edmondson 2011; Goffin and Koners 2011; Goffin et al. 2001; Leonard and Sensiper 1998; Lubit 2001; Sarin and McDermott 2003
group features (incl. composition, size, routines, autonomy, context)	x	x	Bens 2005; Edmondson and Nembhard 2009; Gammegaard and Ritter 2005; Hogan 2002; Kayes et al. 2005; Newell and Swan 2000; Nonaka and Konno 1998; Nonaka and Takeuchi 1995; Nonaka et al. 2000; Sarin and McDermott 2003; Scarbrough et al. 2004
group members' relationships (incl. face-to-face interaction, common experience)	x	x	Ardichvili et al. 2003; Augier et al. 2001; Bhatt 2002; Cross et al. 2001; Davenport and Prusak 1998; Edmondson and Nembhard 2009; Koskinen et al. 2003; von Krogh 1998; von Krogh et al. 2000; Nonaka 1994; Nonaka and Konno 1998; Sarin and McDermott 2003; Scarbrough et al. 2004; Senge 1990; Sense 2005; Zollo and Winter 2002
communication (incl. common language, conversations)	x	x	Crossan et al. 1999; Davenport and Prusak 1998; Halding-Herrgard 2000; von Krogh et al. 2000; Leonard and Sensiper 1998; Nonaka 1994; Senge 1990; Sense 2005
group culture (incl. willingness to seek and use others' information, openness for feedback, information validity, norms)	x	x	Argyris 1976 and 1999; Bens 2005; von Krogh et al. 2000; Nonaka et al. 2000; Popper and Lipshitz 2000; Riege 2005

To maximize group learning and the application of knowledge, the group leader should actively involve the individual members in the group decision making, but not let his concern about the feelings of the members overshadow the focus on the objectives (Sarin and McDermott 2003). Participatory behavior encourages the group members to take a broader view of their jobs, and to consider a wider variety of information, inputs and constraints in their decision making process. Democratic climate leads to the free exchange of the ideas and to more opportunities for the cross-functional knowledge fertilization, thus preventing localized and isolated problem solving. Such behavior helps converting tacit knowledge within the individuals, to explicit knowledge shared by many group members.

A facilitative group leader constantly challenges the group members to new height, encourages them to think freely, and openly discuss their opinions and ideas (Sarin and McDermott 2003). This kind of group leader creates a nurturing environment within the group, where the members feel safe to take risks and explore the non-routine alternatives. This encourages the members to voice dissenting opinions, without a fear

of reprisal or backlash, thus allowing the individuals to disagree on the issue-based conflicts. A supportive and coaching oriented group leader encourages the members to openly admit, analyze and learn from their errors (Edmondson 2011).

The group leader's considerate behavior encourages open communication and information sharing in the group, but it could also lead to complacency within the group. Leonard and Sensiper (1998) claim that a highly considerate group leader may create a conflict-averse team climate, which prioritizes the maintenance of peace and harmony, above everything. The group members are less likely to challenge each other's opinions and ideas, which lowers the overall level of learning.

The group leader gives structure to the group by clearly outlining the goals and the expectations of the group members (Sarin and McDermott (2003). The clearer the structure, the higher the learning is within the group. Focusing on the results, allows the group members to come up with innovative and creative means for achieving those objectives. Also, the group leader's position in organization affects knowledge creation in the group (Leonard and Sensiper 1998). High-ranking group leaders have access to extensive knowledge bases, thus helping the learning in the groups. However, inequality in status among the group members, is a strong inhibitor to knowledge sharing.

Usually, formal work groups are made up of diverse individuals, who bring different experience, skills, styles and knowledge to the group (Kayes et al. 2005). Nonaka et al. (2000) see that a cross-functional group improves the possibilities to articulate tacit knowledge into explicit concepts. Such groups are ofter more innovate, but the members need to work to value others, who are different (Kayes et al. 2005). Therefore, selecting people, with the right mix of specific knowledge and capabilities, is critical (Nonaka and Konno 1998). Collaboration in the diverse group can be difficult, because each profession has its own language, terminology, beliefs, approaches to learning, mechanisms for information exchange, goals and reward structure (Edmondson and Nembhard 2009). On the other hand, the competing viewpoints can promote new ideas and sound decision making, but they also lead to conflicts, which waste time and erode relationships in the group. Sometimes, diversity in the group is associated with higher levels of dissatisfaction, turnover, sick leave usage and job stress. In stressful situations the groups can even unravel.

The size of the group should be large enough to accomplish its goals, but small enough to ensure coordination of the tasks (Kayes et al. 2005). As the size of the group grows, more time and effort is spent on the process and coordinating activities, rather than addressing the problems or the task (Sarin and McDermott 2003). When the number of

the people engaged in the collaborative task increases, the individual effort reduced. This phenomenon is referred as social loafing. It is more common in a situation where the individual contribution to the group effort cannot be easily identified. However, as the group develops, it gains the ability to actively adapt its size to its nature and to the complexity of the goals.

Smaller groups with members from similar attitudes, tend to be more cohesive than other groups, and they are liable to suffer from group think (Kayes et al. 2005). The cohesiveness may reduce the group members' willingness to disagree, and to encourage maintaining the positive feelings and commitment to the group (Edmondson and Nembhard 2009). Group think happens when people feel that they should hold back their true feelings out of fear of repercussions (Kayes et al. 2005). Withholding best ideas, leads to faulty decision making and conventional thinking (Bens 2005). If the cohesion and the bonding leads to an overcommitment to restrict norms and enforces people to agree for the agreement's sake and/or the suppression of dissent, then someone has to 'blow the whistle' (Hogan 2002). The person who does this, is often punished, and/or labelled for being 'negative' or 'subversive'. People, who wish to preserve the status quo, spend inordinate amounts of energy in denial that there is something wrong, and in maintaining the 'business as usual'.

Other group work related problems highlighted by Newell and Swan (2000), are conformity, obedience and risky shift of group polarization. Kayes et al. (2005) mention also over-dependence on the dominant leader, overcommitment to the goals and diffusion of the responsibility. The groups may make more conservative decisions than the individuals acting alone, and they can produce outputs which are worse than could have been produced by the most competent group members (Newell and Swan 2000).

Group routines are group specific patterns of behavior, and they define how the group operates. When the groups cannot exploit previously established, organizationally embedded routines and practices, they need to develop new ways of working (Scarbrough et al. 2004). Group autonomy allows the development of the group routines which are distinctively different to the mainstream organizational practices, thus increasing the possibility that the individuals will motivate themselves to create new knowledge (Nonaka and Takeuchi 1995). This is where significant learning may be generated.

Learned topics are always related to the context where the learning happens, and the context transforms as the situation evolves. Therefore, group learning is difficult to transfer to the other groups (Scarbrough et al. 2004). Gammegaard and Ritter (2005)

mention also the problem of decontextualization, which refers to a situation where knowledge is located, but it cannot be retrieved due to problems of understanding the matter. Documents and manuals facilitate the transfer of explicit knowledge to other people, and help them indirectly experience the experience of others (Nonaka and Takeuchi 1995). Documents should be accompanied by narrative framing, which is likely to provide the contextual information, which will allow the others to interpret the experience regarding their own situation (Newell and Edelman 2008).

The interaction between the group members plays a critical role in group learning (von Krogh 1998). Nonaka and Konno (1998) see that physical face-to-face experience are the key to conversion and transfer of tacit knowledge. The face-to-face interaction is considered the richest medium, because it allows immediate feedback. The interaction uses much variety, natural language and the messages are tailored personally to the recipient (Koskinen et al. 2003). Misinterpretation of meanings is less likely than in less close forms of social relations. Ardichvili et al. (2003) note that sometimes people feel that belonging into a tight-knit face-to-face group makes using knowledge network (e.g. community of practice) redundant, and they rely more on each other than the network.

Learning is reliant upon the participants' willingness to admit mistakes or deficiencies in their actions, to engage in conversation about those issues, and to subject themselves and their experience to the constructive criticism of their peers (Sense 2005). The willingness to expose oneself is related to the perceived quality of their peer relationship. Cross et al. (2001) claim that safe relationships are often the most effective for learning purpose. According to von Krogh et al. (2000), constructive and helpful relationships between the group members speed up the communication process, enable the individuals to share their personal knowledge and to discuss their ideas and concerns. The relationships are critical also for obtaining information, solving problems and learning how to do one's work (Koskinen et al. 2003).

Zollo and Winter (2002) see that by sharing their individual experience and comparing their opinions with those of their colleagues, the group members can achieve an important level of understanding of the causal mechanisms intervening between the actions required to execute a certain task, and of the performance the outcome produces.

Learning in the group is also dependent on the group members' common experience, especially on the experience of solving problems (Senge 1990). According to Bhatt (2002), the individuals decide with whom to interact, how to interact and what knowledge to seek, based on their expertise and experience. In other words, who the person knows, significantly affects what the person eventually knows (Koskinen et al.

2003). The databases only complement the personal networks of those seeking answers to the problems (Davenport and Prusak 1998; Koskinen et al. 2003). Experiences, which are derived from the previous jointly activities, improve also the possibilities to share tacit knowledge (Koskinen et al. 2003).

Nonaka (1994) claims that without some form of shared experience, it is difficult for a person to project himself into another individual's thinking process. Sharing many common sectors of time and space, before the current problem solving tasks, enables the emergence and the maintenance of the contexts with similarities (Scarbrough et al. 2004). Context, i.e. individual's interpretation of the situation, influences what knowledge people choose to create, use and share, and, thus, what problems can be solved and how the problems are solved (Augier et al. 2001). As part of the group, the person has an opportunity to observe how the others conceptualize situations, approach problems, and generate and evaluate solutions (Sarin and McDermott 2003).

The more people work together and the more time they spend socializing and casually talking about their experience, sharing anecdotes and sharing impressions of each others experience, the more tacit knowledge they will share (Edmondson and Nembhard 2009). The authors (ibid) found out that a stable group membership facilitates learning and intra-team coordination. However, after a few years, the stable group membership affects negatively on the group performance. The group members decrease communication with the individuals outside the group. This may be alarming, because external communication is seen to contribute significantly to the group's success.

Sharing of all forms of knowledge, requires a joint language, a commonly understood terminology (Halding-Herrgard 2000). To learn in the group, the individuals needs to be able to communicate through words and actions, i.e. to make their tacit knowledge explicit (Crossan et al. 1999). More experience and deeper knowledge leads to high tacitness of knowledge, which in turn leads to the greater difficulties to articulate knowledge. The more distance the individuals have from each other's practice, the more difficult it is to communicate knowledge they use. Even though expressions are often inadequate, inconsistent and insufficient, the discrepancies and the gaps between the images and the expressions help promoting the reflection and the interaction between the individuals (Nonaka 1994).

Conversations include mutual exchange of ideas, viewpoints and beliefs, thus allowing sharing tacit knowledge (von Krogh et al. 2000). Conversations hold both the reflective voice of listening and silence, as well as, the active voice of speaking (Sense 2005). According to Senge (1990), most groups lack the ability to distinguish between

discussion and dialogue, and to move consciously between them. Decisions are made in discussion. Discussion is free and creative exploration of the complex and subtle issues, including deep listening to one another and suspending of one's own views. In dialogue, different views are presented and defended, and there is a search for the best view to support the decision which must be made this time. Dialogue focuses on exploring complex issues from many viewpoints, and to go beyond any individual's understanding. Nonaka (1994) sees that building trust in the group involves repeated dialogue among the members. Both, discussion and dialogue, can lead to new courses of actions, but the actions are often in the focus of discussions, whereas new actions emerge as byproducts of dialogue (Senge 1990).

Good conversations require right pacing and etiquette to achieve a mutual insight and an atmosphere of high trust (Senge 1990). If lacking guidance, the individuals may rely on their own ideas when making a particular decision, and their efforts may go in many disparate direction. When a group of diverse individuals addresses a common challenge, the result is a cacophony of perspectives (Leonard and Sensiper 1998). In a well managed conversation, the intellectual conflicts between the diverse viewpoints, are channeled into new ideas and products. Also, the minority opinions offered during the group decision making, stimulate more innovative solutions to the problems.

Von Krogh et al. (2000) note that conversations in the business settings are often fraught with hidden agendas, issue-selling, unquestioned advocacy, domineering attitudes and intimidation. Still, most conversations focus on work, as people ask each other about the current projects, bounce the ideas off one another and get advice how to solve problems. However, transferring knowledge through personal conversations, may be threatened by the leaders, because some of them assume that socializing as waste of time (Davenport and Prusak 1998).

The groups tend to develop their own culture over time, based on knowledge, beliefs, routines and behaviors their members hold in common. Willingness to seek and to use others' information is one of the crucial aspects of the group culture enabling knowledge sharing (Riege 2005). Gathering information from various stakeholders also enhances the tacit knowledge accumulation (Nonaka et al. 2000). Riege (2005) argues that ignorance in both ends, is one of the biggest knowledge sharing barriers in the groups. The individuals may experience a level of uncertainty over the value of the possessed knowledge to others. Neither the knowledge source nor the recipient is too concerned with who requires knowledge, or who possesses knowledge.

Popper and Lipshitz (2000) see that openness for feedback enhances the possibilities to have accurate information, which is complete, undistorted and verifiable. Openness for feedback means willingness to hold oneself (and one's actions) open to inspection, to receive valid feedback. It reduces the likelihood of self-deception by countering pressures to distort or suppress threatening information, and by broadening the scope of one's information base and points of view for its interpretation. According to Argyris (1976), once a decision are executed, feedback is required to evaluate the effectiveness of the decision. If the group has no active feedback practices, the members withhold their knowledge (Bens 2005). The factors which inhibit valid feedback, tend to become more operative as the decisions become more important and threatening to the participants in the decision making process (Argyris 1976).

When aiming to adjust overall rules and norms in the group, valid information, including feelings, and informed choice, are essential. Argyris (1976) claims that information accuracy seems to be more easily generated for less important and less threatening decisions. Even if the available information is accurate, its relevance to the group needs to be evaluated. The evaluation requires context understanding. Also, issue orientation is one the characteristics of a learning culture (Popper and Lipshitz 2000). Issue orientation means the evaluation of information strictly on its merits, without regard to irrelevant attributes, such as social standing of its source or recipient.

Groups composed of highly competitive people, tend to create norms, which make other groups outsiders or competitors (Argyris 1999). To justify their existence, the groups build up their own boundaries, practices, values and codes of conduct, and often create such a terminology that others cannot participate in what they do (von Krogh et al. 2000). Temporary or visiting group members might feel intimidated, and their input to the group work remains less effective (Argyris 1999). This might faultily be viewed as an evidence of the superiority of the group, compared to the others.

2.4.3 Effect of the organization on knowledge creation and sharing in groups

Most people have a natural desire to learn, share what they know and to make things better, but this natural desire is thwarted by a variety of logistical, structural and cultural hurdles that the organizations create (O'Dell and Grayson 1998). The author of the study summarizes the organizational elements affecting knowledge creation and sharing in the groups in Chart 7.

Chart 7 Organizational elements affecting knowledge creation and sharing in groups

ELEMENT	EFFECT		REFERENCES
	knowledge creation	knowledge sharing	
business environment	x	x	Fiol and Lyles 1985; Kessler et al. 2000; Lubit 2001; Popper and Lipshitz 2000; Saban et al. 2000; Sense 2005; Ueki et al. 2011
leadership commitment (incl. vision, incentives)	x	x	Argyris 1994 and 1999; Desouza 2003; von Krogh et al. 2000; Levitt and March 1998; Lubit 2001; McDermott and O'Dell 2001; Nonaka and Takeuchi 1995; Nonaka et al. 2000; O'Dell and Grayson 1998; Popper and Lipshitz 2000; Prencipe and Tell 2001; Riege 2005; Senge 1990; Sense 2005; Smith 2001; Ueki et al. 2011
organizational design (incl. structure, knowledge flows, dominant knowledge, autonomy)	x	x	Argyris 1999; Becerra et al. 2008; Crossan et al. 1999; Eskerod 1996; Fiol and Lyles 1985; Kaulio 2006; Kessler et al. 2000; von Krogh et al. 2000; Lam 2000; Lubit 2001; McDermott and O'Dell 2001; Mladkova 2007; Nonaka 1994; Nonaka and Takeuchi 1995; O'Dell and Grayson 1998; Prencipe and Tell 2001; Riege 2005; Senge 1990; Sense 2005; Zika-Viktorsson et al. 2006
national culture	x	x	von Krogh et al. 2000; Nonaka 1994; Sarker et al. 2005; Ueki et al. 2011; Wenger et al. 2002
organizational culture (incl. care, justice, values)	x	x	Argyris 1994 and 1999; Bens 2005; Bratianu and Orzea 2010; Davenport and Prusak 1998; Edmondson 2011; Kessler et al. 2000; von Krogh et al. 2000; Lin 2007; Lubit 2001; McDermott and O'Dell 2001; Popper and Lipshitz 2000; Riege 2005; Sarin and McDermott 2003; Smith et al. 2005
communication (incl. storytelling)	x	x	Argyris 1999; Crossan et al. 1999; Davenport and Prusak 1998; von Krogh et al. 2000; Leonard and Sensiper 1998; Mladkova 2007; Nonaka 1994; Nonaka and Takeuchi 1995; Nonaka et al. 2000; Paulin 2010; Szulanski 1996; Zollo and Winter 2002
teamwork (incl. personal networks and coaching)	x	x	Collis and Winnips 2002; Dryer and Noboeka 1998; Kogut and Zander 1992; Lubit 2001; Newell and Edelman 2008; O'Dell and Grayson 1998; Sarin and McDermott 2003; Swan et al. 2010
organizational routines	x	x	Bhatt 2002; Jashapara 2004; Kessler et al. 2000; von Krogh et al. 2000; Levitt and March 1998; Lubit 2001; Nonaka 1994; Nonaka et al. 2000; Popper and Lipshitz 2002; Zollo and Winter 2002
organizational memory (incl. content, access to information)		x	Ardichvili et al. 2003; Augier et al. 2001; Davenport and Prusak 1998; Jashapara 2004; Levitt and March 1998; Lubit 2001; Nonaka and Takeuchi 1995; Reddy and McCarthy 2006; Riege 2005; Saban et al. 2000; Thierauf 2001
physical environment	x	x	Ardichvili 2008; Ardichvili et al. 2003; Bratianu and Orzea 2010; Cross et al. 2001; Davenport and Prusak 1998; Koskinen et al. 2003

On the organizational level, the key driver for superior performance is the organization's ability to change when the environment calls for it, and to find the shifting source of advantage (Lubit 2001). In the fast changing business environment, the organizations, which do not learn, will not survive (Popper and Lipshitz 2000).

Shorter term business pressures affect the quantity and the quality of the individuals' reflection and discussion of their learning processes, and on the implementation of their learning strategies (Sense 2005). Saban et al. (2000) argue that the managers are encouraged to quickly cut-bait on new products, which do not meet or exceed the short term performance goals. This weakens the ability of the organization to generate future streams of successful new products by reinforcing nonfunctional philosophies, practices and procedures. On the other hand, in a too stable organization, there is only a little inducement to learn and/or change, unless the established behavior grows obsolete (Fiol and Lyles 1985; Kessler et al. 2000).

Ueki et al. (2011) claim that changes in the global business environment influence the leadership at the top of the organization, and provides a context for defining the management philosophy, vision and business strategy. These contextual factors influence the organization's structure and the organizational culture.

A shared vision of the organization's aspirations and the future, supports learning in the organization (Senge 1990). The knowledge vision gives a direction to the knowledge creating process and the knowledge created by it (Nonaka et al. 2000). The vision specifies what knowledge the organization members need to seek and create, and generates ideas on how the existing knowledge can be effectively exploited to reach the future (von Krogh et al. 2000). Instilling the vision encourages a better utilization of knowledge, and helps legitimizing the knowledge transfer process itself.

Clear communication of the knowledge vision helps preventing confusion and negative perspectives (Desouza 2003). Yet, too often, communication and managerial directions are either too vague or detailed, with neither providing a clear picture and a guideline to the employees (Popper and Lipshitz 2000). Many leaders have difficulties in moving from the philosophical discussion about the ideals for learning, to translating those ideals into actionable items (Sense 2005). Von Krogh et al. (2000) argue that usually the goal is to get the right information to the right people, at the right pace, with the help of the information technology. Overemphasizing the tools and the methods guides the awareness of the individual organization members, and constrains it.

The vision requires a strong commitment from the leadership (Desouza 2003). According to Ueki et al. (2011), knowledge creation is effective in organizations, where the management vision and the business strategy permeate the organization. Also, the strive for improving the brand value and the customer satisfaction, improves the effectiveness of the knowledge creation process. The most successful knowledge sharing initiatives are those which are inextricably tied to the business and its strategic objectives (Riege 2005). Best practice organizations see knowledge sharing as a practical way to solve business problems. The databases, knowledge systems and knowledge initiatives have a clear business purpose.

The commitment of the leadership is visible in the investment they made in resources and work processes, supporting learning in the organization (Sense 2005). The organizational culture usually places far greater emphasis on the competing activities, and knowledge creation generally needs to be done on one's own time (Lubit 2001). The work processes need to allow people to have time to generate and share knowledge and, then, also identify those who may be interested in sharing their knowledge (O'Dell

and Grayson 1998). The top leadership should give priority to the knowledge creation and sharing activities to make them happen.

Generally, the organizations are unable to effectively leverage knowledge because of the lack of the commitment of the top leadership, and because of the absences of the role models, who exhibit the desired behavior (Desouza 2003). Therefore, an active and visible commitment to learning, and the leadership's active participation in the learning process, is important. The middle managers have a key role in facilitating the knowledge creation in the organizations (Nonaka and Takeuchi 1995). They work as a bridge between the ideals of the top leadership and the realities of the business, confronted by the front-line employees. Von Krogh et al. (2000) describe middle managers as knowledge activists. They motivate workers, get people to talk to one another and coordinate the efforts of the creative professionals.

The managers often censor what everyone needs to say and hear (Argyris 1994). By doing so, they deprive the employees and themselves of the opportunity to take responsibility for their own behavior by learning to understand it. The emphasis on being positive is counterproductive. It overlooks the critical role that dissatisfaction, low morale and negative attitudes can play. It also assumes that the individuals can only function in a cheerful world, even if the cheer is false. Being considerate and positive can contribute to simple problems, like cutting cost, but it will never help the individuals to figure out why they lived with the problems for a long time. According to Argyris (ibid), positive thinking at any price and protecting organizational members from the consequences, and even from the knowledge of the cause and effect, may produce superficial honesty and adaptive learning. It will never yield that kind of learning, that might help the organization change.

Learning efforts in the organizations, like knowledge codification, are based on the presumption of good behavior among the members, not on incentives (Prencipe and Tell 2001). Still, the potential risk of losing advantage and the lack of proper reward mechanism are the main reasons for an individual to be reluctant to share his knowledge. Rewarding and recognition highlights the things the organization considers important (Levitt and March 1998) and therefore, rewarding should focus on the desired behavior (von Krogh et al. 2000).

The desired behavior can be e.g. providing access to help, and other behavior which builds up care in the organizational relationships (von Krogh et al. 2000). Also, knowledge sharing efforts, such as mentoring, responding to questions by others and making contributions to the databases and discussion groups, need to be measured and

rewarded (Lubit 2001). Additionally, the employees must be encouraged and rewarded for sharing tacit knowledge when they write up their personal stories, document their insights and use photos, drawings or rough diagrams to show how to solve a difficult problem or improve existing work processes (Smith 2001). McDermott and O'Dell (2001) suggest that undesired behavior, such as hoarding knowledge and failing to build on the ideas of others, should have visible and serious career consequences.

An introduction of a reward system or changes in the compensation incentive policies, rarely effect the organizational culture, nor does it enhance knowledge sharing in long-term, because the knowledge sharing process needs to be natural (O'Dell and Grayson 1998). The professionals value peer recognitions, not explicit rewards and incentives. Any kind of rewards evaporate quickly, and do not increase motivation for knowledge sharing (Riege 2005).

The way the organizations are designed and managed, the way people's jobs are defined and the way people are taught to think and interact, affect fundamentally on learning (Senge 1990). The organizational structure may impede conversations, which could develop valuable knowledge (Crossan et al. 1999). Von Krogh et al. (2000) argue that an open and flexible organizational structure supports knowledge sharing. Lubit (2001) notes that organizational structure, which can foster knowledge sharing, are often complicated, but the benefits they bring, are crucial.

Organizational forms exist as a continuum, ranging from the pure functional form through the matrix form to the pure product or project based form. Functional organizations are organized according to the functional specification (Lubit 2001). These organizations are good at sharing expertise within a discipline, and they allow people to specialize and, therefore, stay at the top of their field. Prencipe and Tell (2001) argue that in the functional organizations, the departments act as knowledge silos. These organizations are typically poor at sharing knowledge across the functional lines, and they are less likely to adapt to changes in the environment. According to Senge (1990), the functional divisions cut off contacts between the functions, and this makes it impossible to analyze thoroughly the most important problems in the organization. Locations, divisions and functions are so focused on maximizing their own accomplishments and rewards, that they, consciously or unconsciously, hoard information and, thereby, sub-optimize the total organization (O'Dell and Grayson 1998).

Matrix organizations are organized both within the projects and along the functional lines. The projects are composed of people representing all the relevant functions.

According to Argyris (1999), the matrix organizations are difficult to put into actual practice. For example, people seem to polarize issues, resist exploring ideas thoroughly, mistrust each other's behavior, and focus on trying to protect one's own function. The author (ibid) claims that the project approach does not provide the individuals enough recognition within their own functional departments, for the performance of the group. The problems in the matrix organizations are mainly caused by the leadership's behavior styles and the group dynamics, inherited from the traditional top-down organization.

Organizational design supporting both interdisciplinary knowledge sharing and intra-disciplinary knowledge growth and specialization, is a product oriented organization with centers of excellence maintaining the technological expertise (Lubit 2001). These organizations can share information across the functional lines and speed the development of the new products. However, they are relatively weak at supporting special expertise in the functional areas.

Many companies have given up the matrix organization, and use 'management by projects' strategy instead (Eskerod 1996). These organizations are also referred as projectified organizations, project-based organizations or project oriented organizations (Kaulio 2008). The multi-project settings is increasing in industrial importance, because the project-based organizations have become, more or less, a de facto standard for organizing complex development work and high value service offerings.

Within the project based organization, the projects embody most, if not all, of the business functions (Prencipe and Tell 2001). The responsibility is delegated to the projects, and the authority lies with the project manager (Eskerod 1996). The projects share a common resource pool, and the individuals can be assigned to several projects, or other tasks, at the same time. The project team members refer to the project manager only, and they do not have a superior outside the project. Not only is less idle time secured, but also certain expertise can be shared, and people are able to transfer their knowledge between the different projects (Zika-Viktorsson et al. 2006). However, these organizations lack the organizational mechanisms for the knowledge acquired in one project to be transferred and used by the other projects (Prencipe and Tell 2001).

The decision making and information flows affect knowledge sharing in the organizations. McDermott and O'Dell (2001) claim that knowledge sharing seems less likely to occur in a highly structured multilayered and hierarchical organization, which usually corresponds to topdown knowledge flow. These organizations operate in stable and predictable environments, in which there is a little incentive or need for either

change or learning (Fiol and Lyles 1985). The organizations lack formal and informal mechanisms, which typically provide continuous support to and improvement of diverse sharing activities. According to Mladkova (2007), the topdown structure does not support working with tacit knowledge at all. The individuals or small groups own tacit knowledge, but it is not widely available, and the organizations cannot profit from it. (Lubit 2001). These organizations tend to be slow in decision making, which in turn may increase conflicts. The organizations initiate quick creation of knowledge, but fail to distribute it. The hierarchical organizational structure also inhibits learning process, because the knowledge diffusion across the organization is difficult. New knowledge cannot be generated unless there is a sufficient technical expertise or 'critical mass' in a certain area (Kessler et al. 2000). Sense (2005) reminds that in the traditional organizations, challenging higher authorities and their offering and process is not part of the culture.

Bottom-up knowledge flow equals to a flexible and flat organization. Flat organization has less organizational levels, which allows it to build direct relationships among the employees and with the customers (Mladkova 2007). People work independently from their superiors, and the decision making is related to the knowledge. These organizations are based on autonomy, teamwork and strong horizontal relationships. Both tacit and explicit knowledge can be found at bottom levels of the organizational structure. Autonomy of the teams supports tacit knowledge creation, but it does not support free flow of tacit knowledge through the whole organization. The groups, the communities and the individuals own tacit knowledge, but they do not share it.

Combined knowledge flow represents the combination of topdown and bottom-up structures (Crossan et al. 1999). The organizational culture fosters both the topdown learning, to realize short-term efficiencies, and the bottom-up learning for long-term renewal. This type of organization is probably the most effective. All individuals are important, and they all should cooperated on both the vertical and the horizontal levels. The vertical level of the organization is responsible for the management of the organization, and it can be managed in traditional way. The horizontal level creates, distributes and uses knowledge.

Organizations with a combined knowledge flow, offer important roles to the middle managers. The middle managers are responsible for communication and knowledge management in the company. Usually, combined communication flows are found in highly innovative organizations, which need to create and share a strong knowledge background (Mladkova 2007). The same ideas is presented as 'middle-up-down' organization where work is done in self-directed teams (Nonaka 1994). The teams

consist of the individuals who share the responsibilities and have the authority and responsibility to make decisions affecting their work, with a minimum of interference and questioning by the others.

The organizational structure predetermines the dominant knowledge in the organization. Organizations characterized by an explicit knowledge base, tend to have formal structures of control and coordination, and they exhibit high standardized tasks and work roles (Lam 2000). Organizations with a tacit knowledge base, will exhibit centralized structure and thy use more informal coordination mechanisms.

Tacit knowledge constitutes a source of competitive advantage for many organization, but still the organizations seem to be more concerned with protecting their explicit knowledge (Riege 2005). Becerra et al. (2008) claim that explicit knowledge is immediately identifiable, but tacit knowledge is harder to detect and absorb. The organizations may protect themselves against those knowledge transfers, whose risks are readily observable and more easily avoided. Sharing tacit knowledge is difficult due to its value and distance. Many forms of tacit knowledge, like intuition and rules-of-thumb, have not been considered valuable, as they do not correspond to the business related concepts, such as rationality and logic.

Mobilization of tacit knowledge requires autonomy and commitment of the knowing subject (Riege 2005). The organizations can depend on different knowledge agents. Organizations drawing their capability from the collective knowledge of their members, develop effective mechanisms for integration and coordination, and on the organizational level, mainly explicit knowledge is shared. In contrast, those organizations, which rely on the contribution of the key individuals, tend to accord them a high degree of autonomy. Autonomy increases the possibility that the organizational units take the knowledge developed somewhere else and apply it freely across different levels and boundaries (Nonaka and Takeuchi 1995). An autonomous organization is more likely to maintain greater flexibility in acquiring, interpreting and relating knowledge.

Many organizations are no longer contained within the national borders, and the tasks become disperse (von Krogh et al. 2000). Wenger et al. (2002) found out that the national cultural differences set challenges in the multinational and global organizations. People's willingness to ask questions which reveal their ignorance, disagree with others in public, contact the known experts, discuss their problems and follow others in the conversations, vary greatly across the cultures. Especially, in the Asian cultures, the desire to save face could constitute a significant barrier to active

participation in the groups. Also, in high power distance cultures, information flows are usually constrained by the organizational hierarchy (Sarker et al. 2005). The members of the individualistic societies are known to view themselves as independent, and to be motivated by their own thoughts and preferences. They have less incentive to share information and knowledge with others. In a work environment, these people prefer to venture out on their own, and they believe that withholding information is the key to success.

Nonaka (1994) sees that in Western cultures, the dominant knowledge of rationality is an explicit knowledge-oriented approach. It tends to ignore the importance of commitment, and instead center on the reinterpretation of the existing explicit knowledge. The members from less individualistic societies, believe that the success depends on the ability to share knowledge with the others, and they prefer to involve the others in almost every aspect of their work. Nonaka (ibid) notes that the Japanese culture tends to overemphasize action and efficiency, at the expense of a search for higher level ideas, which have an universal application. When Ueki et al. (2011) compared the organizations in Japan and United States, they found out that the organizations located in Japan, appear to implement a more comprehensive approach to knowledge creation. They also incorporate the human development practices, such as job rotation and cross-functional training, more fully into organizational life.

The organizational culture means the shared values, beliefs and practices of the people in the organization (McDermott and O'Dell 2001). It is reflected in the visible aspects of the organization, like its mission and espoused values. The culture is receptacle and disseminator of how the organization has chosen to react in the future, to what it has experienced in the past. The culture exists on a deeper level as well, embedded in the way people act, what they expect of each other and how they make sense of each other's actions.

Change and/or learning in the organizations often involve restructuring the norms and the belief systems (Argyris 1999). Davenport and Prusak (1998) claim that the organizational culture can enable knowledge sharing, and the cross-cultural differences can explain the direction of the knowledge flows. The culture can also have negative effects. A highly rank oriented culture, as well as an authoritative or directive leadership style, can inhibit knowledge sharing efficiently (Bens 2005). If people feel pressured, they will be less motivated to engage in dialogue. Bratianu and Orzea (2010) emphasize that it is the managers' responsibility to create an organizational culture where the individuals are encouraged to express freely their feelings and opinions.

The theory of organizational knowledge creation discusses care in the organization. In the organizational relationships, care is reflected in the courage which the organizational members exhibit toward one another (von Krogh et al. 2000). Courage is needed when experimenting, allowing own ideas to be exposed to judgement, and giving opinions or feedback. The care-based relationships provide the foundation for trust, support and commitment, required to nurture unplanned interactions. This requires that the leaders understand how the organizational members interact with one another and with the outside environment.

In the case of low care, each person will try to seize the individual knowledge, rather than share it on the voluntary basis (von Krogh et al. 2000). Any attempts to present new ideas, concepts or prototypes will be met with harsh judgement, and the individuals will end up building their own hegemonies of knowledge and then do their best to protect them. Sharing more knowledge than necessary will lead to reduced power and influence for the individual. The individuals are not motivated to make their knowledge explicit or share it, except through clear transactions which benefit them, i.e. swapping documents or other forms of explicit knowledge. When there is only little room for experimentation, sharing tacit knowledge becomes impossible. When care is high, the individuals show genuine interest in the other's progress. When the colleagues are supportive, the individuals are more likely to articulate their knowledge spontaneously, using metaphors and analogies, and share their tacit knowledge.

Justice in the organizations is an influential antecedent of the employee behavior or attitudes at the workplace and, specifically, the commitment of the employees towards the organization and the trust in the other organizational members (Lin 2007). Lubit (2001) claims that knowledge sharing can be encouraged by procedural justice in the decision making. Procedural justice has three aspects: engagement, explanation and clarity. Engaging people to the decision making means that their opinions are asked for the decisions affecting them. Explanation refers to that all who are affected and involved, understand why the final decision was made. Clarity of the expectations means that before, during and after decision making, everyone understands what is expected of them and what are the rules of the game. When all the aspects of the procedural justice are fulfilled, the individuals are most likely to both share their ideas and to carry out decision which are made. Procedural justice in performance evaluations and distributing benefits, leads to organizational citizenship behavior. This behavior includes conscientiousness in carrying out job responsibilities and initiative, and such extra job behavior as helping the peers with their work and communicating useful information to people in the other departments.

Most organizations have an unspoken set of core values which, guides what people do and how they make sense of each other's actions (McDermott and O'Dell 2001). The individuals are expected to be truthful and forthcoming about the world they work in, about the norms, the procedures and the strengths and the weaknesses of their superiors (Argyris 1999). Other aspects, like feelings, failings and conflicted motives, are taken for granted and remain unexamined. McDermott and O'Dell (2001) see that the core values are not usually communicated through the orientation programs, but they can be identified from the ways the organizational members act, speak and interpret the organization around them. Frequently, the values of the organization are carried out by small groups of people who have regular contact, working together or sharing ideas and experience.

The organizational culture might not support the learning process, unless values, such as, risk taking, openness in communication and teamwork are shared and rewarded (Kessler et al. 2000). Smith et al. (2005) claim that by supporting risk taking, the organization can increase knowledge creation capability. Also, a high perceived likelihood of potentially costly but avoidable errors, facilitates learning (Popper and Lipshitz 2000). A failure stimulates risk seeking and diagnostic behavior. High tolerance for mistakes in the organization, allows the groups to engage in non-routine and creative problem solving, and experiment through a process of trial and error (Sarin and McDermott 2003). Internally generated ideas enable the group members to associate more strongly with the group, and to have greater a commitment to its successful completion (Kessler at al 2000).

However, people are programmed at an early age to think that failure is bad (Edmondson 2011). The belief prevents the organizations from effectively learning from their missteps. When the important problems involve a potential threat of embarrassment, defensive reasoning takes over (Argyris 1994). Defensive routines are used to bypass and cover up errors, which are important to correct if the organization is to perform effectively. The mistakes are too ofter covered up, blamed on others, explained away, punished or ignored (Riege 2005). To change the organization, the individuals must take an active role, not only in describing the faults of the others, but also in drawing out the truth about their own behavior and motivation (Argyris 1994).

The most effective way for an organization to transfer knowledge, is to hire smart people and let them talk to one another (Davenport and Prusak 1998). Communication is the main mode by which the workers discover what they know and share it with their colleagues. According to Argyris (1999), to address the root causes of the problems, the individuals need to be encouraged to communicate openly and publicly test assumptions

and beliefs. Szulanski (1996) points out that frequent communication alleviates anxiety caused by misinformation, and facilitates interaction between the individuals. This, in turn, assists in the creation of a shared meaning or context within which the knowledge transfer process can be facilitated.

Leonard and Sensiper (1998) note that communication in the organizations is often logical, rational and based on hard data. Rarely, the evidence is regarded as relevant, unless it is backed up with analysis. It is equally important to select a suitable knowledge carrier, because the groups often exhibit a strong preferences for a particular type of communication. Nonaka (1994), as well as, Nonaka and Takeuchi (1995) see that sharing redundant information speeds up the knowledge creation process, thus making it possible to solve new problems. They argue that redundant information helps building unusual communication channels, and sharing extra information helps the individuals understand their position in the organization. Redundancy of information increases the amount of information to be processed, and can lead to information overload. It also increases the cost of knowledge creation. Paulin (2010) argues that the more frequent use of communication channels affects negatively on the perceived knowledge sharing, at the same time as the cooperation improves. This can be also explained by information overload. The perceived low level of knowledge sharing has triggered an increase in communication.

Storytelling is a significant part of the learning process (Crossan et al. 1999). Stories reflect the complexity of the actual practice, rather than the abstract descriptions of e.g. the organizational routines. The stories give meaning to the world and represent the norms of behavior, experience, explanation of the reality and basic human values, thus influencing what people accept and what they reject (Mladkova 2007). Nonaka et al. (2000) claim that sharing the background to and the stories about the organization helps members form routine knowledge. Routine knowledge consists of tacit knowledge that is routinized and embedded in the actions and the practice of the organization.

The stories allow the individuals to regulate their own behavior, and help orienting themselves for bonding with others and in understanding the organization's value system (von Krogh et al. 2000). The stories also help the leaders explain their goals, initiate changes, neutralize gossips, build a shared vision and explain difficult measures. Positive stories are about victories and success, and they help create a common understanding among the people. Negative stories are about failures and over gone dangers, and they help share knowledge and learn. The success of the storytelling depends on the content of the story (tacit knowledge being transferred), the storyteller's personality, language skills and his ability to transform knowledge to the story, as well

as the audience's activity and relation to the story and the storyteller, their previous knowledge, experience and mental models (Mladkova 2007). In addition, the success of the storytelling depends on the ability of the audience to open their minds to the story and the knowledge it carries.

However, stories, paradigms and beliefs may include potential disconfirmation and what is learned, appears to be influenced by the history, rather than by the frames applied to that history (Zollo and Winter 2002). Disagreements over the meaning of the history are possible, and different groups develop alternative stories, which interpret the same experience quite differently. The stories can make it difficult for the individual to express contradictory ideas (von Krogh et al. 2000). They may also polarize new knowledge and direct the attention elsewhere.

The paradigms define the themes discussed in the management meetings, used language, the key stories told and the routines followed (von Krogh et al. 2000). They influence what data and information the individuals are likely to search for, and how they interpret the data. The paradigms socialize new organizational members and get them lined up behind the current thinking of the company. Unfortunately, the paradigms also determine the legitimacy of the personal knowledge within the organization, and the nonconformist attempts to justify personal beliefs are often met with skepticism.

Organizations cultivating the climate of teamwork are better able to stimulate knowledge exchange and combination between the individuals (Sarin and McDermott 2003). Newell and Edelman (2008) suggest that the accumulated experience should be strategically used by assigning people to projects, where their previous experience is going to be applicable. Swan et al. (2010) support the idea and conclude that the organizations generally only learn from the projects, if at all, by the accumulation of experience among the groups and the individuals. Much of what is learnt in a project, goes no further than the project itself. At best, learning is transferred through the individuals moving on to new projects, or through the personal networks.

Therefore, the activities supporting the personal networks are crucial to foster knowledge sharing in the organizations (Kogut and Zander 1992; Lubit 2001). Transfers, training weeks, knowledge fairs, seminars, task forces and councils provide opportunities for people in different subsidiaries to meet, exchange ideas, become acquainted, and later be able to work together and share ideas while at distance (Dyer and Noboeka 2002). In business, people often network informally with others with similar interests, or form communities of practice to discuss their experience, gather ideas of the others and receive feedback on their own ideas (Lubit 2001).

Most of the important information people need to implement a practice, cannot be codified or written down. It has to be shown to them, or it requires dialogue and interactive problem solving (O'Dell and Grayson 1998). An individual may never conceive of some of the best solutions without the assistance of the experts. Coaching arrangements and opportunities to observe the experts, are efficient at conveying tacit knowledge. Coaching, along with mentoring, are most effective when the coaches/ mentors understand exactly which skills lead to the superior performance, and can therefore help the coachee/mentee develop these particular skills (Lubit 2001). Collis and Winnips (2002) mention also scaffolding, where the mentor models the desired learning strategy or task, and then gradually shifts the responsibility to the mentee.

An organization's tacit knowledge is embodied in the routines, and the organization "remembers" by exercising the routines (Bhatt 2002). The organizational routines are stable patterns of behavior, which characterize the organization's reactions to variegated internal or external stimuli. They help understand the interplay between the organization's structure, its processes and its actions (Jashapara 2004). The routines are independent of the individual actors who execute them, and they are capable of surviving a considerable turnover in the individual actors (Bhatt 2002). The rules and the procedures are meant for ensuring that the organization can effectively coordinate its work processes and tasks.

The lessons of history are encoded in the routines, and they are an important basis for the intelligence of the organizations (Levitt and March 1998). The routines make the lessons accessible to the organization and the organizational members, who have not themselves experienced the history. The interferences drawn from the experience, are recorded in documents, accounts, files, standard operating procedures and rule books, organizational structures and relationships, in standards of good professional practice, organizational stories, and in shared perceptions of the way things are done in the organization. However, the organization cannot dictate the rules for coordination and knowledge sharing. The employees often form informal communities of expertise from where they can get necessary pieces of knowledge (Bhatt 2002).

The organizational routines can be communicated through a variety of channels, such as imitation, socialization, education and personalization processes, and they become part of the collective memory (Jashapara 2004). Recording the rationale for the routines, helps preserve the knowledge upon which they are based (Lubit 2001). According to von Krogh et al. (2000) the procedures represent the embedded experience and the successful solutions to the complex tasks. They make the organization more effective and efficient in the current operations. The disadvantage is that the procedures direct

communication, define planning steps and set performance measurements for control. Successful experience leads to excessive exploitation of the existing knowledge which, in turn, hinders the exploration of new knowledge (Nonaka et al. 2000).

The organizational routines are subject to change, especially if the actions do not produce the intended outcome, or they produce an undesirable outcome (Jashapara 2004). The routines can also be expanded to take advantages of new possibilities. Innovations in the routines consist of new combinations of the existing routines, and reliable routines provide the best components for the new combinations. Research on organizational learning suggests that the organizations which are effective at learning, have developed routines allowing the organization to effectively develop, store, assimilate and apply new knowledge on a systematic basis (Nonaka 1994).

In moderately dynamic or highly volatile markets, the organization can learn to adapt its routines to the changed circumstances (Jashapara 2004). This leads to the development of the dynamic capabilities. Zollo and Winter (2002) define the dynamic capabilities as learned and stable patterns of collective activities, through which the organization systemically generates and modifies its operating routines, in pursuit of improved effectiveness. On a simplistic level, the dynamic capabilities are considered as routines to learn routines (Jashapara 2004). They are composed of simple routines consisting of very few rules and a greater tendency towards improvisation.

The dynamic capabilities develop through the coevolution of tacit accumulation of experience, knowledge articulation and knowledge codification processes (Zollo and Winter 2002). Experience accumulation refers to the central learning process by which the operating routines have traditionally been through to develop. These capabilities arise from learning, and they constitute the organization's systematic methods for modifying the operating routines.

The organizational learning mechanisms (OLMs) are institutionalized structural and procedural arrangements, which allow the organization to learn non-vicariously, i.e. to collect, analyze, disseminate and use systematically information relevant to the organization and to its members' performance (Popper and Lipshitz 2000). The OLMs are dedicated to facilitating learning in the organization, or to disseminate what the individuals and the groups learn through the organization. The OLM's shape the operating routines both directly and as an intermediate step in the dynamic capabilities (Zollo and Winter 2002).

The internal learning process in the organization starts with the creation of knowledge by the individuals, and the external learning process starts with the identification of a new idea by an outside source (Zollo and Winter 2002). Both of the processes involve tradeoffs. Kessler at al. (2000) found out that focusing more on the internal learning, will allow the organization to develop its own core competences and appropriate more profits, while also allowing for more control and a greater understanding of the tacit knowledge embedded in the development process. External learning is required for the organization to develop a broader knowledge base, to keep abreast of the cutting-edge technologies and to remain flexible.

An organization's knowledge is stored in its organizational memory, which is a cumulative learning of the organization through its founders, managers or employees. The organizational memory is said to be the most influential way to access information. The organizational memory may reside in people's minds (Jashapara 2004). This 'soft' form of the memory can be invaluable in a variety of circumstances, e.g. when diagnosing an error in a complex piece of technology or locating non-traditional information sources. The 'hard' form of the memory relates to the storage and the retrieval processes and to the computer-based organizational memory. The repositories contain information from the organization's history, such as knowledge about the individuals, the culture, the transformations, the structure and the ecology.

The content of the organizational memory is non-exhaustive. Much of experience is unrecorded, simply because the cost is too high (Levitt and March 1998). The organizations make distinction between the outcomes which are be considered relevant for the future actions, and the ones which are not. Saban et al. (2000) note that once formed, the organizational memory has a tendency to filter out information, which does not reflect the organization's norms, rules or strategic goals. According to Levitt and March (1998), recently and frequently used routines are more easily evoked from the memory, than those which have been used infrequently.

The existing knowledge is dispersed throughout the organization, poorly organized and managed (Ardichvili et al. 2003). Therefore, knowledge availability is also partly a matter of direct costs of finding and using what is stored in the organizational memory (Levitt and March 1998). The employees are not aware of the knowledge so they cannot acquire it (Reddy and McCarthy 2006). Usually, the knowledge fragmentation problem is solved by trying to make knowledge available across the organization. According to Nonaka and Takeuchi (1995) this kind of requisite variety enables knowledge creation, but it also produces an information overload problem.

Davenport and Prusak (1998) argue that knowledge mapping, i.e. documenting who knows what in the organization, creates an essential knowledge inventory. Still, it does nothing to guarantee the ongoing availability of knowledge. Having access to knowledge only when its 'owner' has time to share it, or losing it entirely if he leaves the organization, are significant problems. The organization has to have strategies for preventing such losses. A partial answer is to try to transfer as much knowledge as possible to someone else, through mentoring or apprenticeship, so that the important tacit knowledge is not wholly concentrated in one person. Explicit knowledge can be embedded in the procedures or represented in documents and databases, and transferred with reasonable accuracy.

Many formal knowledge sharing practices depend on the information systems offering support on data acquisition, organization, storage, retrieval, search, presentation, distribution and reproduction. Thierauf (2001) claims that most companies in an industry have access to the same technology. The difference in performance lies in the way the technology is used to enable and support the competitive advantage. The technology often removes the temporal physical and social distance barriers by improving the knowledge sharing process, and locating knowledge carriers and seekers. However, the role of technology can be exaggerated and misstated, which causes confusion about what technology should or can do and cannot do. Whilst most people are not reluctant to use technology, the familiarity or unfamiliarity of the information system can be a potential knowledge sharing barrier. Unrealistic expectations placed on the technology could result in reluctance to use the system (Riege 2005). It seems necessary to involve the users in designing or choosing the new and modifying the existing information systems.

Input process, i.e. getting the entries approved by the managers to the information system, is time consuming. This is a potential problem, especially in the high technology sectors, markets and competitors which change rapidly and knowledge may become obsolete almost overnight (Augier et al. 2001). Also, security and confidentiality considerations lead to self-imposed censorship. Inadequate categorization and quality control regarding the database content, make finding the state-of-the-art information held in the databases very time consuming. The impersonality of the groupware allows anyone to post information, but it does not create the same confidence in the quality of knowledge, which personal acquaintance and reputation can inspire (Davenport and Prusak 1998). An ongoing and immediate technical support function needs to support timely solutions for any kind of problems, as well as, anticipate the potential problems and pitfalls. Usually, training programs do

not give adequate attention to informing people of the existence of the database systems and helping people learn to navigate them (Lubit 2001).

The physical spaces in the organization affect on how the organizational members interact. For example, the corporeal proximity enhances tacit knowledge utilization in the project work (Koskinen et al. 2003). The organizations could encourage knowledge sharing across the lines of the departments or the business units, by creating locations and occasions for the workers to interact informally (Davenport and Prusak 1988). However, the offices and the departments have a tendency to be arranged according with the hierarchies within the organization, and they disregard the need to work together and exchange ideas, experience and knowledge (Bratianu and Orzea 2010).

Davenport and Prusak (1998) note that moving to virtual offices decreases the opportunities to personal conversations. Distance, in a form of physical separation and time, makes it difficult to share tacit knowledge (Cross et al. 2001). Ardichvili et al. (2003) and Ardichvili (2008) see that virtual communities of practice, supported by the internet technologies, are an alternative to live conversations and knowledge exchange. As the community members already know each other, they are more willing to contribute knowledge, as well as, to use their knowledge network as a source of knowledge. The key issue is to choose and implement a suitable technology, which provides a close fit between the people and the organization.

2.5 Chapter summary

This chapter summarizes the ideas of knowledge and learning in the organizations. Organizational knowledge consists of the employees' industry experience and education, as well as, of the diverse information and knowledge the employees hold. Knowledge is invested in practice, i.e. in the methods, ways of doing things and successes that demonstrate the value of knowledge as it develops. The organization's success depends on how well it can enhance its own knowledge base by either creating new knowledge, or obtaining existing knowledge.

Knowledge is created in the social interaction. The values and beliefs of the knower determine what he sees, absorbs and concludes from the observation. Due to the personalized nature of the knowledge, it needs to be expressed to be useful for the others. Knowledge consists of both tacit and explicit elements. Tacit knowledge is tied to senses, tactile experience, movement, skills, intuition, unarticulated mental models or

implicit rules of thumb. When tacit knowledge comes to action, the person acts concentrating on the activity, not how it is done. Explicit knowledge has a universal character and it can be articulated and managed with tools and techniques.

Learning takes place in the organizations during the dynamic interaction amongst the individuals, the groups and the organization itself. Individual learning is seen as the point of departure for organizational learning. Organizational knowledge is created through communication of the individual learning among the co-workers. Therefore, the organizational learning is dependent on the organization members exchanging and combining existing information, knowledge and ideas, as well as, internalizing and applying what they have learned.

Much of the knowledge transfer and learning in the organization, takes place in the group level. This places the groups into an important position in organizational learning. Learning in the groups often occurs as unintended byproduct of the group activity. The organization learns by the learning of its members (learning in organizations) or by ingesting new members, who have knowledge, which the organization did not previously have (learning by organization). Some of the individuals' learning is embedded in the organizational systems, structures, strategy, routines and investment in the information systems and the infrastructure. Learning is reflected as changes in the collective knowledge, value base and behavior, which subsequently affects the organization's performance.

The organizations acquire new knowledge through the process of congenital learning, experiential learning, vicarious learning, grafting and noticing. Knowledge sharing refers to the activities through which knowledge is exchanged among the individuals or the groups or the organizations. The goal of knowledge sharing is either to create new knowledge by differently combining existing knowledge, or to become better at exploiting existing knowledge. The more people work together and the more time they spend socializing and casually talking about their experience, sharing anecdotes and impressions of each others experience, the more tacit knowledge they will share. By codifying the tacit knowledge, it can be accessed and used by some others, sometime in the future, and it is not dependent of the personal networking. Explicit knowledge can be shared through oral communication and codification gives permanence to knowledge, which may otherwise exist only inside an individual's mind.

Knowledge transfer means identifying existing and accessible, i.e. explicit, knowledge, and then transferring and applying this knowledge to solve specific tasks better, faster and cheaper than they would otherwise have been solved. The goal is to reuse what

others have already learned. Especially, the organizations are interested in transferring best practices. Best practice is any practice, knowledge, know-how or experience, which has proven to be valuable or effective within one organization or organizational unit, and which may have applicability to other organizations or organizational units. The transferred knowledge is more like a source of inspiration and insights for the local operation, not a direct order to be followed.

Additionally, the author of the study presented different approaches to organizational learning. The experiential learning theory describes learning as a process, in which knowledge is continuously derived from and tested out in experience. The model of single-loop and double-loop learning describes organizational learning as a mental process. The 4i framework of organizational learning builds on the tension between exploration and exploitation in the organization, and it considers organizational learning at three levels: individual, group and organization. The theory of the organizational knowledge creation describes the transformation process of tacit knowledge to explicit knowledge (and vice versa), to create new knowledge.

Then, the author of the study discusses different types of groups in the organizations. Also, the idea of team working is discussed. The focus in this study, is on project teams and other formal workgroups in the organizations. An increasing number of the organizations use projects and team working to achieve the defined strategic objectives, and to adapt to the changing business environment. The characteristics of the project work include temporary nature, specific end-result, non-recurrent character, complexity and significance. In a project-based organization, the organizational tasks are performed in projects As several projects are being performed simultaneously, the need for planning and control are obvious. Usually, the employees are working in more than project at the time. The relation between the projects could be often be characterized by competition, thus leading to sub-optimization and an insufficient level of knowledge exchange. There is no time to learn from the others, and the competitive environment does not stimulate coordination.

The projects are found to be rich and fertile sites for learning, and the individuals will learn a lot, while being assigned to challenging and varied projects. The projects generate a vast amount of knowledge on the organizational processes, as well as, technical knowledge on the products. Learning significantly enhances the project team's ability to innovated and faster bring products to market. Also, unlearning is critical, because many pieces of knowledge, intuitions and opinions depend on the assumptions about the world, which are simply no longer true.

Project based learning encompasses intra-project learning (or exploration) and inter-project learning (or exploitation). Knowledge from project to project flows through direct and detoured transfers. The mediums of direct transfers are mainly employees who directly move to the next project with knowledge achieved from the previous project. Detoured transfers occur through several different mediums, e.g. knowledge repositories, company manuals, training programs, work processes and employee minds. When the project finishes, there is a risk that the knowledge created and experience gained during the project work, will be lost. Unless the lessons learned, especially related to the project management experience, are communicated to the subsequent projects, there is a risk that the same mistakes will be repeated. Lessons are learned on specific situations in business operations, which exist in the organizational boundary, thus making them volatile regarding time.

Much of the projects' learning is tacit in nature, and it is difficult to articulate, capture and disseminate. Codifying knowledge facilitates the sharing of learnings within the project team, and provides an opportunity for sharing the lessons learned across the projects. However, the learnings are often inaccurately captured, and the context relevant to the learning, is too often captured incompletely, inaccurately, or not at all. Therefore, the organizations should focus on stimulating individual learning and running project reviews to generate and transfer tacit knowledge. Everyone benefits from reviewing past activities and decisions, to learn what worked, what did not, what can be changed and what must be managed. The author of the study presented two alternative ways to review a project: Post-Project Appraisals and learning histories.

In most business organizations, failure and fault are virtually inseparable, and examining failures in depth is emotionally unpleasant and can chip away the individual's self-esteem. The way the managers respond to failures, and whether they encourage open discussions of them, welcome questions and display humility and curiosity, affects the most to the project team members' willingness to speak about failures. The effect of the group leader, and other elements affecting knowledge creation and sharing in the groups, are presented at the end of the chapter. The elements were divided into three sets: the elements related to the group members, the elements affecting the individuals while working in the group, and the elements related to the organization. Some of the presented elements, will be used in the facilitation method for capturing lesson learned in groups:

- the individuals' motivation, trust and defensive routines
- the group leader's behavior and target setting for the workshop; group size and routines; face-to-face interaction and conversations; openness for feedback; the

group members' common experiences and common language, as well as, information accuracy and relevance

- the commitment of the leadership and physical environment as the proximity in time and space

3 Small group facilitation

The third chapter of the dissertation discusses small group facilitation. The idea of facilitation, as well as, the role of the facilitator are described. Various approaches and techniques, suitable for facilitating the collection and the analysis of the lessons learned in the groups, are presented.

In the social constructive approach on learning, the learner cannot be taught new knowledge, but his process of creating knowledge can be facilitated (Siljander 2005). This approach emphasizes the learner's active role in knowledge creation and modification. The learner is goal oriented, information seeking subject, who is accountable for his own learning process. In business environment, facilitation is mainly introduced in contexts like organizational change, organizational learning and organizational performance (Kato 2010). Facilitation is also recognized as a form of leadership. It is regarded as an important characteristic of the leaders working to manage and control situations by facilitating the process. In the context of training and/ or learning, facilitation can be understood as an act of realizing goals, through using a set of tools. Be selecting and combining the tools, the facilitator can strategically and effectively control the situation toward the achievement of the desired goal.

Facilitation is a process in which a person, the facilitator, helps a group of people complete their work and improve the way they work together (Farrell and Weaver 1998, Herbert 2010) Facilitation involves managing the relationships between people, tasks and technology, as well as, structuring the tasks and contributing to the effective accomplishment of the meeting outcomes (Bostrom et al. 1993). Facilitation aims to ensure the creation of a space with clear and valid limits for action, holding the space to maximize the participants' opportunity to act, and acknowledge their experience in the space, as well as, letting go of any need to achieve predetermined and fixed outcomes (Herbert 2010). Also, facilitation emphasizes learning from the process. This requires that the participants are offered tools to reflect on their experience.

Facilitation is concerned with encouraging open dialogue among the individuals with different perspectives, so that the diverse assumptions and options may be explored (Hogan 2002). Facilitation can reduce the cultural, professional or organizational barriers, which make communicating difficult (Kolb 2004). Heated debates can generate a great deal of angst, and they stop people reaching a useful understanding of one another's issues (Hogan 2002). The author (ibid) compares an argument to a fight. In argumentation, there is minimal communication beforehand. No ground rules are set either. The implicit rules allow shouting and interruptions, repetition of the ideas, the

survival of the fittest and not presenting any new ideas. The atmosphere can be sometimes even threatening, because the thinking is dualistic and it emphasizes winning and losing. The arguments are warlike narratives and others' points are right on target. The convictions are not negotiable, and the arguments polarize thinking, e.g. with stereotyping. In argumentation, all ideas are voiced as proven facts and questions are used to score points, or to mask suggestions. The argumentation assumes unity of views between the people on each side.

In the facilitated meetings, the dialogue is prepared beforehand, and the ground rules are set (Hogan 2002). The atmosphere is exploratory, and it is safe to disagree and voice concerns. In the dialogue, the participants are searching for shared concerns, beliefs and values, and voice also uncertainties, as well as, deeply held values. Genuine questions are used as tools to open up thinking. The participants speak for their own point of view.

Co-facilitation means that two, or more, facilitators are working in partnership, to enable the group and its individual members to reach an agreed outcome, in a way that maximizes their own and others' learning, through the active involvement of all (Hogan 2002). Co-facilitation is used for making things easier for both the group and the facilitators. It is often chosen as an alternative to solo facilitation when the complexity of the problem, the long-term needs for skill or knowledge development, the number of people involved, and/or the time required, suggest that the facilitation process will be difficult for one facilitator to manage alone. Also, in some cross-cultural situations it may be useful to work with a co-facilitator from another culture. The other facilitator may have long-term exposure to both cultures and can explain the meaning of each side's communication behavior. At times, this person may explain misunderstandings. Co-facilitator can also be an interpreter, language translator. Sometimes, the direct translations have negative connotations and using other expressions are preferred.

3.1 Facilitator's role

The facilitator is a self-reflective process-person, who has a variety of human, process, technical skills and knowledge, together with a variety of experience to assist the groups of people to reach their goals together (Hogan 2002). A skilled facilitator has presentation and training skills, as well as, facilitation skills and he can interweave seamlessly between the three, when necessary. The most important skill of the facilitator is active listening (Farrell and Weaver 1998). Active listening includes both encouraging, restating, reflecting and summarizing the discussions in the meeting. The

facilitator encourages the participants to keep talking, and shows that he is listening and understanding. The facilitator also reflects what he hears and summarizes it to pull the important ideas and facts together, thus establishing the basis for further discussion. The facilitator has to be comfortable with anger and conflict. Since there are only a few prescribed rules or ways of doing things, the facilitator needs to be flexible and creative.

The facilitator actively engages in guiding the participants to reflect on, intensify and generalize their own and the other group members' experience (Kato 2010). He also maintains or transforms the flow of the interactions between the group members. Hogan (2002) claims that facilitator's role is to challenge the assumptions, and to create an environment, which is conductive for people to move out of their comfort zones. However, people will not shift, until they are ready, willing and able, and the facilitator should respect the 'choice' of the individual. Also, the facilitator needs to be able to build a secure, trusting environment where the participants can experiment and break out of, or rewrite, the scripts which inhibit their growth and learning. A part of the facilitator's job, is to help people feel included in the group.

Weisbord and Janoff (2007) summarize the facilitator's role as a discussion leader, a recorder, a reporter and a time keeper. The facilitator suggests ways of proceeding and offers tools and techniques (Bens 2005). He makes sure that everyone is heard, and points out digressions. The facilitator asks probing questions and offers ideas for the group's considerations. He also offers feedback on the meeting and suggests improvement ideas. The facilitator helps people maintain the ownership of the meeting process and the outcomes, as the group itself is responsible for what is happening (Weisbord and Janoff 2007). In other words, the facilitator does not try to influence the group's decision, or to take the control away from the group (Bens 2005). The facilitator is concentrating on the meeting process, and not making any content decisions for the group. The facilitator helps the group achieve closure and encourages them to define clear next steps. However, it is not the facilitator's task to take responsibility for the defined actions.

According to Kolb (2004), a true facilitator is not concerned about the issues under discussion by the group, nor has a vested interest in the outcome. This means that the facilitator's role in the group cannot be a leader or a mediator (Hogan 2002). In the traditional meetings, the role of a chairperson, i.e. the person who manages the meeting process, is usually undertaken by the group leader. As a power-holder in the group, he could influence the content and the flow of the discussion. It is often difficult for the group leader to be objective enough to perform this role, because he is so enmeshed in

the group process and he is holding the power in the group. In some cases, the role of the group leader can be in direct conflict with the role of the facilitator.

Farrell and Weaver (1998) compare the roles of the organizational leader, the person leading the group and the group external facilitator. The organizational leader is concerned with doing the right thing, and he takes the long-term view, concentrates on 'what' and 'why', and thinks of innovation, development and the future. The organizational leader sets the vision, and he hopes that the others will respond and follow. He appeals to hopes and dreams, inspires innovation and expects the others to help realize his vision. The group leader is more concerned with doing the things right and is more short-term focused. He is concentrating on 'how', and thinks of administration, maintenance and the present. The group leader sets the plan and the pace for the group, and expects that the others will complete their tasks. He monitors the boundaries, defines the limits and inspires stability.

The facilitator wants to help people do things, and find different views and articulate them (Farrel and Weaver 1998). His task is to help people concentrate, be clear in the 'here and now' and communicate their thoughts. The facilitator helps people make meaning of the tone and direction, defined by the organizational leader, to function well at the pace required by the group leader. Weisbord and Jenoff (2007) recognize two potential problems when the group's formal leader is acting as a facilitator. The group leader will either withhold his knowledge and hope, that the others will come around, and/or impose his own ideas without hearing any others. Likewise, it is hard for some group members not to be swayed by the position power of the group leader.

Hogan (2002) compares the roles of the internal facilitator, who is a member of the facilitated group, and the external facilitator, who is an outsider in the group. The positive aspect of the internal facilitator, like the group leader or member, is that he is easier available for the meetings than the external facilitator. He also knows the group history, situation, politics and people involved. However, it is harder for the internal facilitator to stay out of the meeting content and the objectives, as well as, to concentrate on the meeting process. Additionally, the group members may pressure the internal facilitator to manipulate the meeting process. It may also be difficult for the internal facilitator to confront the individuals higher in the group or the organizational hierarchy, and to stay unbiased towards some individuals.

The external facilitator is a facilitation specialist, who is invited to the meeting to apply his process and relational skills (Bostrom et al. 1993). The external facilitator is less biased, has fewer initial stereotypes and is not part of the political structure of the group

(Hogan 2002). It is easier for the non-group member to stay out of the meeting content and concentrate on the process. The external facilitator prevents proceedings being dominated by the individuals and/or the minority groups. He can confront where necessary, without the fear of retaliation, and use apparently innocent 'naive observer' questions. The workshop results, gained with the help of the external facilitator, have more credibility both with the participants and the outsiders.

The external facilitator needs to be selected with care, because some group members may find it hard to accept the outsider to intervene in the group work (Hogan 2002). As an outsider, the external facilitator needs to prepare well for the workshop. He needs to learn the language or the concepts of the group, as well as, the history of the group and the organization. In highly sensitive discussions, the facilitator's background, alliances and motivation may influence the level of trust which develops, or even whether the group members will agree to participate in the workshop (Bens 2005).

3.2 Facilitated meetings

The facilitator cannot manage other peoples' behavior, but he can manage the meeting structure, i.e. the conditions under which people interact (Weisbord and Janoff 2007). The authors (ibid) believe that the structure becomes critical, when there is a great the range of differences in the meeting room. Bostrom et al. (1993) created a facilitation framework (see Figure 18) to describe the meeting structure.

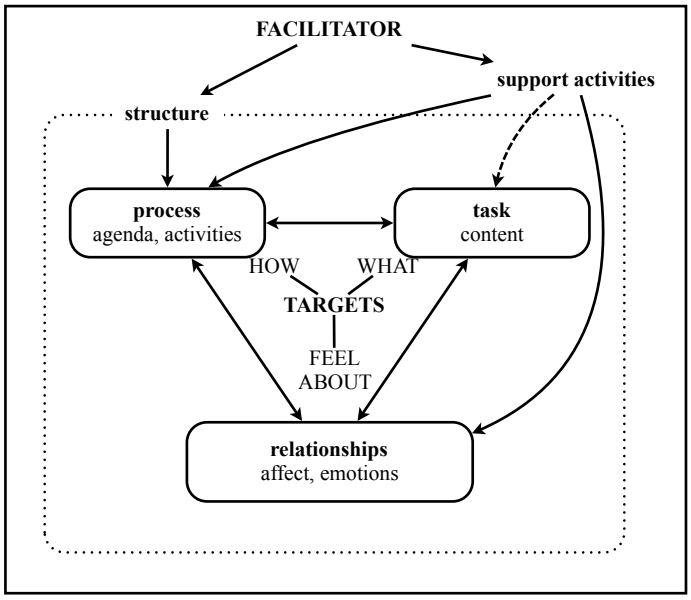

Figure 18 Facilitation framework (based on Bostrom et al. 1993, p. 157)

The meeting structure establishes the frame or the context to activate the individuals or the group into a particular way of behaving (Bostrom et al. 1993). Usually, the meeting structure includes the expected outcomes, the role specialization of the participants, the rules to follow, the procedures to accomplish and the techniques (or technology) to carry out the procedures. Targets refer to what the facilitative acts are trying to influence, including how the group does its work (process), the content of work (task) and/or how the group works together (relationships). The meeting structure is applied mainly through the meeting process, which influences the exploration and the accomplishment of the task outcomes and the relational outcomes. The task refers to the content of the workshop, and it guides the meeting process by stating what to do next. The individuals' and/or the group's affect relationships influence the participants' involvement in and contribution to the process, the quality of their contribution, as well as, the commitment to and the acceptance of the task outcomes. Both, the workshop process and the task, react to the relationships.

Besides providing the meeting structure, the facilitator can use support activities to enact the structure, to encourage effective behavior and to deal with the disruptive influences. The support activities are usually promotive, thus encouraging the effective task and relational behaviors, or counteractive, e.g. by challenging the relevancy of the provided information (Bostrom et al. 1993). All support activities are carried out through communication acts. The meeting structure and the support activities may be directed at the process, the task or the relationships. Process facilitation only indirectly influences the content of the discussion, by managing the procedural and the relational context of the interactions. In a case, where the individuals are brought together primarily for their task content expertise and judgment, the support activities aim to influence the meeting content.

A facilitated meeting is an interactive social process. All parties have a degree of ownership and responsibility for both the success and/or the failure of the event (Hogan 2002). The facilitator does not take exclusive or foremost credit for the outcomes of the meeting. Also, he should acknowledge the group members' efforts and accomplishments. Bens (2005) describes the facilitated meetings with a series of steps (Figure 19).

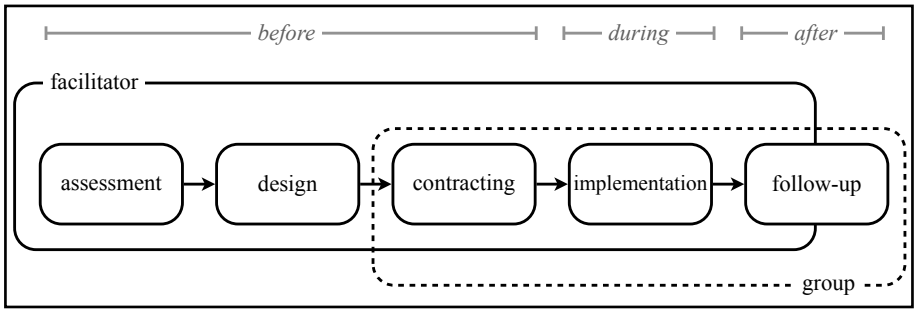

Figure 19 Facilitation assignment (based on Bens 2005)

What happens in the facilitated meeting, is strongly influenced by the pre-meeting activities (Bostrom et al. 1993). Therefore, proper preparation to the meeting is essential, especially for the external facilitator (Bens 2005). The assessment refers to the period of research, which is conducted to gather information about the group, the needs and the expected outcomes. The assessment results may indicate that the chances for success are poor, the resources and other forms of the organizational support are not in place, and the initiative lacks serious intent. In such case, the facilitator should resign from the assignment. Other good reasons to leave the facilitation assignment, are insufficient openness and trust to address the root causes of the issues in the agenda.

After the assessment, the facilitator designs the meeting and creates a draft agenda, in response to the data received in the assessment (Bens 2005). The meeting design includes identifying the meeting goal(s), the objectives and the expected outcomes, as well as, the activities and the needed process tools. The design is reviewed with the client and adjusted, when necessary, and then agreed to by all parties. This step is called contracting. In the contracting, the facilitator has an opportunity to negotiate the power needed to manage the assignment. It is also important to gain buy-in from the group leader. During this step, it is very common for the client to resist one or more of the key design elements. The rejection may be due to the incorrect assessment or due to the client's unwillingness to face the serious problems or to deal with difficult people, or the client feels the depth of the proposed conversations as threatening.

The fourth step in the facilitated meeting is implementation, i.e. the facilitator conducts the facilitated meeting. Usually, the facilitated meeting is divided into five phases (Bens 2005). In the welcome and warm-up phase, the facilitator opens the meeting and welcomes the participants. The group is energized and then the objectives are reviewed and the key issues and needs are assessed. The facilitator clarifies and gets agreement on outcomes, makes the roles and the rules clear, and establishes a positive group affect. In the agenda ratification phase, the facilitator proposes the meeting process and the participants accept it.

The facilitated dialogue refers to the implementation of the agreed meeting design. The facilitator's task is to help the group adapt and execute the agenda, i.e. to accomplish the task outcomes. People come together in the groups to learn from each other and from the facilitator (Hogan 2002). The participants want to know why they are doing something, i.e. how it will help them in the performance of their work or quality of work and/or home lives. The group members want to engage in the mutual enquiry, rather than be told what to do and how to do it. The facilitator needs to be able to 'go with the flow' and adapt when the participants seize their autonomy and suggest different ways of achieving the group's goals. Therefore, the facilitation process should be flexible and adapt to the needs of the group (Masters and Albright 2001). However, without any group facilitation technique, the groups interacting free are seldom able to follow the conditions necessary for the efficient group performance.

In the summary phase, the made agreements are reviewed and the next steps are planned (Bens 2005). Immediate dissemination of the results reinforces the agreements made, and maintains the momentum into implementation (Bostrom et al. 1993). Most facilitation assignments end when the main discussion is over. Therefore, the last step of the facilitation assignment, follow-up on the action plans, is the weakest element of most meetings (Bens 2005). Much effort is expended, before and during the meeting, but by the time the meeting has adjourned, the participants' energies and attention are focused elsewhere. The facilitators rarely have much control or involvement with the ultimate outcome of the meetings which they lead. The facilitators can either build the action follow-up into their assignment, or help the client create a well developed implementation and reporting mechanism for the defined actions.

3.2.1 Elements affecting the facilitated meetings

Facilitative theories, techniques and processes provide the framework for the meetings. However, also other elements influence the outcome of the facilitation practice. For example, the breadth and the depth of the skills and the experience of the participants, as well as, the supportiveness of the work and/or the community environment, affect the workshop results. The outcome of the meeting, also depends on the amount of time allocated to achieve the results, the meeting context and the serendipities, which emerge from people and groups working towards joint goals. Furthermore, the facilitator's skills, style, adaptability and personality, and the processes and procedures he uses, have an impact on the facilitated meeting.

Hogan (2002) argues, that the facilitator can create barriers for learning. The group will not learn if the facilitator is unable to build the safe environment for the group members to interact. The facilitator should not pack too much into one session and limit the questions, just to finish all the content. Also, he needs to understand that some participants may expect the facilitator to act as a teacher, who assumes that people are lacking in skills and knowledge. Instead, in facilitation the learner is seen as a responsible, autonomous individual, who knows what he wants to learn and whose experience is honored and valued.

Each adult has millions of experience and the facilitator needs to reserve enough time for the participants, to discuss and relate the new ideas and the new learning to their experience (Hogan 2002). The facilitator has to make an optimal provision for differences in the learning styles, the time and the place, the pace of learning, as well as, the cultural and physical differences. Some people need frequent stretch breaks because of achy joints. Poor learning can be expected also when the facilitator uses technical terms and jargon, and applies only such teaching or training methods he feels comfortable with. The facilitator needs to support people through steep learning curves and be patient and never condescending. If the meeting goes wrong, neither the group nor the facilitator should be blamed (Bens 2005). Often the problems stem from the planning phase of the meeting. A careful debriefing is required to spot the errors, so that learning from all perspectives is gleaned. Also, it may be appropriate to take some sort of remedial action to ensure, that such occurrences do not happen again.

Introducing the facilitator to a meeting, affects the group dynamics (Masters and Albright 2001). Therefore, the facilitation is more likely to work in helping the groups when they are not extremely polarized. The group has to be ready for the facilitator and understand his role. There is no point in forcing people together when they are so emotionally charged, that they cannot think straight enough to communicate coherently.

The larger the group size becomes, the more complex the number of interactions are possible (Hogan 2002). In small groups, the participants usually feel more satisfied because they have more chance to participate in the discussions, and they feel themselves more important. Also, small groups are more intimate and finish simple tasks quicker than large groups. However, it is harder to deal with awkward behavior in a small groups and, usually, fewer participants equals to fewer ideas and varieties of discussion, as well as, less experience overall. In large groups, there are more minds, skills and experience to process information and there is a chance to meet others as a mixed group. Large groups may take higher risks, which may be useful for the meeting outcome, but they are harder to organize. There are more tension, formality and

inhibitions and mood swings. Additionally, some subgroups are likely to form. In large groups, the members have less opportunities to speak, which may results in dissatisfaction, social loafing or for some individuals to be left out of the discussions. Possible dominators may appear and there is more pressure to conform. Shy people can stay anonymous, but due to the feeling of anonymity, the group is less likely to help a person in need.

During the facilitated meeting, the behavior of the group varies, and it is natural for the group to work at a varying pace and in different ways. The group needs time for reflection, experience phases of confusion, go round in circles or off on tangents and be very noisy at times (Hogan 2002). The author (ibid) reminds that all behavior is caused. Defenses play an important part in the individuals' strategies for survival in the world, as they have experienced and perceive it. People may not know what facilitation is, or understand the difference between the process and the content of the meeting (Bens 2005). Also, it is normal for some individuals, subgroups or groups to challenge the purpose of the workshop or the role of the facilitator (Hogan 2002).

There may occur interpersonal or intergroup conflicts in the meeting, or external factors affect the group (Hogan 2002). Fight behavior can occur as verbal and nonverbal conflict. When the group switches into the fight mode, learning is inhibited by playing the win-lose battles. The participants may 'fight' and challenge the facilitator. In flight mode, the group members joke. This can be productive in defusing tension, but it can be a delaying tactic or defensive technique for putting off the task at hand. The third type of defensive behavior, is dependence on the facilitator. The participants feel no dependence on each other for learning, but want to rely totally on the facilitator and regard him as an expert, who has all the answers to their problems. When a group of people come together, the participation and/or learning of some individuals may be inhibited by their psychological defensiveness. The person whose repressed anger is triggered, may behave submissively, rather than aggressively. The participants who are embarrassed, may just smirk and/or giggle.

In the ideal world, the relations between the group leader and the staff, would be so safe, open and honest that everyone could confidently speak their mind with their superior present. However, most group members feel inhibited in the presence of the group leader. Bens (2005) listed the pros and cons of having the group leader present during the facilitated conversation. The leader's presence demonstrates his openness and commitment to collaboration, but may keep people from raising the issues or identifying the problems. The group leader has wisdom and expertise to add, and he sees better the big picture. His presence may inhibit discussion and creativity or the

leader may dominate the discussions. However, the leader can help the group access resource. Although, at the same time, the group leader may hinder the members' ownership of the meeting outcome. Weisbord and Jenoff (2007) see that asking the group leader not to attend the meeting is impractical and, moreover, it denies the group one of its most valuable resources. The facilitator should address the topic with the group leader in advance, to increase the group leader's awareness about the consequences of his participation.

Also, the group members' needs influence the group behavior. The participants' motivation may be enhanced if their needs are met, e.g. if they are comfortable, in bright surroundings, with food and drinks available (Hogan 2002). The physiological needs underpin the preparation work, undertaken by the facilitator and the group. Cooperation in the workshop improves when the basic physiological needs of the participants are met. Safety needs relate to the contracting for safe ground rules, the methods for confronting inappropriate behavior and the ethical issues. Indeed, the success of the facilitated meeting frequently depends on the attention paid to building the trust and rapport, at the beginning of the meeting. The belonging needs relate to how the facilitator manages the issues of the diversity and exclusivity. The issues of self-esteem and recognition are involved in how the facilitator treats people with respect, at the beginning, during and at end of the meeting, and how he ensures that the participants do the same. Self-esteem and recognition also relate to the methods of giving and receiving feedback. The methods needs to be realistic, objective and constructive. The facilitator needs to be able to 'give face', as well as, prevent people from 'losing face'. Self-actualization needs relate to the self-fulfillment and realizing ones potential.

3.2.2 Intervention techniques

Conflict situations in the facilitated meeting raise from various reasons. The participants may be unable to manage the work that they are being asked to perform, i.e. they lack required skills, the task is unclear or the participants have not bought into the task (Bens 2005). Also, there may be a problem with the meeting process, or the used approach is not effective in dealing with the particular task. The conflicts may arise due to the organizational barriers, the lack of the basic meeting and problem solving skills or the ineffective leadership, referring to the lack of group management skills. Additionally, the interpersonal conflicts cause people to act out.

When the discussion comes across a difficulty, it is the facilitator's job to make an intervention. Since intervention is always an interruption and it disrupts the flow of discussion, the issue should be addressed quickly and the group can return to the discussion at hand. The interventions are needed only when the group behavior becomes ineffective and hampers the progress (Bens 2005). The facilitator needs to intervene if the group makes hasty decisions without sufficient data, or throws out its meeting process. The intervention is needed also when the proposed solution lacks the creativity or innovation required by the situation, or the group members fail to explore a wide range of possibilities, because an influential member is pressuring them to accept the solution he favors.

Kolb (2004) divides the interventions into task and maintenance interventions. Task interventions are comments, suggestions or procedures, which move the task along. The maintenance interventions center on activities and behaviors, which promote the social support among the group members. Maintenance interventions are used with greater frequency in the developmental facilitation. In the developmental facilitation, the group seeks to improve their own facilitative skills, while they solve their problem. The goal is to become a self-facilitating group, over time.

Another categorization of the interventions techniques, is made by Bens (2005). The content interventions include offering expertise, making suggestions, giving advice and telling the participants what to do. Hence, the facilitation is a neutral process, the content interventions are appropriate only when the group is in need of an additional information or an expert advice. The author (ibid) sees that the main focus of the facilitator should be on intervening on the process level. Process interventions include providing feedback, offering critiquing tools, redirecting behaviors and asking probing questions. Context setting activities are appropriate when the purpose, process, roles and other limits are unclear or missing. These activities include creating a vision or clear goal, setting specific objectives, developing a milestone or other output measures, clarifying the roles and the responsibilities, establishing a time frame, identifying financial and other constrains, and clarifying the decision making levels.

Commitment building activities are needed when the trust level is eroded, and the individuals are resistant and lack buy-in (Bens 2005). The awareness of the resistance factors can be raised, even before the meeting, by conducting interviews and surveys. During the meeting, the facilitator can map the resistance levels, use force-field analysis to identify blocks, use partner interviews to encourage expressing of concerns, pose buy-in questions, which generate commitment and create organizational support for the initiatives. Process adjustment is appropriate when the discussions has stalled and the

group is making little or no progress. The facilitator can stop to check, if the tool or the approach is yielding results, test the current approach and even try alternative approaches, if needed.

If the group does not have the norms it needs to deal with the challenging situations, the facilitator uses norm development interventions. He asks generic norming questions and uses survey format to test the adherence to the existing norms, like listening to others, objectivity, open-mindness and staying on the topic. Behavioral redirecting is needed when the ineffective behavior threatens both the progress, and the group cohesion. A person behaving ineffectively, is preferable coached in private, not on the spot. Coaching is done in three parts. First, the ineffective behavior is described to the individual. The facilitator also explains the impact of the behavior. Then, the behavior is redirected by explaining what the facilitator expects the individual to do, or by asking him what he thinks should be done. When two parties, or two individuals, are openly engaging in an unresolved conflict, the facilitator needs conflict mediation because the conflict hampers the progress of the whole group. The facilitator brings the conflicting parties together in private, so they can listen to each other. The conflicting parties are asked to describe what they need from each other, and what they are offering in return.

The facilitator gives structural feedback when the group needs to hear feedback about its performance. The feedback allows the group members to implement corrective actions (Bens 2005). Feedback received in surveys, is processed by analyzing the reasons for ratings, and creating ideas to improve. In some cases, the facilitator may need to use skill development intervention. This is needed when the group members are missing the key skills they need to debate objectively, make decisions or implement actions. The skill needs are assessed, e.g. by observing the group process. The facilitator can offer feedback, conduct a formal training session, provide reading materials and use role plays and coaching sessions. Rapport development is appropriate when the group members are reserved because they do not know each other, or because there is tension in the air. These intervention activities include using icebreakers, warm-up games, team challenge exercise and humor.

3.3 Facilitating groups capturing and analyzing the lessons learned

There are several alternative ways to facilitate capturing and analyzing the lessons learned in the groups. The workshops can be arranged by following a certain facilitation

approach, or by combining different facilitation tools and techniques, to fit the purpose and the agenda of the meeting.

3.3.1 Facilitation approaches

Dynamic facilitation and Open Space are suitable facilitation approaches, when reaching the meeting goals requires innovativeness from the participants. *Dynamic Facilitation* is an energy-based form of facilitating, where people address difficult issues creatively and collaboratively, and achieve breakthrough results (IAF Methods 2012). The approach establishes a process of talking and thinking, known as Choice-Creating, which builds mutual respect, trust and the sense of community. The purpose of the dynamic facilitation, is to help people discover creative and practical approaches to the challenging practical issues. This facilitation approach follows the energy of the group, without constraining the energy with agendas or exercises. The facilitator's very active, yet non-directive role, welcomes the participants' advocacy, while at the same time, creates the container for transformation (Zubizarreta 2006). The dynamic facilitator elicits a self-organizing dynamic both in what people talk about, and how they talk.

The key feature of the dynamic facilitation, is the use of four flip charts, or screens, which are labeled as 'problems' (or 'situation statements' or 'inquiries'), 'solutions' (or 'possibilities' or 'options'), 'concerns' and 'data' (Zubizarreta 2006). Off to the side, is an another flip chart, reserved for any decision the group makes. The facilitator uses the flip charts to catch the thoughts and the responses of the group, on an ongoing basis. Using the flip charts, indicates that what the participants say is heard and welcomed into the dialogue. The flip charts direct the participants' attention toward the front of the room, and everyone works on the issue, not on each other. The group determines the content of the workshops and generate the results. The group is working on what they care about, regardless of whether it seems possible to solve, or not. All objections the participants have to each others' ideas, are framed as concerns. The facilitator focuses on the meeting process. He helps the participant choose the discussed topic and reflects back to them what they are saying or seem to be feeling. The facilitator makes sure that all views are respected. Active listening eliminates miscommunication and stimulates breakthroughs.

IAF Methods (2012) describes *Open Space* as a method for convening people for fully participatory conferences, retreats, action planning and task work. The participants co-

create the agenda, and lead their own discussion and action sessions in a dynamic way, which invites the interdisciplinary and inter-group thinking. According to Owen (1997), the Open Space is effective in situations where a diverse group of people must deal with complex, and potentially conflicting material, in innovative and productive ways. The method has worked effectively in face-to-face situations with groups of from five to one thousand members. At minimum, the meeting should last for one full day. The constraints of time and space, can be stretched with the help of the technology. However, the meeting should not be interrupted with another activity, to maintain the energy of the participants.

According to Owen (1997), the Open Space technique is based on four principles:

Whoever comes, is the right people.
Whenever it starts, is the right time.
Whatever happens, is the only thing that could have.
When it's over, it's over.

Also, there is the law of two feet. If during the meeting any person finds himself in a situation where he is neither learning nor contributing, he must use his two feet and go to some more productive place. The law creates ‘bumblebees’ and ‘butterflies’. The bumblebees move constantly, from meeting to meeting, and lend richness and variety to the discussions. The butterflies are people, who often never get into any meeting. They do little, but they create ‘centers of non-action’, where the participants can enjoy silence or engage in conversations of new unexplored topics.

The Open Space meeting starts with a circle of chairs, without a predesigned agenda. Although, the focus and the intent of the meeting is defined beforehand, and they are preferably formulated into questions. The participants are invited to express their interest or issues, which they are concerned with, and to invite interested people to discuss the topic on a certain time and place, in parallel sessions. All issues are posted to the community bulletin board where people can sign up for as many session as they want participate in the ‘village market place’. The participants meet in concurrent and overlapping mini-discussions around a theme or an issue, across the departmental, hierarchal or historically opposite lines. The small group discussions happen throughout the day, with the participants moving from one group to another, whenever they feel that they can no longer learn or contribute to the discussion, or when they feel drawn to another topic. At the end of the meeting, each participant is invited, but not obligated, to share briefly what the event has meant for them and what they propose to do in the future.

The Double team and the Group fair are both more problem solving oriented facilitation approaches than Dynamic facilitation and Open Space. The *Double team* is used to solve a problem by creating new ideas and solutions, from which the best options are selected for the implementation. Mantere (2003) claims that the Double team was created based on the observation that the pairs of individuals generate more ideas than the individuals on average. A group, consisting of 3-5 people, generates approximately the same amount of ideas than two individuals as a pair. It was also noted that the individuals in pairs, generate different ideas. The ideal size of the group in Double team technique, is 5-15 persons.

Leskelä et al. (1994) describe that the Double team activities are divided into three parts: analysis, idea generation and solutions. In analysis phase, the participants form a common view, regarding the subject matter. Usually, the topics are related to the problems or challenges in the current operation. Next part is dedicated to generating the ideas and the means to fix or remove the problems. In the solution part, the best ideas for the implementation, are selected. All three parts consist of the same phases. First, the individuals write down their own perceptions regarding the selected topic. Then, the ideas are discussed in pairs. The pair forms common ideas together and the ideas are presented to others. In the cross-evaluation phase, the best options are selected. Finally, the best options are grouped by the agreed criteria.

According to Mantere (2003) the *Group fair* is based on four principles:

- participation in analysis enhances the commitment to the results
- the principles of the creative problem solving support the creation of a good solution
- the systematic way of working is efficient
- realizing together strengthens the joint learning

The Group fair works best with 9-36 persons, divided into 3-6 groups. However, it can be expanded to a larger population. In the beginning of the Group fair, the participants form groups, based on the topics on the agenda. Each individual creates his personal suggestions, which are later discussed in the group and summarized into the group proposals. When the group proposals are ready, the groups are mixed. At least one representative from the original group, stays in the original group. The group proposals are discussed and enhanced in the new groups. The final group proposals are evaluated in pairs. The pairs select the most suitable suggestions for the final discussion, where the action items and their responsible persons are agreed.

3.3.2 Facilitation tools and techniques

The facilitator can manage task focused meetings, using the principles of *differentiation and integration* (Weisbord and Janoff 2007). To enable differentiation, the participants are asked to speak individually, or to work in small groups where all members share a functional similarity. To help people integrate their diverse perspectives, they are assigned to work in mixed groups. Usually, the whole group is engaged in integrating what the small groups have learned, when each of the small groups reports their results.

For the small group discussions, the optimum group size is estimated to be approximately five to seven people (Weisbord and Janoff (2007). The groups often focus on re-discussing the previously shared information. Therefore, the facilitator should help the group members bring out previously unshared information. The facilitator also ensures that everyone has 'airtime' for giving ideas and opinions. To avoid social loafing or someone being left out of the discussions, all group members should be assigned a task (Hogan 2002). Additionally, the group members should be allowed to join small group of their choice, and/or move to other groups if they feel they are not being heard.

Keeping the focus in the meetings, can be hard. Using a ‘parking lot’ poster, allows the group to capture items which are outside the scope of the meeting or session. Items in the parking lot can be dealt with at another time (IAF Methods 2012). When an issue or suggestion comes up, which is outside the scope of the workshop, the facilitator (or the participant) points this out. With the group’s permission, the facilitator writes the topic in the flip chart, indicating the parking lot. At the end of the workshop, the facilitator asks the group how the topics in the parking lot will be dealt with, and who will be responsible for that task.

Weisbord and Jenoff (2007) present four procedures to enable the conversations to focus on the select topic. These procedures get the participants to talk about the same world, enable everyone to contribute, demonstrate the relationship between the group members and their task, and encourage people to differentiate themselves. ‘Go-around‘, i.e. asking the same quick question from each of the participant. It is especially useful for reducing the fantasies, which people build up about the strangers they have not met before. It also helps the participants realize where the others stand, before making the decision or seeking to solve a problem. Additionally, the technique can be used to get a stuck group moving, e.g. when the facilitator is not sure what to do next. Go-around can be also used to test someone’s assumptions.

Weisbord and Janoff (2007) use ‘timelines’ to learn from the past, to find patterns in the present and to discover implications for action. To create a timeline, every person writes or draws a picture to the line. Then the participants form small groups, which compose stories, based on their reading of one of the lines. The small groups are also asked to explain what the created story means for the work of the meeting.

Third procedure, described by Weisbord and Janoff (2007), is drawing a ‘mind map‘. The meeting participants are asked to come up with ideas of the trends in the society, which affect their topic now. The person who names the trend, indicates where it goes on the mind map. It can be written on a new line, coming off the circle, or tied to an existing line. All trends are explained with concrete examples. In case the trends are conflicting, they both go on the map. The purpose of the activity, is to develop a view of the world, which includes all the participants’ perceptions. All following conversations will be about the same world. The ‘flowcharts’ are used when the group is trying to understand a sequential process, like making a product or delivering a service. The technique works best with such a system, where each step follows the previous one. Each participant describes a step, and each step is written on a large paper on a wall. The key questions are “what happens first” and “what happens next”, and ”then, what happens”.

A very popular technique for *generating the ideas* and capturing the insights and intuitions, is to conduct a ‘brainstorm’. It helps everyone understand the problem and clarify the objectives. In the brainstorming sessions, the ideas generally come from intuition, rather than from logical processes (Lubit 2001). These spontaneous reactions reflects the participants’ tacit knowledge. Originally, brainstorming was a tool for the decision making, but currently it is mainly employed to generate ideas (Mindtools 2012). Masters and Albright (2001) see that brainstorming is the bedrock of facilitation in many sessions, because it is intended to stimulate creative thinking. Brainstorming is an interactive process, which is meant to be inclusive and iterative. The process requires a psychologically safe environment.

Rules for the brainstorming are:

no criticism of ideas,
go for large quantities of ideas,
build on each others ideas and
encourage wild and exaggerated ideas.

The additional guidelines are to consider one idea at time, limit the discussion to idea review phase and disallow personal criticism. When the ideas have been brainstormed,

the group members are asked to select 3-10 best ideas for the further processing (IAF Methods 2012). Brainstorming encourages the participants to combine, synergize and improve upon ideas, as well as, to think outside-the-box and listen actively (Subashini 2010).

When the individuals brainstorm on their own, they come up with more ideas and often better quality ideas, than the groups of people who brainstorm together (Mindtools 2012). In individual brainstorming, people do not have to worry about the other people's egos or opinions and, therefore, they can be more freely creative. However, group brainstorming can be very effective for bringing the full experience and creativity of all members of the group, to bear on an issue. When the individual group members get stuck with an idea, the creativity and experience of an another member can take the idea to the next stage. Group brainstorming can develop the ideas in more depth than the individual brainstorming. Also, group brainstorming helps everyone involved feel that they have contributed to the end solution, and it reminds people that also other people have creative ideas to offer.

Group brainstorming may fail because of the production blocking, the fear of evaluation and free riding in the group (Toubia 2006). Production blocking happens when the participants are unable to express themselves simultaneously. People are paying so much attention to the others' ideas, that they are not generating any ideas of their own, or they are forgetting their own ideas while they wait for their turn to speak (Mindtools 2012). The fear of evaluation is related to the group members' defensive routines (Toubia 2006). The participants may free ride on each other's creative efforts, because the output of the idea generation session is typically considered at the group level, and the participants are not recognized for their individual contributions. Also occasionally, the group members are not always strict in following the rules of brainstorming (Mindtools 2012).

According to IAF Methods (2012), structured brainstorming, also called as 'nominal group technique', encourages the less active persons to participate in the group work. Each person spends several minutes in silence individually brainstorming all the possible ideas they can generate and they write these ideas down. The participants are divided into smaller groups, which collect the ideas by sharing ideas one person at a time, and record them on a flip chart. No criticism is allowed but clarifications to the ideas can be asked. Then, each individual evaluates and ranks the ideas by awarding points for the ideas. Each small group prepares a report on the ideas receiving the highest score, and presents them to others.

Yet another variation of the brainstorming, is ‘reverse brainstorming’. Reverse brainstorming generates alternative routes to solving a problem (IAF Methods 2012). The original problem definition is reversed, by turning a question such as "How do I solve this problem?" into "How could I possibly cause the problem?" and "How do I achieve certain results?" into "How could I possibly achieve the opposite of the desired effect?".

‘Debriefing wheel’ generates ideas and actions to improve a process or an activity. It also reinforces and appreciates what is working (IAF Methods 2012)**.** The analysis can be conducted prior the meeting to collect comments of the current status, or during the meeting to plan the future activities. The facilitator draws a circle on a flip chart and divides it into five sections. The sections are labeled as

Start: what should be started (which perhaps has not been done yet)
Stop: what should be stopped
Continue: what is working and should be continued
More of: what should be done more
Less of: what should be done less

The facilitator asks the participants to comment on any category and writes the comment, or a summary of it, on the flip chart. The comments are used to generate an action plan for the group.

‘Compromises’ are usually used in such a *decision situation,* where there are two or more potential solutions, over which the participants are divided (Bens 2005). Compromises generate much discussion and create solutions, but they tend to divide the parties, and they often result in damaged relationships within the group. ‘Majority voting’ is another type of divisive decision methods. It should be used in situations where there are clear choices and the group division is acceptable. Majority voting produces a clear decision fast, but the decision can be of low quality if people vote according to their personal biases. If the voting is open, like show hands, the method pressures people to conform. When there are many choices, simple majority rule voting is often not the best method for reaching the decisions, especially if the facilitator wants everyone to feel that they own the decision.

Bens (2005) sees that ‘consensus building’ should be used for important issues, and/or for such issues, in which the commitment and the support of the group, are essential. A consensus decision is a decision, which is acceptable to all members of the group and it is seen as the best decision for the group as a whole. The consensus decision may not be any individual’s ideal decision, or meet with everyone’s approval, but all can support it.

‘Multi-voting’ helps reducing the number of options so that the group decision is focused on the most popular alternatives. IAF Methods (2012) describe multi-voting process as follows:

- The facilitator asks each participant to select TOP3 (or some other number) items, which meet the criteria the person has decided on. The participants put dot stickers, or any other makers, next to the items listed on the flip chart, or similar.
- When everyone has placed their markers, the facilitator counts up the totals and put the numbers next to the items.
- The facilitator takes the TOP 3 or 4 items and ask why someone voted on them. Also, he asks how many of the top issues need to be included in the priorities, and if there are any items missing from the priority list.

The group's consensus is built in this discussion process. Often items that do not receive enough votes should be included in the priorities and discussion gives an opportunity for that to emerge.

Another method for reaching consensus, is to arrange a ‘closed individual vote with grades’ (IAF Methods 2012). The facilitator puts the alternatives visible to the participants, and the participants are asked individually to evaluate the alternatives and grade them each with a number between 1 and 10. Ten is “If this alternative is the one we choose, I will start shouting in joy, and this is the ultimate choice, nothing negative with it" and one equals to "This is a catastrophe, everything will collapse and I will feel really bad about this". The participants write the grades on a sheet of paper, therefore, they cannot adjust their grading, depending on the others’ grading. The facilitator collects the papers and summarizes the grades on each alternative.

When the group has decided with which alternatives to continue, they need *analysis* techniques to proceed with the selected topics. ‘SWOT analysis’ (also know as SLOT) is used in project planning, strategic planning and other processes, where an agreement is needed about the current situation of the project, department or organization (IAF Methods 2012). This is such a common tool, that a facilitator is often not used to assist the group with it.

For each created idea, the following aspects are considered:

- Strengths: the characteristics of the business, or the group, which gives it an advantage over the others
- Weaknesses (or Limitations): the characteristics which place the group at a disadvantage in relation to the others

- Opportunities: the external chances to improve performance (e.g. to make greater profits) in the environment
- Threats: the external elements in the environment, which could cause trouble for the business or the group

The strengths and the opportunities are seen as helpful to the group. The weaknesses and the threats are harmful in achieving the objective. The strengths and the weaknesses are organizational attributes, while the opportunities and the threats relate to the environment.

The **'**force field analysis' helps the group members understand and present the forces, which are working for and against the individual or the group. The analysis is built on the idea that forces, persons, habits, customs and attitudes, both drive and restrain the change. The analysis helps identify the causes of the problem which the individual or the group is tacking, or to start identifying the needed actions. The force field analysis can also be used to assess the impact of the proposed solutions.

The first step in the force field analysis is to state the problem or the desired state (IAF Methods 2012). The facilitator should make sure that all the group members understand the stated issue. The statement should be constructed of the factors working for and against the desired state, the status quo or the problem state. Then, the group brainstorms the positive and the negative forces. Next, each force or factor is reviewed and clarified, if necessary. The constituent elements are described for each force, and the group describes actions which can be taken to (re-)balance the situation. Then, the group determines how strong the hindering forces are (either high, medium or low) for achieving the desired state, or in the matters of improving the problem state. The forces with the biggest impact, should be tested as the likeliest causes. Focus on the strongest forces in the solution development phase, is likely to reduce the group members' resistance to the upcoming change.

Williams (2004) claims that 'cause maps' could be a useful addition to the lessons learned meetings, especially for the projects which are either complex or the reasons behind the outcome, are not obvious. The cause maps provide an opportunity for 'what if' analysis, and they demonstrate also the results of the particular management actions. An example of a cause map is illustrated in Figure 20.

The cause maps provide useful guidance why the project turned out, as it did. The elements of the main issues are noted down. Where one issue was the cause for exacerbation of another issue, a link is drawn between them. The different types of the

events can be made visible by different colors. The events are classified to ‘events which occurred outside the project’, ‘management actions, taken in response to the problems in the project’, ‘effects on the project outcomes’ and ‘others’, indicating the remaining variables, which explain the behavior of the project and its causality.

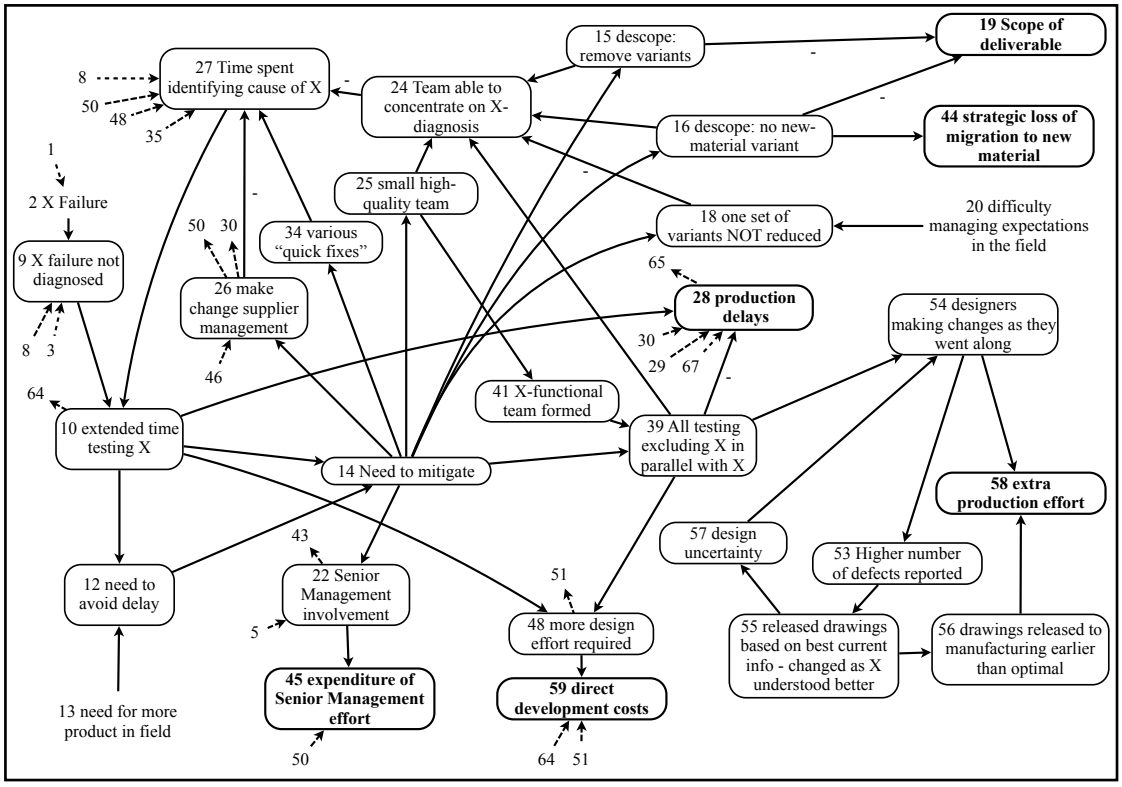

Figure 20 Example of a cause map (Williams 2004, p. 276)

The key line of the investigation is to look for the feedback loops. If there is chain of concepts in the map, where each event enhances or exacerbates the next, and where the chain eventually arrives back at starting concept, then a vicious circle or a positive feedback loop has been set up. The management actions often set up the feedback loops which drive the project behavior.

The technique of ‘Six Thinking Hats’ can be used to look at the decisions or their implications from a number of perspectives. This forces people to move outside their habitual thinking style, and helps them get a complete view of the situation (de Bono 1999). The technique allows necessary emotion and skepticism to be brought into what would otherwise be purely rational decisions. Each ‘thinking hat' represents a different style of thinking. A person with the white hat, focuses on the data available. He looks at the information he has, and sees what he can learn from it. The person is looking for gaps in his knowledge and tries to fill them, or take account of them. The purpose is to analyze past trends and extrapolate from historical data. The person assigned with the red hat, looks at the problems using intuition, gut reaction and emotion. Also, he tries to

think how other people will react emotionally, and he seeks to understand the responses of people who do not fully understand his reasoning.

With the black hat, the person looks at all the bad points of the decision (de Bono 1999). He looks at it cautiously and defensively. The person tries to see why things might not work. This perspective is important, because it highlights the weak points in the plan, and helps spotting fatal flaws and risks before the plan is implemented. The role is seen as one of the real benefits of this technique, because it prepares the group for the difficulties. The yellow hat is the opposite to the black hat. It represents the optimistic viewpoint, which helps seeing all the benefits of the decision and the value in it. This type of thinking helps the person keep going when everything looks gloomy and difficult. The green hat stands for the creativity. In this role, the person can develop creative solutions to the problem. It is a freewheeling way of thinking, without any criticism of the ideas. The sixth, blue, hat stands for the process control. This is the hat worn by a person chairing the meeting. A variant of this technique, is to look at problems from the point of view of the different professionals, like doctors, architects, sales directors, or the different customers.

Responsibility of the agreed actions can be defined using a 'responsibility chart'. The chart is known as ARSI, ARCI, RACI or RASI (IAF Methods 2012). The responsibility chart helps in identifying or defining the roles and the responsibilities, by providing an answer to the question "who will do the thing which has to be done?". The responsibility chart can be used to record the current state, to identify needed improvements, and to validate the development of the future state (Weisbord and Janoff 2007).

For each defined action, the group members define

A - final authority, the person who owns the outcome

R - responsibility to act, the person who carries out the task

S/C - support/collaborator with resources, the person(s) giving advice or input to the task

I - must be informed before action is taken, the person(s) receiving information

The activities can also be mapped against the functions involved.

3.4 Chapter summary

In this study, facilitation is defined as a process in which a person, the facilitator, helps others complete their work, and to improve the way they work together. The facilitator helps the group members interact and achieve closure, and he encourages them to define clear next steps. Usually, the facilitator does not have much control, or involvement, with the ultimate outcome of the meetings. The facilitator is not concerned about the issues under discussion by the group, nor does he have a vested interest in the outcome. Neither does he try to influence the group's decision or in any other way to take control away from the group.

What happens in the facilitated meeting, is strongly influenced by the pre-meeting activities. Therefore, proper preparation for the meeting is essential. In the meeting, the facilitator is concentrating on the meeting process. The facilitator cannot manage the other peoples' behavior, but he can manage the workshop structure, i.e. the conditions under which the participants interact.

Conflicts in the facilitated meetings, may arise due to the organizational barriers, the lack of the basic meeting and problem solving skills, or the lack of the group management skills. Also, interpersonal conflicts cause people to act out the in facilitated meeting. Interventions are needed when the group is making a hasty decision without sufficient data, the group abandons the meeting process, the proposed solution lacks creativity or innovation required by the situation, or when the group members fail to explore a wide range of possibilities, because an influential member is pressuring them to accept the solution he favors.

Additionally, the author of the study presented facilitation approaches, tools and techniques, suitable for facilitating the capture and analysis of the lessons learned in the groups. Dynamic facilitation and Open Space are suitable approaches when there is a need for innovative solutions. Double team and Group Fair are more problem solving oriented. Also, alternatives for managing task focused meetings, keeping focus in the discussion, generating ideas, decision making, analysis of the selected alternatives and defining the responsibilities of the agreed actions, were presented.

4 Facilitation method for capturing lessons learned

In this chapter, the case organizations are briefly described, and then, the chapter describes how the facilitation method was built and validated. Also, the business criteria for the method are presented and justified. In addition to presenting the facilitation method, the relation between the method and the model of experiential learning as well as the theory of organizational knowledge, is illustrated.

4.1 Case organizations

The new facilitation method is created to improve the lessons learned practices of the product development projects in Organization Alpha. Organization Alpha is a large multinational industrial corporation which has research, design and manufacturing operations also in Finland. The corporation employes over 100,000 people globally. The facilitation method was also assessed in other contexts than product development. Organization Beta is a large service provider in engineering, manufacturing and related business services, and it operates in six countries world wide. The organization has over 1700 employees. The selected case is from the manufacturing context. Organization Gamma is a scientific research centre, located in Finland. The organization employs 20-30 persons.

All case organizations were operating in a multi-project setting, i.e. several projects are being performed simultaneously in the organization. The projects were managed by the project portfolio. The organizations did not provide exact organizational routines for the projects to follow, thus allowing the project teams to develop their own routines. The purpose of the lessons learned workshops is to analyze the past and to develop the group routines. Also, the workshops provide input to the development of the organizational routines, to better match the needs of the projects.

In Organization Alpha, there were tens of product development projects ongoing at the same time. The organization was designed as a matrix, and the projects were dominating the functional lines. The majority of the employees were assigned to only one project at the time, but some employees, e.g. in a specialist roles, were working in several projects in parallel. Also Organization Beta was designed as a matrix, but the functional lines were stronger than the projects. There were only a few ongoing manufacturing projects at the time. The employees were assigned to only one project at the time, but some of the key project members could be transferred to a new project

before the project was completed. Organization Gamma had a project-based structure and the number of the parallel projects varied. Usually, the employees were working in two or three projects at the same time.

The author of the study was employed by the Organization Alpha for several years, but she left the organization before she started to write the dissertation. Her role in the organization was more of a facilitator than a researcher, and she had other responsibilities also. During the empirical study, the author of the study was interacting with the projects, the management team and the operational development (OD) team. The management team authorized her to design the facilitation method and arrange the workshops, and the OD team was using the workshop results. All nine cases from Organization Alpha were collected in years 2008-2009.

In Organization Beta and Organization Gamma, the author of the study was facilitating purely for the research purposes, and she did not have any formal relationship with the organization, nor she was paid for the workshop. The author of the study was interacting only with the projects, not with the stakeholders nor the organization as a whole. Cases from these two organizations, one case from each, were collected in year 2011.

All cases in Organization Alpha represent the product development projects. The groups consisted of more males than females, and the age of the group members varied between 30-45 years. Most of the group members had a university level degree and several years' work experience in the industry and in the organization. The case from Organization Beta is from a manufacturing project. There were both males and females in the group, quite evenly. The group members were of age between 30-50 years. The younger group members had a higher education than the older group members, but the older group members had more experience in the industry and in the organization. Organization Gamma's case is a research project. The group members had a university level degree and their age range was 30-35 years. There were both males and females in the group, and they all had worked in the organization for a few years.

4.2 Creating the new facilitation method

The process for creating and validating the facilitation method followed Kolb's (1984) experiential learning cycle (see Chapter 2.2.4). The author of the study gained concrete experiences of the lessons learned workshops by facilitating them. She observed the groups and evaluated the used method, the templates and the assumed causal relations

of the selected elements affecting knowledge creation and sharing in the groups. The facilitation method, the templates and the hypothesis of the causal relations were modified based on the analysis, and they were tested again in new workshops. The process is described in Figure 21.

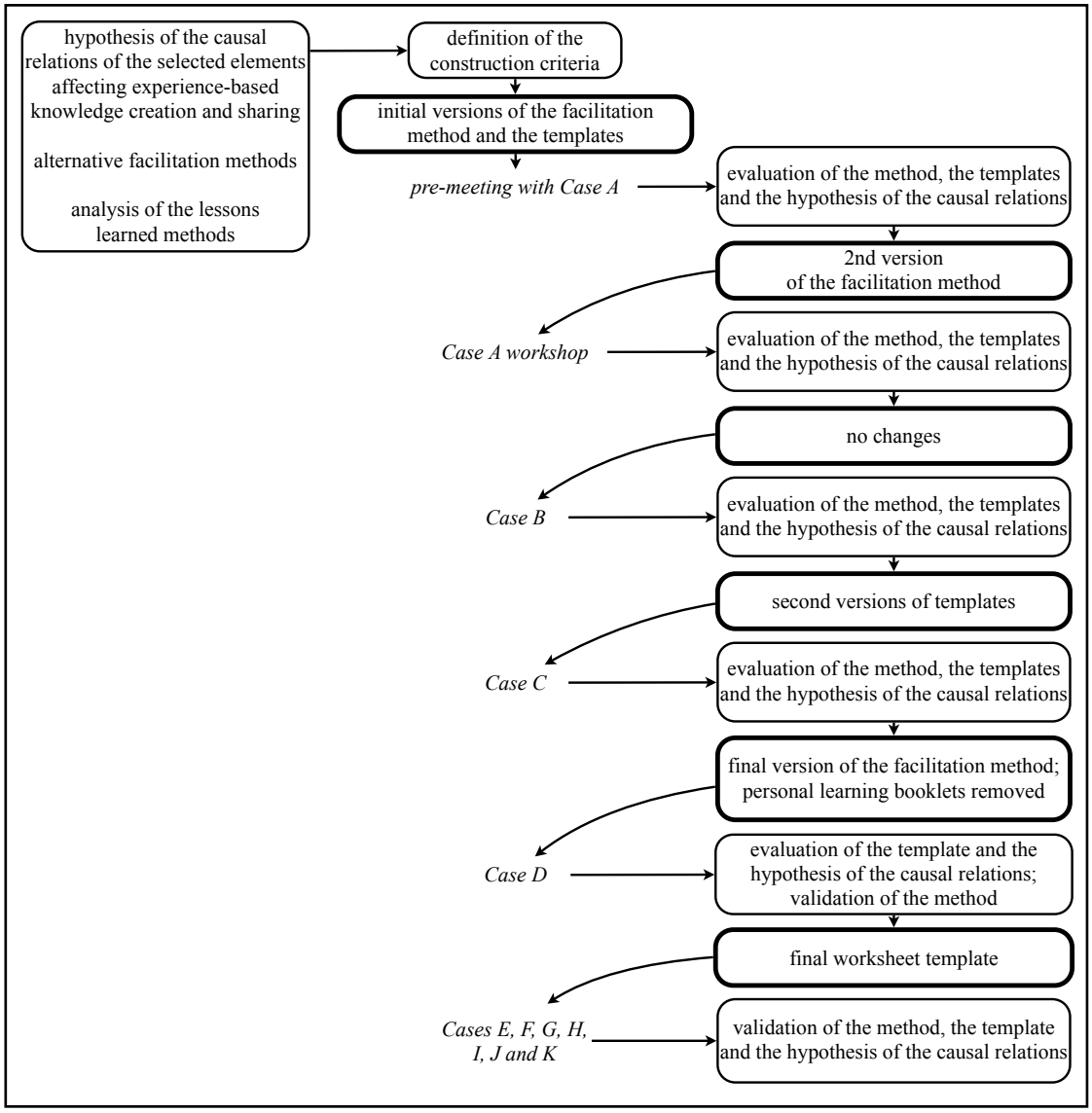

Figure 21 Process for creating and validating the facilitation method for capturing lessons learned in groups

The initial versions of the facilitation method and the templates were based on pre-understanding gained from literature review and the criteria set for the facilitation method, described later in this chapter. The identified *alternative facilitation methods*, suitable for experience based learning in groups, were presented in Chapter 3.3.

The *elements* affecting knowledge creation and sharing in groups, are presented in Chapter 2.4. As described in Chapter 2.5, only a part of the elements are included in the

facilitation method. The effect of the individuals on knowledge creation and sharing in the groups, is described in the facilitation method with the individuals' motivation, trust and defensive routines. Learning from mistakes and failures requires strong motivation, and most individuals are unlikely to share their knowledge without feeling of trust. Defensive routines discourage reflection, and the individuals may leave their own behavior unexamined.

From the group related elements, the facilitation method includes the group leader's behavior and target setting for the workshop, the group size and the group routines, as well as, face-to-face interaction. Also, the group members' common experiences, conversations and common language, openness for feedback and issue orientation, as well as, information accuracy and relevance, are included. The example the group leader sets by his own behavior, has a powerful impact on the group. When the goals and the expectations are clearly outlined, the group members can focus on the desired results. In large groups, more time and effort is spent on the process and coordinating activities. Smaller groups tend to be more cohesive than larger groups. The group routines define how the group operates, also when the focus is on learnings from the experience.

Face-to-face interaction is the richest communication medium and the misinterpretation of the meanings is unlikely. Common experience between the group members increases the possibility for the interaction and sharing tacit knowledge. Common language and joint terminology is needed to make tacit knowledge explicit. The conversations include the mutual exchange of the ideas, viewpoints and beliefs, and the participants alternate in listening and speaking. The willingness to hold oneself (and one's actions) open to inspection to receive valid feedback, enhances the possibilities to have accurate information. Also, issue orientation increases information accuracy, because the information is evaluated strictly on its merits, not on irrelevant attributes, such as social standing of the information source. Even if the available information is accurate, its relevance to the group, needs to be evaluated.

The effect of the organization is described in the facilitation method with the commitment of the leadership and the physical environment as the proximity in time and space in the workshop. The commitment of the leadership is visible in the investment they make in capturing and sharing lessons learned in the groups, as well as sharing the learnings between the groups and using the groups' learning on the organizational level. If the leadership gives priority to the lessons learned workshops, they require the groups to arrange the workshops and they are interested in the learnings the groups capture and share. Also, the leadership should be committed to use the

captured and shared learnings to improve the organization. Physical spaces in the organization affect how the organizational members interact. In the workshop, the group is located in the same physical place at the same time, to enable interaction between the group members.

The author of the study acknowledges that many of the *excluded elements* affect the knowledge creation and sharing in the groups. For example, the individuals' emotions and experience affect their behavior in the group. Experience also helps the individuals internalize what they have learned. The ability to change allows the individuals to learn something new and change their behavior, which both are essential in experience-based learning.

The group members' diversity can both enable and hinder knowledge creation and sharing in the group. Collaboration in a diverse group can be challenging, but the diverse viewpoints can promote new ideas and sound decisions. Team autonomy supports knowledge creation, but makes knowledge transfer hard. Also, the context dependency of the group learnings makes transferring the learnings to other groups challenging. Additionally, the group norms can hinder the interaction with other groups.

Due to fast changing business environment, it is hard for the individuals or the groups to find time to learn from their experience. On the other hand, in a stable environment, there is only a little inducement to learn. The way the organizations are designed and managed, the way people's jobs are defined and the way people are taught to think and interact, affect on knowledge creation and sharing. However, people's willingness to ask questions, disagree with others, contact known experts, discuss their problems and follow others in the conversations, varies greatly across the national cultures. Also, the core values of the organizational culture guide what people do, and how they make sense of each other's actions. For example, the belief that failure is bad, prevents the organizations from learning from their missteps. Organizations cultivating the climate of teamwork are better at creating and sharing knowledge. Although, transferring knowledge happens mainly through the individuals assigned to the projects, through the personal networks or in coaching arrangements. Getting access to the learnings, requires awareness of the learnings and their location in the organizational memory. Some of the lessons of the history are stored in the organizational routines.

The *facilitator's effect* on the group is excluded from the facilitation method. Yet, the author of the study understands that the facilitator can affect several elements included in the facilitation method. Prior the workshop, the facilitator can influence the group leader's behavior and setting the learning goals, as well as, the group routines regarding

learning from the experience. The workshop arrangements (e.g. physical place and group size) and the meeting structure, including the facilitation tools, affect the way the group members interact. With the intervention techniques, the facilitator can help the group members maintain issue orientation, to increase information validity. Therefore, it can be said that it the facilitator does influence how the group captures lessons learned in the workshop.

The author of the study reviewed the *practices for collecting lessons learned* in Organization Alpha by observing the workshops and following the implementation of the created action plans. All groups were product development projects and they arranged interim project reviews to collect lessons learned after each major milestone, approximately four times during the project lifecycle. The scope of the lessons learned remains quite narrow, in time wise. Examples of the used methods are illustrated in Figure 22.

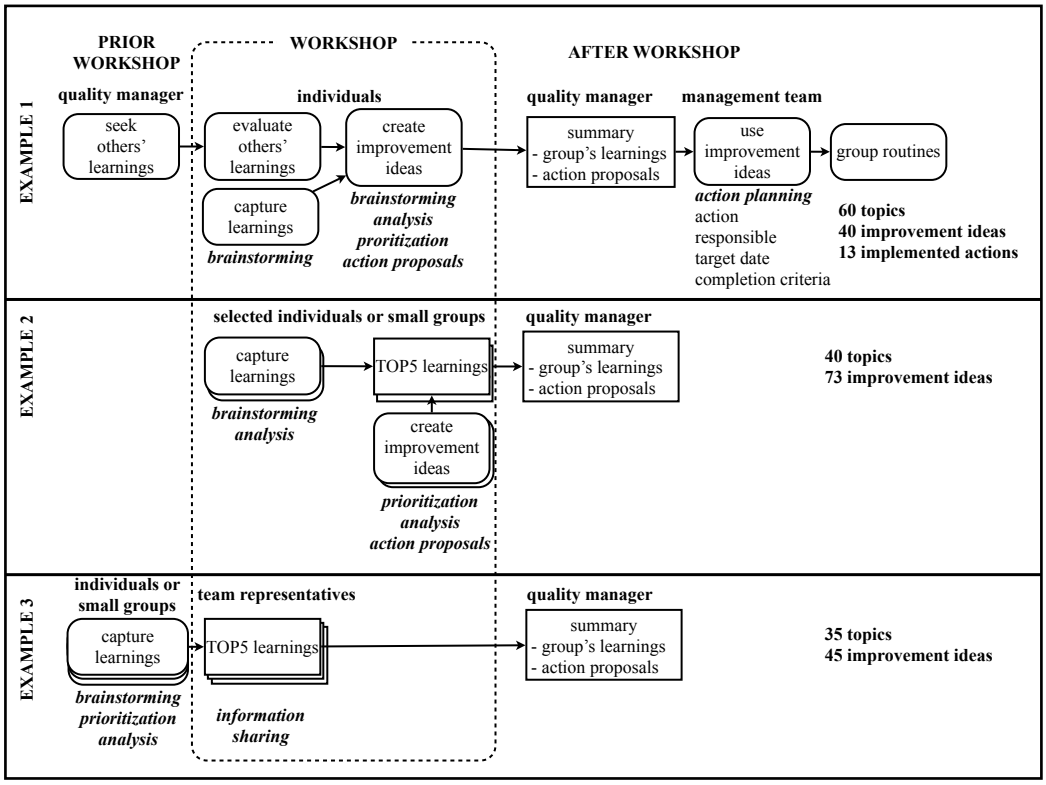

Figure 22 Examples of lessons learned methods in product development projects

The lessons learned workshop described in *Example 1* was arranged as part of a two-day face-to-face project meeting, and it was facilitated by the quality manager of the project. All group members, approximately 70 persons, participated in the workshop. The group leader was not present. The workshop was arranged in the early phase of the project, and there was a plan to use the improvement ideas to improve the group's own routines. Learnings were brainstormed and analyzed individually. Other groups'

learnings were used as input material. Anonymously captured learnings were related to the group work, as well as, the organizational routines. The group members captured 62 learnings and created 40 improvement ideas. Improvement ideas related to small practicalities were well defined, but the larger scope in the idea, the more abstract the proposals were. The project management team prioritized the action proposals and 13 of them, were implemented. All captured learnings and suggested improvement ideas, as well as, the action plan to implement the ideas, were available to all group members in the group's database. While observing the workshop, the author of the study identified several elements affecting knowledge creation and sharing in the group.

- Proximity in time and space:
  All participants were in the same place at the same time, except the group leader who assigned the role of the group leader to the quality manager.
- Setting goals:
  The operating mode was new and the project was in its early phase, i.e. there was a clear need to develop new group routines.
- Group leader's behavior:
  The group members were asked to propose improvement actions. The group leader's absence caused some doubts regarding the implementation of the improvement ideas. The group leader was committed to use the learnings and improvement ideas.
- Common experience:
  The group members met for the first time and they did not have any common experience yet. Some of the members had worked together in previous assignments.
- Trust; face-to-face interaction:
  Both the trust level and the level of face-to-face interaction was low. Brainstorming and analysis was done mainly individually. The group members were able to discuss with each other, but they were instructed to capture learnings and create improvement ideas individually. Also, all documentation was anonymous to encourage everyone to contribute.

In *Example 2,* two identical lessons learned workshops were arranged due to physical distance of the group members. Both workshops were facilitated by the quality manager of the project. Team leaders from 11 teams, as well as, up to two additional team representatives, nominated by the team leaders, were invited to the workshops. The group leader was present in the second workshop. Learnings were collected from 8 teams. The team representatives analyzed the positive and negative findings and divided them into subcategories. The subcategories indicated whether the lessons learned were related to the groups' responsibility area or not, i.e. whether the group or someone else

could be blamed for the failures or praised for the success. Finally, the learnings were prioritized into TOP5, thus making the total number of the analyzed lessons as 40. Each of the TOP5 learnings had 0-5 action proposals, 73 in total, and they were related to the group routines. Focusing on TOP5 learnings helped the team representatives create more concrete improvement ideas. However, there is no evidence that the improvement ideas were used in the group, because the group did not make any action plan to implement or transfer the learnings. Captured learnings and suggested improvement ideas were available to all group members in the group's database. Due to lack of contribution from three teams, the captured learnings are not complete. The author of the study observed the workshops and identified several elements affecting knowledge creation and sharing in the group.

- Proximity in time and space:

  Two separate workshops were arranged in two locations. The workshop participants were already meeting on daily basis in the normal project work. Face-to-face interaction with the group members located in another site was not possible. Only the quality manager interacted with all participants.
- Group leader's behavior:

  The group leader selected the meeting participants, and only 1-3 representatives from each team were invited, not all group members. He allowed some teams not to contribute. The group leader himself participated only in one workshop, and he lacked the committed to implement the improvement ideas.
- Setting goals:

  There was not any clear goals for the workshops. The main purpose was to fulfill the milestone criteria.
- Common experience; trust:

  The group members had been working together for a year. They knew each other and the level of trust was high.
- Information accuracy:

  The team representatives prioritized their lessons and focused only on the most important learnings in the analysis. A template was used to unify the analysis. By answering the questions in the template, the group members would consider the lessons from various viewpoints and provide other groups important information. The provided information is incomplete, because not all teams were contributing.

Example 3 describes lessons learned practices in a group, where the actual workshop was used only for information sharing purpose. Each of the 10 teams received instructions and template from the quality manager, to capture their own lessons

learned. Only 7 teams arranged their own workshops and some of the teams did not follow the agreed routine nor used the template. Therefore, the format of the captured learnings, as well as, the level of the analysis variated. Due to lack of contribution from three teams, the captured learnings are not complete.

The team leaders, as well as, up to two additional team representatives nominated by the team leaders, participated in the group level workshop. Each team presented their TOP5 learnings and improvement ideas (if defined). The total number of the analyzed learnings was 35. There were 0-9 improvement actions for each analyzed learning. Some teams were not able to define any improvement ideas, and one team come up with 19 ideas. The total number of the improvement ideas was 45. Approximately two-thirds of the suggested ideas were poorly formulated and the suggested actions were unclear. The group did not make any action plan to implement or transfer the learnings, so there is no evidence that the improvement ideas were used in the group. Captured learnings and suggested improvement ideas were available to all group members in the group's database.

The author of the study's observed several elements affecting knowledge creation and sharing in the group.

- Proximity in time and space:
  Each team arranged their own lessons learned meetings, in a way or another. The workshop participants were already meeting on daily basis in normal project work. Face-to-face interaction with another teams or team members located in another site, was not possible.
- Group leader's behavior:
  The group leader was not willing to arrange a face-to-face workshop to capture learnings and to analyze them. The face-to-face meeting was meant for sharing the most important lessons from the teams. He also allowed some teams not to contribute and he was not committed to implement the improvement ideas.
- Setting goals:
  There was not any clear goal for the workshops. The main purpose was to fulfill the milestone criteria.
- Common experience; trust:
  The group members had been working together approximately for two years. They knew each other and the level of trust was high.
- Motivation:
  The team leaders' motivation to capture and analyze learnings seemed to vary a lot. The motivated team leaders put effort to the analysis and proposed

several improvement ideas. The unmotivated team leaders did not capture any lessons from their teams.

- Information accuracy:
  A template was provided to the teams, to unify the analysis. By answering the questions in the template, the team members would consider the lessons from various viewpoints, and provide other groups important information. However, some teams did not use the template. The teams' learnings were prioritized and the members focused only on the most important learnings in the analysis. Provided information is incomplete because not all teams were contributing.

After gaining the needed pre-understanding, the author of the study set the *criteria for the new facilitation method*. The facilitation method is based on the selected elements affecting knowledge creation and sharing. The group members do not automatically learn from their experience and, therefore, learning needs to be prompted and structured to be meaningful and useful for the group (Busby 1999). The facilitation method includes the meeting structure, the used facilitation tools and the template for capturing the lessons learned. The template is needed to codify the group members' tacit knowledge into explicit. Codification allows knowledge to be accessed and used by some others, sometime in the future, and it is not dependent on the personal networking (Newell and Edelman 2008). The template guides the group members to convert their tacit knowledge into explicit, and document it. There would be separate templates for the group level and the individual level learnings.

Communication is the main mode by which the individuals discover what they know, and share it with their colleagues (Davenport and Prusak 1998). Physical face-to-face experiences are the key to conversion and transfer of tacit knowledge (Nonaka and Konno 1998). Therefore, the lessons learned workshop is arranged face-to-face. Face-to-face interaction uses much variety, natural language and the messages are tailored personally to the recipient (Koskinen et al. 2003).

The groups are not willing to invest much time in the learning activities, because that time is taken away from other responsibilities, which have a higher priority (O'Dell and Grayson 1998). This implies that the lessons learned workshop should be relatively short, approximately 3-4 hours. The facilitator needs to prepare the workshop together with the group leader beforehand. In the workshop, the group members capture their learnings and create improvement ideas to other groups. Knowledge sharing to other groups happens after the workshop.

Goffin et al. (2010) argue that the way project evaluations are facilitated is crucial. An experienced facilitator can create the right atmosphere and guide the discussion. In this facilitation method, one experienced external facilitator hosts the workshops, because the group members do not have the needed skills, and it is easier for a non-group member to stay out of the meeting content and concentrate on the meeting process instead. However, it is harder to find external facilitators to host the workshops (Hogan 2002). Therefore, the facilitation tools and techniques used in the new method need to be selected so that one person can facilitate the workshop alone.

The larger the group size becomes, the more complex the numbers of interactions are possible (Hogan 2002). According to Weisbord and Janoff (2007), the optimum group size for a small group discussion is 5-7 persons. In small groups, the participants usually feel more satisfied, because they have more chance to participate in discussions and they feel themselves important (Hogan 2002). Small groups also finish simple tasks quicker. However, fewer participants equal to fewer ideas and varieties of discussion, as well as less experience overall. The author of the study estimated that within the given 3-4h timeframe, there could be maximum of three small groups in the workshop. Therefore, the group size in the construction is limited to 5-20 persons. Larger groups would require co-facilitation and more time allocated to the workshop.

The initial version of the facilitation method and the related templates, presented in the next subchapter, were created to fulfill the predefined criteria. The facilitation method and the templates were presented to the group leader of the Case A, in a pre-meeting. Considering the comments received in the meeting, the method, the templates and the hypothesis of the causal relations of the selected elements affecting knowledge creation and sharing in the groups, were evaluated. The facilitation method was revised and the second version of the method was used in the Case A workshop. After the workshop, the author of the study, as well as the co-facilitator present in the workshop, evaluated the method, the templates and the hypothesis of the causal relations again. No changes were made and the same versions of the method and the templates were used again in Case B workshop.

After Case B workshop, the author of the study evaluated the facilitation method, the templates and the hypothesis of the causal relations of the elements affecting knowledge creation and sharing in the groups. As a result, the templates were revised for Case C. While evaluating the method, the templates and the hypothesis of the causal relations after Case C workshop, the author of the study decided to remove the template for capturing individual level learnings from the construction. The group members in Case A and Case C workshops were reluctant to use the *personal learning booklets*. The

author of the study discussed the topic with her superior and they both agreed that it was more important to focus on the group level learnings, than take the risk of the groups abandoning the whole lessons learned practice due to uncomfortable phase in the workshop.

The construction was built with three cases (A, B and C) and the rest of the cases (from D to K) were using the final version of the facilitation method. The template for the group learnings was updated for the last time after Case D. In total, it took four cases (A to D) to complete the *worksheet* template and it was validated by seven cases (E to K).

4.3 Facilitation method

The facilitation method is divided into three phases, and it consists of the activities conducted prior, during and after the workshop. Prior the workshop, the facilitator and the group leader meet to discuss the workshop, and they agree how to prepare for it. In the workshop, the group members capture their learnings and propose improvement ideas for the target group, based their own experience. After the workshop, the learnings are transferred to others in the organization, according to the plan made in the workshop. The facilitator keeps the meeting minutes of the discussions and stores them in the agreed location. The facilitator and the group leader agree how the group's learnings are brought to the organization's attention for the operational development purposes.

The facilitation method can be illustrated as an experiential learning cycle. The steps in Kolb's (1984) experiential learning cycle and the facilitation method are linked in Figure 23. Prior the workshop, the group performs the tasks it is assigned to, and that group work represents the concrete experience in the experiential learning. These concrete experiences are highlighted in the group history presentation at the beginning of the lessons learned workshop. Topic selection guides the reflective observation into certain aspects of the group's work. Abstract conceptualization happens by analyzing the experience and defining the improvement ideas. A plan for active experimentation, i.e. transferring the learnings to other groups or the implementing the improvement ideas in the own group, is done in the workshop. Actual knowledge transfer, as well as, the evaluation and the use of the improvement ideas happens after the workshop. The improvement ideas affect the group routines and/or the organizational routines, thus having impact on the group work in the future.

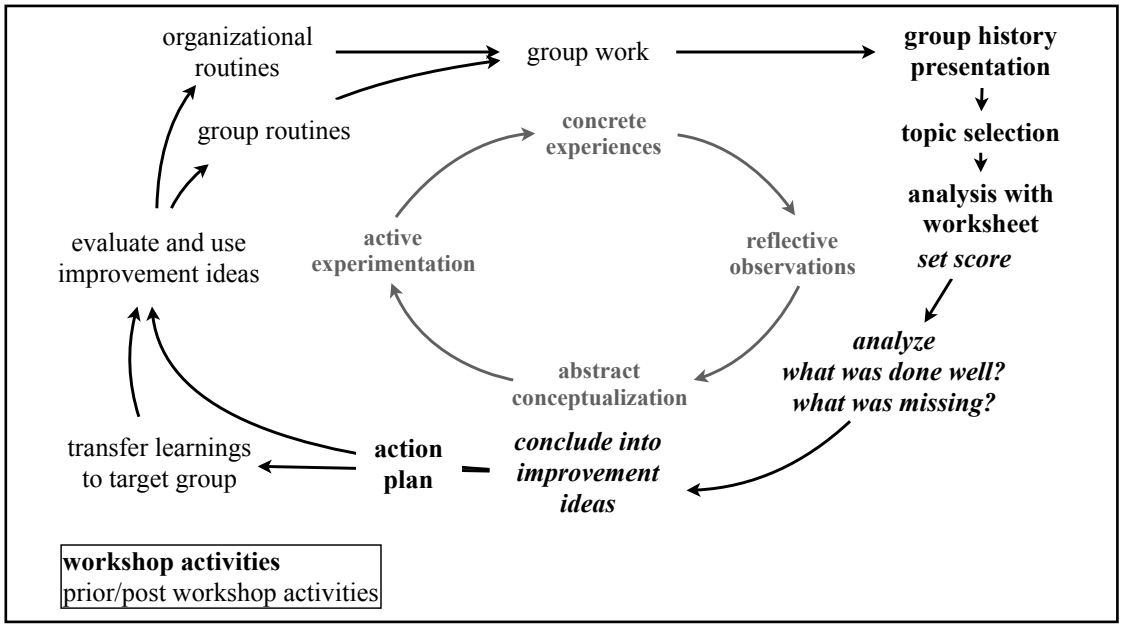

Figure 23 Steps in Kolb's experiential learning cycle and in the facilitation method

The facilitation method can also be linked to the process of organizational knowledge creation presented by Nonaka and Takeuchi (1995). The links between the process steps and the facilitation method, are illustrated in Figure 24.

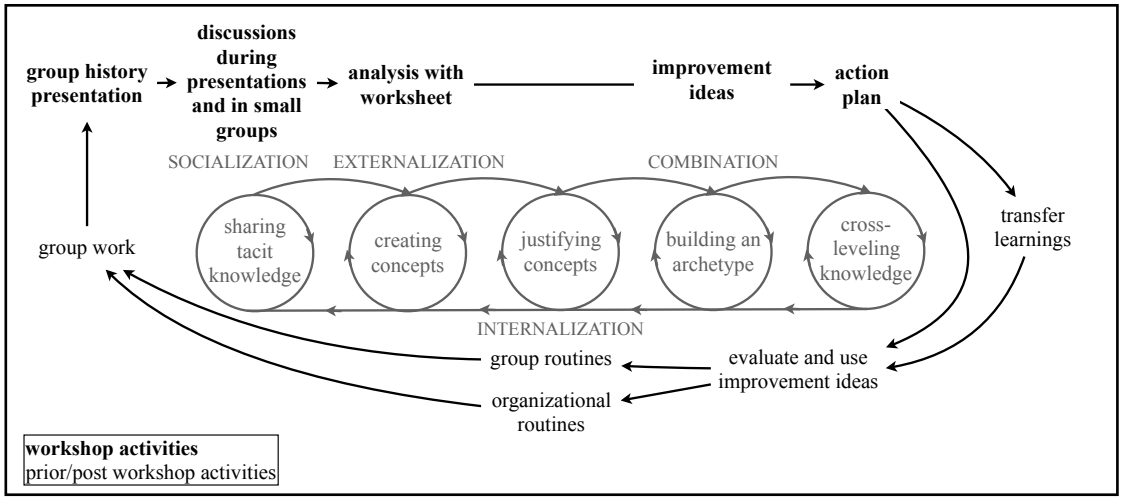

Figure 24 Steps in Nonaka and Takeuchi's organizational knowledge creation process and in the facilitation method

The group history presentation summarizes the previously internalized knowledge. In discussions, the participants share their experience and opinions, thus making their tacit knowledge explicit. These experiences and opinions are articulated as they are written to the *worksheet*. Best practices and improvement ideas are formulated based on the articulated experience. They are then either transferred to the target group or used in the group's own work. When the improvement ideas have been integrated to the group and/ or the organizational routines, they have been internalized. The lessons learned

workshop can be seen as ba, i.e. a shared space for emerging relationships. The workshop provides a platform for advancing individual and/or collective knowledge, and it serves as a foundation for knowledge creation. In the workshop, information is interpreted to become knowledge. Knowledge is acquired through the individuals' own experiences, or through the reflections on the experience of others.

As described in the beginning of this chapter, the method was evaluated in the case workshops and modified accordingly. The initial version of the construction is illustrated in Figure 25.

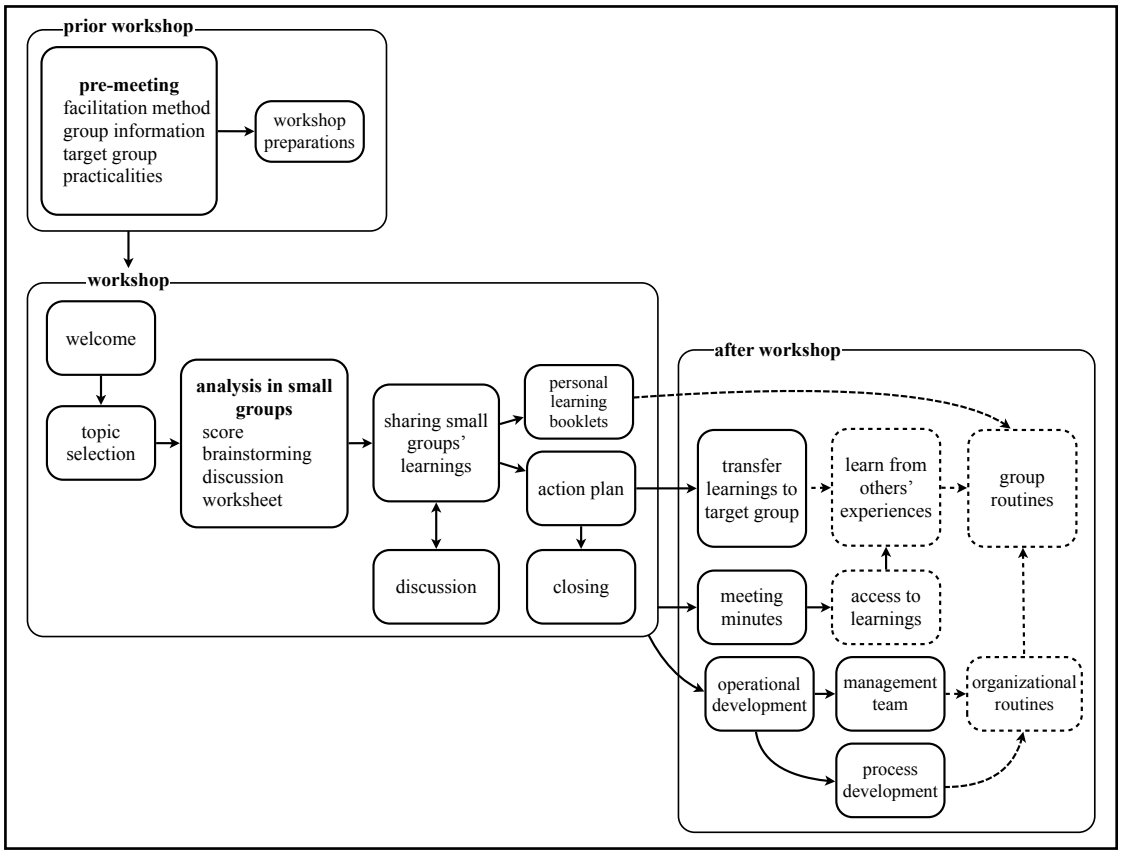

Figure 25 Initial version of the facilitation method

Prior the workshop, the facilitator meets the group leader in a pre-meeting, for approximately one hour. Also, other key persons of the group may participate in the pre-meeting. The pre-meeting can be arranged face-to-face or by telephone. The purpose of the pre-meeting is to motivate the group leader, define the workshop goal(s) and agree the practical arrangements related to the workshop. In the initial version of the facilitation method, the workshop goal is to collect lessons learned and propose improvement ideas for a particular target group, selected by the case group.

In the pre-meeting, the facilitator explains the idea of the facilitation method, as well as, the planned activities prior, during and after the workshop to the group leader. A process picture of the facilitation method can be used to illustrate the phases. Also, the templates are shown to the group leader. The group leader provides the facilitator the needed information about the group, its members and activities. The facilitator needs to be aware of the potential challenges so that he can prepare for the difficult situations before hand. The challenges can be related to the personal conflicts among the group members, urgent group activities expected to distract the group members in the workshop, or prior negative experiences in similar workshops.

As an outcome from the pre-meeting, the date and venue for the workshop are agreed. The venue should be large enough to allow the small groups to discuss without disturbing others. The facilitator and the group leader also agree the work division concerning the needed reservations and meeting invitations. The group leader defines the workshop goal(s) and which group members are invited to the workshop. By having all relevant people in meeting, the group will be able to produce faster action on problems, decisions, policies and plans (Weisbord and Janoff 2007). Also, being present in the meeting, leads to a greater personal responsibility. In small groups, usually everyone is invited to the workshop. In large groups, the group leader nominates representatives from each team to be invited. The amount of workshop participants is restricted to 20 persons. Larger workshop can be arranged if an additional facilitator to guide the small group work is available, and the group leader is willing to invest more than 3-4h time to the workshop. Also, all the participants should be located in the same physical place at the same time.

The facilitator asks the group leader to create preliminary proposals for the topic selection phase in the workshop. This is a precaution, in case the workshop participants are not used to come forward with their own ideas. The group leader informs the group about the coming workshop and its goals, even though the facilitator may send the invitations to the group. The way the group leader addresses the upcoming workshop, influences the group members' motivation to participate. The facilitator is responsible for providing the group members a short description of the facilitation method, which helps them prepare to the meeting. The facilitator should also get familiar with the group activities by reading group related documentation, e.g. project plans, status reports or similar. Understanding the group status helps the facilitator evaluate the level of common experience, trust in the group and potential defensive routines affecting the face-to-face interaction in the workshop.

The initial version of the facilitation method, as such, was never used. While preparing for the first workshop, the method was already revised. The group representatives in Case A proposed adding a timeline presentation to the beginning of the workshop. The timeline displays the group events or major activities in a chronological order. The project related to Case A had lasted for several years, and only some of the current group members were aware of the activities in the early years. The facilitator added a *group history presentation* to the second version of the facilitation method (see Figure 26). The group history presentation defines the timeline of the group activities, as well as, establishes a common ground for the conversations. This second version of the method was used in three workshops (Cases A, B and C).

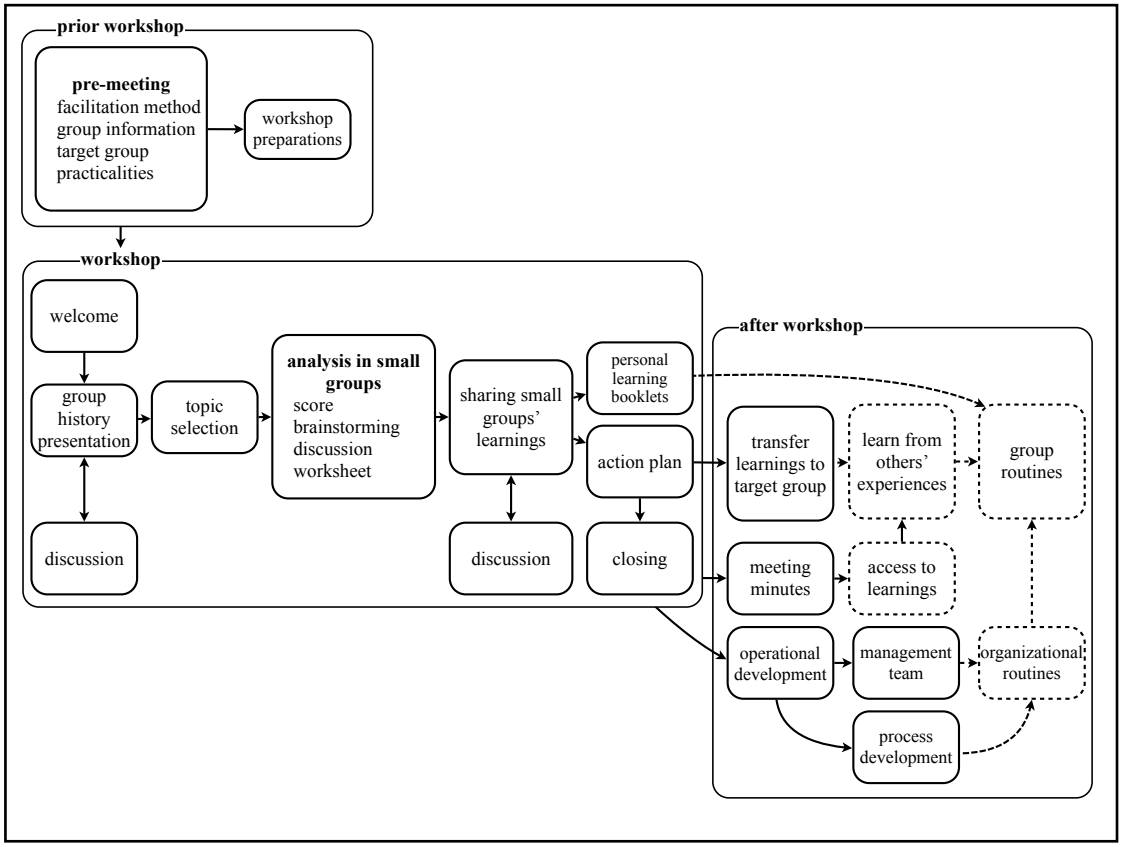

Figure 26 Second version of the facilitation method

The preparation for the workshop happens as described in the initial version, but the group leader is responsible for creating the group history presentation. The workshop takes approximately 3-4 hours. A small group, with less than 10 persons participating, can complete the planned tasks within three hours. The larger the group, the more time the discussions take. Also, the topic selection and sharing the results takes more time as there are more topics to be selected, and more small groups sharing their learnings.

In the welcome phase, the facilitator or the group leader explains the goal(s) of the workshop. The purpose of the phase is to highlight the importance of the workshop and to emphasize that each individual present in the workshop is responsible for the outcomes. If the participants have not met face-to-face earlier, a short introduction round is recommended. The facilitator explains the used facilitation method, as well as, the structure of the workshop. If the group is not familiar with the idea of the facilitation, a brief introduction to facilitation and the facilitator's role is appropriate. The rules of the workshop are explained the participants as part of the welcome phase The rules (adapted from Bens 2005) ensure that various viewpoints are brought up and analyzed within the given time in the workshop.

Listen to others - everyone's opinion matters.

Respect others' opinions - there are no right or wrong answers.

Focus on this workshop - do not use laptop, mobile phone or any other devices unless it contributes to the workshop outputs.

Consider time restrictions.

Stay on topic.

The group history is usually presented by the group leader. The informal presentation focuses on the main activities of the group, within the workshop scope. Usually, the activities are described in a timeline or other chronological order. The workshop participants are asked to interrupt and comment the presentation whenever they need to. The comments highlight the activities that were most important from the group members' point of view. If the group work has been challenging and/or the group has not been able to discuss the past events earlier, the group history presentation can take a long time. Even though the facilitator does not want to influence the discussed topics, he should make sure that the discussion is progressing into right direction. After the presentation, each group member is encouraged to express what have been the biggest challenges in the group work so far. In the topic selection phase, the group members propose topics that they would like to analyze in the small groups. Usually, the selected topics are related to the faced challenges. The number of topics to be selected depends on the amount of the small groups conducting the analysis and the time available. The analysis of one topic takes about 30-40 minutes. Sharing the analysis takes at least 15 minutes per topic.

The workshop participants form small groups with 2-7 persons. The group leader can form the groups beforehand, if he wants to control the group composition. E.g. key persons of the group can be assigned to different small groups, and other participants can choose their small groups based on their interests. If the group leader has no preference on the composition of the small groups analyzing the topics, the participants

are allowed to form the groups themselves. The group leader can participate in one of the small groups, or circulate and visit all of them. If the small groups will analyze more than one topic each, they can be re-formed to mix the participants. Once the small groups have found a working area and settled down, the facilitator explains the idea of the *worksheet* and instructs how to use it. The initial version of *worksheet* template is illustrated in Figure 27. This version is used in Case A and Case B workshops.

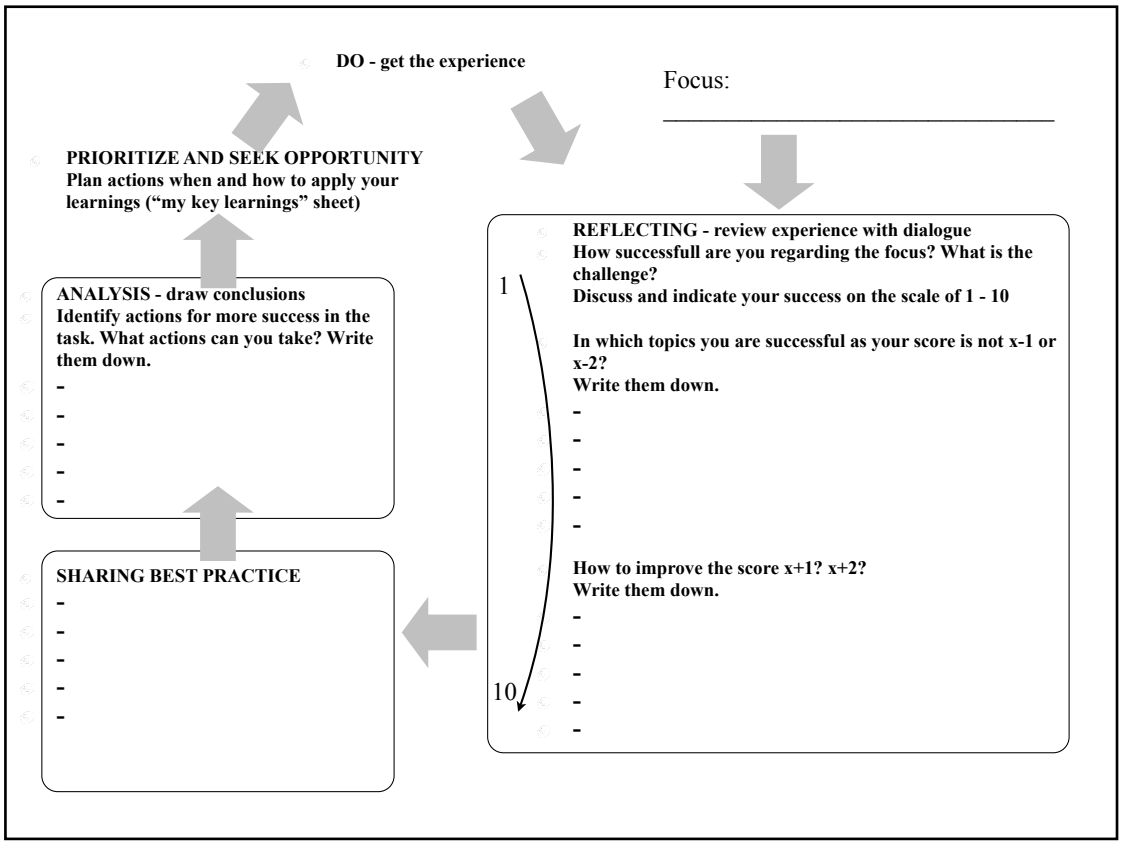

Figure 27 Initial version of the worksheet template

First, the members of the small group define their focus area, i.e. the topic which they are analyzing. They evaluate with a scale question how well the group, as a whole, has performed in that area. The scale is from 1 to 10, and it consists of even number steps so the group cannot choose a neutral score in between 'disaster' and 'excellent'. Then, the members of the small group spend 5-10 minutes brainstorming individually to find answers to the questions related to the scale questions ('reflecting'). After that, the individuals present their ideas to each other, and the members of the small group discuss the ideas for 20-30 minutes. During the discussion, they fill in the 'reflecting' part in the *worksheet*. If there is a need, the performance score can be adjusted during the analysis.

The group routines, which are considered effective, are defined into the *worksheet* as the group's best practices. Best practices are analyzed and the improvement ideas and/or the potential actions to replicate the best practices, are identified. Considering the

observations in Case A and Case B workshops, the information written into 'Sharing best practices' and 'Analysis' fields were identical. Therefore, the fields were combined in the next version of the *worksheet* template (see Figure 28), introduced in Case C workshop.

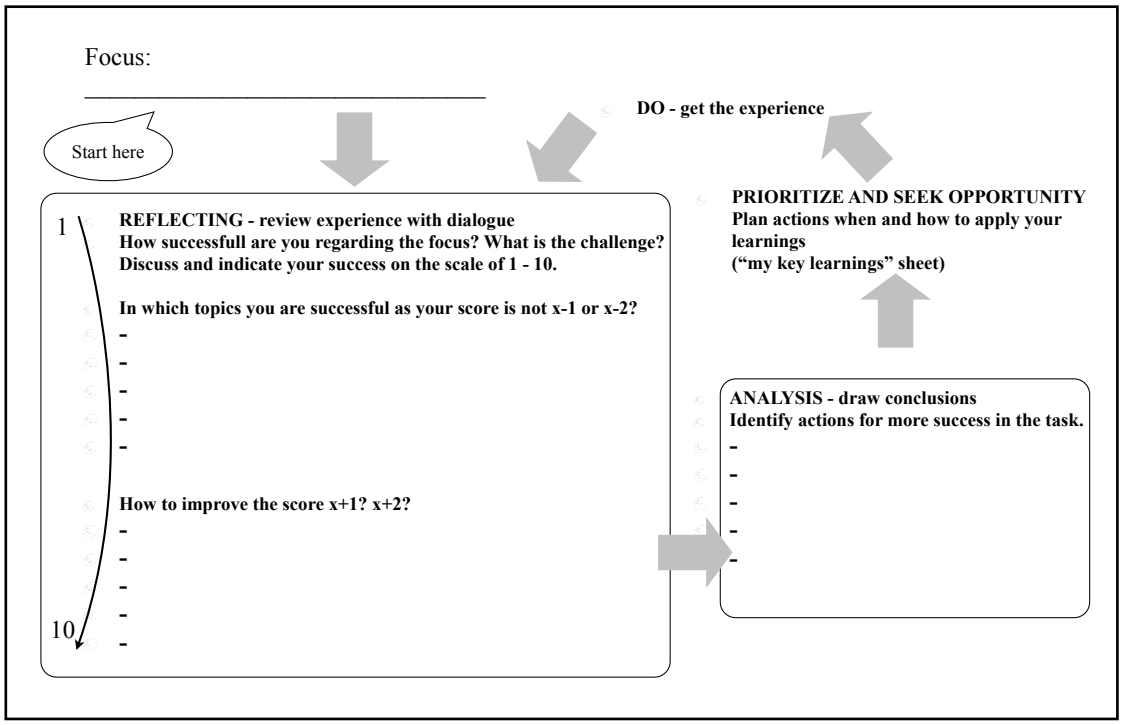

Figure 28 Second version of the worksheet template

In the second version, the layout of the template was changed, and the section for 'best practices' was removed. After the scale questions and reflecting their experience, the members of the small group identify potential actions for better success in a similar situation in the future. As in the first version of the *worksheet,* implementing the potential actions on the individual level is planned and prioritized in a *personal learning booklet*.

Once the analysis phase is completed, the small groups share their results and present their topic, score and analysis, as well as, the proposed improvement ideas to others. Everyone is allowed to comment, clarify or ask questions during the presentation. Like the group history presentation, this phase can take a long time, because the group members want to contribute to other topics than what they were analyzing in their own small group. When all topics have been presented and discussed, it is time to agree how the work continues from there. The facilitator is not usually involved with outcome of the meetings he leads. The facilitator can help the group create an action plan to transfer the group's learnings to the target group. Also, the effect of the captured learnings to the organizational level should be evaluated, and actions planned accordingly. When the

group level learnings have been summarized, the participants analyze their own experiences with the *personal learning booklets*[2]. Besides the analysis of the individual level learnings, the template guides the group members to plan implementing the improvement ideas on the individual level. In the closing phase, the group leader and the facilitator clearly articulate what is going to happen next.

It is the group leader's responsibility to implement the action plan, i.e. transfer the learnings to target group. If the learnings are meant to improve the group's own performance, they need to be integrated to the group routines. Transferring the learnings to another group can happen in several ways. One way to is to arrange a face-to-face meeting with the target group. The learner group presents the captured learnings and proposed improvement ideas. The groups are able to interact, which increases the probability of successful knowledge transfer (Reddy and McCarthy 2006). The group's learnings can be used also in other context, if the group members are assigned to new project groups or the group, as such, is assigned to a new task. In both cases, the learnings need to be consciously integrated to the group routines.

The facilitator delivers the workshop minutes, including all discussed topics and completed worksheets, to the group. If the minutes and the learnings are published to other groups or to the organization, the group members are allowed to comment and edit the documents before the publication. Public meeting minutes enable others to access the learnings, and possibly learn from the group's experience. However, using others' learnings require activity from the recipient group. They have to make the effort to find the material, get familiar with the learnings and evaluate their usefulness. The improvement ideas need to be re-created to match the group's needs, and then integrated to the group routines. The operational development (OD) team can evaluate the group learnings from the organizational perspective. If the proposed improvement ideas are useful to most of the organization, they are integrated to the organizational routines with the management team's decision and/or by developing the work processes. The proposed improvement ideas may be visible as changes in the work processes and checklists, thus influencing several groups, not just the target group defined by the learners.

The group members in Case A and Case C workshops were reluctant to use the *personal learning booklets*. After Case C workshop, the method and templates were evaluated again, and the author of the study decided to remove the *personal learning booklet* from the facilitation method. She discussed the topic with her superior and they both agreed

[2] *Personal learning booklets* are not part of the final version of the facilitation. Therefore, the templates are not described in this chapter. Two versions of the templates are available in Appendix 1.

that it was more important to focus on the group level learnings, than take the risk of the groups abandoning the whole lessons learned method due to uncomfortable phase in the workshop. Removing the *personal learning booklet* from the method creates the third, final version of the construction (see Figure 29). Now the facilitation method is aimed to capture lessons learned only in group level.

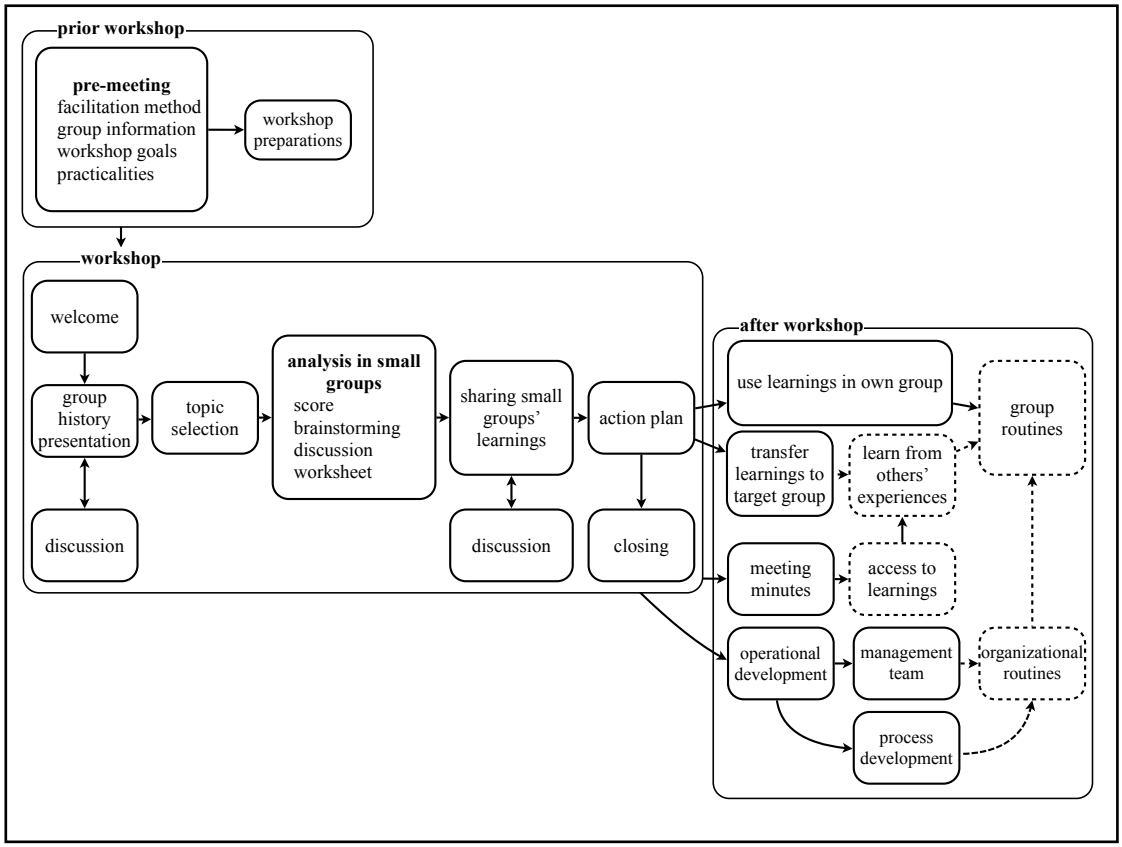

Figure 29 Final version of the facilitation method

In the initial and the second version of the facilitation method, the learnings were targeted to another group. Like in Case B, the group was using the learnings to improve its own routines. In the final version, the lessons learned workshop can be targeted to capture learnings and create improvement ideas for a particular target group, or to address a certain need for performance improvement in the learner group. Therefore, also the activities after the workshop, were modified. The after-workshop activities include now either using learnings in the own group, or transferring them to the target group.

The final version of the facilitation method is used from Case D workshop onwards. The *worksheet* template was updated again after the Case D workshop, and the third version of the template was created. This final version of the *worksheet* (see Figure 30)

is used in rest of the cases, from Case E to Case K. For Case J and Case K the template is translated into Finnish for the convenience of the workshop participants.

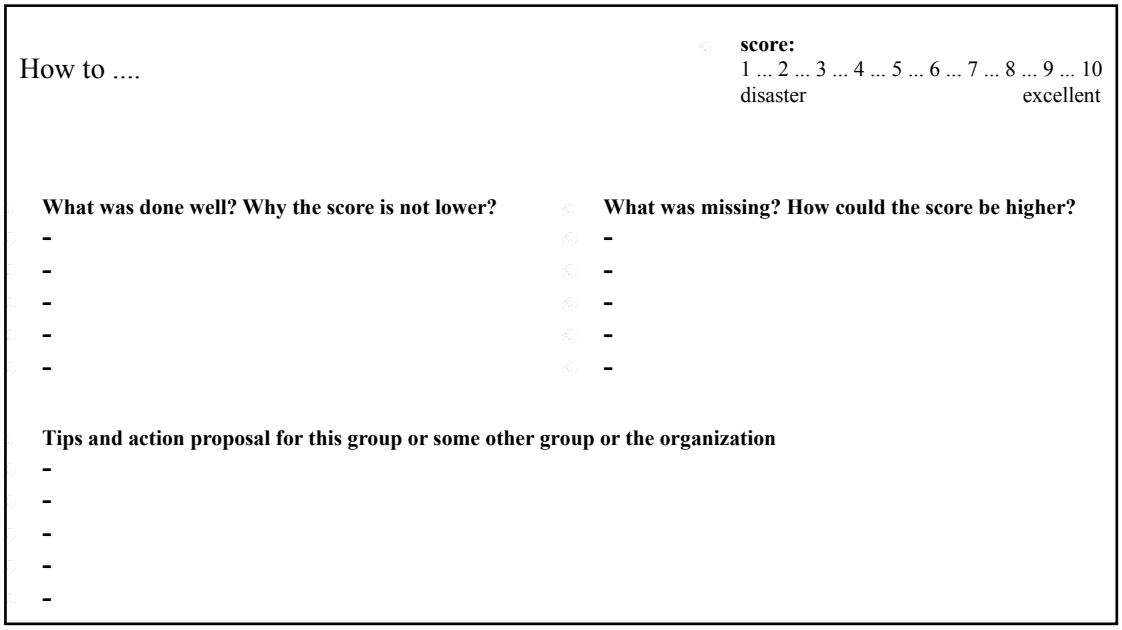

Figure 30 Final version of the worksheet template

The final version of the *worksheet* template is simplified from the previous versions, to allow more space for the analysis and the actual learnings. The terminology is changed to be more aligned with the common language used in the organizations. The instructive texts were also shortened, because the template and its use is explained to the group, prior they are expected to use it. Also, the facilitator is able to instruct the small groups, if needed, during the analysis of the learnings. Instead of selecting the focus for the analysis, the topic is defined into 'How to...' field. The topic can be written as a whole sentence, like 'How to communicate product requirements to the supplier?', or with some keywords, like 'product data management'. The second step in the analysis, is to evaluate how well the group performed with respect to the topic under analysis.

The small group members first brainstorm individually ideas to the 'What was done well? Why the score is not lower?' and 'What was missing? How could the score be higher?'. Then, they discuss the ideas together in the small group, and list the activities or resources which enabled the group to achieve the current score. 'What was done well' section highlights all the activities and invested resources which contributed to the topic. Unless the score is '1', the group has done something for the benefit of the topic, and they should be able to list successful activities here. To 'What was missing?' section, the members of the small group list activities which they did not perform or resources they did not have, but which could have contributed to the group's success. This section emphasizes the alternatives that the group members are aware of. It can

also rise the awareness of the business decisions and their consequences, i.e. the best possible actions cannot be implemented, or certain resources are not available due to reasons, which are not controlled by the group.

To 'Tips and action proposals for this group or some other group or the organization' the members of the small group describe how they would have acted if they had the knowledge they currently have and all the needed resources available. This section summarizes the best practices listed in 'What was done well?' and possible or alternative activities and/or resources identified in 'What was missing?'. Depending on the workshop goal, the improvement ideas can be targeted to the group itself for a later phase in the project work, to some other group in a similar situation, or generally to the organization.

The facilitator uses several *facilitation tools* during the workshop. The welcome phase includes target setting and establishing the group norms (Bens 2005). Through the workshop, the facilitator listens actively and asks questions. He can use go-around, i.e. asking the same quick question from each participant, to encourage people to participate (Weisbord and Janoff 2007). For example, after the project history presentation, the facilitator asks each participant to briefly describe the biggest challenges in the project. Topics for the analysis are selected with majority voting, which encourages the group members to share the responsibility of the decisions (Bens 2005). Majority voting can be used in the topic selection, because there are clear choices and the group division is acceptable. The group is not selecting just one option but several because the group is divided into two or three small groups.

When forming the small groups for the analysis phase, the participants physically move in the meeting room and the movement reenergizes the group (Hogan 2002). Working in the small groups enables differentiation, and participants have better chances to participate in the discussions than in a large group (Weisbord and Janoff 2007). The *worksheet* template provides structure to the analysis and ensures that the discussion focuses on the right topics. The scale question helps the group members visualize how they rate their performance concerning the topic under discussion (Bens 2005).

Brainstorming is the bedrock of facilitation (Masters and Albright 2001). Ideas generally come from intuition rather than logical processes, thus reflecting the individual's tacit knowledge (Lubit 2001). In small groups, the ideas are first brainstormed individually and then together. When the individuals brainstorm on their own, they come up with more ideas (Mindtools 2012). However, brainstorming as a group, can develop the ideas in more depth and it helps everyone feel they have

contributed. The facilitator observes the small groups and makes interventions, if needed.

The small groups report their analysis and proposed improvement ideas to the whole group. Other participants are able to contribute the analysis, and the group is again integrated (Weisbord and Janoff 2007). The facilitator listens actively to the discussions, asks questions and encourages the group members to participate. The action plan represents the group's shared responsibility for the implementation and follow-up for the agreed actions. The principles of consensus are applied to create the action plan to ensure commitment and support of the group members (Bens 2005).

4.4 Chapter summary

The facilitation method is divided into three phases: activities prior, during and after the workshop. Prior the workshop, the facilitator and the group leader discuss the facilitation method, the group, the workshop goals and the practicalities. The workshop begins with a group history presentation, and the group members select the topics for further analysis, to be done in the small groups. The analysis includes a scale question related to the group performance, and brainstorming ideas.

The small groups use a *worksheet* to document the activities and invested resources, which contributed to the group performance concerning the selected topic. They also document the activities the group did not perform or resources they did not have, but which could have contributed to the group's success. The members in the small groups describe how they would have acted if they had the knowledge they currently have and all the resources available. Each small group presents their analysis, and the others have a possibility to comment on the results. Then, the group plans how they are going to proceed with the captured lessons learned.

After the workshop, the group implements the plan, and either transfers the learnings to the identified target group, or uses the improvement ideas to modify the group's own routines. The group reviews the meeting minutes and then they are made available for others in the organization. The captured lessons learned and the improvement ideas are also delivered to the function or team responsible for the operational development in the organization, because they can be used to improve organizational routines.

5 Empirical tests of the facilitation method

In this chapter, the empirical tests of the construction are presented. Each case is described in details, from the viewpoint of the facilitator. The cases are also analyzed regarding the identified elements affecting knowledge creation and sharing in the groups.

The author of the study acted as an external facilitator in all cases, i.e. she was not a member of the groups capturing the learnings. First, the basic information of the case group is described. The information includes the project context and status, the group size and the scope of the learnings in time wise. Also, the group members' familiarity with the practice and the facilitator is described. Then, it is explained how the workshop was prepared, what happened in the workshop and what kind of activities were conducted after the workshop. The activities and the deviations from the planned course of the workshop, are also illustrated in the figures.

In Case A, there were more than 20 persons participating the workshop, and the number of the participants was more than the ideal size of the group planned for the method. Therefore, there were two facilitators present in the workshop. In three cases (Case A, B, and K) the workshops covered the lessons from the whole project lifetime. Also, Case J's scope included project work from a long time. In other cases, the workshops were interim lessons learned meetings, and they focused only on a certain phases in the projects.

In some cases (Case B, D, F, H and I) in Organization Alpha, there was a member of the management team present in the workshop as an observer. Due to the recent organizational change, there had been major changes in the organization structure and the organizational members, as well as, the project portfolio. The observer was not the superior of the group leader, but he may have been familiar to the group due to other reasons. The observer's role was to get familiar with the group members, as well as, the project, and answer the group members' questions related to the organization, if they had any. He would also collect feedback for the management team. Having an observer in the meeting is not included in the facilitation method, but his presence is acknowledged in the case descriptions.

After the case description, it is analyzed how the selected elements affected experience-based knowledge creation and sharing in the groups. The analysis is conducted merely in the role of the researcher, not the facilitator, and the analysis were not presented to the groups as part of the meeting documentation. In Case A, the analysis was done

together with the co-facilitator. In other cases, the author of the study analyzed the workshops, and she discussed both her observations and the analysis with the person, who co-facilitated the first workshop.

Originally, both the author of the study and the co-facilitator were employed by the Organization Alpha. However, they left the organization, and by the time of conducting the case studies in Organization Beta and Organization Gamma, neither the author of the study nor the co-facilitator were employed by the Organization Alpha anymore. They did not have a formal work relationship together either. Yet, the author of the study discussed the observations and analysis again with co-facilitator, but now the co-facilitator's role was more like a coach for the author of the study.

5.1 Building the facilitation method with Cases A to C

Case A was a product development project that had been recently ended. The criteria for the facilitation method were not fulfilled, because more than 20 persons participated in the workshop. Also, the requirement of face-to-face interaction was not completely fulfilled, because the group leader was absent and his learnings were added to the meeting documents afterwards. The workshop covered several years, i.e. the whole project life time. The workshop was held in the external premises, and there was an informal event for the participants afterwards. Capturing lessons learned was part of the organizational routines, and the workshop participants were familiar with the practice in general. However, they had not participated in such activities earlier in this particular project. The author of the study, as well as, the co-facilitator were familiar to the workshop participants. Activities in Case A are described in Figure 31.

In the pre-meeting, the practicalities were discussed with the group leader. As the number of the workshop participants would be more than 20 persons, there was a need for co-facilitation. In this pre-meeting, the need for the group history presentation was brought up, and the initial facilitation method was revised accordingly. The group leader was not going to participate in the workshop, and it was agreed that the key persons from the group would make the group history presentation. The group leader and the co-facilitator identified the target group together, based on the assumed similarities in the operating mode and the relationship with the key supplier. At least one of the key persons was already working in the target group.

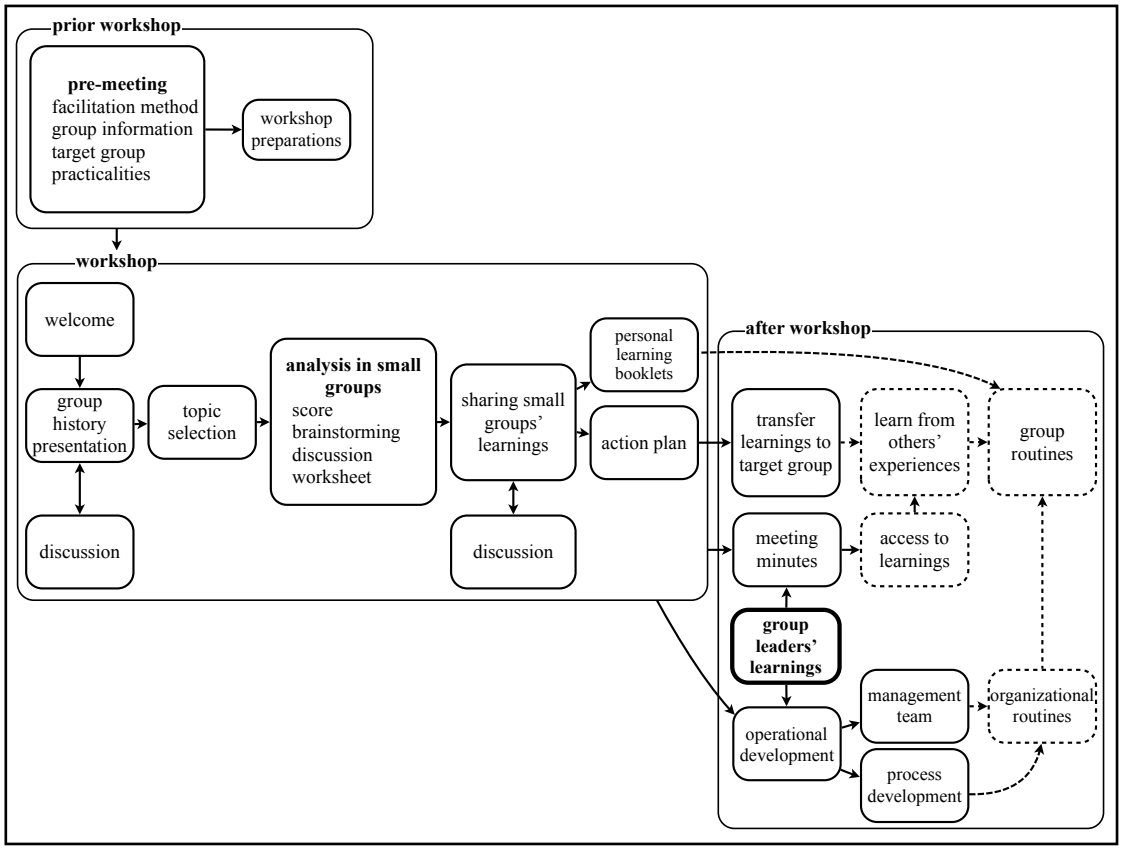

Figure 31 Capturing and sharing learnings in Case A

The group history presentation raised much emotional discussion. The project had lasted for longer than anticipated, and the group had faced several challenges, both within the organization, and with the key supplier and the customers. The discussed topics in the workshop were selected by the group members, based on their applicability and potential relevance to the target group. For the analysis phase, the key persons were assigned to different small groups by their own initiative. Other participants were allowed to choose based on their interest in the selected topics. The analysis was documented in the *worksheets*. Each small group presented its results and the others were able to contribute to the analysis. The group analyzed three topics and created 12 improvement ideas for the target group. The analyzed topics were related to the requirement definition at the early phase of the project and the cooperation with the internal and the external suppliers. Then, the participants were asked to fill in the *personal learning booklets*.

The group planned how to introduce the learnings to the target group, as well as, to complement the learnings with the group leader's interview. One representative from each small group and both facilitators participated in the meeting with the target group. Later, the target group personnel discussed the presented ideas and created an action plan for their project to prepare for similar activities or challenges. The co-facilitator

interviewed the current group leader, as well as, his superior who had been involved with the project in the past. The leaders' learnings were added to the meeting minutes. The author of the study wrote the meeting minutes and the key persons of the group reviewed them before the minutes were made available to other groups in the organization. Other groups were also informed about the workshop and the location of the results. The facilitators analyzed the learnings, as well as, their own observations. Some topics were discussed with the operational development team as possible process development activities. Some topics were raised to the management team meeting agendas for further discussion.

In this case, the identified elements affecting knowledge creation and sharing, had both positive and negative impact. The elements identified in the workshop, are summarized in Chart 8.

Chart 8 Elements identified in Case A workshop

ELEMENTS		**EFFECT**		
		positive	**+/-**	**negative**
related to individuals	motivation	x		
	trust	x		
	defensive routines			x
group related	group leader's behavior		x	
	target setting	x		
	group size			x
	group routines	x		
	common experiences	x		
	common language	x		
	face-to-face interaction	x		
	conversations	x		
	openness for feedback	x		
	issue orientation	x		
	information accuracy	x		
	information relevance	x		
organizational	leadersip priorities	x		
	proximity in time			x
	proximity in space			x

The author of the study and the co-facilitator noted that the group was allowed to invest in the workshop and to arrange it in external premises. There was also an informal event after the workshop for the participants. The facilitators assumed that collecting the lessons learned in this project, was considered important on the organizational level, because the workshop investment were approved by the management team. The high importance may be due to the unique nature of the project. The group leader's behavior had both positive and negative impact on the workshop. He did set the goal for the workshop and nominated the target group for the learnings, but he did not participate in

the workshop. In the pre-meeting, the group leader assigned the key persons of the group to take his role and prepare the group history presentation.

The project had lasted for a long time, and only a few members had been working in the project all the time. For example, the group leader had been recently assigned to the project and he had less experience with the project than most of the group members. The author of the study argues that the group did not loose any valuable information due to the leader's absence. He might have had access to some additional information, like reasoning for a certain management team decisions concerning the project, but the key persons were more familiar with the project than the group leader was. Although, the group leader should have participated in the workshop. His presence would have emphasized the importance of the event even more. The previous group leader would have had valuable knowledge to share, but the current group leader did not invite him to the workshop. Both facilitators were familiar with the previous group leader, who was known as a strong person, and the facilitators assumed that his presence might have inhibited the conversations in the workshop. During his leadership, the group routines did not include capturing the lessons learned, even though the organizational routines required the project to do so. The current group leader was not present in the workshop and his learnings, as well as, his superior's comments were added to the minutes afterwards. Therefore, the interaction between the group and the leader was missing, and the contributing individuals were not in the same place at the same time.

The group history presentation concluded several years into one presentation, thus offering important context understanding for those group members, who have joined the project later. The project work was divided into teams, and the group history presentation provided a big picture of the project and emphasized the common experience. The presentation also aligned the terminology used in the different teams, and made it easier to discuss the topics together. The group members were very motivated to capture and share their learnings. Both facilitators agreed that it seemed that the workshop had two goals. First, the group members wanted to document the faced challenges and point out the dysfunctional areas in the group level and in the organizational routines. The group had been acting quite autonomy and its routines had differed a lot from the organizational routines or the routines in the other groups. The second goal was to offer useful ideas for the target group. The group members were motivated to participate in the workshop. Most members were already assigned to other projects but they still wanted to participate in the workshop. The motivation lasted longer than the workshop, because the group members, who hosted the small groups, participated in the target group's meeting to share the learnings with them.

The workshop goals affected the analyzed topics, and the topics were selected because of the target group. As agreed in the pre-meeting, the key persons hosted the small groups conducting the analysis of the selected topics. The author of the study argues that these key persons took the leader's role and inspired other workshop participants to be active and open in discussions. The small groups had focused discussions and they captured learnings, which seemed to contain accurate and relevant information, to benefit the target group. The trust level was high and all members were participating, despite their position in the group or the level of expertise.

The large group size caused some practical issues. First, two facilitators were needed to assist the small groups. Their purpose was to ensure that everyone's voices were heard, and the small groups focused on the agreed topics and kept the schedule. Second, finding facilities to accommodate such a large group was difficult. Third, the more people are involved in the workshop, the harder it is to find suitable timing for a workshop in which everyone could participate. Brainstorming and the discussions in the small groups took time. The group was divided into three small groups. Therefore, there were more than 7 members in each small groups. The analysis may have been deeper or performed faster if there were fewer members in the small groups. However, if the group would have been divided into more than three small groups, both selecting the topics for the analysis and sharing the small group work results, would have taken longer time. The facilitators did not recognize any defensive routines hindering the interaction in the group. The defensive routines appeared when it was time to fill in the *personal learning booklet*. The group members were not willing to make any individual level analysis or plans to implement the learnings.

Case B was a product development project that had been recently ended. The amount of the participants was suitable for the method. The workshop covered the whole project life time, approximately 18 months. Capturing the lessons learned was not part of the organizational routines, and the workshop was arranged by the group leader's initiative. The workshop participants were familiar with the practice in general, but they had not used this facilitation method. The author of the study was familiar to the group members. A member of the management team was participating the workshop as an observer. He was also familiar to the participants. Activities in Case B are described in Figure 32.

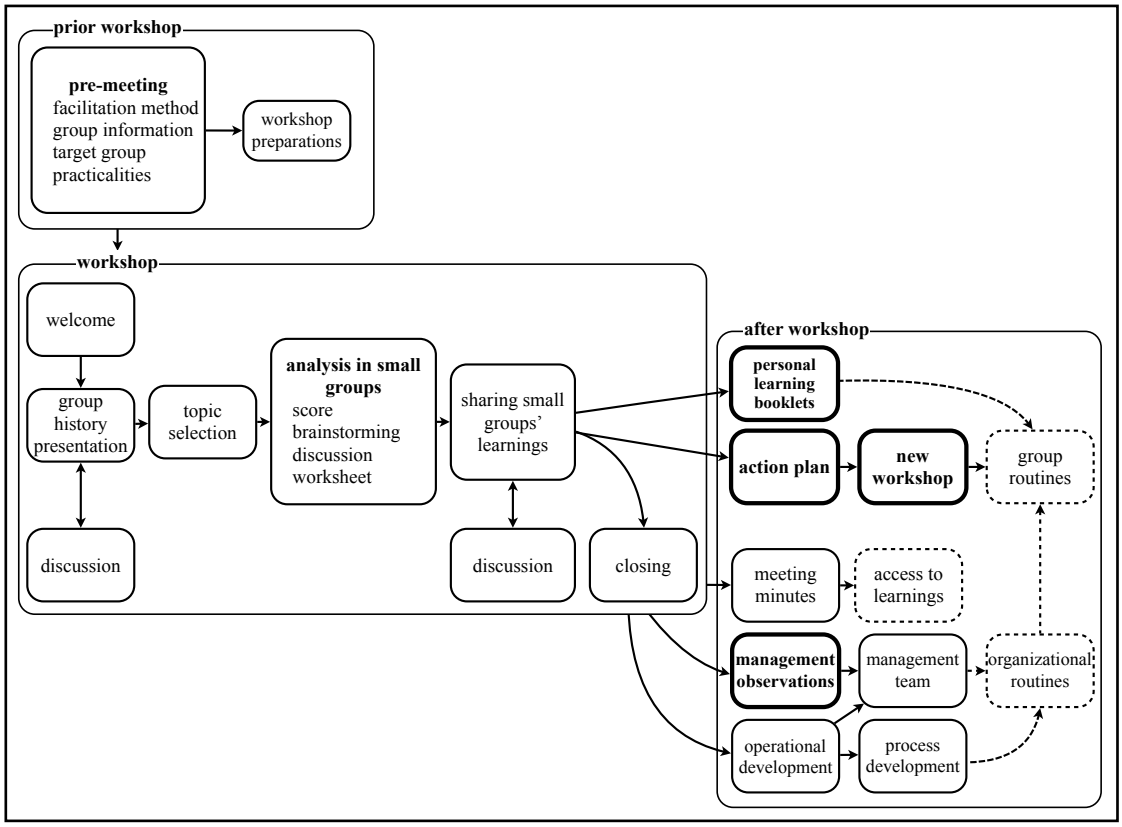

Figure 32 Capturing and sharing learnings in Case B

The author of the study agreed the workshop practicalities with the group leader in the pre-meeting. The group leader wanted that the purpose of the workshop was to prepare for a similar project, which would be implemented by the same group in the future. Therefore, the target group was the group itself. The group leader, along with some key persons, prepared the group history presentation for the workshop.

After the group history presentation and related discussion, the workshop participants drafted six topic proposals. In a further discussion, three topics were selected for the analysis. The key persons of the group were assigned to different small groups, and the other participants were allowed to choose based on their interest in the selected topics. The participants were willing to discuss the topics, and the focus remained mostly on the group level items. Also, the management team representative participated actively in the discussions.

The group analyzed three topics related to the group routines and the cooperation with other groups, and proposed 16 improvement ideas. The analysis was documented in the *worksheets*. Each small group presented its results and the others were able to contribute to the analysis. The *personal learning booklets* were introduced in the workshop. The participants did not want to spend time on them in the workshop, and it was decided that they could fill in them later, on their own time. The remaining time was dedicated to

giving feedback to the management team. The group leader wanted to create the action plan after the workshop. One of the created actions was to arrange an additional workshop where some of the improvement ideas were developed further. The author of the study was asked to facilitate the workshop. In that workshop, the Group fair technique was used.

The author of the study wrote the meeting minutes, and they were reviewed by the participants. After their approval, the minutes were made available to the other groups in the organization. Other groups were also informed about the workshop and the location of the results. The author of the study concluded the learnings, as well as, her own observations for the operational development (OD) team. Some topics were discussed with the OD team as possible process development activities, and a few topics were raised to the management team meeting agendas for further discussion. The management presentative raised some topics to the management meeting agendas and he discussed some process development activities with the OD manager.

Although the later part of the workshop did not follow the construction exactly from the timing point of view, the author of the study sees that all identified elements affecting knowledge creation and sharing, had a positive impact in the group. The initiative to arrange the workshop came from the group leader, and he had a major role in the success of the workshop. The organizational routines did not require the group to capture their lessons learned, but the group leader thought that the workshop would help them modify the group routines for the next project. The enthusiasm and the activity of the group leader demonstrated the importance of the workshop to the group members. He had also involved the key persons from the group to prepare the group history presentation. The group leader set clear goals to the workshop. He also invested in the additional workshop, where some of the improvement ideas were developed further. That additional workshop was arranged in the external premises and the one-day event had also informal activities for the participants. The investment, supported by the management team, highlighted the importance of the workshop, and the group members were motivated to continue developing the improvement ideas further.

The author of the study argues that the group members understood the benefits of the lessons learned workshop and were very motivated to contribute. They saw that the workshop was their chance to affect the group routines used in the next project, which they were about to start soon. The group was located in the same site, and the members interacted daily face-to-face, but mainly on technical topics. The workshop provided an opportunity to focus on the group routines and set the technical details of the group work aside for a few hours. The group had worked together even before this project, so

they had plenty of common experience, and they had developed their own routines and language. The level of trust was high and the members were able to communicate freely. They analyzed the selected topics from various viewpoints and were able to provide relevant information for further use. Also, the size of the group was optimal for the method.

Having a management representative in the workshop did not hinder the interaction. This person was familiar to the participants, and his interest in the project was valued by the group members. When the group members were asked to provide feedback for the management team, they felt that their opinions matter in the organization. The author of the study did not identify any defensive routines in the lessons learned workshop. Leaving the *personal learning booklet* as a post-workshop activity, was more related to the task prioritization based on the workshop goals, than the group members' defensive routines. Although, the author of the study is not aware if the group members ever used the *personal learning booklets.* In the additional workshop, one of the most experienced group members did not want contribute to the group work, but he preferred staying as an observer. He did not feel comfortable to share his knowledge about the past activities or routines, because he thought that it would hinder others' ideas and the development of the new group routines.

Case C was a product development project in its early phase. In this case, the criteria for the facilitation method were not fulfilled because only four persons participated in the workshop. The workshop covered the initial planning phase of the project, approximately 6 months. The group was recently transferred from another organization, where capturing lessons learned had not been part of the organizational routines. In the current organization, the practice was mandatory for the group. The author of the study was not familiar to the workshop participants. Activities in Case C are described in Figure 33.

The workshop practicalities were agreed in the pre-meeting between the author of the study and the group leader. The author of the study described the practice and the workshop agenda to the group leader. The group leader introduced the project and the group members. They agreed that the group leader would compile a presentation of the group history. He would also suggest a target group for the lessons learned. In the pre-meeting, the author of the study found out that there was a personal conflict between the group leader and one of the key persons in the group. Between the pre-meeting and the actual workshop, the group leader changed his mind, and he did not compile the group history presentation as agreed. Neither did he search for the target group. The group leader had also selected the topics for the analysis himself before the workshop.

Unfortunately, the author of the study was not aware of the changes in the group leader's plans.

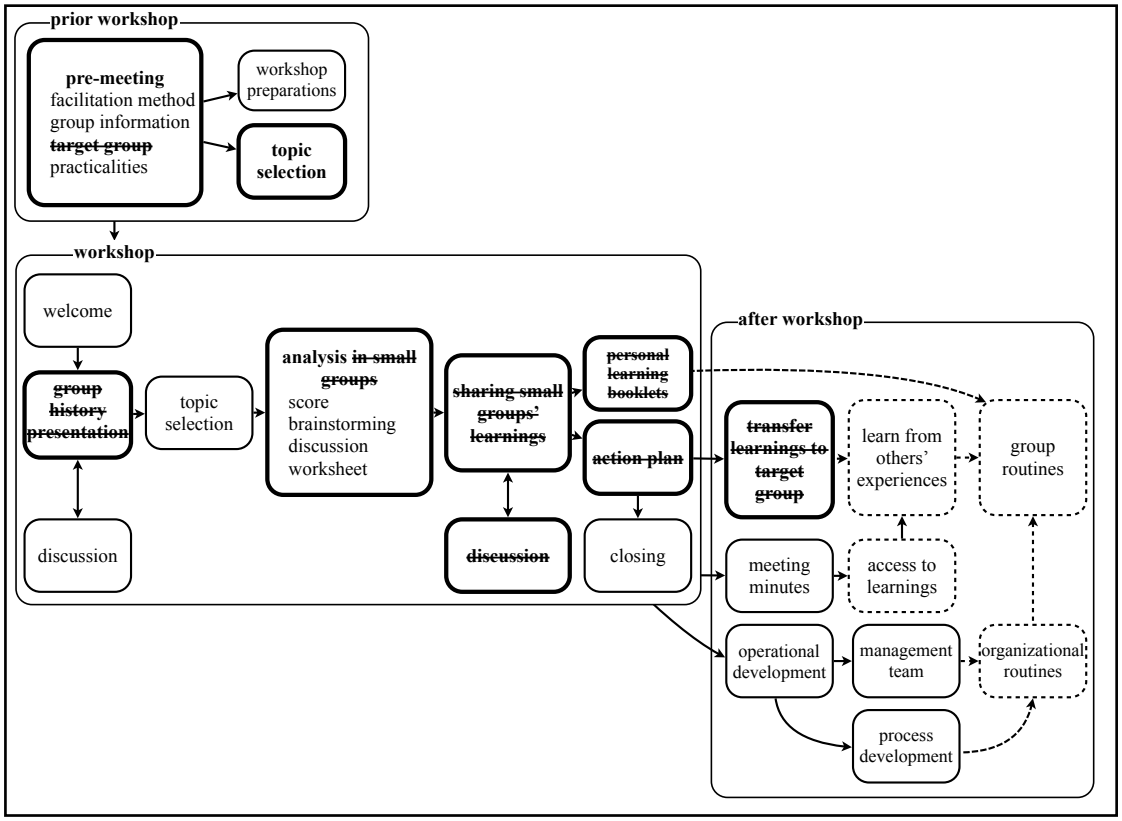

Figure 33 Capturing and sharing learnings in Case C

Due to the lack of the group history presentation, much time was spent on discussing what had happened in the project so far. The group members selected two topics from the themes defined by the group leader for further analysis. The topics were related to the operating mode and the cooperation with the internal and the external suppliers. Because of the small number of the participants and the tense atmosphere in the workshop, the analysis using the *worksheet* was done all together. The author of the study was leading the discussion. The group created six improvement ideas. The *personal learning booklets* were not used, due to resistance of the group members. The group did not make any action plan to implement the improvement ideas themselves.

The author of the study wrote the meeting minutes and they were reviewed by the participants. After the approval, the minutes were made available to other groups in the organization. Other groups were also informed about the workshop and the location of the results. The author of the study concluded the learnings, as well as, her own observations for the operational development (OD) team. Some topics were discussed with the OD team as possible process development activities. A few of them were raised to the management team meeting agendas for further discussion.

The author of the study claims that the facilitation method failed in this case. Most of the identified elements had negative impact on experience-based knowledge creation and sharing in the group. The elements identified the workshop, are summarized in Chart 9.

Chart 9 Elements identified in Case C workshop

ELEMENTS		EFFECT		
		positive	+/-	negative
related to individuals	motivation			x
	trust			x
	defensive routines			x
group related	group leader's behavior			x
	target setting			x
	group size			x
	group routines			x
	common experiences			x
	common language	x		
	face-to-face interaction			x
	conversations			x
	openness for feedback			x
	issue orientation	x		
	information accuracy	x		
	information relevance			x
organizational	proximity in time	x		
	proximity in space	x		

The author of the study argues that the main element causing the poor result of the workshop, was the group leader's behavior. Due to his defensive routines, the workshop lacked goals and the group history presentation. He had also selected the topics for the analysis by himself. He had not briefed the group members properly about the workshop, and the participants were a little confused at the beginning of the workshop. Their defensive routines gradually faded when they were discussing the group history, but the defensiveness reappeared when the *personal learning booklet* was introduced. The author of the study assumes that motivation of the group members was low. They have not been able to prepare to the workshop properly and they did not know what they were expected to do.

The group had been working together only for a few months, and one member had just joined the group. It seemed that the group members were not used to express their opinions regarding anything else than the technical topics. There were too few participants to form the small groups, and the group leader's behavior was limiting the face-to-face interaction during the whole workshop. The personal conflict between the group leader and one of the key persons was not brought up during the workshop, but generally the atmosphere was tense and the flow of the ideas seemed limited. The

person who had the disagreement with the group leader, was practically silent throughout the workshop.

Due to the previous experience in other projects, the group members had a common technical language for the conversations. The participants discussed more the technical topics than the group routines, even though the selected topics were related to the group routines. It seemed that no new viewpoints were brought up, and the workshop was mainly an opportunity to focus on certain topics and summarize the group members' opinions regarding them. Therefore, the relevance of the captured learnings was low. The improvement ideas were merely normal project management practices which should have already been part of the group routines.

After Case C workshop, the author of the study removed the *personal learning booklets* from the final version of the facilitation method. From now on, the facilitation method was purely focusing on the group level experience and learning from them. Also, workshop could be targeted to a particular target group, or learner group itself. In the pre-meetings, the importance of the group history presentation was emphasized more for the group leaders.

5.2 Validating the facilitation method with Cases D to K

Case D was a product development project already at the end of implementation phase. The amount of the participants was suitable for the method. The workshop focused on the implementation phase of the project, which had lasted about one year. The group was recently transferred from another organization, where capturing lessons learned had not been part of the organizational routines. In the current organization, the practice was mandatory for the group. The project was following the routines and the targets defined by the old organization, and similar activities would not be started in the current organization any more. The author of the study was not familiar to the workshop participants. A member of the management team was participating the workshop as an observer. He was familiar to the workshop participants. Activities in Case D are described in Figure 34.

In the pre-meeting, the author of the study described the facilitation method and the workshop agenda to the group leader. The group leader introduced the project. It was agreed that the group leader would compile a presentation of the group history. Also, the possibility to find a target group was discussed, and it was agreed that no specific target

group is available for the learnings. The improvement ideas could be used in the group's own work.

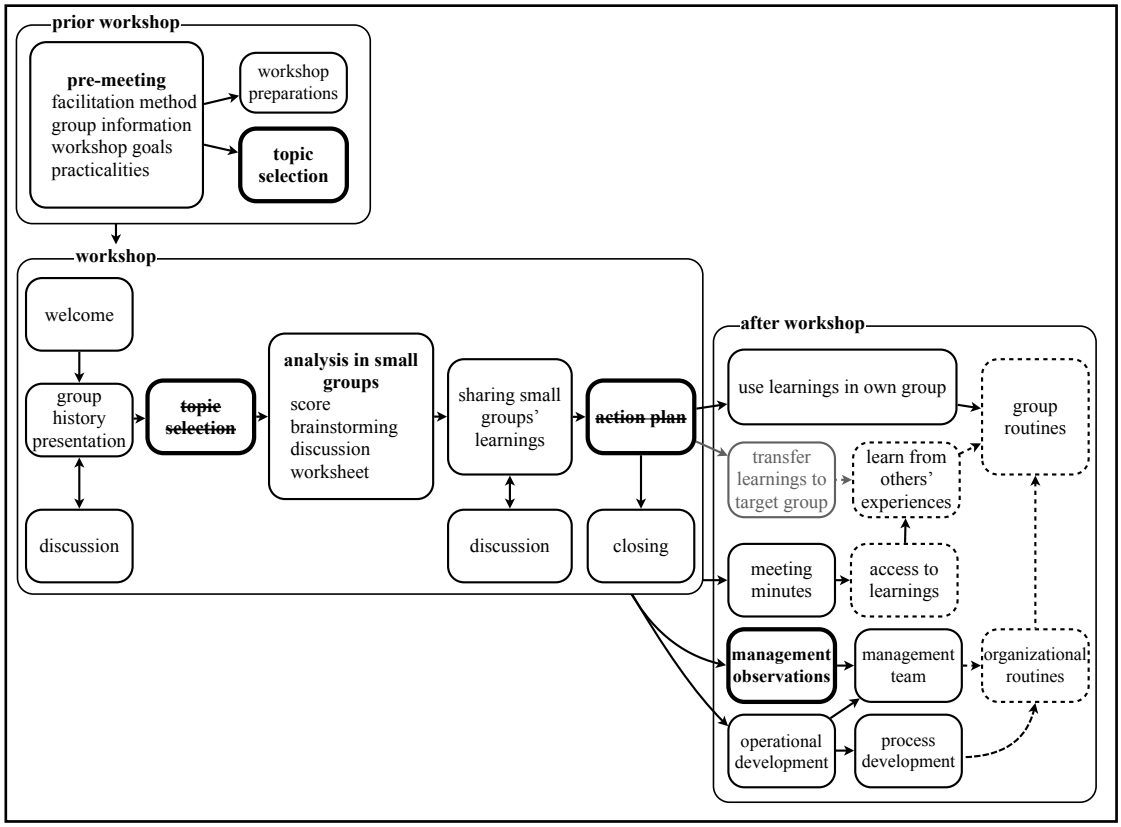

Figure 34 Capturing and sharing learnings in Case D

In the workshop, the group leader presented the group history and the participants highlighted some topics from the presentation. The group members had defined together some themes for the lessons learned beforehand in a project meeting. Three of the preselected themes were analyzed in the small groups, and the group created 10 improvement ideas. The discussed topics were related to the group routines and the deliveries from the suppliers. The analysis was documented in the *worksheets*. Each small group presented its results and others were able to contribute to the analysis. The identified improvement ideas would be beneficial for the group itself in the later phases. No separate action plan to implement the ideas was created. The management team representative was purely in an observer role, and he did not participate in the discussions much, at any phase of the workshop.

The author of the study wrote the meeting minutes and they were reviewed by the participants. After the approval, the minutes were made available to other groups in the organization. Other groups were also informed about the workshop and location of the results. The author of the study also concluded the learnings, as well as, her own observations for the operational development (OD) team. Some topics were discussed

with the OD team as possible process development activities. Some topics were raised to the management team meeting agendas for further discussion. The management team representative summarized his observations to the management team, but he did not raise any topics to the management meeting agendas.

The author of the study argues that all the identified elements, except leadership priorities, had a positive impact on experience-based knowledge creation and sharing in the group. This project was seen as important in the management team, because one of the team members was present in the workshop as an observer. He was familiar to the group members and his presence did not hinder the interaction in the group. Yet, the management representative was passive and his usefulness in the workshop, as well as, his contribution to the management team, can be questioned.

The group leader was committed to the workshop. He had prepared the group history presentation and involved the group to propose the topics for the analysis prior the workshop. Even if the method was new to the group, the members were willing to contribute and all invited group members were present in the workshop. The group had been working together for some time, and the members had common experiences and a joint language. Also, the trust level was high. The interaction was lively and the atmosphere was relaxed. The discussions in the small groups were open and focused on the selected topics and the proposed improvement ideas were practical. The group did not make any action plan to implement the ideas to the group routines.

After Case D workshop, the *worksheet* template was updated for the last time. All the following cases used the final version of the template. *Case E* was a product development project preparing for mass production. The group size was suitable for the method. The workshop focused on the last eight months of the project life time. The group's responsibilities were about to end, and an another group, responsible for the product maintenance activities, would take over the tasks. Therefore, the target group of the learnings was the maintenance group. Capturing lessons learned was part of the organizational routines and the workshop participants were familiar with the practice. They had participated in similar activities earlier in the project. Although, the previous workshops had been facilitated differently. Even though the group had been working together for a long time, this lessons learned workshop was the first time when the whole group met face-to-face. The author of the study was familiar to most of the participants. Figure 35 illustrates the activities in the Case E.

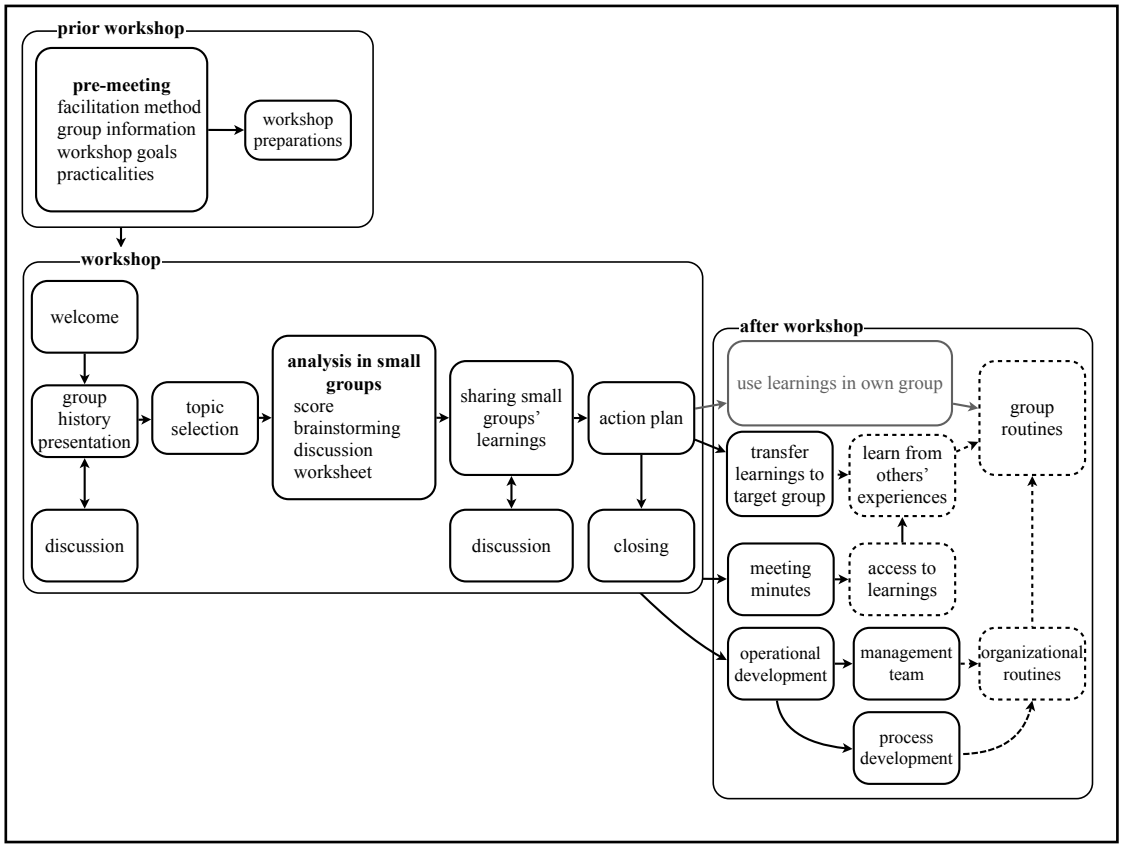

Figure 35 Capturing and sharing learnings in Case E

In the pre-meeting, the author of the study discussed with the group leader the facilitation method, its differences to the earlier methods the group had used, and the practicalities related to the workshop. The target group was agreed and the group leader promised to prepare a group history presentation for the workshop.

The group leader presented the group history and the participants selected topics for the analysis, based on their usability and/or importance to the target group. Two small groups were formed and they both analyzed two topics and created 15 improvement ideas for the target group. The analyzed topics were related to the cross-functional cooperation in technical problem solving, the cooperation with the customers and manufacturing related themes. These activities would be repeated in the maintenance phase also. The analysis was documented in the *worksheets*. Small groups presented their results and others were able to contribute to the analysis.

The group created an action plan to transfer the learnings to the target group. The group leader and the key persons from the group, as well as, the author the study had a meeting with the target group. The topics discussed in the workshop were introduced to the target group, and the captured learnings and suggested improvement ideas were

presented. Later, the target group included some of the suggested actions into their project plan.

The author of the study wrote the meeting minutes from the workshop, and they were reviewed by the participants. After the approval, the minutes were made available to other groups in the organization. Meeting minutes from the meeting with the target group, were also written by the author of the study and made available for the other groups. Other groups were informed about the workshop and location of the results. The author of the study concluded the learnings, as well as, her own observations for the operational development (OD) team. Some topics were discussed with the OD team as possible process development activities. A couple of topics were raised to the management team meeting agendas for further discussion.

The author of the study argues that this workshop was successful in both capturing and sharing learnings. All the identified elements were positively affecting experience-based knowledge creation and sharing in the workshop. In this case, the group leader was fully supporting the workshop. He had emphasized the importance of the workshop to the group prior the workshop, and in the workshop, he was very active, yet not dominating, and demonstrated the desired behavior to the workshop participants. There was a clear goal for the learnings, and all the participants were supporting the goal and wanted to participate. The group members seemed to be very motivated to complete the project and move on to other tasks. They believed that if the learnings and the improvement ideas were properly documented, the target group could use the documents and not to rely so much on the group members in the future. They were also willing to participate in the knowledge transfer meeting with the target group, to ensure that the learnings were understood properly.

Case E was a multisite project, and this workshop was the first time when all group members met face-to-face. The lack of face-to-face interaction raised much discussion during the group history presentation. The group members felt that some of the challenges in the project could have been easier to solve, if the group members had known each other personally. The group members had worked for a long time together virtually and the interaction in the workshop was vidid. They analyzed the group practices and created practical improvement ideas keeping the target group in mind. The author of the study did not identify any defensive routines related to the workshop. However, the group was a little doubtful regarding the target group’s competences on handling the project responsibilities in the future.

Case F was a product development project which had been recently started. The number of the participants fit the criteria of 5-20 persons. The focus of the group's first lessons learned workshop was on the requirement setting phase of the project. Also, attention was paid to the effect of the recent changes in the operating mode of the group. Capturing lessons learned was part of the organizational routines, and the workshop participants were familiar with it, and they had participated in similar activities in other projects. Those workshops had been facilitated differently. The group leader was familiar with the used facilitation method, because his previous project (Case E) had already used it. Also, the management representative had participated in a similar workshop earlier. This group was the target group for the lessons learned captured in Case A. The author of the study, as well as, the management representative were familiar to the participants. Activities in Case F are described in Figure 36.

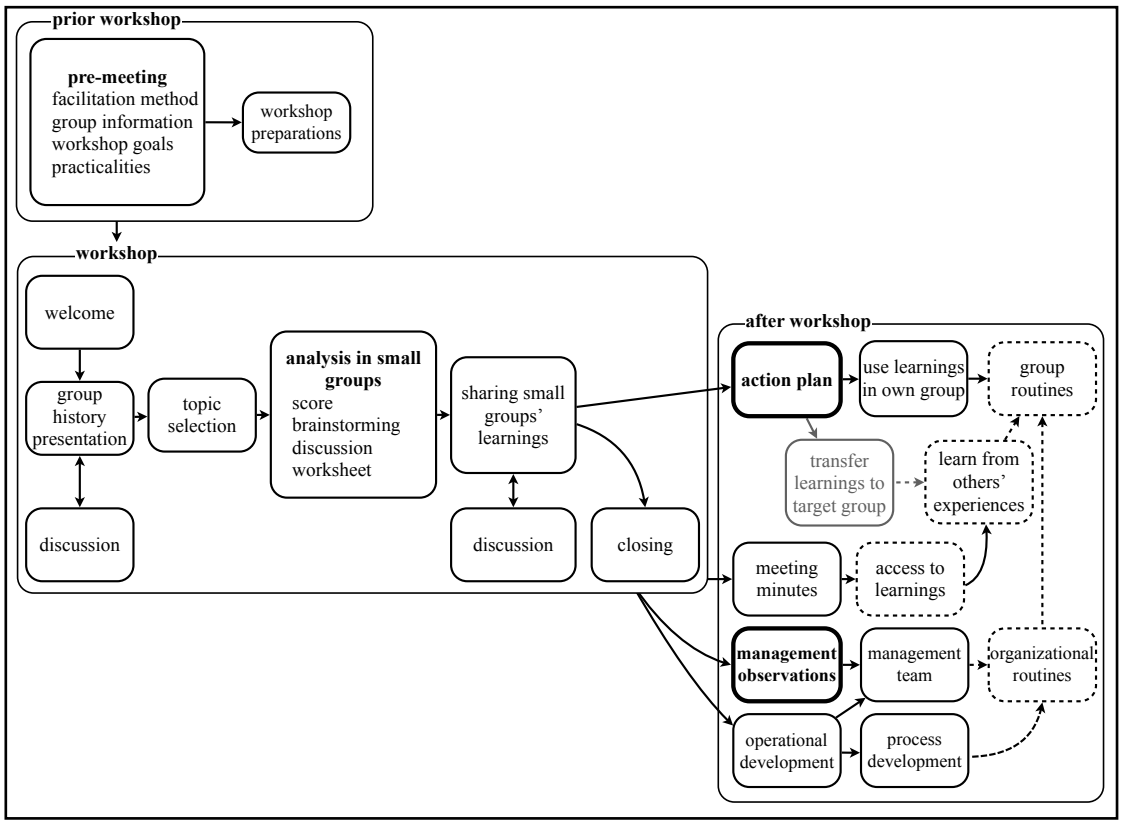

Figure 36 Capturing and sharing learnings in Case F

In the pre-meeting, the author of the study discussed mainly the practicalities with the group leader, because the group leader was already familiar with the facilitation method. It was agreed that the main emphasis in the workshop is to improve the group routines. The group needed to understand how the changes in the operating mode would affect the daily life in the project. The group leader agreed to prepare a group history presentation for the workshop.

During the group history presentation, the discussion focused on the changes in the operating mode and its implications on the daily work. The presence of the management team member was fortunate, because he had valuable knowledge regarding the new operating mode and its effects on the projects. The management team representative participated actively in the discussions. The topics selected for the analysis in the small groups, were related to the group routines and the cooperation with the external supplier. Also, the management representative participated in the analysis in the small groups. The group analyzed six topics and created 26 improvement proposals, and they were documented in the *worksheets*. Each small group presented its results and others were able to contribute to the analysis. The group did the action planning later in a project meeting.

The author of the study wrote the meeting minutes and they were reviewed by the participants. After the approval, the minutes were made available to other groups in the organization. Others were also informed about the workshop and location of the results. The author of the study concluded the learnings, as well as, her own observations for the operational development (OD) team, and some topics were discussed with the OD team as possible process development activities. The management representative concluded his observations to the management team and raised some topics to the meeting agendas for further discussion. The representative also discussed the process development activities with the OD manager.

The author of the study argues that all the identified elements were positively affecting experience-based knowledge creation and sharing in the group. This project had a high priority in the organization. It was still in an early phase but the management team was interested in its progress already now. The management team representative participated in the meeting and he encouraged the group members to give feedback to the management team. He also provided valuable information regarding the organizational level topics to the group.

The group leader had found the facilitation method effective in his last project, and he promoted the workshop and highlighted its importance to the group members prior the workshop. In the workshop, he was very active and constantly encouraging the group members to express their opinions and suggest improvements to the group routines. There was a clear goal for the learnings, and the group members were motivated to contribute. Even though the group had recently started the project and lacked common experiences together, the trust level was high. Most of the group members knew each other from the previous projects and they had a common language and it was easy for them to discuss openly.

In the analysis phase, the participants discussed the group routines in their previous projects and evaluated whether they could be useful also in this group. The group members had acknowledged that, due to the project's high status in the organization, the group routines could differ from the organizational routines. All the improvement ideas were reevaluated after the workshop, when the group did the action planning. The author of the study did not identify any defensive routines during the workshop.

The product development project in *Case G* focused in their lessons learned workshop to the planning phase of the project. The group size was acceptable for the method. The group was recently transferred from another organization. Capturing lessons learned had been part of their organizational routines but the method had been different. Like Case D, this project was following the routines and targets defined by the old organization, and similar activities would not be started in the current organization any more. The author of the study was not familiar to the workshop participants. Activities in Case G are described in Figure 37.

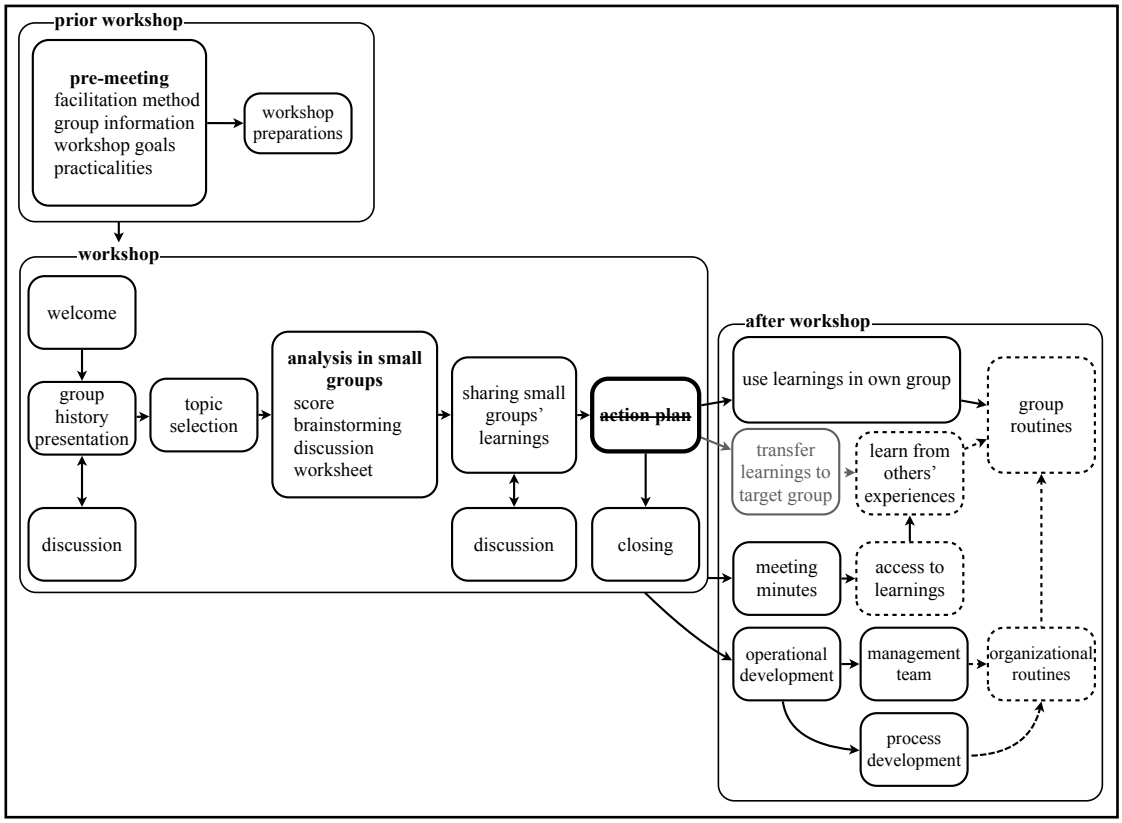

Figure 37 Capturing and sharing learnings in Case G

In the pre-meeting, the author of the study discussed the facilitation method and the practicalities with the group leader. The group leader introduced the project. It was agreed that the learnings would be used in the group itself. The group was still following the old operating mode, but the surrounding environment and the internal

suppliers had changed their operating modes, and the group needed to adjust its routines to enhance the cooperation with the stakeholders. The group leader agreed to prepare a group history presentation for the workshop.

After the group history presentation, the group members selected the topics for the analysis. Each small group analyzed two topics. All together, six topics were analyzed and the analysis included 14 improvement proposals. The analyzed topics covered practices related to technical documentation, reporting and meetings, as well as, the group practices adjustments needed due to new operating mode in the surrounding environment. The learnings were documented in the *worksheets*. Each small group presented its results and others were able to contribute to the analysis. Any separate action plan was not created to implement the suggested actions.

The author of the study wrote the meeting minutes and they were reviewed by the participants. After the approval, the minutes were made available to other groups in the organization. Other groups were also informed about the workshop and the location of the results. The author of the study concluded the learnings, as well as, her own observations for the operational development (OD) team. Some topics were discussed with the OD team as possible process development activities. Some topics were raised to the management team meeting agendas for further discussion.

The author of the study claims that, even though the facilitation method was not familiar to the group, the group members could anticipate what the workshop would be like. At the beginning of the workshop, the group members defensive routines hindered the face-to-face interaction, but during the group history presentation the group relaxed. Otherwise, all the identified elements had a positive impact on the workshop. The group members' motivation increased as they realized the workshop goal, and that they could decide the analyzed topics and suggest the improvement ideas for their own group routines. The participants were motivated to change the group routines to better match the routines of the stakeholders, to improve the cooperation.

The group leader's attitude was positive, but not as encouraging as e.g. in Case B, E or F. The group had worked together for some time, and the group members trusted each other. The level of interaction varied a lot in the small groups. Everyone was allowed to choose their small groups based on their interests. Therefore, the author of the study assumes that the difference between the small groups was more related to the personalities of the participants, than their interest in the topics. For one small group, it seemed very hard to write down anything to the *worksheet*. The small group members discussed as much as the participants in the other small groups, but they lacked a person

who could conclude their ideas. Generally, the improvement ideas were very practical and could be easily implemented into the group routines. The group did not create any action plan for the implementation.

Case H is the same project as in Case G, but there were six months between the workshops. The project had recently been cancelled by a management decision, in the middle of the implementation phase. The group size was acceptable for the method. Most of the participants had participated in the previous workshop also. They were familiar with the method and the author of the study. The project was following the operational mode of the previous organization, and there would not be any similar project in the organization in the future. The operating mode did not require such workshop to be organized at the sudden end of the project, but the group leader wanted to get input from the group members to the final report. The management representative participating the workshop was familiar to the group members. Activities in Case H are described in Figure 38.

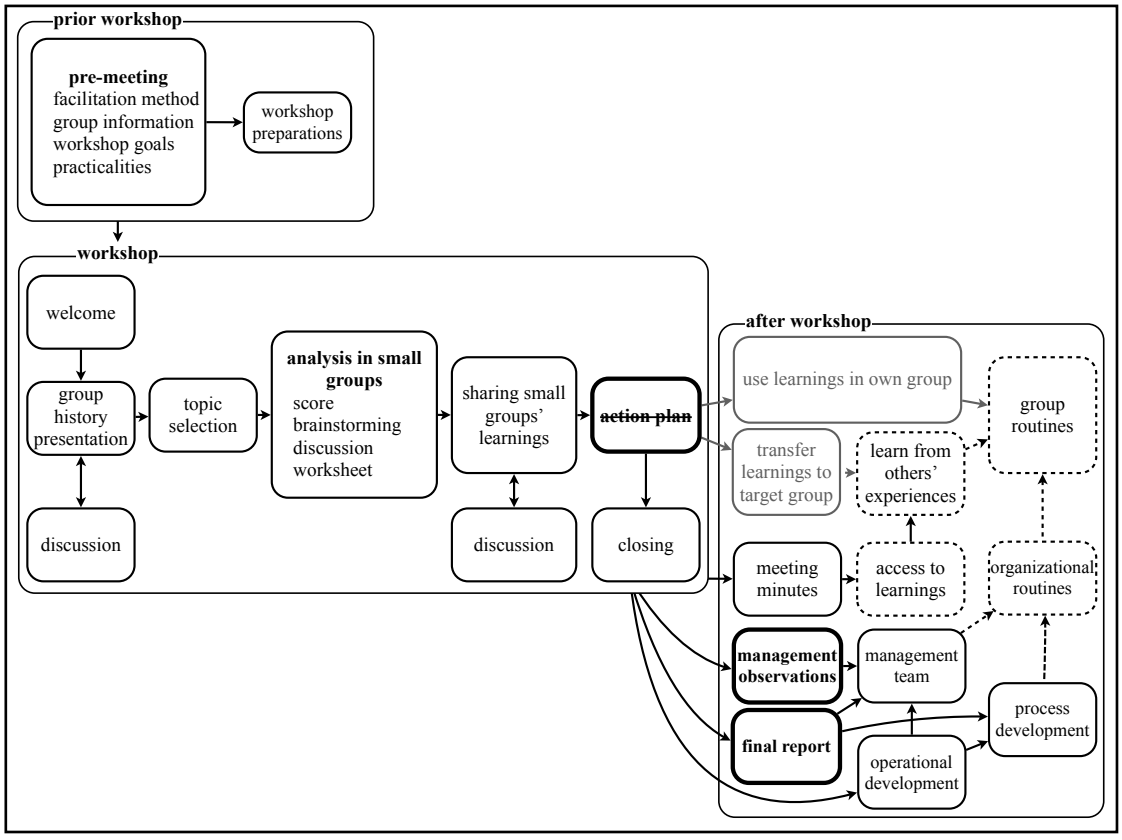

Figure 38 Capturing and sharing learnings in Case H

In the pre-meeting, the author of the study discussed mainly the practicalities with the group leader. They also discussed the group members' motivation to participate in the workshop. The purpose of the workshop was to analyze faced challenges since last workshop, and to get input to the final report of the project. After the workshop, the

group would have informal activities together in another location. The group leader agreed to prepare a group history presentation for the workshop.

The group history presentation covered the activities of the early implementation phase. Two topics were selected for the analysis and they both were related to the cooperation with the suppliers, both internal and external. The group created eight improvement ideas. Each small group presented its results and others were able to contribute to the analysis. No separate action plan were created, but the group leader planned to add the learnings to the final report of the project. The management representative participated actively in the discussion, and he was especially interest in getting feedback to the management team.

The author of the study wrote the meeting minutes and they were reviewed by the participants. After the approval, the minutes were made available to other groups in the organization. The other groups were also informed about the workshop and location of the results. The author of the study concluded the learnings, as well as, her own observations for the operational development (OD) team. Some topics were discussed with the OD team as possible process development activities. Some topics were raised to management team meeting agendas for further discussion. Also, the management representative raised some topics to the management meeting agendas and he discussed the process development activities with the OD manager. The group leader included the learnings in the final report of the project.

The author of the study noted that the level of interaction, as well as, the workshop outcomes, were different from the first workshop (Case G). This time, there were more elements affecting negatively knowledge creation and sharing in the group. The elements affecting the workshop are summarized in Chart 10.

The project in Case H was not considered important to the organization, and it was cancelled. However, the cancellation made the Case H learnings interesting to the management team. One management team representative participated in the workshop and he was actively involved in the discussions. The group leader initiated the workshop, and he was motivated to arrange the workshop, because he needed input to the final report of the project and thought that the facilitation method would be suitable for that purpose.

Chart 10 Elements identified in Case H workshop

ELEMENTS		EFFECT		
		positive	+/-	negative
related to individuals	motivation			x
	trust	x		
	defensive routines			x
group related	group leader's behavior	x		
	target setting	x		
	group size	x		
	group routines	x		
	common experiences	x		
	common language	x		
	face-to-face interaction	x		
	conversations	x		
	openness for feedback			x
	issue orientation			x
	information accuracy			x
	information relevance			x
organizational	leadersip priorities			x
	proximity in time	x		
	proximity in space	x		

The group members' motivation was a lot lower than in the previous workshop (Case G). Besides the project cancellation, their insecurities were influenced by the ongoing organizational change. They were afraid of being made redundant, because they were not involved in an active project any more. The group members did trust each other, but they had doubts regarding the organization. They participated in the group history related discussions actively, but the quality of the analysis in the small groups was lower than in the previous workshop. The final report of the project did not seem to be a good enough goal for the participants, and the improvements ideas were of very general nature.

Case I was a product development project. The group fulfilled the criteria related to the group size, but not the criteria of face-to-face interaction as one of the group members participated the workshop via teleconference. The project was preparing for the mass production, and the focus of the workshop was in the last 12 months. The project responsibilities were about to, end but the maintenance responsibility would remain with certain members of the group. No target group was identified for the learnings. The group was recently transferred from another organization where capturing the lessons learned had been part of the organizational routines, but the method was different. The project was following the routines and the targets defined by the old organization, and similar activities would not be started in the current organization any more. The author of the study was not familiar to the workshop participants, but the management representative was. Activities in Case I are described in Figure 39.

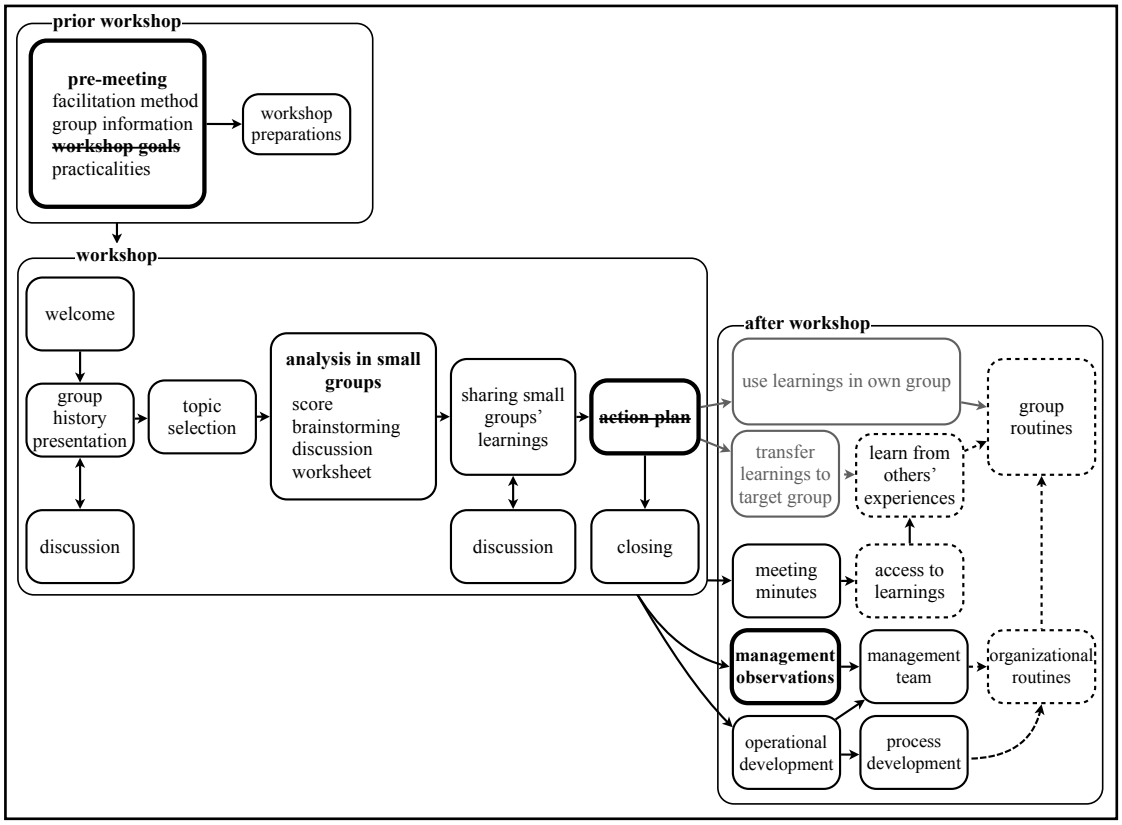

Figure 39 Capturing and sharing learnings in Case I

In the pre-meeting, the author of the study discussed the facilitation method and the practicalities with the group leader. The group leader informed that one of the group members would not be able to personally present in the workshop, and the author of the study promised to make arrangements to find a way for the remote member to participate. It was agreed that there would not be any specific goal for the learnings and the group leader agreed to prepare a group history presentation for the workshop.

During the group history presentation, there was much discussion related to the technical challenges faced in the project. Also, the management representative participated in the discussions actively. The group selected two topics for the further analysis.

Due to the remote participant, one small group was analyzing the topic in a separate meeting room with teleconferencing equipment, and the author of the study was visiting them regularly to check the progress. The management representative visited both small groups and participated in their discussions. The analyzed topics were related to the operating mode and the cooperation in the verification phase. The group created six improvement ideas. The small groups presented their results and others were able to contribute to the analysis. No action plan was created.

The author of the study wrote the meeting minutes and they were reviewed by the participants. After the approval, the minutes were made available to the other groups in the organization. The other groups were also informed about the workshop and location of the results. The author of the study concluded the learnings, as well as, her own observations for the operational development (OD) team. Some topics were discussed with the OD team as possible process development activities and some topics were raised to management team meeting agendas for further discussion. The management representative raised some topics to the management meeting agenda and discussed the process development activities with the OD manager.

According to the author of the study, some of the elements affecting knowledge creation and sharing, appeared to affect negatively the workshop. The elements identified in the workshop, are summarized in Chart 11.

Chart 11 Elements identified in Case I workshop

ELEMENTS		**EFFECT**		
		positive	**+/-**	**negative**
related to individuals	motivation	x		
	trust	x		
	defensive routines			
group related	group leader's behavior	x		
	target setting			x
	group size	x		
	group routines	x		
	common experiences	x		
	common language	x		
	face-to-face interaction	x		
	conversations	x		
	openness for feedback	x		
	issue orientation	x		
	information accuracy	x		
	information relevance			x
organizational	leadersip priorities	x		
	proximity in time	x		
	proximity in space			x

In this case, one group member participated in the workshop via teleconference. The project was located in three sites, and virtual meetings were part of the normal group routines. The remote participant was able to follow the discussion and the presentations online. Although, it was harder for him to contribute to the discussions where the whole group was participating. In the analysis phase, one small group was located in a separate meeting room where they could discuss with the remote participant without disturbing the other small group. They used the *worksheet* in electronic format and the remote participant could see what others were writing.

The group leader was motivated to arrange the workshop. Also, the management team was interested in the project and one representative participated in the workshop. The representative had participated in a similar workshop earlier, and he was active in the discussion. The group had worked together for a long time and the trust level was high. However, the author of the study argues that the lack of workshop goal affected the outcome. Even though the level of interaction was high and the participants discussed actively, only few improvement ideas were suggested and they were quite general of nature.

The group had severe technical challenges under investigation at the time of the workshop, and the discussion during the group history presentation paid attention to them. The group members were motivated to analyze the group routines. Yet, the author of the study argues that it would have been better for the group to arrange the workshop after the technical issues were solved, since they distracted the participants little. The author of the study did not acknowledge any sign of the defensive routines in the workshop.

Case J represents a different organization and context, than the previous cases. Case J was a manufacturing project in Organization Beta, and it was preparing for mass-production phase. The group size was acceptable for the method. The scope of the workshop was from the start of the project to the current date, covering approximately 3 years. The group had not earlier captured their lessons learned. Capturing the lessons learned were required in the organizational routines, but the group did not follow the routines systematically. The workshop participants were not familiar with the method nor the author of the study. The initiative to arrange the workshop came from the group leader, after she had heard about the new facilitation method. Activities in Case J are described in Figure 40.

In the pre-meeting, the author of the study described the facilitation method and the course of the workshop to the group leader. The group leader introduced the project and the operating mode to the author of the study. It was agreed that the group leader would compile a presentation of the group history. The group leader had already identified the target group for the learnings. The group leader would invite one person from each team or sub-project to the workshop, as well as, some representatives from the target group. The group leader was not able to identify any formal organizational routines to promote the group's learnings in the organization. However, she had a plan to study the operational mode further based on the workshop results, and suggest changes to the organizational routines.

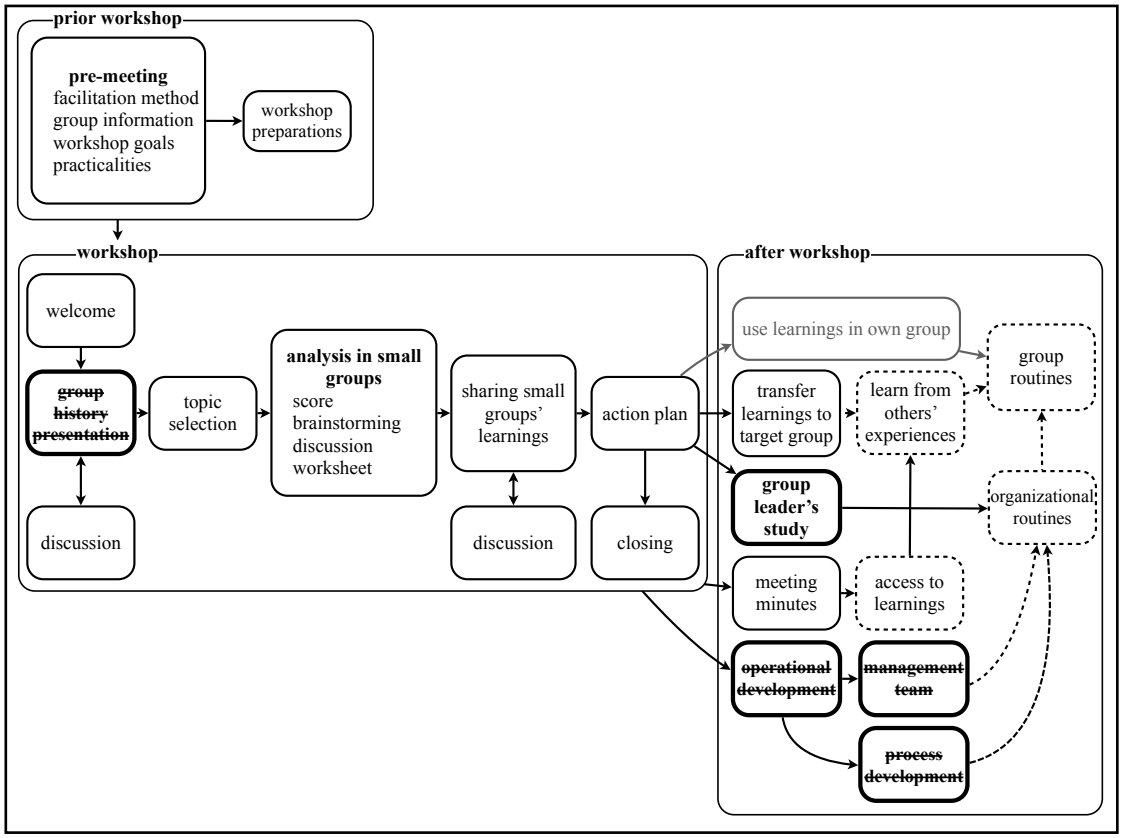

Figure 40 Capturing and sharing learnings in Case J

The group leader did not make a group history presentation for the workshop. Instead, she presented a summary of the operating mode, the responsibilities and the status of the project. The challenges faced by the group were discussed also. The group members proposed three topics for the analysis, but due to their lack of interest in one of the topics, only two topics were analyzed. The analyzed topics were related to the product data management and the cooperation with the customer. Small groups created 17 improvement ideas related to the topics and documented them in the *worksheets*. Each small group presented its results and others were able to contribute to the analysis.

The action plan for the next steps was created. The author of the study wrote the meeting minutes and they were sent to the group leader. She saved them to the organization's database. Later, the group leader discussed the operational mode with the group members. She interviewed the key persons and made further suggestions to the target group, as well as, to the organizational routines.

The author of the study argues that, in this case, most of the elements affecting knowledge creation and sharing, were having a positive impact to the workshop. The elements identified in the workshop are summarized in Chart 12. The group leader was very motivated to arrange the workshop, and there was a clear goal for the learnings. However, she did not make the group history presentation for the workshop. Also, the

group leader scheduled the workshop for a shorter time than the author of the study recommended. The group leader did not believe that the group members were willing to spend more than two hours to the workshop, due to a hectic phase in the project. Discussion related to the project status at the beginning of the workshop, took much time, and the latter part of the workshop suffered from the tight schedule. Especially, sharing and discussing the small groups' results would have needed more time. After the workshop, the participants commented that there was too little time reserved for the workshop. The group leader was interested in studying the project further, and her goal was to suggest new organizational routines based on the feedback of the group. The actual plan for this was just discussed, not written to anywhere.

Chart 12 Elements identified in Case J workshop

ELEMENTS		EFFECT		
		positive	+/-	negative
related to individuals	motivation	x		
	trust	x		
	defensive routines			x
group related	group leader's behavior		x	
	target setting	x		
	group size	x		
	group routines	x		
	common experiences	x		
	common language	x		
	face-to-face interaction	x		
	conversations	x		
	openness for feedback	x		
	issue orientation			x
	information accuracy	x		
	information relevance	x		
organizational	proximity in time	x		
	proximity in space	x		

The group was not used to having an external person present in their meetings, and the participants were little reserved at the beginning of the workshop. When the role of the facilitator and her duties to keep the confidentiality were explained, the participants became more active. Due to the long duration of the project, the lack of the group history presentation was unfortunate. The project was the first of a kind in the organization, and there had been many challenges and other issues, which the participants wanted to discuss. Discussion focused on items out of the group's control and, therefore, did not fully serve the workshop goal. The analysis in the small groups was better focused. Although, the only topic proposal which was related only to the group itself and not its stakeholders, was not analyzed at all. The author of study argues that the created improvement ideas were very practical. One member from the target group participated in the workshop, and the analysis, as well as, the discussions during the workshop, provided valuable information for the target group.

Case K represents the research project context and Organization Gamma. The size of the group was suitable for the method. The workshop focused on the whole project lifetime, approximately six months. The group had not earlier captured any lessons learned and the organizational routines did not require such activities. The workshop participants were not familiar with the method, nor the author of the study. The initiative to arrange the workshop came from the facilitator. Activities in Case K are described in Figure 41.

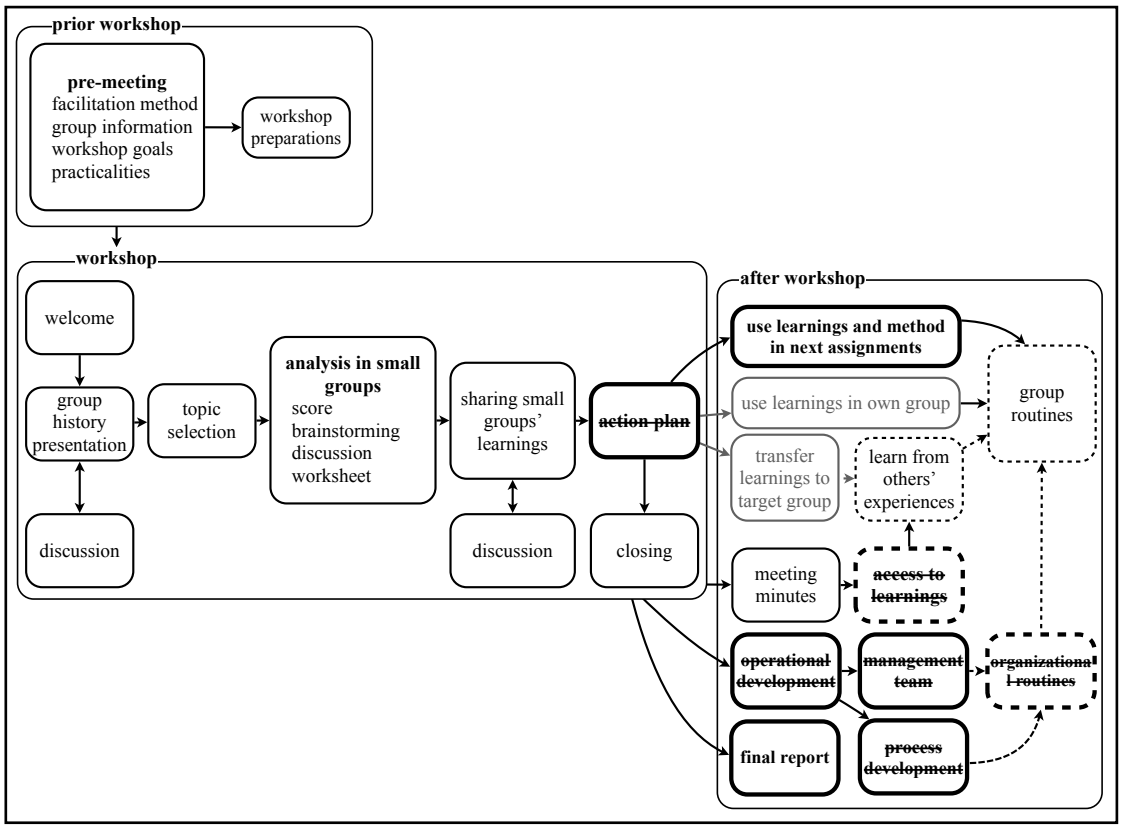

Figure 41 Capturing and sharing learnings in Case K

In the pre-meeting, the author of the study presented the facilitation method to the group leader. The group leader introduced the project to the her. The group leader was not able to identify any target group for the learnings, nor an organizational routine to promote the group's learnings in the organization. The goal of the workshop was to conclude the project. It was agreed that the group leader would compile a presentation of the group history.

After the group history presentation, the group members selected topics for the small groups. Using the *worksheets,* they analyzed two topics and created 14 improvement ideas. The topics were related to the operating mode and the research methods used in the project, which both were new in the organization. The small groups presented their results and others were able to contribute to the analysis. The author of the study wrote

the meeting minutes, and they were sent to the group leader. He forwarded them to the group members but they were not made available for the rest of the organization. The group leader used the learnings in the final report of the project.

According to the author of the study, all the elements identified from the Case K affected positively the workshop. Formally capturing lessons learned was new to the project in Case K, because their organizational routines did not require such activities. In practice, there were no organizational routines affecting the group routines, and the group routines were dependent on the group leader. In previous projects, the participants had discussed the lessons but not in such a formal way as in this workshop. The group leader was willing to test the facilitation method and he encouraged the group members to participate. After the workshop, he asked permission to use the facilitation method, as well as, the *worksheet* template, in his other projects as well.

The project had been divided into two teams, and the group members admitted that it had been challenging to understand the big picture. The author of the study argues that the group history presentation concluded the two sides of the project and gave a good summary of the group activities to all the participants. The group had been using distinctive routines and new research methods, and the group members were motivated to analyze the project. The analysis was in-depth and more analytical than in other cases, which may be influenced by the nature of the participants work. The group members were used to studying, analyzing and concluding topics. They discussed actively and the analysis phase lasted longer that the group leader had estimated in the pre-meeting. The improvement ideas were practical and described in details. Some of them were related to the organizational routines, and others were focusing on the group level routines. The group leader included the learnings into the final report of the project. The author of the study did not identify any defensive routines during the workshop.

It became clear already in the pre-meeting, that transferring the learnings from this project to the other projects in the organization, would happen only through the group members. The group members worked parallel in several projects and they could promote their learnings in the other groups. The organizational culture did not encourage sharing the operational mode related items to other projects, and only research topics were communicated. The group did not have any official way to promote their learnings in the organization. The discussion related to the possible ways to share the learnings was cut short in the workshop, due to time pressure to end the workshop.

6 Cross-case analysis

In the sixth chapter, a cross-case analysis of the empirical study is presented. At the end of the chapter, the new facilitation method is compared to the old methods, in the context of Organization Alpha, to assess how well the created construction answers to the real life problem, which initiated the study.

6.1 Analysis

In the cross-case analysis, the case workshops described in the previous chapter are compared and analyzed regarding the *workshop goals, phases in the workshop and the learnings*. The case summary is presented in Chart 13.

Chart 13 Case summary

case	workshop goal	PHASES						LEARNINGS	
		pre-meeting	group history	topic selection	analysis in small groups	sharing results	action plan	analyzed topics	created ideas
A	target group	yes	yes	yes	yes	yes	yes	3	12
B	group routines	yes	yes	yes	yes	yes	after-wards	3	13
C	no	yes	no	by group leader	as a whole group	no	no	2	6
D	group routines	yes	yes	by group	yes	yes	no	3	10
E	target group	yes	yes	yes	yes	yes	yes	4	15
F	group routines	yes	yes	yes	yes	yes	after-wards	6	26
G	group routines	yes	yes	yes	yes	yes	no	6	14
H	final report	yes	yes	yes	yes	yes	yes	2	8
I	no	yes	yes	yes	yes	yes	no	2	6
J	target group	yes	no	yes	yes	yes	yes	2	17
K	final report	yes	yes	yes	yes	yes	yes	2	14

The workshop goals are classified as ‘target group’, ‘group routines’ and ‘final report’. If there were no predefined goals for the workshop, the classification is ‘no’. In nine cases out of eleven, the group leader had defined goals for the workshop. There were three kinds of goals: a to provide improvement ideas for the routines of a specific target group, to improve the group’s own routines or a final report concluding the group activities. Four groups were aiming to improve their own routines and three groups had defined a target project for their learnings. Two groups were using the workshop to

conclude the learnings for the final report of the project. Two groups did not define any goals for the learning, although Case C workshop would have provided an opportunity to improve the group routines, if the group leader had wanted to so do.

If the group followed the construction, all phases are marked as ‘yes’. The answer may be replaced with an additional explanation if the phase was conducted in a different way and/or order than defined in the facilitation method. Missed workshop phases are marked as ‘no’. The number of the analyzed topics and created improvement ideas are listed for each case.

Next, possible cross-case patterns are searched for. The groups, which lessons were meant to be used outside the group, have created an action plan to transfer the learning either to the target group or to the final report of the project. When the groups are using the learnings to improve their own routines, the action planning happened after the meeting or not at all. Four groups did not make any kind of plans to implement the learnings in the group routines.

The author of the study noticed the distinctive nature of Case C, when compared to the other cases in this study. Only the pre-meeting was arranged as planned in the facilitation method. The group did not have any goals for the learnings, nor did they have a history presentation prepared by the group leader. The group leader had selected the topics for the group beforehand and the group selected two of them for analysis. The analysis was done as a whole group and, therefore, there was no need to share the results either. Also, Case D had selected the topics for the analysis beforehand, but the selection had been done by the whole group. Case I did not have the group history presentation either, but otherwise the group followed the planned facilitation method. The analysis phase and sharing the analysis results of the small groups, were conducted as planned in all cases, except in Case C.

In three workshops, the small groups analyzed more than one topic each. The small groups in Case E, Case F and Case G analyzed two topics each. There were two or three small groups in the workshops, depending on the amount of participants and the topic suggestions made by the groups. The author of the study expected that the groups without a specific learning goal (other than fulfilling the milestone criteria set by the organization), would create less improvement ideas per analyzed topic, than the groups with a predefined goal for learnings. However, the results do not support these assumptions. The amount of the created improvement ideas does not seem to be related to the workshop goals.

Prior the empirical study, the *elements affecting knowledge creation and sharing* in the groups were identified, and some of them were selected for the facilitation method. Each case is analyzed regarding the identified elements and their impact. The symbol '+' indicates that the element had a positive effect on the workshop and the symbol '-' indicates a negative effect. If the element had both a positive and a negative effect on capturing the lessons learned, the impact is indicated with '+/-'. The impact of the identified elements is summarized into Chart 14.

Chart 14 Summary of the elements affecting knowledge creation and sharing in cases

ELEMENTS		IMPACT IN CASE										
		A	B	C	D	E	F	G	H	I	J	K
related to individuals	motivation	+	+	-	+	+	+	+	-	+	+	+
	trust	+	+	-	+	+	+	+	+	+	+	+
	defensive routines	-		-				-	-		-	
group related	group leader's behavior	+/-	+	-	+	+	+	+	+	+	+/-	+
	target setting	+	+	-	+	+	+	+	+	-	+	+
	group size	-	+	-	+	+	+	+	+	+	+	+
	group routines	+	+	-	+	+	+	+	+	+	+	+
	common experiences	+	+	-	+	+		+	+	+	+	+
	common language	+	+		+	+		+	+	+	+	+
	face-to-face interaction	+	+	-	+	+	+	+	+	+	+	+
	conversations	+	+	+	+	+	+	+	+	+	+	+
	openness for feedback	+	+	-	+	+	+	+	-	+	+	+
	issue orientation	+	+	+	+	+	+	+	-	+	-	+
	information accuracy	+	+	+	+	+	+	+	-	+	+	+
	information relevance	+	+	-	+	+	+	+	-	-	+	+
organizational	leadersip priorities	+	+		+/-		+		-	+		
	proximity in time	-	+	+	+	+	+	+	+	+	+	+
	proximity in space	-	+	+	+	+	+	+	+	-	+	+

The author of the study argues that group routines for experience-based learning were dependent on the group leader. In many cases, the organizational routines required the groups to arrange lessons learned workshops, but the actual group routines depended on the group leader. It seemed that especially the high priority groups were allowed to operate independently, and they could develop the group routines distinctive from the organizational routines. In Case A, the former group leader had not arranged any lessons learned workshops, even though they were required by the organizational routines, but the current leader wanted to follow the organizational routines. Groups in Case B, Case I, Case J and Case K captured the lessons learned even though it was not mandatory, because they wanted to improve their group routines or to provide improvement ideas for the target groups' routines.

It was surprising that in Organization Gamma (Case K), the research projects were so isolated. The personnel was administrated by the organization, but all the group routines were group leader specific. Inter-project communication was not encouraged. The group

members were familiar only with the projects they were participating in themselves. Although, such a situation is quite common in the project-based organizations, like Organization Gamma. Those organizations lack the mechanisms for transferring the knowledge between the projects.

In Organization Alpha, the management decisions and their effect, as well as, the level of the management support, was discussed in the groups. The participants felt that the decisions were not explained to them thoroughly. The management team was interested in the learnings of some groups (Case A, Case H), but mainly their investment in the practice was seen as a decision to create the new method for capturing the lessons learned, and as a management representative participating in some of the workshop (Case B, Case D, Case F, Case H, Case I). In the workshops, where the management representative was participating, the groups had an opportunity to discuss their concerns with someone who had been participating the decision making. In Case D, the management representative was very passive and his interest in the group's learnings did not seem to be genuine. Also, in Case I the project cancellation decision made by the management team, affected the group members' motivation and, ultimately, the quality of the proposed improvement ideas. In this case, the presence of the management team member mainly increased the defensive routines of the participants and did not encourage the issue orientation needed to analyze the learnings.

Spatial distance, as such, was not a problem in any of the cases. The group in Case I was used to having virtual meetings. With the help of the information technology, the remote participant was able to participate in the discussions. Although, the author of the study believes that using computers with internet connections in the small groups, makes it easier for the participants to be distracted from the topic. The participants might read emails and visit internet pages and focus less on the meeting agenda. Spatial distance added with the separation in time could have been a major problem in Case A. The group leader was not present at the workshop and he was interviewed afterwards, and his learnings were made available to the group members as part of the meeting minutes. However, the group leader had been involved with the group only for a short time, and the group members had better knowledge regarding the project than the group leader. He assigned the leader role to some key members of the group and their active participation positively influenced the participants. Also, the clear goals of the workshop helped the participants be motivated to contribute. Although, the group leader could have had access to additional information, which is not otherwise available for the group members.

The author of the study argues that the group leader's behavior was the main element affecting the lessons learned workshops. Therefore, the pre-meeting was important to the facilitator. That pre-workshop activity was the only occasion for the facilitator to analyze the group leader's motivation to capture learnings and to improve the group routines. The level of the group leader's motivation affects his preparation for the meeting, how he behaves in the meeting, and what he does after the meeting with the learnings and the improvement ideas. If the group leader is not motivated, the whole workshop suffers. The leader might not behave negatively on purpose, but the group members sense the group leader's true state of mind from gestures, body language, choice of words, etc., and they react accordingly.

Only in Case C, the group leader's negative behavior did cause real problems in the workshop. The defensive leader did not prepare for the workshop, and neither did he brief the group for the workshop. He was not willing to discuss the topics, and he was not committed to implement the suggested improvement ideas to the group routines. He agreed to arrange the workshop only because he had to. The lack of goal and the group history presentation, made the workshop challenging for the facilitator and the participants. Also, the group leader's personal conflict with one of the group members created a tense atmosphere. In such a small group, a personal conflict between two group members, can freeze the interaction totally.

In Case A, the leader should have prioritized the workshop higher and participated the workshop in person. Fortunately, he shifted the responsibility to some key group members who took the leader's position and acted as very good examples for the rest of the group members. In Case J, the group leader's preparation was insufficient. There was a shorter time allocated to the workshop, and some of the valuable time was wasted on discussing the group activities. The group history presentation would have been a faster and more comprehensive way to obtain the big picture. In the other cases, the group leaders were motivated, committed and prepared for the workshops. The author of the study claims that in cases like Case B, Case E and Case F, the group leaders were extremely enthusiastic about the workshop and they inspired their groups to focus on the experience-based learning. They also wanted to create a formal action plan to implement the improvement ideas to improve the group routines, or to provide the improvement ideas to the target group.

When there was a clear goal, the learnings were analyzed more thoroughly and improvement ideas were more detailed, yet still practical. Only in two cases (Case C, Case I) a clear purpose for the workshop was missing. In Case C, it was due to group leader's lack of motivation. The project was ending in Case I, and due to its different

operating mode, the group leader did not identify any target group. Finding a target group for the learnings, other than the group itself, was more difficult in Organization Alpha than the author of the study anticipated. In Organization Beta (Case J) there was a clear continuation from one project to another and the target group was easy to select.

The difficulty to identify the target group in Organization Alpha, may be related to constant organizational changes. Discontinuity in the project portfolio, makes it hard to identify the similarities between the groups in a multi-project organization. Organization Alpha was constantly changing its design and goals, and during the lifetime of a project, there were more than one change in the organizational structure, the priorities and the operational mode. The groups were forced to modify their routines to match the organizational change. Therefore, collecting interim learnings and not waiting for the end of the project, is important. Post-project learnings would, most likely, not be useful to anyone because of the differences in project contexts. Interim learnings could be used to improve the group's own performance and to adjust the routines to the organizational changes. Also, the similarities between different groups would be easier to identify for the interim learnings, because the projects are executed in parallel in the multi-project organizational setting.

Another possible reason for not finding a target group for the learnings, is that the trust level between the groups, may be low. The group leaders are not willing to offer advice or share the learnings to a specific group, i.e. the level of openness for feedback is low in the case of intra-group transfer. Also, the group members found it easier to suggest improvement ideas for their own group than for some other group. The author of the study noticed that in Organization Alpha, the analyzed topics were thematically related to same themes in several groups. She suggested that the groups would see what the other groups had learned from a similar situation, and she offered to provide the material, even though the groups were able to access the documents themselves. Usually, the groups were not willing to use their time to evaluate others' learnings.

Setting a goal for the workshop increased the group members' motivation and the relevance of the created improvement ideas. With the clear goal, close to the group's own work, the group members were motivated to analyze their experiences and capture the lessons learned. Also, the groups had a control over the discussed topics and they could choose the most important topics to the discussed. The analysis targeted to a certain purpose, produced useful information, accompanied by the sufficient context data.

The improvement ideas created in Case C and Case I could not be used, as such, because the suggestions were of too general nature. It would have required an additional facilitated meeting to elaborate the ideas, to be able to modify the group routines based on the experiences. In Case H, the low motivation of the participants resulted in poor analysis, thus generating insufficient information. The workshop goal affected also action planning in the workshop. In cases, where the target group was clear, the groups made action plans to transfer the learnings. In cases, where the goal was to improve the group's own routines, only the most motivated group leaders wanted to create a formal action plan.

The participants' behavior was closely related to the group leader's behavior. The author of the study argues that the participants did understand the purpose of the workshop and acknowledged its potential, but whether they wanted to contribute or not, was related to the group leader's behavior. Motivated participants were open to feedback and shared their knowledge with other group members. The lack of motivation caused poor issue orientation, and the conversations focused on other items than the topic under analysis. The lack of motivation in Case C and Case H, inhibited the openness and the shared knowledge had little relevance or it did not have any novelty value. In Case H, the cancellation of the project and the uncertainty of the future employment, decreased the participants' motivation to create the improvement ideas, even though the group leader was committed to the workshop. The participants did not have any reason to contribute to the future projects, because their involvement in the activities was uncertain. The group leader's behavior was the main reason for poor motivation in Case C. It is the only group where defensive routines were relatively high during the whole workshop.

In some workshops (Case G, Case H, Case J), the participants seemed reserved at first because they did not know the facilitator nor the facilitation method. When the facilitator's role and the purpose of the workshop became clear, the level of interaction increased. The participants knew that they had full control over the meeting documents and they could censor the documented discussions afterwards, if needed. The defensive routines in Case A, were caused by the *personal learning booklets*. The participants did not want to analyze the learnings on a personal level.

Common experience, i.e. working together as a group, created trust within the group and helped concentrate on the group related topics. Common experience was emphasized in the group history presentation. Especially, in long and/or large projects, the history presentation was in an important role. The timeline helped the participants understand the big picture, refresh their memories, as well as, concentrate on the topics related to the group. In cases where there were no group history presentation (Case C

and Case J), the discussion about the project status before selecting topics, took more time than in other cases.

In most the workshops, the group members interacted well and the relationships between the participants were positive. The conversations were occasionally very emotional, especially when the topics were related to challenges. The inexperienced group members or newcomers, were treated as equal group members, and they participated in the conversations as much as they could, and the senior group members were willing to explain unclear topics to them. Also, the trust level between group members was high. In most cases, the group members had been working together for a while, or they had worked together in previous projects and had earlier established personal relationships. Case C is the only example of low trust and poor interaction between the group members. The group members had been working together only for a short time and the tension between the group leader and one of the key group members, hindered the interaction of the whole group. It seemed that no-one wanted to express their own opinions. Also, the usefulness of the improvement ideas can be questioned.

The groups trusted the external facilitator, even though she was not a member of the group, and was not known to the some of the groups. All the groups knew that the facilitator was guiding the meeting process, not the content, and the group members could discuss openly because they had full control over the meeting documents. In Organization Alpha, the facilitator had a good reputation and some groups had been working with her earlier. In Organizations Beta and Organization Gamma, the author of the study was not a member of the organization nor known to the groups.

The author of the study followed the guideline from Weisbord and Janoff (2007) which suggests, that in the small groups, the maximum number of the participants is seven people. Therefore, the ideal group size for the facilitation method was defined as 5-20 persons. Five persons, or more, are needed for the analysis done in the small groups. If there are more than 20 persons in the workshop, the participants have to be divided into several small groups, or the number of people participating the small groups becomes too large. The more small groups there are, the more topics the group can handle, but the time needed to share the small groups' results increases and the workshop needs more time than 3-4 hours. In Case A, co-facilitation was used to accommodate a larger group and the workshop was scheduled for a longer period than in other cases. In Case C, the group was too small but the workshop could still have been successful if the group leader had supported the planned activities.

It was easy for the groups to blame the customers, the suppliers or the organization for the problems. Usually, the groups (e.g. in Case A and Case J) acknowledged the shift in the analysis, returned to the original topic, and focused on the group related items. Despite the emotional conversations, the captured learnings were accurate. Some groups wanted to remove the emotional outbursts from the meeting minutes prior the publication. In Case J, the group had not had any opportunity to discuss the project earlier, and even in the analysis phase, the discussion was still emotional and focused much on the stakeholders. The author of the study claims that the group members would have needed an opportunity to express their emotions earlier, when the problems or challenges were acute. If they had an opportunity to express their emotions before the workshop, the group members could have concentrated better on the facts while capturing the lessons learned.

The cross-case analysis provides validation for the hypothesis regarding the causal relations of the elements affecting knowledge creation and sharing in the groups. The selected elements and their causal relations are presented in Figure 42. The facilitator's effect to knowledge creation and sharing in the groups, is not illustrated. As described in Chapter 4.2, the facilitator can affect the group leader and his motivation, defensive routines and behavior. Also, the facilitator may influence the group routines, e.g. by arranging the lessons learned workshop to capture the learnings. The workshop arrangements, the meeting structure and the facilitation tools affect the way the group members interact.

The figure illustrates also some additional elements. The group leader's own motivation and his defensive routines affect the way he behaves. However, the workshop goals, defined by the group leader, may change his motivation. Besides the target setting, the author of the study identified the group leader's participatory behavior as an important element affecting knowledge creation and sharing in the groups. The context understanding, as an element related to the group, was added to the illustration, because the context understanding seems to be an outcome from the common experience, and it is a prerequisite for being able to evaluate the information relevance.

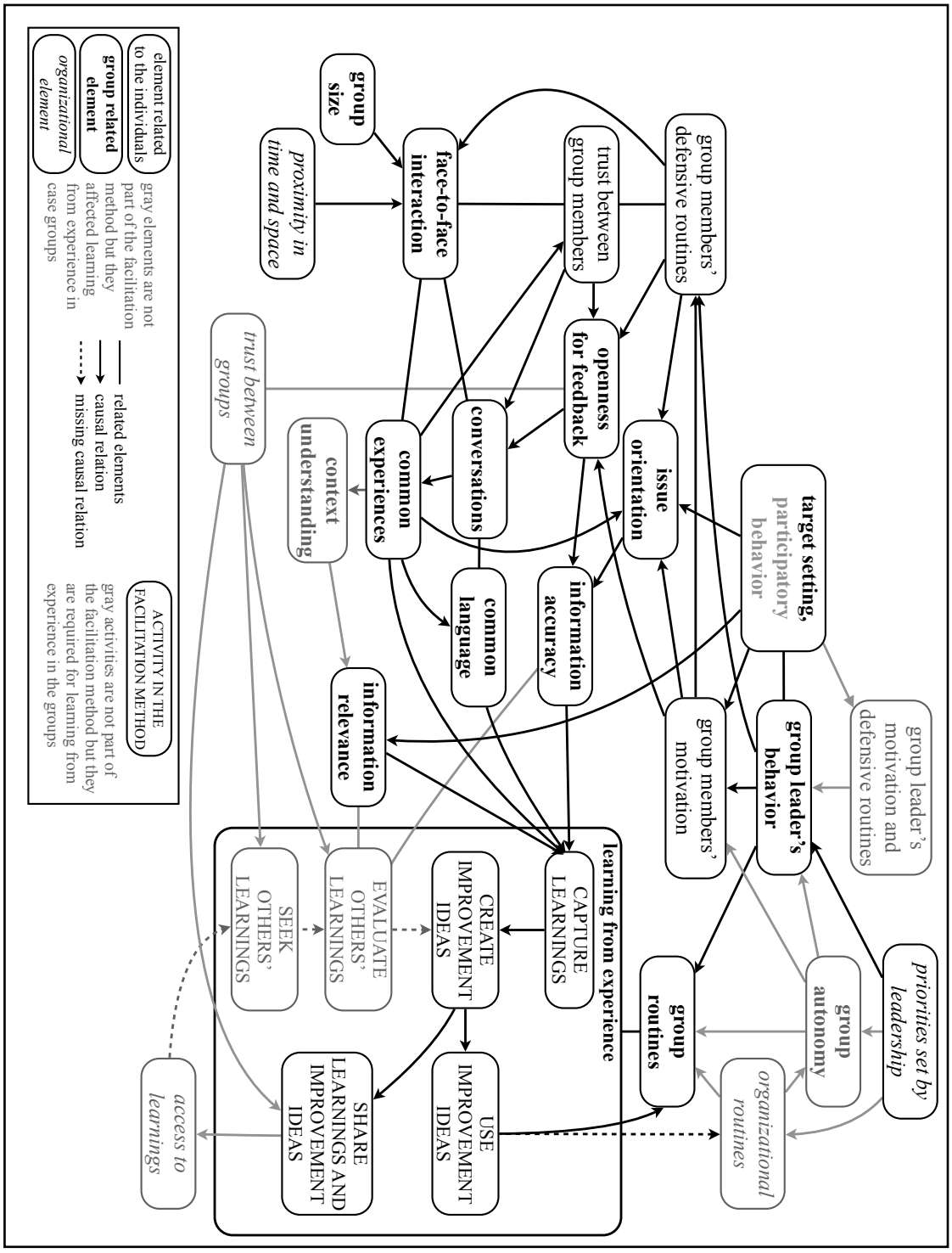

Figure 42 Causal relations of the elements affecting knowledge creation and sharing in groups

Also, the element of the organizational routines is added to the illustration. It seems that the improvements ideas did not initiate changes in the organizational routines, and the organizational routines did not have much effect on the group routines. The group autonomy, allowed by the organizational routines and priorities set by leadership, has a strong influence on the group routines. Trust between the groups mainly influences how the groups share their learnings with the other groups, and how willing the groups are to

seek other' learnings and to evaluate them. Without evaluation, the improvements ideas cannot be used, because the project-based learning is context-dependent.

In addition to the elements affecting knowledge creation and sharing in the groups, the author of the study made observations related to the *practical arrangements* of the workshops. The group members' previous experience in capturing the lessons learned, affects the time needed for the workshop. The first workshop takes more time, because the participants need time to adjust to the process and internalize what they are expected to do. Also, negative previous experience related to capturing or sharing the lessons learned, affects the workshop, and the facilitator needs more time to address the benefits of the new method and build a proper field for the interaction. If the group leader has not previously been involved in capturing the lessons learned, he may shift the responsibility to the facilitator and act as one of the group members, waiting to see what will happen. Then, the facilitator could take more responsibility, e.g. in action planning, and gently force the group leader to create an action plan to implement the improvement ideas and to take the responsibility for the implementation. When the workshop scope covers a long time, the group history presentation and the related discussion take time. There are also more topic alternatives for the analysis phase. The more topics the group analyzes, the more time the small groups need to share the analysis with others.

The timing of the workshops varies, based on the group routines. Interim lessons learned workshop allows the group to develop its routines incrementally, and to improve the group performance during the project lifetime. Post-project workshop does not help that particular group anymore. The post-project workshop needs to have a motivating goal for the group members to contribute. However, there is a risk that the captured information is not accurate enough, and the suggested modifications to the other groups' routines are outdate. Also, the key group members may leave the project before the post-project workshop is arranged, and their knowledge remains unshared.

Capturing the lessons learned is relatively easy in the groups, but transferring the improvement ideas to another group or to the organizational level, is difficult. Inter-group transfers may happen if the groups have identified similarities between them. Although, the transfer initiative has to come from the sender group. This inter-group transfer of the improvement ideas, happened in both Organizations Alpha and Organization Beta. The sender group had identified similarities between the two groups and acknowledged that they had valuable knowledge for the recipient. The sender group captured their learnings and suggested improvement ideas for the group routines, thus keeping the recipient group in mind. The sender group could only offer improvement ideas but the group had no control over the possible use of the ideas. Whether the

improvement ideas were integrated to the group routines or not, was the recipient's decision. In Organization Gamma, the groups operated so independently that they were not aware of their similarities or differences. Transferring learnings could only happen when the individuals share their lessons learned and/or improvement ideas in the new groups, they are assigned to. The group leader in Case K suggested that each research project should document their best practices and make them available for everyone in the organization. Then, the groups would have access to others' learnings.

Transferring learnings from the group level to the organizational routines, is rare. In Organization Alpha, the learnings were transferred to the organizational level in two ways: through the operational development (OD) team or by a management team representative, participating in the lessons learned workshop. The management team was aware of all the arranged workshops. However, they did not pay any attention to the learnings, unless the management team member was participating a certain workshop, and brought some of the topics to their attention. Captured learnings and created improvement ideas were analyzed in the OD team, which suggested changes to the organizational routines, either directly to the management team or through the process development. It became clear that the leadership team was not prepared to change the routines based on the input from the OD team. The ideas coming from the top priority groups mattered more, but neither did those improvement ideas have any major effect on the organizational routines. Therefore, it can be questioned how important the lessons learned workshops and the projects' experiences really were for the management team in Organization Alpha.

At first, it seemed that the lessons learned activities were fully supported by the management team in Organization Alpha. One facilitator, the author of the study, was assigned to create the new method and manage the meetings, and in a few cases, the group leaders were allowed to invest more in the workshop, than in a normal project meeting. In some cases, the management team representatives participated actively in the workshops, and asked the group to give for feedback to the management team. Still, the groups were not encouraged, or required, to share their knowledge with others, and in most cases, the management team did not pay any attention to the workshop results. It seems, that it was enough that the workshops were arranged and the documented learnings were available in the agreed databases, but the outcome of the meeting did not matter. This could be interpreted in a way which implies that the goal of the management team was to fulfill the milestone criteria in the development process. There were very few intentions to use the proposed improved ideas in other groups, or to improve the organization's performance.

In other case organizations, Organization Beta and Organization Gamma, there were no routines to transfer the knowledge from the group level to the organizational level. The group leader in Case J (Organization Beta) conducted a study regarding the operating mode in the project, and recommended changes to the current operating mode to improve both the group routines of the target group and the organizational routines. The effect of the change proposals are currently unknown. In Organization Gamma, there were no organizational routines guiding the project work.

6.2 Comparing old and new lessons learned methods

This study was initiated by the real life problem. When the projects cannot exploit the organizational routines, they need to develop new ways of working, based on their experience. The purpose of the study is to understand how the project teams learn from their experience and modify the group routines to match the changes in the operating environment. Organization Alpha had developed routines to capture lessons learned in groups (see Chapter 4.2), but the results were not as good as desired. Therefore, the author of the study was assigned to design a new method for capturing the lessons learned.

The new method is distinctive in several ways from the old methods. In the new method, the goal is to modify the group routines, either in the own group or in the target group, by capturing the lessons learned and creating the improvement ideas for the group routines. The group members are interacting face-to-face, both as a whole group, and in the small groups. The analyzed topics are selected by the group, and the template guides the analysis, as well as, capturing the learnings. Also, the facilitator is a group external person. Earlier, the quality manager of the project acted as an internal facilitator. The old and the new methods to capture lessons learned can be compared only in Organization Alpha. In the other case organizations, the comparison is not possible because the group routines did not include capturing and sharing lessons learned. Chart 15 provides a summary of the lessons learned methods in Organization Alpha.

The starting point in Organization Alpha for the old and the new lessons learned methods is the same: the lessons learned workshops are arranged in groups because they are required by the organizational routines. The purpose of the new facilitation method is to improve the way the groups learn from the experience, and to improve the quality and practicality of the created improvement ideas related to the group routines. The new

facilitation method allows the groups to focus the analysis on the most important routines, thus increasing the motivation of the group members to contribute and the interaction between the group members. Better improvement ideas would be easier to evaluate and implement on the group routines and/or the organizational routines.

Chart 15 Summary of the lessons learned methods in Organization Alpha

	example A	example B	example C	new facilitation method
workshop goals	improve the group routines; fulfill the milestone criteria	collect lessons learned to fulfill the milestone criteria	share the project/team specific learnings; fulfill the milestone criteria	improve the group routines or offer improvement ideas to another group; fulfill the milestone criteria
participants	whole group	2 separate workshops for the selected subgroup/team representatives; the group leader present in one workshop	selected subgroup/team representatives	whole group; the number of the participants limited to 5-20 persons
facilitator	quality manager of the project	quality manager of the project	quality manager of the project	group external facilitator
steps	evaluate others learnings and capture own learnings; create improvement ideas (prioritization and action planning after the workshop)	capture learnings; prioritize and analyze TOP5 learnings; create improvement ideas; share TOP5 learnings and improvement ideas with others	share the captured learnings; analyze TOP5 learnings and create improvement ideas; share TOP5 learnings and improvement ideas with others	select topics for the analysis; analyze the topics in small groups; share analysis with others; plan actions
face-to-face interaction	conversations in small groups (due to spatial arrangements); analysis as individuals	conversations as a whole group (only half of the project present in one workshop); analysis in own subgroup/team	conversations as a whole group; mainly information sharing	conversations as a whole group and in the small groups; action planning as a whole group
topic selection	by the individuals; input from the previous projects may have guided the selected themes	each team selected their own TOP5 topics for the analysis	done prior the workshop in each subproject/team	as a whole group; only few topics selected for the analysis
template	no	yes	yes; but it was not used in every subproject/team	yes

With both the old and the new facilitation methods, the collected and analyzed learnings were related to the group and the organizational routines, and the actual outcome of the group work, i.e. the developed product, was not addressed. Considering the analysis of the causal relations of the elements affecting knowledge creation and sharing in the groups, the author of the study concludes that the group members' motivation is one of the key elements in the facilitation method. Motivation increases the interaction between the group members, thus influencing the results, i.e. the improvement ideas. Therefore, the old and new methods are compared on aspects of the group members' motivation and the interaction in the workshop, as well as, the usability of the created improvement ideas.

Defining clear goals for the workshop helps the participants focus the learning efforts on the most important themes, which also increases the motivation of the group members. Some groups were eager to analyze their learnings to help other groups develop their group routines, while some groups wanted to improve their own performance. Although, there were also groups, whose leaders did not want to set any goals for the learnings. The author of the study expected that the ability for the group members to focus their efforts by selecting topics for analysis, would affect positively

on their motivation. It seems that the approach works. After introducing the new facilitation method in the organization Alpha, Case B group wanted to use the method 'voluntarily'. The group leader thought that the new method would be beneficial when they were analyzing and developing the group routines further.

The template in Example B and Examples C, focused on both the successes and the failures in the project. The new *worksheet* template has a positive approach and it guides the group members to focus on the achievements and the potential activities, not on the failures and the blame game. The analysis starts with individual brainstorming, which allows the group members to prepare themselves to contribute in the small groups. The new template helps capture detailed learnings and come up with practical improvement ideas. The groups were expected to be more willing to seek out and use others' learnings, because the quality of the available learnings and the improvement ideas increased with the new method. Still, the groups were not willing to use others' lessons learned. Only the selected target groups were interested in the learnings and the improvement ideas they were offered. The other groups did not want to invest in seeking, evaluating and using others' information.

The level of interaction between the group members is increased with the new method, because the workshops are held face-to-face. Only in Example A, the whole groups was contributing to the lessons learned in the same place at the same time. In the workshops, facilitated with the new method, the group members discuss a lot, both as a whole group and in smaller groups. The purpose is to allow the group members to exchange and develop ideas further. The group history presentation is used to refresh the group members' memories regarding the activities, and to emphasize the common experience in the group. The history presentation also helps direct the discussions to the group related topics, instead of the organizational topics or issues related to the stakeholders. The group members are allowed to comment on the presentation, and in some cases, the group history presentation and the related discussion took almost half of the time reserved for the workshop. The trust level is high and the participants can freely express their opinions, because the group is able to modify the captured learnings and meeting minutes before they are made public in the organization.

In Example A, the group members would analyze any topics they wanted, but in the other examples the analysis effort was focused on only few topics. Also in the new facilitation method, only the most important topics, selected by the group members, are analyzed. By focusing the analysis on only a few topics, the learnings are captured better. Also, the number of improvement ideas per analyzed topics is higher than with the old method. The better the analysis, the more practical the improvement ideas are.

The analysis serves as a justification for suggesting the improvement ideas. Also, the analysis provides enough context information for the non-group members to understand the improvement ideas and evaluate the usefulness of the ideas in their context. Two groups in Organization Alpha identified the target groups for their learnings. The created improvement ideas were detailed and easy to understand, even for people who had not participated in the project or the workshop. In both cases, the group held a meeting with the target group to present the learnings and the improvement ideas for the target group's routines. The target group had a chance to ask questions and clarifications from the group. Previously, the transfer of the group learnings had happened informally or by assigning experienced people to new groups, if at all.

As seen in the examples, only one project (Example A) used the created improvement ideas. Two other example projects just wanted to complete the milestone criteria and had no intention to benefit from the learnings. When facilitated with the new method, five groups used the learnings to improve their own routines. The proposed improvement ideas were very practical and they were related to daily project work. The groups accepted the changes in the group routines easily, because they had participated in defining the changes themselves, and the group members believed that the changes would improve the groups' performance. Earlier, the group routines were mainly influenced by the group leaders and their experience. Now, the group members were able to influence the group routines, because the routines were modified together as a group. Without any goal for the learnings, the quality and the level of the practicality of the improvement ideas is relatively low, and the improvement ideas are quite similar to the ideas created with the old lessons learned methods.

When using the new facilitation method, there were better chances to influence the organizational routines in the Organization Alpha. All group learnings and improvement ideas were discussed in the operational development (OD) team and the OD team proposed changes to the organizational routines, based on the feedback from the groups. In Organization Alpha, the OD team had been accused for being very distant from the projects' daily work, and the change proposal made by the OD team had been questioned and rejected as impractical ideas. Now, the OD team felt that the change proposal were better justified, because they were originated by the projects. The management team approved some of the proposed changes. However, the priorities set by the management team conflicted with the agreed changes. As a consequence, the implementation of the changes to the organizational routines, was not very successful. This implies that the groups' learnings do not have much impact on the organizational level.

In Chapter 2.3.3 the author of the study presented process-based method for the project reviews. The new facilitation method and presented methods, are compared in Chart 16.

Chart 16 Comparison of the project review methods and the new facilitation method

	project reviews	Post-Project Appraisals	learning histories	new facilitation method
focus	project internal topics	investments and organizational routines	critical events in the organization	project internal topics selected by the project personnel; mainly group routines
timing	during the project or after the completion	two years after the project completion	after the project completion	during the project or after the completion
applicable	to all projects	to selected projects	to selected projects	to all projects
hosted by	group external moderator	group external PPA team	learning historian	group external facilitator
method	face-to-face meeting	personal face-to-face interviews (+document analysis by the PPA team)	personal face-to-face interviews, small group discussions	face-to-face meeting
documentation	partly in project reports	information from the reports is collated in three booklets	event descriptions and analysis/commentary	topics analyzed in worksheets

The project reviews, the Post Project Appraisals, the learning histories and the new facilitation method all are moderated or conducted by a person external to the group. The project reviews and the new facilitation method have many similarities. The participants meet in a face-to-face meeting, and the analysis focuses on the group internal topics. Also, both methods can be used during the project work, not just after the project completion. They both require little investment and, therefore, they can be implemented in all groups in the organization. The main differences between these two methods are that in the new facilitation method, the groups have full control over the meeting content, i.e. the group members decide what topics are discussed, and the analysis of the selected topics is formalized with the template.

The Post-Project Appraisals (PPAs) and the learning histories are conducted only for the selected projects, after the project has been completed. Both methods require more investment on the learning process than the project review or the new facilitation method. Also, the methods are not suitable to capturing the interim learnings. Therefore, the PPAs and the learning histories cannot be used to help the particular project any more. The PPAs focus on the groups from the investment point of view and the learning histories are related to the critical events in the organization. The new facilitation method is focusing on the daily work in the projects, i.e.the group routines.

The new facilitation method allows the groups to create improvement ideas within a few hours and the ideas are ready for the implementation immediately after the workshop. The improvement ideas generated with the Post-Project-Appraisals, are available to the organization after a few years from the project completion. Also, it takes time to change the routines based on the learning histories. The event descriptions are collected in face-to-face interviews and the analysis of the events is conducted by the team of learning

historians. When the learning histories are ready, they can be used as a basis for a small group discussions.

6.3 Comparing results with 4i framework

The empirical results can be analyzed regarding the 4i framework by Crossan et al. (1999), presented in the Chapter 2.2.6. It seems that intuiting and the interpreting processes in the groups, follow the 4i framework. The individuals recognize based on their experience the opportunities to improve the group routines, either in their own group or in the agreed target group. The individuals explain the ideas to the other group members and make their tacit knowledge explicit. When the ideas are interpreted together, the group members develop a shared understanding regarding the topic, and the group members are able to propose improvement ideas. The integrating process presented in the framework is not fully supported by the empirical results in this study. The group develops a shared understanding but as Crossan et al. (ibid) note, new knowledge does not necessarily lead to changes in action. Only in a few cases, the groups actually planned to integrate the learnings in the group routines. Although, it is possible that the learnings are integrated in the routines without any formal action plan.

The empirical results do not support the institutionalizing process described in the 4i framework. Crossan et al. (1999) claim that the formal rules, the procedures and the routines established by the group, become embedded, i.e institutionalized, on the organizational level in as systems, structures, procedures and strategy. As seen in the empirical study, transferring learnings from the group level to the organizational routines, is rare. It can be argued that the groups can institutionalize routines mainly on the group level. Especially, the groups having a high degree of autonomy, are able to institutionalize such routines, which differ from the organizational routines. Group autonomy can be given by the leadership or be taken by the group leader. Therefore, the organizational routines for feedforward, from the group level to the organizational routines, needs to be consciously developed.

Consequently, the author of the study suggests modifications to the 4i framework. The individuals intuit, i.e. recognize opportunities, based on their experience to improve the group routines, either in their own group or in the agreed target group. The individuals explain the ideas to the other group members, thus making their tacit knowledge explicit. The ideas are interpreted together in the group and the group members develop a shared understanding regarding the topic and are able to propose improvement ideas.

The author of the study claims that the integration process can lead to institutionalized routines both on the group and the organizational level. The group can plan on using the learnings to improve the group routines, or to forward the improvement ideas to other groups, or to the organizational level. The author of the study further argues that the groups have more effect on the individuals' emotions and actions, than the organizational systems, structures, strategy and routines. Especially, in high priority and/or autonomous groups, the effect of the group routines and culture is very strong. The modified version of the 4i framework of organizational learning is illustrated Figure 43.

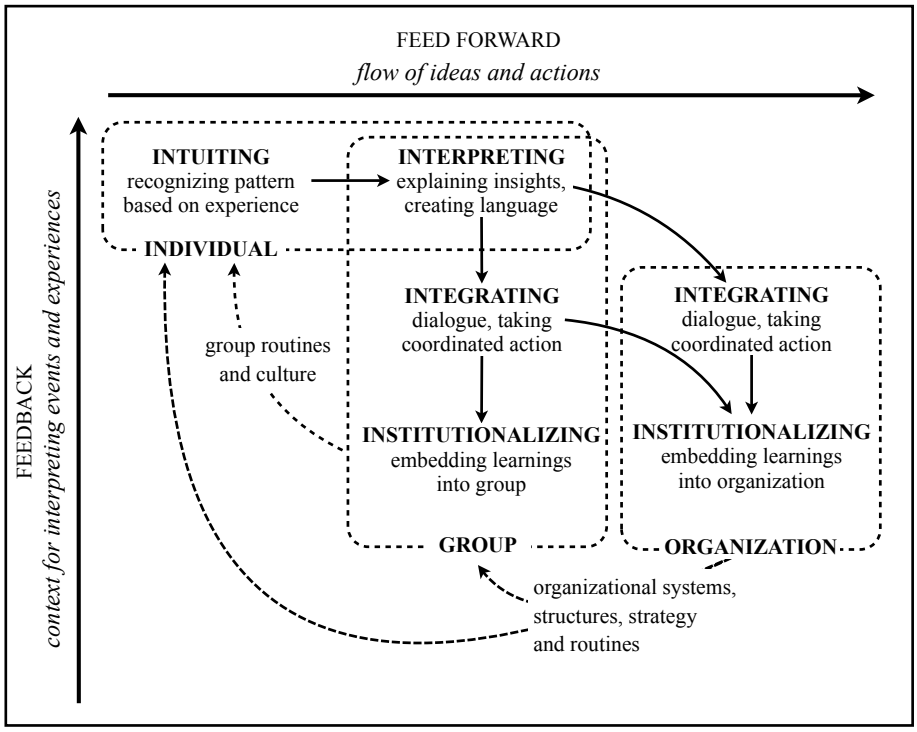

Figure 43 Modified 4i framework of organizational learning

7 Results

In this chapter, the results of the study are presented. The main findings regarding knowledge creation and sharing in the groups, are summarized. Also, the suggested modifications to the 4i framework of organizational learning and the new facilitation method for capturing lessons learned, are discussed.

A constructive study starts with a problematic real life situation, and designing a construction can be seen as a problem solving activity, which results in something new and different (Kasanen et al. 1991). In this study, the construction includes both the elements affecting knowledge creation and sharing in the groups and the facilitation method, which is based on the selected elements and their causal relations. The elements and hypothesis of the causal relations are identified from the existing theory base, and they are assessed with case studies. The novelty value of the study is to make the elements and their relations visible, and to combine known facilitation tools and techniques in a unique way. Additionally, the 4i framework by Crossan et al. (1999) is assessed and the author of the study proposes modifications to the framework.

By connecting the construction to the theory base, it is possible to demonstrate that the construction may also be applicable in other contexts (Kasanen et al. 1991). The construction, especially the facilitation method, is based on the experiential learning theory, the model of single-loop and double-loop learning, the 4i framework of organizational learning and the theory of organizational knowledge creation. The author of the study argues that the study results are valid in 5-20 persons' formal work groups, operating in a multi-project product development context. She also assumes that the results can be applied in similar groups in the research and manufacturing contexts. The findings regarding the selected elements affecting knowledge creation and sharing in the groups or the 4i framework, may apply to smaller or larger groups, but the facilitation method does not.

7.1 Elements affecting knowledge creation and sharing in groups

The author of the study argues that the group leader's behavior influences the group routines related to the experience-based learning, both learning from the group's own experience and from the experience of the other groups. The strong effect of the group leader's behavior was anticipated based on the literature review (see e.g. Sarin and McDermott 2003; Edmondson 2011; Goffin and Koners 2011). The group leader's

behavior affects the motivation and the defensive routines of the group members, as well as, the group culture and the group routines. One person, the group leader, has the power to decide whether the group captures and shares learnings, and how the activities are conducted. Surprisingly, the group leader's behavior was even more dominating element than the priorities set by the leadership or the organizational routines guiding the groups' routines.

The Not-Invented-Here (NIH) syndrome described by O'Dell and Grayson (1998) and von Krogh et al. (2000) refers to a situation where people hesitate to share what they have and to use what others have. In this study, the groups shared their learnings, or at least allowed the other groups to access the learnings. The NIH was limited to using others' information, unless it was directly targeted at the specific recipient. The group leaders did not encourage the group members to seek and use others' information, although the groups accepted input, which was specifically created for them. This may be caused by the high level of group autonomy and/or the competition between the groups, which is common in a multi-project organization. Argyris (1976) claims that groups composed of highly competitive people tend to create norms which make other groups outsiders or competitors. Generally, internally generated ideas enable the group members to associate more strongly with the group and to have greater commitment to it (Kessler at al 2000).

The author of the study further argues that a clear goal motivates the group members to capture and analyze their learnings. This finding supports Sarin and McDermott (2003) who argue that by outlining the goals and expectations of the group members, the group learns better. In this study, the learning goal can be either a need for improvement in the group's own routines, or to provide improvement ideas to an another group's routines. The goal helps the group focus on relevant topics and analyze them from suitable perspectives. Proper analysis enhances the accuracy and the validity of the created information. Documenting the thorough analysis provides the necessary context information, and helps overcoming the challenges related to the context dependency in the project-based learning. Precise improvement ideas, justified with relevant and accurate information, are more likely to be implemented, than ideas of general level, accompanied by poor or none context information.

Busby (1999) notes that the project review participants tend to overemphasize the role of the environment and underemphasize their own involvement, when explaining the results. The author (ibid) also claims that there is a strong tendency to explain problems by referring to other parties. The author of the study observed similar behavior in the case groups. However, the author of the study argues that the groups were better able to

focus the analysis on the group related topics, if there was a group history presentation at the beginning of the workshop. The history presentation defines the timeline of the group activities, as well as, establishes a common ground for the conversations in the workshop.

Another argument based on the empirical study, is that a short facilitated face-to-face workshop enables valuable discussion between the group members, and allows the groups to learn from their experience to modify the group routines. To learn from their experience, the group must create a conversational space where the members can reflect on and talk about their experience togethers (Kayes et al. 2005). However, the group does not necessarily engage in the learning cycle, but need an intervention by a skilled coach or a trained team member. The groups which are assisted by a trained facilitator or had a team member who could facilitate, are able to improve the learning process. The face-to-face workshops allow the participants to be at the same place at the same time. It maximizes the level of interaction, thus enabling the learning in the group. The face-to-face interaction is also required to convert tacit knowledge to explicit and to transfer it to others (Nonaka and Takeuchi 1995).

The external facilitator is neutral to the issues under discussion, and has no interest in the outcome of the workshop. As a person external to the group, he is less biased and is not part of the political structure of the group (Hogan 2002). He can manage the conditions under which the group members interact and keep the dialogue moving (Weisbord and Janoff 2007). The group itself is responsible for what is happening. The meeting structure, defined by the facilitator, activates the group members into a particular way of behaving (Bostrom et al. 1993). The way the group leader behaves and encourages the group members to participate in the workshop, affects the level of interaction within the group.

Additionally, the author of the study claims that case organizations do not have the capability nor the routines for learning from the groups' experience. Levitt and March (1998) argue that the lessons of the organizational history are encoded in the organizational routines. Organizational learning mechanisms facilitate learning in organizations, or disseminate what the individuals or the groups learn (Popper and Lipshitz 2000). Considering the empirical results, it is unclear for the author of the study, whose lessons are forming the organizational routines in the case organizations. None of them seem to have structural or procedural arrangements allowing them to learn from the individuals' or the groups' experience. The learning happens mainly on the individual and the group level. In the case organizations, it is hard for the groups to initiate any changes to the organizational routines and/or the operating practices. It

seems that the leadership is not either willing or able to use the knowledge of the groups or the individuals.

This finding supports the conclusions of both Scarbrough et al. (2004) and Swan et al. (2010). Scarbrough et al. (2004) argue that transferring knowledge generated within a group, either to other groups or to the organization, does not happen smoothly or directly. Swan et al. (2010 conclude that even within highly project-oriented organizations, learning in the groups only occasionally leads to the organizational learnings. The author of the study also agrees with Anbari et al. (2008) who claim that project reviews, or in this case, the lessons learned workshops, require the management commitment to include the process into organizational routines. Additionally, the empirical results support Prencipe and Tell (2001) who claim that project-based organizations, like Organization Gamma, lack the organizational mechanisms for the knowledge acquired in one project to be transferred and used by other projects.

This argument also implies that learning in the case organizations is mainly single-loop learning, and it happens on the group level, not on the organizational level. Therefore, the experience of the groups and their members, within and specific to the organization, does not create a change in the organization. The groups analyze their work results afterwards by reflection-on-action, and they can detect and correct errors by changing the group routines. Transferring learnings to the organizational level is rare and the governing variables, i.e. the organizational routines, are not changed. Only when the groups' learnings change the organizational routines, the learning can be double-loop.

7.2 4i framework of organizational learning

Due to the rareness of transferring learnings to the organizational level, the author of the study to assessed the 4i framework of organizational learning created by Crossan et al. (1999) in Chapter 6.3. The author of the study argues that the groups can institutionalize routines mainly on the group level. Especially, the groups having a high degree of autonomy, are able to institutionalize such group routines which differ from the organizational routines. Considering the results of the empirical study, the author of the study suggested modifications to the framework. Also, the author of the study argues, the groups have more effect on the individuals', than the organizational systems.

In the modified version of the framework, the integration process can lead to institutionalized routines both on the group level and on the organizational level. Also,

the effect of the group culture and routines to the individuals, is illustrated. Additionally, the author of the study claims that the capability to learn from the groups' experience in organizations needs to be consciously developed, because the capability does not seem to develop automatically.

7.3 Facilitation method

Busby (1999) argues that the learning process in a group needs to be prompted and structured to be meaningful and useful. Therefore, the author of the study argues that the facilitation method for capturing the lessons learned in the groups, is needed. The groups need to learn form their experience, to be able to improve their routines. The facilitation method is designed to support the experience-based learning in groups. The improvement ideas are based on real life experience, and the template ensures that the sufficient information is available for evaluating the learnings later.

The facilitation method is created as a scientific study and it was iteratively built and validated with the empirical, multiple case study. The method is based on known theories, and the theory base for the facilitation method is made explicit. The method acknowledges the elements affecting knowledge creation and sharing in the groups. It consists of the known facilitation tools and techniques, but their combination is unique. Additionally, each of the steps in the method, can be connected to the theory base.

The new method seemed to increase the group members motivation, and the level of interaction between the group members needed for experience-based learning, appeared to be high. The *worksheet* template provided structure to the analysis, and the created improvement ideas contained valid information and were of high relevance and practical. The groups were willing to integrate the improvement ideas into their routines.

Also, the author of the study argues that the new facilitation method is simple, goal oriented and effective. The method is easy to implement and it does not require significant investment from the group or the organization. The improvement ideas are created within a few hours, and they are ready for use immediately after the workshop. The facilitation method describes how the 3-4 hour workshop is prepared and what happens during and after the workshop. The method includes a template for capturing the learnings. The external facilitator hosting the workshop, provides the tools for the discussion and analysis, and manages the interaction between the group members.

In this facilitation method, the groups have a clear goal for capturing and sharing the learnings. The learnings can be targeted at the groups themselves or at the defined target groups. The groups decide themselves, which topics are discussed and analyzed, This allows the group members to concentrate on what they believe is important. The control over the meeting content seemed to increase the group members' motivation to contribute.

Therefore, the author of the study argues that the new facilitation method enables the groups to learn from their experience, to modify the group routines. The results of the empirical study support this argument. Also, the comparison of the lessons learned methods in Chapter 6.2, supports the new method. However, the author of the study acknowledges that further studies are needed, to determine if it is worthwhile to use the method, i.e. what kind of benefits using the new method brings to the groups and to the organizations.

8 Conclusions and discussion

The final chapter of the dissertation answers the research questions and discusses the contribution of the dissertation from theoretical and practical viewpoints. Also, the study is assessed regarding validity, reliability and generalizability. At the end of the chapter, suggestions for further research are presented.

8.1 Answering the research questions

Answering the research questions required both theoretical and empirical research. The theoretical part focused on organizational learning, project work and small group facilitation. First research question, '*What elements affect knowledge creation and sharing in the groups, to enable experience based learning?'* was answered by identifying the elements from the literature. The novelty in the answer is to make the elements visible, and dividing them in three categories. Some elements are related to the group members as individuals. Another set of the elements, affect the individuals when they are cooperating with the other individuals in a formal work group. The third type of elements describe how the organization affects knowledge creation and sharing in the groups.

The second research question was '*What are the causal relations of the group related elements affecting knowledge creation and sharing in the groups, thus enabling experience based learning?'*. As an answer, some group related elements were selected for further analysis. Their causal relations were assumed based on the theoretical study, and the relations were assessed and revised in the empirical study. The answer to the research question, is illustrated as causal relations of the elements affecting knowledge creation and sharing in the groups. The novelty in the answer, is making the causal relations of the elements visible.

The answers for the first two research questions were used as a basis for answering the third research question, '*How the process of learning from experience, to modify the group routines, can be made more effective?*'. The author of the study designs a facilitation method for capturing the lessons learned in the groups, based on the selected elements and their causal relation, as well as, the selected theories, i.e. the experiential learning theory, the model of single-loop and double-loop learning, the 4i framework of organizational learning and the theory of organizational knowledge creation. The facilitation method is assessed and revised in the empirical study.

The facilitation method considered the elements affecting knowledge creation and sharing in the groups, as well as the alternative facilitation approaches and methods identified from literature. Selected facilitation tools and techniques are known in the literature, but the way the tools and techniques are combined in the new facilitation method is unique.

The author of the study argues that the answers to the research questions have the required novelty value. The whole construction, both the causal relations of the elements affecting knowledge creation and sharing in the groups, and the new facilitation method, resulted in something new and different. Also, the functionality of the construction is demonstrated in the empirical study, and with a comparison of the old and new methods for capturing lessons learned in Organization Alpha. A similar comparison was not possible in the other case organizations, because the groups in Organization Beta and Organization Gamma, did not have any prior routines to capture the lessons learned.

8.2 Contribution of the research

8.2.1 Theoretical contribution

This dissertation contributes to the theory by illustrating the causal relations of the elements affecting knowledge creation and sharing in the groups, and by modifying the 4i framework of organizational learning, created by Crossan et al. (1999). The *elements and their relation*s were identified from the theory base and validated with the case studies. Some of the identified elements were already acknowledged in the theory of organizational knowledge creation by Nonaka and Takeuchi (1995) and the model of single-loop and double-loop learning by Argyris (1999), as well as, Kolb's (1984) experiential learning, but the effect of the group leader was not included. Yet, the analysis of the causal relationships and the empirical results of the study suggest that the group leader has a significant influence on the group routines and behavior.

In Kolb's (1984) experiential learning model, the individuals' motivation is not addressed. Without the motivation, it is unlikely that the individual will have any incentive to learn. The theory of organizational knowledge creation is based on the idea of self-directed teams, which assumes that each individual in the group is acting as an example, like a leader. Also, Argyris' (1999) double-loop learning calls for shared leadership, sharing power with anyone who has competence or is relevant in making the

decisions. In such participatory teams, motivation for creating and sharing knowledge is expected to be high, as well as, the willingness to seek and use others' information. However, the formal work groups in the cases, were not self-directed nor did the group members share the leadership. The degree of autonomy varied, but each of the group had a nominated leader and the role descriptions of the group members were fixed for the specific work task.

The model of double-loop learning and the theory of organizational knowledge creation address the role of the top leadership in the organization, and their vision and commitment to the knowledge creation and sharing activities. The importance of the leadership commitment was acknowledge in the empirical study. Without the top leaders commitment, the project-based learning did not have effect to the organization. The effect of the group autonomy was also discussed in the theories, and the conclusions were similar to the observations made in the empirical study. High group autonomy allows the groups to develop their own routines.

In the theory base, the effect of the group members' relationships, openness for feedback, the level of trust within the group and the group members' defensive routines were acknowledged to affect knowledge creation and sharing in the groups. Especially, the importance of face-to-face interaction and communication was highlighted. The empirical study supports these arguments.

Both, the theory of experiential learning and the model of double loop learning, are built on the assumption that the individuals observe their experience, and then make changes to their actions, based on the observations. The experiential learning theory highlights the role of the group members' common experience in knowledge creation. Experiential learning aims at changing the individuals' behavior, while the objective of the double-loop learning is to adjust the organizational rules and norms. The empirical results of the study suggest that the groups can change their own routines based on their own experience. However, the groups are not able to change the organizational routines, and the learning in the organizations remains single-loop.

The model of double-loop learning emphasizes common goals and valid information in the learning process. Their importance was also acknowledged in the empirical study. However, it seems that the need for issue orientation in the learning process, was missing from the theory base. The idea of the issue orientation may be built into the ideas of having valid information and in the effect of the group members' defensive routines, but it is not mentioned as such. Issue orientation means the evaluation of information strictly on its own merits, without regard to irrelevant attributes, such as the

social standing of its source or recipient. Without issue orientation, the information accuracy of the captured learnings suffers. Also, it is hard to evaluate the usefulness of the improvement ideas if the evaluation is biased due to emotional elements.

The author of the study assessed the *4i framework of organizational learning* created by Crossan et al. (1999) and suggested modifications to the framework. In the modified version the integration process can lead to institutionalized routines both on the group level and on the organizational level. Additionally, the author of the study claims that the capability to learn from the groups' experience in organizations, needs to be consciously developed as the capability does not develop automatically.

8.2.2 Practical contribution

The practical implications of the study are twofold. The causal analysis of the elements affecting knowledge creation and sharing in the groups, highlight the role of group leaders, as well as the, top leaders in the organization. Understanding the relations, helps the organizations plan actions to support capturing and using the lessons learned and experience-based learning in general.

The created facilitation method offers a simple and easily implemented tool for capturing experience-based learnings in the groups. The learnings can be captured fast, and the improvement ideas are ready to be used after the workshop. If the groups learn from the experience, the they can modify their routines to better match the operating environment. Additionally, the group members' involvement in defining the routines increases motivation and commitment to follow the routines in the daily work.

8.3 Assessment of the research

8.3.1 Results

The aim of the construction is to be relevant, easy to implement and simple (Kasanen et al. 1991). Guba and Lincoln (1994) argue that constructions are not, more or less, true in the absolute sense, but simply, more or less, informed and/or sophisticated. In this study, the built and validated facilitation method fulfilled its business requirements set in Organization Alpha (see Chapter 4.2). The other case organizations became involved

in the study during the validation phase of the construction, and they did not set any requirements for the facilitation method.

The facilitation method included the meeting structure, the facilitation tools used in the meeting and the template for capturing lessons learned, as set in the *criteria for the facilitation method*. While building the method, the template for the individual level learnings was removed and the final version of the facilitation method focuses on capturing the group level learnings. The criteria for the method defined that the group members capture their learnings and create improvement ideas for the other groups. The scope of the learnings was widen, and the workshops can be targeted to capture learnings and to create improvement ideas for either a particular target group, or to address a certain need for performance improvement in the learner group. Therefore, the after-workshop activities include either using learnings in the own group, or transferring the learnings to the target group.

With the new method, the lessons learned workshops are arranged face-to-face and they last approximately 3-4 hours. The interactive workshops are facilitated by an experienced facilitator, who does not work in the group capturing the learnings. The facilitator provides the facilitation tools for the group and guides the meeting process. One facilitator can manage a group of 5-20 people, but for larger groups, a co-facilitator is needed. Larger groups also require more time for the workshop. Prior the workshop, the facilitator and the group leader prepare for the workshop. In the workshop, the group captures the learnings and plans how they are going to use and/or transfer them to the other group(s) or to the organization. The implementation of the plan happens after the workshop, and the group leader is responsible for the implementation.

Using multiple sources of information, maintaining the chain of evidence and having key informants reviewing the draft study reports, are the main activities to build the *construct validity* (Kasanen et al. 1991). The author of the study used several types of data sources and created a case study database for storing and organizing the evidence. The case specific reports and the cross-case analysis are described in separate chapters in this study. This makes it possible to evaluate the strength of the cross-case analysis by identifying the highlighted characteristics from the individual reports. In Organization Alpha, the workshop descriptions were reviewed and approved by the case groups as they approved the meeting minutes. The draft case reports, i.e. the case descriptions and the analysis were reviewed by two key persons involved in Organization Alpha's cases. In cases from Organization Beta and Organization Gamma, the group leaders reviewed the case reports.

For nontechnical constructions, like the created facilitation method, a market test is recommended for testing the validity (Kasanen et al. 1991). A strong market test means a long-term follow-up to see if the organizations, which have implemented the construction, have improved their performance, and comparing their results to the organizations which have not implemented the construction. However, a long term follow-up is not in the scope of the study. A weak market test evaluates the readiness for the economically responsible managers to implement the construction in their organizations. According to authors (ibid), it is sufficient in business settings, if the real-life managers accept the construction and decide to try it. The construction was taken into use in Organization Alpha and it was part of the organizational routines for two years. The construction was also used once in two other organizations. The group leader from Case J in Organization Beta, has indicated her interest to arrange additional workshops for other projects as well. Also, the group leader in Case K asked permission to continue using the method. Therefore, the author of the study argues that the construction passed the market test, and the internal validity aspect of the construction has been proven.

Generalizability or external validity refers to whether the findings are credible in the light of other results, and if they are applicable in an another setting. Generalizations cannot be made directly from the data, but from the interpretations based on the data (Saaranen-Kauppinen and Puusniekka 2006). In qualitative research, generalizability can be defined as transferability of the research, i.e. how the results apply to other contexts. The problem and limitation of the constructive research approach, is the difficulty of generalizing the results, because the observations building and validating the construction are made in a few case organizations. Gummeson (1993) notes that the verification of the construction's generalizability should be done by critically applying the results to different cases, and analyzing eventual analogous features in them. Kasanen et al. (1991) argue that successful problem solving in one organization will likely to be functional in other organizations as well. In this study, the construction was built with three cases and validated with six cases in Organization Alpha. The construction was further assessed with two additional case in two organizations, Organization Beta and Organization Gamma, which each represented a different context than Organization Alpha.

The external validity of the construction can be improved by replicating the study in multiple cases (Kasanen et al. 1991). The author of the study assessed the construction also in Organization Beta and Gamma, thus not relying solely on the cases in Organization Alpha, which represents product development context. Naturally, generalization for the manufacturing and the research context cannot be proven with

single cases representing each domain. However, the author of the study assumes that the construction can be generalized also in those contexts.

Reliability concerns whether the researcher is obtaining data on which he can rely on, and whether the same results would have been obtained if the research was carried out by someone else, other than the author of the study, using her methods. Normal scientific requirements for the construction include objectivity and generalizability (Kasanen et al. 1991). To assess the construction's reliability, the data collection procedures need to be analyzed. In the constructive approach, the researcher progresses step by step. The nature of the steps is defined in the context where the methods are applied to, and every step, i.e. phase, of the construction can be checked. This leads to the objectivity of the construction. If someone else repeats the steps, he should end up with similar results to the author of the study. In practice, this might be very problematic because of the human factors affecting the construction implementation and the success of it. In this study, the process to build and validate the construction, including the modifications to the method and the template(s), are described and justified in details in Chapter 4. By checking the steps, it is also possible to evaluate how the construction was designed.

The reliability of the study was enhanced by thoroughly describing the data collection and analysis, thus enabling the repeatability of the research by another researcher, and improving the transparency of drawing the conclusions from the data. This study incorporates several cases, in which the author of the study facilitated capturing lessons learned in groups. However, the qualitative data is interpreted by the author of the study and the influence of her persona, attitude, beliefs and experience cannot be excluded (Yin 2009). It seems unlikely that the same results would have been achieved by some other researcher, because the author of the study has influenced the results by facilitating the groups. Still, it cannot be judged to be a weakness in this study or in the data, because the researcher’s influence is natural in the constructive research approach.

The geographical location, from which the data is collected, affects the subjective adequacy of the results. Therefore, it can be argued that the results are better, because the author of the study and the groups in case studies originate from Finland, i.e. they had similar cultural backgrounds and an understanding of the surrounding national community. However, the author of the study was familiar only with the product development context, but not with the other contexts where the case studies were conducted. Also, the results may not apply to other parts of the multinational organizations like Organization Alpha and Organization Beta, because the case groups were located in Finland and the majority of the group members were also Finnish.

The author of the study's subjective interpretation clearly affected the results regarding the facilitation method, thus questioning the reliability of the results. The author of the study affected the results by using the facilitation techniques to keep the dialogue moving in the workshops. These intervention methods were used only when the group was not able to interact. The workshops structure was defined by the facilitation method and it would remain the same if someone else uses the method. Naturally, an another researcher would have probably created a somewhat different facilitation method and applied different facilitation techniques. An issue to be noted regarding the validity of the research, is the selection of the facilitation tools and techniques used in the method. The tools and techniques were chosen by the author of the study, and the decision was affected by her personal judgement. Nevertheless, the tools and techniques were considered to be appropriate, because they all fit into the idea of small group facilitation, and they were used in situations, which they were originally designed for.

In participatory research, there are two main threats to the *quality of research*: observer bias and data access limitations. The researcher may have a selective perception and interpretation of what he sees or hears. However, the author of the study endeavored to keep an open and objective mind. Both Walsham (2006) and Flyvbjerg (2006) claim that the question of subjectivism applies to all methods, not just to the case study and other qualitative methods. All individuals are biased by their own background, knowledge and prejudices to see things in certain ways, and not others (Walsham 2006). A neutral researcher is not aligned with a particular individual or a group within the organization, nor is he concerned with making money, nor does he have strong prior views of specific people, systems or processes, based on previous work in the organization. In Organization Alpha, the author of the study had a dual role. She was employed by the organization and it was part of her job description to facilitate knowledge sharing in the organization. The author of the study was assigned to the task of defining a new method for capturing the lessons learned in the projects by her superior, and she was determined to complete the task. She was acting independently when designing the method and facilitating the workshops, but the final version of the method had to be approved by the management team.

Huxham and Vangen (2003) argue that when the only means for collecting data is through the notes made by the interventionist, during and after the intervention, the detail has to be forfeit. The researcher's subjectivity influences not only what is captured, but the way it is captured. There can be no opportunity to recapture the data with fresh eyes at later date, except by memory. Another threat refers to the fact that the researcher is only interacting with the group for a limited time and he cannot observe what happened before or after the workshop. However, this is a typical limitation in

doing field research. The authors (ibid) further argue that it may not be possible to take comprehensive notes without the researcher being regarded by the group members as offensive.

In this study, the group members expected the author of the study to constantly make notes about the conversations for the meeting minutes. The meeting structure in the facilitation method is designed so that there is little dialogue between the facilitator and the group, and the emphasis is on the dialogue between the group members. Therefore, the author of the study could concentrate on documenting everything she saw or heard, for the meeting minutes. The groups confirmed her observations by approving the meeting minutes before they were made public in the organization. After each workshop, the author of the study spent time on making supplementary notes and analyzing the workshop, to identify the assumed elements affecting knowledge creation and sharing, as well as, their causal relations. She tested her analysis of the cases in Organization Alpha, with a colleague who had vast experience in facilitating learning in organizations and was familiar with the context. The fact that the plausibility of results rests on the credibility of more than one person, should improve the reliability of the research.

There are also other issues which should be considered when evaluating the reliability. First, it can be questioned whether the amount of cases is adequate to answer the research questions. Three cases were used to build the construction and six cases were used to validate it, all in the product development context. Hence, the number of the cases can be considered adequate for a sufficient reliability. Additional cases in the product development context, would not have improved the reliability of the study. Instead, the reliability of the results regarding other contexts is problematic. The author of the study conducted two additional cases to assess the facilitation method in other contexts. Because there was only one case in the manufacturing context and one in the research context, a few additional cases could affect the quality of the results. Yet, it is unclear whether the additional cases would have provided with more reliable information. As a whole, the reliability of these results is fairly good. The contribution of this research rests on the facilitation method, which has been used in three organizations.

When evaluating the *generalizability* of the results, it should be noted that this research, as a whole, aimed at understanding the phenomenon, rather than describing it. In a multiple case study, replication logic is often used to achieve generalizable results. It can be argued that eleven cases should be sufficient replication and that multiple cases should improve external validity. In each case, the facilitation method defined the

meeting structure i.e. the meeting goals, process and tasks. The groups were selected as case groups when they were evaluated to be suitable for this study, and they provided access and a supportive attitude to the author of the study, to collect data. In qualitative research, the research data is collected from sources which are the most informative from the viewpoint of the research questions.

However, a few issues regarding the generalization of the results, should be pointed out. The case studies focused on the groups in the context of the product development in a large multinational organization. How well the case groups represent their organization, or similar organizations in general, and subsequently the generalizability of the results provided by the case studies, is dubious. The author of the study acknowledges that the results cannot be claimed to be generalizable to all organizations and contexts, but rather to those with conditions similar to those described in the study. The findings can be applied to the organizations representing that context. However, it is unclear whether the results apply to other types of organizations in other contexts, because gaining generalizable results from single cases, related to the manufacturing and the research context, is considered difficult.

Also, the scope of the facilitation method restricts the generalizability of the results. The method is meant for formal workgroups. Yet, the study excluded very small or large formal groups and informal workgroups, and the applicability of the facilitation method was not assessed in those groups. The theoretical contribution of the study can be limited because of the temporal and the contextual factors, such as where and when the research is conducted. Therefore, it can be argued that the causal relations of the selected elements affecting knowledge creation in the groups, represent the situation only in the target population. Overall, it can be argued that the results have a fair external validity (generalizability) in the defined scope.

8.3.2 Research process

If the research can be described as a process of learning, it becomes clear that the most advanced form of understanding is achieved, when the researcher places himself within the context being studied (Flyvbjerg 2006). Valid descriptions of the social activities presume that the researcher possesses the skills necessary to participate in the activities. The proximity to reality, which the case study entails, and the learning process it generates for the researcher, will often constitute a prerequisite for advanced understanding.

According to Yin (1981), there are advantages in the *close involvement*. The close involvement enables in-depth access to people, issues and data. It also allows the researcher to observe and/or participate in the action. The participants can see the researcher as trying to make a valid contribution to the case group itself, rather than taking the data away and writing it up solely for the literature. However, the close involvement with the participants is time consuming. Another disadvantage is that the field subjects may be less open and honest if they believe that the researcher has a vested interest. A closely involved researcher becomes socialized with the participants and looses the benefit of a fresh outlook on the situation.

For the practical reasons, the close involvement with the case groups was the only possible solution in this study. In Organization Alpha, the author of the study was the only person assigned to the task of defining the facilitation method, but also she was the only experienced facilitator available, who could facilitate the workshops. The author of the study spent only 4-5 hours with the group members. The total time needed for one case was approximately four working days, including the workshop preparations, facilitating the workshop, preparing the meeting minutes and conducting the analysis. The author of the study argues that the time spent on the case studies was not excessive, and that the short involvement with the case groups did not threaten her neutrality either.

Another viewpoint to the researcher's close involvement with the research objects comes from McSweeney (2004), who calls for the *independence* of the research in the organizations. The independence is threatened by the researcher himself, and by the others in the organization. The researcher should seek to understand the specifics of the organization being researched, and to seek to question and test his findings. The organizational actors may try to shape the research process or pressure the researcher to leak information, ask for the impossible or pressure to certain conclusions, which may jeopardize the independence of the researcher.

In this study, the organizational actors did nothing to jeopardize the independence of the author of the study. Organization Alpha was interested in the facilitation method only, not the theoretical contribution of the study. The management team did not pressure the author of the study to design the method. She designed the method independently and without making any changes to the facilitation method, at any phase of the study, due to the requests from the management team. All modifications to the method were done based on the gained experience in the case workshops. When the final version of the method was presented to the management team, they accepted it as such.

Later, the author of the study left Organization Alpha. While writing the thesis, she had no formal relationship to any of the case organizations. In the other organizations, Organization Beta and Organization Gamma, the author of the study was neutral and independent, because she was not employed by the organizations, nor paid for the workshops. In these organizations, the research purpose was emphasized to the case groups, and the role of the author of the study was a visiting external facilitator.

The *validity* of the research is concerned with the question of whether the researcher is studying the phenomenon he purports to be studying (Zuber-Skerrit and Fletcher 2007). The dissertation assessed known theories related to knowledge creation and sharing, learning in organizations, as well as facilitation in general, before focusing on how experience-based learning can be facilitated in the groups, to allow the groups to modify their routines.

The need to conduct case studies was evident, because without the cases, it would not be possible to build and validate the facilitation method, nor assess the causal relations of the selected elements affecting knowledge creation and sharing in the groups. Along with the theoretical part, based on the prior research and literature, the empirical data made it possible to answer the research questions in a way, which described the phenomenon in real life situations, thus leading to the practical implications along with the theory elaboration. The fact that the author of the study facilitated the groups in the case study, may have had an impact on the choice regarding the groups' routines for capturing and sharing lessons learned. This, in turn, impairs the validity of the research.

One of the important characteristics of a successful case study is that it can convince the reader of the validity of the case descriptions and the analysis, i.e. the case study makes a credible impression. All cases were described thoroughly, to make it possible for the reader to assess the validity of the findings. The case descriptions were confirmed by the case representatives, which should improve the validity of the research. Also, the analysis of the data affects the validity of the research. The research questions guide the analysis, and they indicate which aspects are selected from the evidence (Saaranen-Kauppinen and Puusniekka 2006). The researcher tests the evidence by analyzing what can be concluded from the data concerning the phenomenon under study, how the evidence relates to prior research, and do the findings support other research results or do they conflict.

Yin (1981) argues that when a case comparison approach is used, the researcher must preserve a chain of evidence when conducting the analytic steps. The author of the study first analyzed the cases individually, to identify the elements affecting knowledge

creation and sharing in a case group. The analysis is presented as part of the case descriptions in Chapter 5. The case analysis focused on two topics: how the selected elements affect experience based learning in the groups, and how to facilitate capturing lessons learned in small groups, to enable to groups to modify their routines. In the following chapter, the author of the study presents a cross-case summary regarding the activities in the case workshops and then, analyzes the empirical evidence as a whole. The author of the study compared the observed elements and their causal relations, to the elements and their relations identified from the literature. The analysis was tested with a colleague who had vast experience in facilitating learning in organizations, and he was also familiar with the studied contexts.

The problem of the validity, may occur in the analysis of the elements affecting knowledge creation and sharing in the groups. The selection of the elements and the interpretations of their causal relations are made by the author of the study, and the objectivity of the causal relations of the elements can be questioned. The validity can be also criticized because the phenomenon was only examined in three contexts, and many other contexts were omitted from the research. Choosing the specific contexts was mainly because the need for the new facilitation method was acknowledged in the product development context. The author of the study wanted to assess the construction in other contexts, closely related to product development, i.e. research and manufacturing. Generally, the validity of the research is impaired if the research design and/or the conduct of the research is such, that the researcher is unintentionally studying, more or less, than the phenomenon claimed to be studied. Consequently, the validity of this research, as a whole, does not seem to be a problem.

The constructive research approach accepts *simultaneously researching and facilitating* the experience of a group of people. Thus, combining the roles of the researcher and the facilitator creates challenges, because of their different interests. Herbert (2010) describes the challenges of researching and facilitating simultaneously with the metaphors of politician, magician, trader/traitor and ventriloquist. As a politician, the author of the study needed to take the stakeholders in the study into account. In Organization Alpha, she was interacting with the projects, the management team and the operational development team. The management team authorized her to design the facilitation method and to the arrange the workshop. As a return, they expected the facilitation method to capture valuable information from the projects, which could be used to develop the organization and its routines. Also, the management team expected the author of the study to arrange many other workshops related to learning from experience to modify the group routines. However, they were not suitable for cases. The author of the study had to arrange them, because her formal role in the organization,

was more of a facilitator than a researcher. In return, the author of the study was allowed to use the new facilitation method and the selected cases in this dissertation.

The operational development team had similar expectations as the management team. They helped the author of the study analyze the groups' learnings and improvement ideas from the organizational perspective. The projects did not request the new facilitation method. Most of them just needed a way to mark the lessons learned related item in their checklist as completed. The organizational routines required arranging the lessons learned workshops, and agreeing to participate in the facilitated workshop was the only way to do so, because the method was part of the organizational routines. To increase the motivation of the workshop participants, the facilitation method and the meeting objectives had to be practical and easy for the group members to relate to. Most of the groups needed to adjust their group routines to match of the changing operating environment, and the new facilitation method helped them do so.

The author of the study had a different role in Organization Beta and Organization Gamma. There she was facilitating purely for the research purposes, and she did not have any formal relationship with the organizations. The author of the study was interacting only with the projects, and not with the stakeholders or the organization as a whole. The projects agreed to participate in assessing the facilitation method, and had expectations related to the workshop results and their usefulness, based on the 'sales talk' given by the author of the study.

Another metaphor used by Herbert (2010) is a magician. This relates to all the practical things that need to be juggled to ensure that the process of combining facilitating and researching continues smoothly. In Organization Alpha, the author of the study could not control the workshop schedule because their timing was defined by the project schedules. The cases from Organization Beta and Organization Gamma were scheduled based on the research schedule of the study. All arranged workshops were carefully documented to ensure that the needed information was available later, in the analysis phase of the study. The case groups from Organization Alpha were selected later from all the case candidates for this study. Since the research process took several years as a whole, thorough documentation was required.

When combining the roles of a facilitator and a researcher, there is an issue of trust and likelihood of tradeoffs between the roles (Herbert 2010). Also, the participants' needs and expectations need to be considered. The author of the study had a formal position and a good reputation as a facilitator in Organization Alpha. Additionally, she had the management team's support and authorization for the workshops. The organizational

routines forced most of the projects to participate in the lessons learned workshops. Therefore, in Organization Alpha the biggest concern was related to the group members' motivation, not their trust in the author of the study as a facilitator. In Organization Beta and Organization Gamma, the author of the study was authorized by the group leaders, but she was not known to the group members. Although, she was facilitating for own research purposes, it was more important for her to fulfill the groups' needs than her own. The workshops were one-of-a-kind events for the projects, but not indispensable for the author of the study. She had already identified other potential projects for the workshops, if these two groups would not be able to assess the facilitation method adequately for the research purposes.

Herbert's (2010) ventriloquist metaphor suggests that, while making room for many voices to speak, the researcher must choose which voices to represent, and be mindful of the effects of their choice. As the research focus in the cases was to analyze the facilitation method, all the meeting content-related analysis was excluded from the study. The main criteria for the selected cases was, that there was an intention to follow the new facilitation method. Some of the case candidates in Organization Alpha were excluded from the study, because the author of study acknowledged that the new facilitation method would not be the ideal solution concerning the workshop goals or the possibilities for interaction. The groups were either focusing on specific topics only, or the majority of the group members were not able to meet face-to-face. Also, the group size mattered when using the final version of the facilitation method. Even though groups with less than 5 persons were successfully using the facilitation method, such cases were excluded from this study.

According to Yin (1981), a case study does not imply the use of a particular type of evidence. The evidence may be fieldwork, archival records, verbal record, observations or any combination of these. Still, the used *research methods* can be criticized. The same phenomenon could have been examined using different data and methods. For example, action research could have been used to create the facilitation method. In such approach, the groups would have participated in creating the new method and using it. Also, interviews with the group leaders and the group members could have provided useful information regarding the elements affecting knowledge creation and sharing in the groups. The author of the study could have studied more the different lessons learned methods described in the literature, and observed the practices in different organizations and contexts.

The choice regarding the research methods was affected by the practical limitations. The groups were not willing to invest much time in the lessons learned activities.

Participation in defining the method or the interviews, would have required more investment from the groups, than just using the method. The author of the study wanted to understand the current practices for capturing lessons learned in the organizations but there were no established routines for such activities in all case organizations. She analyzed three different practices in Organization Alpha and searched for previous research and literature regarding the project review practices.

As part of the assessment of the research process, the author of the study had to consider the *ethical* aspects of the study. The research topic, experiential learning in groups, is not a controversial topic in the field of business studies. The research topic was relevant to the business, and it is related to a practical, real life problem. The need for the facilitation method came from Organization Alpha, not from the author of the study. She would have created the facilitation method any way, with or without the connection to this dissertation, because it was part of her job role in the organization. It was due to the author of the study's own interest, to use the method in a scientific study.

The selected research method, case study, was acceptable, and it provided an opportunity to study the phenomenon in real-life conditions. Without the cases, it would have not been possible to build and validate the facilitation method, nor assess the causal relations of the selected elements affecting knowledge creation and sharing in the groups. The constructive research approach, can accept simultaneously researching and facilitating the experience of a group of people. The close involvement with the groups enabled access to people, issues and data, and allowed the author of the study to observe. However, combining the roles of researcher and facilitator creates challenges because of their different interests and may jeopardize the ethics of the study.

Most of the cases in Organization Alpha had to participate the lessons learned workshops and use the new facilitation method. The organizational routines required the groups to arrange the workshops, and the only possible way to was to use the facilitation method. However, there were a couple of volunteer groups also. In Organization Beta and Organization Gamma the groups were voluntarily using the facilitation method.

Participating in this study did not cause any harm to the individuals, the groups or the organizations. They all are treated anonymously, i.e. it is not possible to identify certain groups or individuals from the case descriptions. Also, business sensitive information, i.e. the meeting content, is excluded from the study. All case organizations allowed the author of the study to use the workshops in this dissertation. The group members were aware of the research focus of the workshop, and the author of the study emphasized to

them that the research focus was entirely on the facilitation method, not on the meeting content. The case descriptions were reviewed and verified to be truthful. Also, the case analysis were confirmed.

All included cases were selected based on the groups' intention to follow the new facilitation method, not based on the success of the facilitation method. For example, in Case C the facilitation method failed, but the case, as such, provides valuable information regarding the elements affecting knowledge creation and sharing in the particular group. Some cases were excluded from the study, because the facilitation method was not the ideal solution concerning the workshop goals, or there were no possibilities for face-to-face interaction between the group members. Also, the group size mattered when validating the final version of the facilitation method.

The author of the study argues, that she has followed the good scientific practice in this study. She was genuinely interest in the research topic. She demonstrated honesty and thoroughness in gaining the pre-understanding regarding the topic, as well as, in conducting the case studies and analyzing their results. The case groups were treated with respect and they were not put in any kind of danger during the study. There was no pursuit of interest, either personal or organizational, in the study. Additionally, the author of the study appreciated the work of the other researchers. Consequently, the ethics of this research, as a whole, does not seem to be a problem.

8.3.3 Facilitator's role

The effect of the facilitator can be seen in the interaction between the group members. The facilitator encourages the participants to keep talking and shows that he is listening and understanding. He also reflects on what he hears and summarizes it, to pull important ideas and facts together, thus establishing a basis for the further discussion (Farrell and Weaver 1998). Prior the workshop, the author of the study influenced (or at least tried to influence) the group leader's behavior and setting the learning goals, as well as, the group routines regarding learning from the experience to modify the group routines. The workshop arrangements (e.g. physical place and group size) and the meeting structure, including the facilitation tools, were defined by the author of the study, and they affected the way the group members interacted. However, the facilitator's effect on the lessons learned workshop was not analyzed in this study.

In all cases, the author of the study was a group *external facilitator*, i.e. she was not a member of the case groups. In two cases, she was not even employed by the case organization. The author of the study argues that the facilitator's familiarity with the group was not a prerequisite for a successful lessons learned workshop. If the facilitator was able to convince the group leader about the facilitation method in the pre-meeting, and both, the author of the study and the group leader, prepared for the workshop as agreed, the facilitation method was likely to be successful. The group leader's support was important because his behavior had a major impact on the workshop and its results. When the role of the facilitator and the workshop goals were explained to the participants, the facilitation method and the facilitator were likely to be accepted, even though they both were unknown to the participants.

The author of the study acknowledges that, evidently, the facilitator's skills, style, adaptability and personality, as well as, the processes and procedures he uses, affect the meeting. However, the created facilitation method defines the used processes and procedures, i.e. the meeting structure, needed time and the template are not dependent on the facilitator. The facilitation method requires only basic *facilitation skills* from the facilitator, as well as, proper preparation for the workshops. By being an outsider to the group, the external facilitator needs to learn the language or the concepts of the group, and the history of the group and the organization. The author of the study was a trained and experienced facilitator, and she prepared for each workshops by getting familiar with the groups. In Organization Alpha, she had unlimited access to the project documentation. In other organizations, she received the relevant documentation from the group leaders. The author of the study estimated the level of group members' motivation, trust and common experience in the group, and the potential defensive routines affecting the face-to-face interaction in the workshop.

The case studies for this study were conducted over three years, and it can be argued that the facilitation skills of the author of the study had developed during that time. Also, it can be questioned whether the groups in later cases were better facilitated than the first cases. However, the used meeting structure and the tools in the workshops were the same for each case group, because they were defined in the facilitation method. The intervention techniques were selected ad hoc by the author of the study, by her understanding regarding the problem in the group. Only in Case C, the facilitator interfered the meeting structure and led the analysis phase. The interaction between the participants was low due to the group members' defensive routines. If Case C workshop had been arranged later, the author of the study might have been better prepared for the potential issues with the group leader, and perhaps she would have used different intervention techniques in the workshop. Alternatively, she could have postponed the

Case C workshop, thus allowing time for the group leader to solve his personal conflict with the group member.

Along with possessing the facilitation skills and preparing to the meeting, the person facilitating capturing the lessons learned, needs to have *experience* in facilitating small groups. Reviewing the experiences, especially failures, can be embarrassing for the group members (Anbari et al. 2008). Experience is needed to be comfortable with anger and conflict possibly arising in the groups (Hogan 2002). It is hard to deal with the awkward behavior in a small group and the facilitator needs to be able to identify the reasons for the conflicts and act accordingly to quickly address the issues.

The author of the study had worked with different groups for several years in Organization Alpha, as a group member, a group leader and a facilitator. Also, she had participated in several lessons learned workshops in all three roles. The author of the study agrees with Hogan (2002) who claims that for an external facilitator, it is easier to stay out of the meeting content and concentrate on the process. The external facilitator can confront the group without the fear of retaliation, consequently, he can better tolerate anger and conflict in the group.

Therefore, the author of the study argues, that any facilitator, having experience of facilitating small groups, could successfully use the facilitation method. The workshop arrangements (e.g. physical place and group size), as well as, the needed preparation, used meeting structure and the tools in the workshops, are defined in the facilitation method. Only the intervention techniques are selected based on the problem in the group, if needed. The post-workshops activities depend on the workshop goals and the group's organization.

8.4 Suggestions for further research

During the theoretical study, the author of the study was especially interested in analyzing the causal relations of the elements affecting the experience based learning, to modify the group routines. In this study, the analysis was mainly done only for the group level elements. The author of the study believes that it would benefit the theories of organizational learning, to analyze *how all the identified elements affect experience-based learning related to the routines, in the organizations*.

Also, identifying the *elements and their relations affecting learning from the product, service or the other output of the project work,* would benefit the doctrine. Additional research is required to evaluate whether the facilitation method could also be used for improving the *research, design or manufacturing object,* the technical device or service the group is researching, developing or manufacturing.

During the study, it became clear that the groups can learn from their own experience and modify their routines accordingly, to improve their performance. Inter-group or group-to-organization learning was not so evident. Knowledge was transferred from the sender group to the recipient group, but the knowledge integration was not analyzed. It is still unclear *how the created improvement ideas are integrated to the group routines.* Additionally, it would be interesting to study how the *transferred knowledge is integrated to the group routines*, i.e. how a group modifies its routines based on other groups' experience.

The link from the group to the organizational routines is also missing. It would be very interesting to see *how the organizational routines can be modified based on the groups' experience* and how the lessons learned can be used on the organizational level. Once the knowledge is captured, it needs to be stored somewhere. A more technological approach to the topic would be to analyze the alternatives for the *organizational knowledge base for the learnings*.

The new facilitation method is meant for small groups interacting in a face-to-face workshop. An additional study could develop a facilitation method suitable for *large groups*, e.g. for a workshop for the group and its stakeholders, or for *two groups trying to learn from each other*. In such situation, both groups are sending and receiving knowledge at the same time in a workshop. The author of the study would also like to know what kind of facilitation method would work when *one group is educating other groups,* like in an interactive lecture or broadcasting, and how the learnings can be captured in *virtual teams,* where the group members may never meet each other face-to-face.

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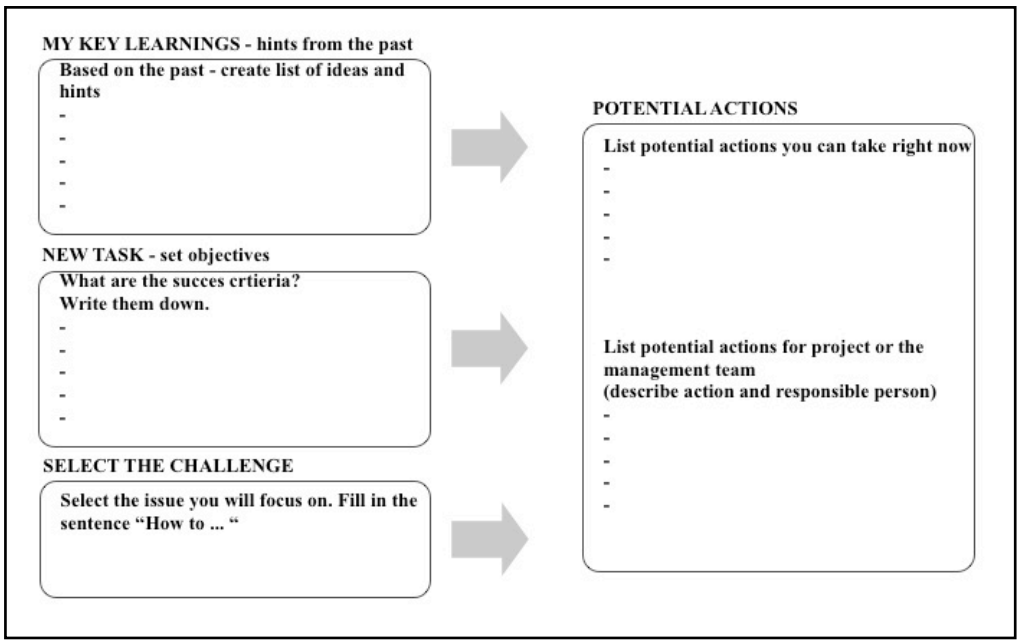
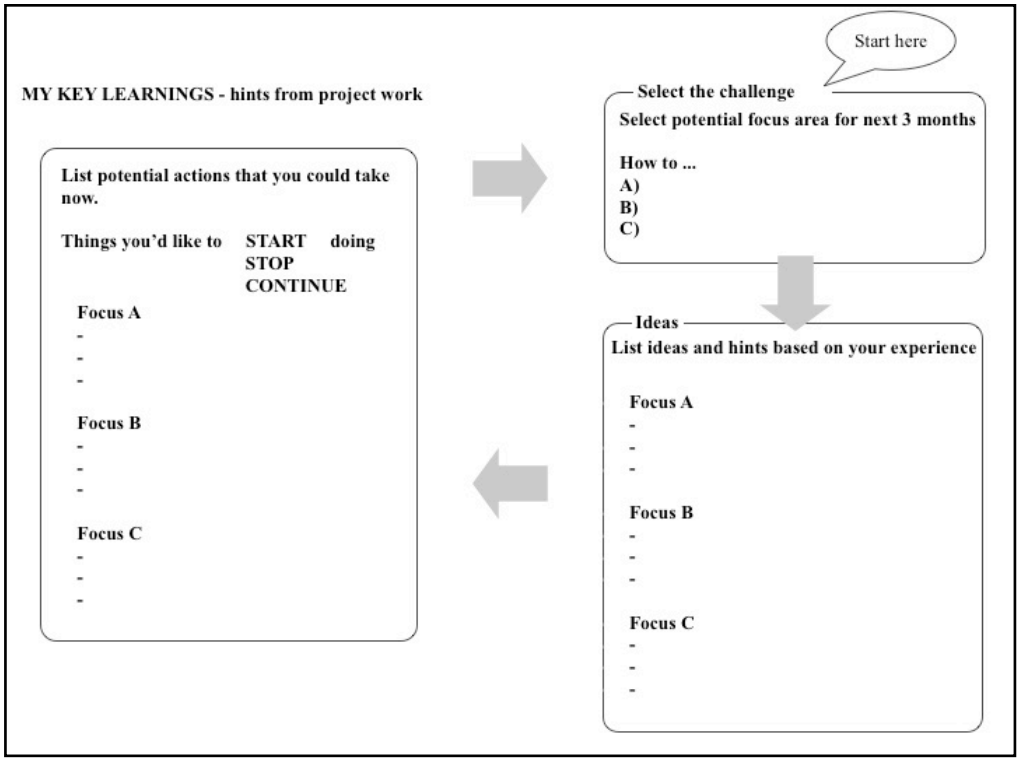
Appendices

Appendix 1. Versions of Personal learning booklet template



Initial version of the template



Second version of the template

Appendix 2. Action plan templates

List real actions that you will take now / within 1 month in your project/team.
Things you'd like to START doing
STOP
CONTINUE

Action What should be done	**Responsible** Who should do	**Deadline** By when	**Completion criteria** How to know that the task is completed

START – what was missing

STOP - waste of time

CONTINUE - keep up

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