Designing Collaboration in Risk Identification

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Master Thesis

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Much speech is one thing, well-timed speech is another.

Sophocles, 496 BC - 406 BC

Preface

"The nose of the bulldog has been slanted backward so that he can breathe without letting go."

Winston Churchill, British Statesman, Prime Minister, 1874-1965

Dear reader,

You just opened the final act of my study Technology, Policy and Management at Delft University of Technology. This thesis report focuses on collaboration in risk management. Collaboration is the degree to which people in an organisation can combine their mental efforts so as to achieve common goals. Knowledge about risks and especially internal risks can be dispersed throughout an organisation so in order to gain insight in the risks, people have to combine their knowledge. Today's technologies enable people working in teams to combine their knowledge independent of the borders of time and place. In this report we will design two approaches to gain insight in risks with a team: one for situations when time and place are the same for every team member and one for the situation when teams are distributed in time and/or place.

This thesis could not have been written without the help and support of many persons. Therefore, I would like to thank:

The section Systems Engineering of the faculty Technology, Policy and Management at Delft University of Technology where I spent my last years of my study with great pleasure. Special thanks go to:
Gert-Jan de Vreede for his help, support and ability to challenge me to exceed my own capabilities. He has been a constant factor in my study during the last three years.
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Mirjam Huis in't Veld, my second supervisor who took the role of Devil's Advocate and provided me several times with an objective view on my research.

All my colleagues from the ORM department of the ING Group. Although I was the youngest by far, I had a great time with the ORM Group team. I did not realise it very often, but I got the ability to 'take a look in the kitchen' of the total ING Group. Special thanks go to:
Hein 'Joost' Koolen, a true missionary within the ING's ORM department who always had time for (small)talk about Operational Risk Management and other related and non-related topics.

Last but not least, I would like to thank the team behind the person who wrote this thesis. I would like to thank my family, all my friends and Watex who supported me in my activities and who had to suffer from my moods during the final months of my thesis.

Jeroen S. Wien
Delft, October 2003

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Management summary

Problem area

Over the past decade, the economy has experienced a considerable growth. Today's complex environmental and organisational pressures confront organisations with a myriad of problems. Many of these problems cannot be solved by one single person because it is unlikely that this person has all the knowledge, resources and experience to accomplish the task. Therefore, teams form wherein the members develop shared meanings about their work and work jointly as a unit on the task, learning together and from one another. Collaboration within this team is essential to accomplish the tasks. We define collaboration as:

The degree to which people in an organisation can combine their mental efforts so as to achieve common goals [Nunamaker et al. 2002].

More than a decade ago, scientists already stated that with respect to teamwork 'we are moving towards an age of any time any place collaboration'. With respect to collaboration, the past decade can be characterized by a move towards virtual distributed teams. Computer and communication technologies are opening up the possibilities for distributed ways of working to effectively and efficiently work together.

An adverse effect of the globalisation, together with the growing sophistication of organisations, is that the activities of these organisations are becoming more diverse and complex. With increasing diversity and complexity, the operational risks an organisation is exposed to will consequently rise. Operational risks can be defined as the risk of direct or indirect loss resulting from inadequate or failed internal processes, people and systems or from external events. Operational Risk Management (ORM) is the process of gaining insight in the operational risks, their impact and probability and the degree to which controls are in place. In ORM, this process is best performed in teams because knowledge about the various risks is likely to be divided among several employees.

The way in which ORM could and should be carried out collaboratively is the subject of this thesis. The central research question is:

What is a good collaborative process to identify risks?

This central research question is divided into three research questions:

1. The identification phase is the basis for a risk assessment. It is therefore key to define risks well and clearly. What are the criteria for a usable and measurable risk definition?
2. What is a good collaborative design to get to a risk description that adheres to the determined criteria in 'same time same place' settings?
3. What is a good collaborative design to get to a risk description that adheres to the determined criteria in distributed settings?

Research approach

To address these three research questions we used the inductive-hypothetical model to design and test our approaches. We selected four cases to address our research questions in which we used the case study approach in combination with action research.
We used the first case as a case study for explorative purposes and to gain insight in the research area. In the three other cases we used action research to be able to not only observe the process but also participate and even intervene in the theory application and testing environment.

The general starting point in our research is collaboration. As our second and third research questions already indicate, we want to design a collaboration process for the identification of risks. In the design of a collaboration process, we strive for a process in which team members are self-sustaining. Doing this enables team members to perform processes without the need of for instance an external (expensive) facilitator. We decided to base our process design on the building blocks of collaboration as laid down by Briggs et al. [2003a]. Their collaboration building blocks, called thinkLets, capture all required facilitation information to create a particular pattern of collaboration. ThinkLets can be combined into repeatable collaboration processes.

Team productivity is the central phenomenon guiding our collaboration process design. The Focus Theory on team productivity was used as a guideline. Focus Theory explains that, in order to be productive, a team has to engage in three simultaneous processes: communication, deliberation and information access. Human attention (cognitive effort) is limited so participants have to divide their attention over the three processes. The three processes influence each other negatively: attention devoted to one process interferes with the attention for the other processes. Furthermore, team productivity is also influenced by two external factors: the degree of goal congruence and distractions. The degree to which the goal of an individual team member corresponds with the goal of the team is qualifying for the productivity: people will not work against their perceived self interest over the long run. Distractions are anything that interferes with the focus of team members' attention toward achieving their goals.

Conclusions

With respect to our first research question we found that in order to come to clear risk descriptions, one must know what a clear risk exactly is. A clear risk description adheres to criteria. We determined nine criteria that provide valuable insight in the risk. The criteria are split up in two categories: comprehension criteria and component criteria.

The comprehension criteria describe the preconditions of a risk description. The comprehension related criteria are:

- Risk-awareness among participants
- Every participant understands the risk description.
- Risks must be described unambiguously (in short, clear terms)
- The risk concerns the group's field of activity

The component criteria describe the aspects that are related to risks and risk management. These aspects can be seen as elements that should be part of the sentence that describes the risk. The component related criteria are:

- The presence of a *Value at Risk*
- An *event* : a potential situation in which the value is threatened.
- The *cause* of the event: the deeper lying, structural cause of the event.
- The *likelihood* of the cause: what is the chance that the event actually occurs.
- The *effect* or consequence of the potential situation: the potential damage.

However, we argue that requiring from participants in collaborative environments to contribute risks adhering to the nine criteria is unfeasible. Following the logic from Focus Theory, the cognitive effort of contributing such risks is too high. Therefore, we need an approach to derive risk descriptions collaboratively that meet the determined criteria.

To this end, we designed a collaboration process using the thinkLets that reduces the cognitive load for participants. Our collaboration process is designed for co-located collaborative environments and reduces participants' cognitive load by working towards a risk description that meets the determined criteria in a stepwise fashion. Our experiences show that, if followed accurately, the approach actually leads to clearer risk descriptions.

With respect to the final research question, we designed an approach for distributed teams that makes it possible for team members to participate at any time and any place. We designed two thinkLets for distributed settings. The approach enables team members to identify risks using the GroupSystems Online™ software. Due to the absence of face-to-face communication, team members have to put more attention and thus cognitive effort on communication and deliberation. Using appropriate technology can reduce this cognitive load. Initial experiences with our approach reveals that the participants appreciate working in a distributed way and that the risk identification in distributed settings provides a powerful base for the remainder of the risk assessment. However, we were restricted to the technology we used in getting agreement about the most important risks and clear description of these risks. This resulted in the inability to execute this activity properly.

Further research related to this thesis report should include further empirical testing in the field. This could lead to a crystallisation and refinement of the criteria and the approaches. Furthermore, there is still a large area for research regarding distributed risk management. We only addressed part of the risk identification phase so there still is a long way to go. Getting agreement among team members over the borders of time and space remains a big challenge. The search and development of (new) technologies that reduce the cognitive load for participants will play a large role in this.

Chapter 1: Introduction

Over the past decade, the economy has experienced a considerable growth. In today's markets, organisations expand, merge, purchase each other or disappear from the scene at a high rate. Globalisation is a frequently heard term in today's society. It can be seen as a primarily economic phenomenon, involving the increasing interaction, or integration, of national economic systems and organisations through the growth in international trade, investment and capital flows. Ruud Lubbers, a Dutch academic and former Prime-Minister of The Netherlands, defines it as a process in which geographic distance becomes a factor of diminishing importance in the establishment and maintenance of cross border economic, political and socio-cultural relations [1998].

The globalisation, environmental and organisational pressures are driving a move towards virtual distributed teams. Computer and communication technologies are opening up the possibilities for distributed ways of working to effectively and efficiently work together. The generic term for applications used when working in a group, is Groupware. Within the Groupware context, there is one application that is focused on the support and well going of meetings and decision-making processes. This application is referred to as a Group Support System (GSS). A large variety of GSS's has emerged that support teams in their collaboration. GSS's have proved its value in same time same place settings with for instance rising team productivity [Dennis et al. 1991; Dyson 1993; Grohowski et al. 1990; Jarvenpaa et al. 1988; McGoff et al. 1989; Nunamaker et al. 1989 and 1996; Post 1992; Vreede et al. 2003]. Thanks to the rapid growth in the ICT sector, the development of GSS's for distributed teams have become possible. The recognition for these systems is growing [Qureshi 2001] but there still is a large area that has to be explored.

An adverse effect of the globalisation, together with the growing sophistication of organisations, is that the activities of these organisations are becoming more diverse and complex. With increasing diversity and complexity, the operational risks an organisation is exposed to will consequently rise. Therefore, Operational Risk Management (ORM) becomes eminent.
ORM is the process of gaining insight in operational risks, the likelihood of occurrence, the impact and determining which controls are or need to be in place to reduce the risk. It is eminent to have a clear and complete insight in the risks because an unidentified or underestimated risk can lead to potential surprises resulting in for instance financial losses and reputational damage. Risks can arise throughout the whole organisation and the impact of these risks can vary considerably. A methodology to perform ORM is Risk and Control Self Assessment (R&CSA). R&CSA aims at identifying, assessing and mitigating risks by departments themselves.

Because business processes within an organisation have become complex, division and specialisation of labour has taken place. Therefore, it has become more difficult for one single person to gain insight in the total process. The main reasons for choosing Operational Risk Management as our application domain are as follows:

- ORM is a mission critical task for many organisations as most major business decisions are made under risk [Turban 2001];
- Today's turbulent markets, growing regulatory environments and increasingly complex systems have led risk managers to realise the importance of measuring and managing Operational Risk [CFSAN 2002, Harmantzis 2003];
- Distributed teams and management need to collaborate in brainstorm sessions. This often results in travelling to different locations [Van Grinsven and Vreede 2003];
- Regulators and organisations require that ORM occurs on a repeatable basis.

The growing sophistication of organisations and increasing complexity of business processes combined with the emergence and expanding of technologies that support teams that are working in distributed settings has made Distributed Group Support Systems a research area that is worth investigating.

This thesis report presents the research, experiences and results with teams that were involved in the identification of risks within the ORM process. We employed case studies and action research in two large service organisations in the Netherlands to design a number of collaborative approaches that enable teams to identify risks in any time any place settings (same time same place as well as distributed settings).

1.1 Research definition

Research objective

The objective of the research is twofold: we pursue a practical as well as a scientific objective.

- The *practical* research objective is to enhance the risk identification phase of ING's R&CSA process to guarantee a higher quality of the results of the identification phase;
- The *scientific* research objective is to design a repeatable collaboration process for the risk identification.

Research questions

The main research question within the master thesis is:

What is a good collaborative process to identify risks?

Sub questions:

1. The identification phase is the basis for a risk assessment. It is therefore key to define risks well and clear. What are the criteria for a usable and measurable risk definition?
2. What is a good collaborative design to get to a risk description that adheres to the determined criteria in 'same time same place' settings?
3. What is a good collaborative design to get to a risk description that adheres to the determined criteria in distributed settings?

Delineation

In this research, we defined some clear boundaries.

- We will focus our research on the identification phase in the Operational Risk Management context;
- We base our collaborative approaches on the thinkLet mechanism. ThinkLets have proved their value in the support of facilitators to cope with group dynamics and collaboration [Briggs et al. 2001; 2003a];
- In case 3 and 4 we use a Group Support System, the focus will be only on the GroupSystems™ software provided by GroupSystems.com. The software is chosen because we base our approaches on thinkLets and thinkLets have proved their value and functionality in accordance with the GroupSystems software [Briggs et al. 2001; 2003a; Vreede et al. 2003] by supporting facilitators in their guidance of the group.

1.2 Structure of the Master Thesis

The remainder of this thesis report will first contain some background information on risk management and especially our application domain: operational risk management (chapter 2). In order to address our main research question, we will discuss existing theory on collaboration and collaborative processes in chapter 3. Chapter 4 will present our research approach wherein we will explicate how we will address our research questions followed by a description of the cases we used in our research (chapter 5). As can be read in the previous section, we are confronted with three research questions. We will address every research question separately in chapter 6, 7 and 8. Chapter 6 will address the determination of the criteria for a good risk description. We will design a collaborative approach for risk identification in chapter 7. Subsequently, chapter 8 will discuss our findings on risk identification in distributed teams. The final chapter, chapter 9, will combine our answers to the research question and will present the main conclusions, reflections on our research and the recommendations for further research.

Chapter 2 Operational Risk Management

"We the Athenians in our persons, take our decisions on policy and submit them to proper discussion. The worst thing is to rush into action before the consequences have been properly debated. And this is another point where we differ from other people. We are capable at the same time of taking risks and estimating them beforehand. Others are brave out of ignorance, and when they stop to think, they begin to fear. But the man who can most truly be accounted brave is he who best knows the meaning of what is sweet in life, and what is terrible, and he then goes out undeterred to meet what is to come."

A speech by Pericles, Athenian general, to his troops before a battle in the war between Athens and Sparta that started in 431 BC

The term 'Risk Management' is used to refer to the dealing with risks. The most widely accepted definition of risk is [Royal Society Study Group on Risk 1992]:

A risk is the combination of the probability of a defined hazard and the magnitude of the consequences of the occurrence.

The ancient speech by Pericles illustrates that mankind has been thinking about risks for ages. Especially at the end of the 20th century, dealing with risks (managing) has become increasingly important and consequently risk management techniques were developed. At that time, risk management and corresponding techniques were focussed on various areas such as the chemical industry [Taylor and Spon 1994; Kenney 1993; Santamaria Ramiro 1997], the manufacturing industry [Cox and Tait 1998], environmental [Kammen and Hassenzahl 1999] and societal [Hale 1988, 2002]. This has led to a myriad of definitions of risk management. Risk Management in this context is defined as:

The process of making and carrying out decisions to minimise adverse effects of accidental losses. Making these decisions requires identification, analysis, choice, implementation, and monitoring with regard to risks.

The application domain of this research is Operational Risk Management (ORM). Especially organisations in the financial service sector are increasingly focussing on ORM. Operational Risk Management is the process of gaining insight in the operational risks of an organisation and the degree to which controls are in place to reduce the risk. We define controls as the measurements that minimise the probability and/or the magnitude of accidental losses. ORM is performed in national as well as international organisations. The definition of an Operational Risk is as follows:

An operational risk is the risk of direct or indirect loss resulting from inadequate or failed internal processes, people and systems or from external events [BIS 2001].

Operational risks are the risks due to one-off events such as fraud, systems failure, litigation or regulatory breach. By its very nature operational risks are difficult to quantify, since they are driven by infrequent events of high severity, and can be significantly mitigated or exacerbated by the quality of internal controls and guidelines.
Sometimes operational risks overlap with other risks. Examples of overlapping risks are credit losses due to failures in the legal processing of guarantees or insurance losses due to exposures unknown/not-reported.

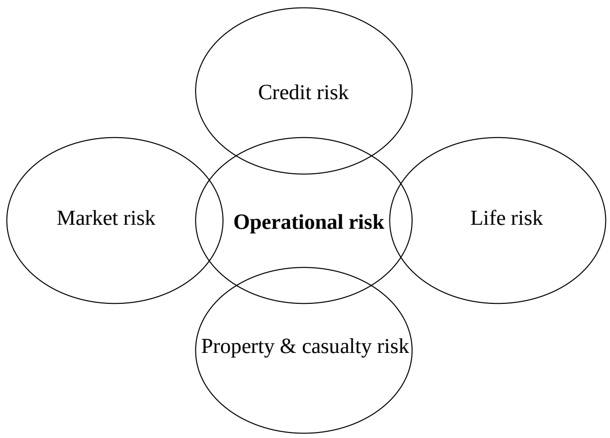

Figure 2.1: 'Sometimes operational risk overlaps with the other risks'

2.1 Why Operational Risk Management?

The definition of an operational risk captures operational events such as IT systems problems, shortcomings in the organisational structure or internal controls, human resources risks, fraud and external threats. Given the importance of these issues, Operational Risk Management was established.

An additional reason why *financial* organisations such as the ING Group, ABN AMRO, and Rabobank have initiated ORM in their organisations concerns external requirements. Shareholders, board, rating agencies, international[1] and national[2] regulators require that these organisations consistently and periodically identify, measure and monitor their key Operational Risks that the business runs in achieving its objectives. The increased attention for ORM is also caused by some major historical operational incidents like the bankruptcy of Barings in the United Kingdom and the Enron and Worldcom affairs in the USA.
Operational Risk Management in financial service organisations is an interesting application domain to carry out a research focussed on the identification of risks in different time and place settings for the reasons we already presented in chapter 1.

[1] The international regulator is the Basel Committee on Banking Supervision. The committee is part of the Bank for International Settlements (BIS).
[2] The national regulator is De Nederlandse Bank (DNB). DNB is represented in the Basel Committee on Banking Supervision.

These were: [Van Grinsven and Vreede 2003]:

- ORM is a mission critical task for many large organisations as most major business decisions are made under risk [Turban 2001];
- Today's turbulent markets, growing regulatory environments and increasingly complex systems have led risk managers to realise the importance of measuring and managing Operational Risk [CFSAN 2002, Harmantzis 2003];
- Distributed teams and management need to collaborate in brainstorm sessions. This often results in travelling to different locations [Van Grinsven and Vreede 2003];
- Regulators and organisations require that ORM occurs on a repeatable basis.

2.2 How to gain insight in Operational Risks?

In the course of time, many standards have been developed for risk management processes [AS/NZS 1999; Cox and Tait 1998; Taylor and Spon 1994; Kenney 1993]. On an abstract level, the majority of the Risk Management standards subscribe to the split-up of the process in three phases (see also figure 2.2):

- Identification
- Assessment
- Mitigation

We will now elaborate on these three phases.

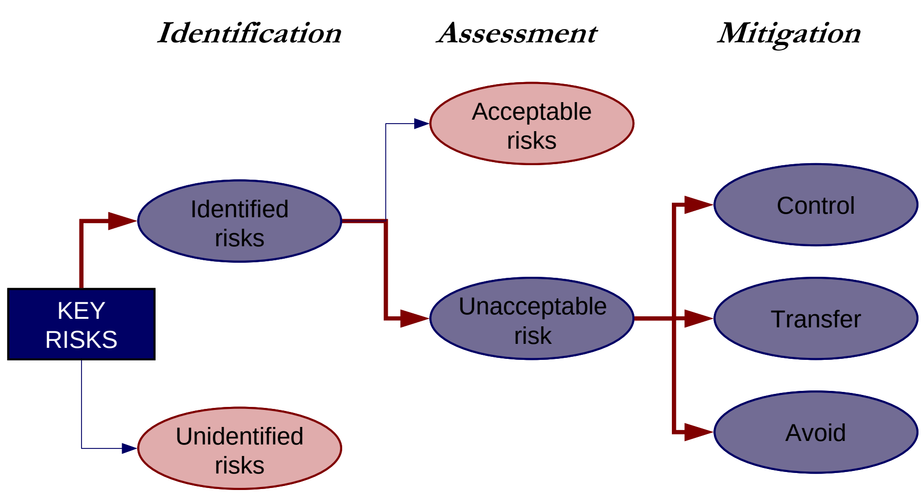

Figure 2.2: Overview of the process

Risk identification is the first step of the process. It aims at identifying all key operational risks within the businesses. Comprehensive identification using a well-structured process is critical, because a potential risk not identified at this stage is excluded from further analysis, therefore leading to potential surprises, which, of course, should be avoided. The identification phase should include all key risks, irrespective of whether or not they are perceived to be under control.

The activities performed in the assessment phase are based on the results of the preceding phase 'Risk Identification'. The assessment phase is meant to gain insight in the potential damage that a risk can provoke. Therefore, the selected risks (areas) will be assessed in detail, by measuring their probability and impact. Based on the results of the assessment a decision is made on the necessity of additional controls and/or the acceptance of residual risks.

Based on the results of the risk assessment phase, possible mitigation measures will be determined. Mitigation measures are the measures that have to be taken to reduce the impact and probability of the risk and thus the potential loss. The residual risk (impact and probability) and the level of risk (after mitigation) will be assessed. For each possible mitigation measure a cost/benefit analyses will be made.
Risk mitigation can be achieved through several ways. Some of them (not limitative) are listed below:

- Risk avoidance (by stopping the activity that generates the risk);
- Reduce the probability of the occurrence (by e.g. implementing process controls, improve supervision, testing, training);
- Reduce the impact (by e.g. insurance, extra capital);
- Transfer the risk to other parties who bear or share (parts of) the same risk;
- Retain the residual risks by financing the possible consequences (e.g. by extra capital).

Risk & Control Self Assessment

The ORM department of the ING Group has developed a Risk & Control Self Assessment (R&CSA) standard in conjunction with the business and the various group functions. The R&CSA standard is based on the Australian/New Zealand standard on Risk Management [AS/NZS 1999] and has been approved by the Executive Board / Risk Policy Committee as ING Group Standard. The R&CSA standard comprises three phases as laid down in the AS/NZ standard: identification, assessment and mitigation (see figure 2.2 for an overview).

The three phases are performed by the department that is under assessment. This is done because the ING Group considers the departments self to be the most capable in the identification, assessment and mitigation of their operational risks. A facilitator who takes care of the well going of the process guides the assessment. The ING is training employees to become internal facilitators in order to perform the risk assessments totally internal instead of hiring (expensive) external facilitators. Another role within the assessment is the Devil's Advocate: this person encourages the participants to take a balanced view of their own ideas, challenges the opinions of the participants with examples and own experience.

The consideration to do the risk assessments with a group is not surprising given that operational risks are the risks that arise on a day-to-day basis. Who has a better insight in these risks than the employees who are confronted with these risks? However, knowledge about these risks can be spread among employees or be with one person. Consequently, in order to perform a risk assessment, people have to work together. Therefore, Executive Centres, Management Centres, departments and business units are expected to perform the Operational Risk Management process themselves. This explains the name Risk & Control *Self* Assessment.

2.3 Requirements

Gaining insight in the operational risks of a department is not a one-off process. To continuously keep the risk level low, risk assessments have to be carried out periodically. These assessments are best performed in teams because knowledge about the various risks is likely to be divided among several employees. In order to get as much information as possible about the risks, team members have to work together throughout the whole process.

The recurring character of the process has led to the development of a standard. Moreover, due to the fact that risk assessments take place on a regular basis, the wish has risen to perform these risk assessments completely internal. Not only the process itself but the facilitation of this process as well. This calls for the design of a risk management process that should adhere to a number of requirements:

- The process should be easy to use for participants of this process;
- It should be designed in a way that it is easy to learn and guide for internal facilitators;
- Gaining insight in operational risks is a time and resource intensive process and thus costly. Performing a risk assessment has to be as efficient as possible.

In the course of this research, a number of processes will be designed. In the design of these processes, the determined requirements will be taken into account continuously.

Chapter 3: Background on Collaboration

"Great discoveries and improvement invariably involve the cooperation of many minds. I may be given credit for having blazed the trail but when I look at the subsequent developments I feel the credit is due to others rather than myself."

Alexander Graham Bell, 1847-1922,
Inventor of Telephone

The main research question of this thesis is: What is a good collaborative process to identify risks? To address this question, we need some background of this topic.

Chapter 2 already discussed the background on risk management, this chapter will elaborate on collaboration. We will first discuss what collaboration exactly is and why it is important for organisations that teams collaborate. Second, we will describe the settings in which collaboration can take place and how collaboration can be supported by technology. However, the purpose of this thesis is to *design* collaboration. Therefore, we will focus our attention on collaboration engineering: an approach for the design and deployment of collaborative technologies and collaborative processes. The final part of this chapter contains a factor that is inextricably connected with designing collaboration: productivity.

3.1 What is Collaboration?

Today's complex environmental and organisational pressures confront organisations with a myriad of problems. Many of these problems cannot be solved by one single person because it is unlikely that this person has all the knowledge, resources and experience to accomplish the task. Therefore, teams form wherein the members develop shared meanings about their work and work jointly as a unit on the task, learning together and from one another. Collaboration within this team is essential to accomplish the tasks. We define collaboration as:

The degree to which people in an organisation can combine their mental efforts so as to achieve common goals [Nunamaker et al. 2002].

The potential of an organisation to create value through the use of its intellectual capital is affected by the extent to which collaborative activities can take place [Nunamaker et al. 2001; Qureshi et al. 2002]. The term "intellectual capital" is often used to represent knowledge that can be converted into profit and create value [Stewart 1997].

3.2 Collaboration settings

Collaboration can take place in various ways. On a very abstract level, team members have to 'meet' in order to collaborate and interact with each other. The word 'meet' has been put between quotation marks because the word 'meeting' is usually considered as a physically gathering of people to discuss certain topics. When a meeting is considered in the time/place dimension environment from DeSanctis and Galuppe [1987; Johansen 1988; Ellis et al. 1991], there are four possible settings to meet (see also table 3.1).

Table 3.1: Different collaboration settings

	Same Time	Different Time
Same Place	• Face-to-face meetings	• A-synchronous co-located meetings
Different Place	• Synchronous distributed meetings	• A-synchronous distributed meetings

Same time, same place

The most common way to meet is the face-to-face meeting, which occurs when time and place are the same for every participant. Participants gather in the same room to have their ad hoc, daily, weekly or monthly meeting. Supporting tools are for instance: flipovers, whiteboards, facilitation services and Group Decision Rooms.

Same time, different place

When time is the same but the place is different, we see synchronous distributed meetings. Participants are geographically dispersed but interacting at the same time. In this case, participants can work with applications like conference calls, videoconferencing or screen sharing.

Different time, same place

The third category concerns meetings where the place is the same but time is different: a-synchronous co-located meetings. In this case, you can think of a shared folder on a computer, group displays or team room possibilities.

Different time, different place

Last but not least, the situation can occur that the group members cannot be at the same place nor at the same time: a-synchronous distributed meetings. Participants are geographically dispersed and can participate in the meeting whenever they want. Although not all participants will be involved in the meeting at the same time, they do interact with each other. In this situation, you can think of a GSS meeting that is neither at the same place nor at the same time like a computer conference.

Combining mental effort within a team can become more difficult in certain situations. Examples of such situations are when people are dispersed in time and place or teams working under a lot of time pressure. It has long been a goal of researchers to enable team members to work together wherever and whenever they want to do so [Johansen 1988; Nunamaker et al. 1991; Briggs and Vreede 1997].
The rapid growth in the ICT-sector has created the possibility for teams to combine their mental efforts and accomplish their tasks without having face-to-face meetings [Briggs et al. 2001]. Nunamaker and Johansen suggest that "we are moving towards an age of any time any place collaboration" [Nunamaker et al. 2001; Colemann 1995; Aytes et al. 1994; Hiltz and Turoff 1992; Niederman et al. 1993; Nunamaker et al. 1994; Turoff et al. 1994] (see also figure 3.2). This is the situation wherein team members are able to work together on their team goals independent of where (place) and when (time).

Table 3.2: Any time any place collaboration

	Same Time	Different Time
Same Place	• **Face-to-face meetings**	• **A-synchronous co-located meetings**
Different Place	• **Synchronous distributed meetings**	• **Asynchronous distributed meetings**

Any Time, Any Place

3.3 Group Support Systems

Since the rise of the Information and Communication Technology in the mid 70ths, multiple Information Systems with diverse applications have been developed. One is the support of working in a group. The generic term for applications that support group work, is Groupware.

Within the Groupware context, there is one application that is focused on the support and well going of meetings and decision-making processes. This application is referred to as a Group Support System (GSS). The term GSS is defined as "Computer based information systems used to support intellectual collaborative work" [Jessup and Valacich, 1993]. Davison and Briggs extend this definition to "a suite of collaborative software tools that can be used to focus and structure a team's deliberation while reducing cognitive costs of communication and information access and minimising distraction among teams working collaboratively toward a goal [Davison and Briggs 2000].

A Group Support System is focused on influencing the balance between the advantages and disadvantages of working in a group positively. A GSS has a number of characteristics that are aimed at enforcing the advantages of group work and diminishing the potential disadvantages. The general characteristics are [Bostrom et al. 1992]:

- *Parallelism*. Participants can add a topic, idea, or point of view simultaneously. They can also organise and evaluate ideas simultaneously;

- *Anonymity*. The software leaves no trace of the sender of information input;
- *Electronic recording and representation*. Every idea, topic or point of view that is generated, is stored.

Because of these characteristics, various advantages of group work, e.g. synergy, mutual stimulation, knowledge sharing etc. can be enforced. Group Support Systems is a widely used collaborative technology that, if used properly, has proven to increase user participation and productivity. It has also proven to reduce project cycle time as well as labour costs [Briggs et al. 2001; Nunamaker et al. 1991; Vreede et al. 2003].

Picture 3.1 and 3.2: A GSS accommodated in a room

However, in spite of the success of the GSS, field studies revealed that the GSS does not often diffuse beyond the initial installation in organisations that purchased the GSS. [Briggs et al. 2003a]. The question rises why the success of a GSS does not result in the transfer of the technology. Briggs et al. [2003a] claim that the answer is to be found in the need for facilitators: "the high conceptual load of GSS forces organisations to use facilitators against whom economic and political reasons combine to reduce their long-term affiliation with the GSS facility". A solution for this reducing affiliation with GSS can be found in designing primary collaborative processes and to train practitioners to be self-sustaining in these processes with GSS [Briggs et al. 2003a]. This is the fundamental goal of collaboration engineering.

3.4 Collaboration Engineering

Collaboration Engineering (CE) is an approach for the design and deployment of collaborative technologies and collaborative processes to support mission-critical tasks [Briggs et al. 2003a]. A fundamental goal of CE is to minimise cognitive load for practitioners while transferring to them relevant facilitation skills and knowledge about GSS and group dynamics.

By designing standard processes, collaboration engineers try to minimise the need to train practitioners to execute mission-critical collaborative processes. These standard processes are developed by packaging facilitator skills as reusable units and mapping those building blocks into methods that yield predictable, repeatable results when applied by different groups [Briggs et al. 2003a]. These building blocks are referred to as thinkLets.

ThinkLets

To accomplish a task, people move through a certain reasoning process. Within this reasoning process people are engaged in a sequence of basic patterns of collaboration. Briggs et al. defined a thinkLet as "the smallest unit of intellectual capital required to create a repeatable, predictable pattern of collaboration among people working together toward a goal" [2001]. In other words, thinkLets are the building blocks that are meant to create a certain group behaviour by providing a facilitator with explicit information about what to say, which decision to make and how to use the GSS tool.

ThinkLets can be classified according to the basic pattern of collaboration they create. Briggs et al. [2003a] propose five basic patterns of collaboration. These patterns will now be described illustrated with examples from the context of this study:

1. *Diverge*: to move from a state of having fewer concepts to a state of having more concepts. This is also referred to as brainstorming. For example when a group has to identify risks, they move from having a few risks to having more risks.
2. *Converge*: to move from a state of having many concepts to a state of having a focus on and understanding of the few worthy of further attention. For example when a group identified 120 risks but they cannot be taken all into the risk assessment due to limited time. Then the group has to select and understand the risks worthy for further assessment.
3. *Organise*: to move from less to more understanding of the relationships among concepts. This takes place when a group identified risks and they have to classify them into relevant impact areas such as front office, back office, and headquarters. This will give them an understanding of where the risks identified will have the most impact.
4. *Evaluate*: to move from less to more understanding of the possible consequences of concepts. E.g. when risks are evaluated in terms of probability and impact the group moves towards more understanding of the consequences of risks.
5. *Building Consensus*: to move from having less to having more agreement in the group. This holds true when people disagree about e.g. the level of assessed risks. It might be the case that one participant voted high in terms of impact while another participant voted low impact for the same risk. Building consensus moves the participants to more agreement by e.g. group discussions.

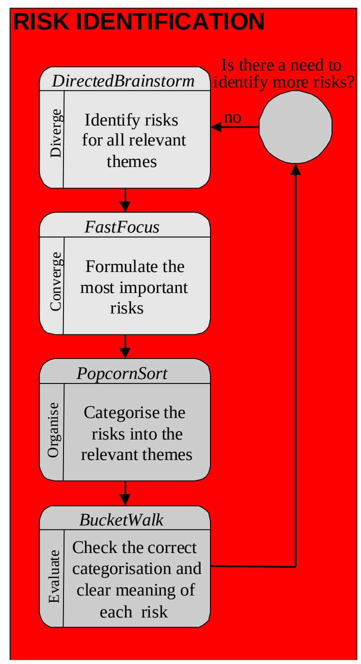

Figure 3.1: thinkLets, the building blocks for a process

In order to create a specific pattern of collaboration, a thinkLet has to comprise at least three components [Briggs et al. 2003a]:

- *Tool*: the technology used to create a pattern of thinking. The technology used is for instance certain software, hardware or simply brown paper;
- *Configuration*: the specifics of how the tools are configured to create a pattern of interaction;
- *Script*: the sequence of events and instructions given to the group to create the pattern of thinking.

Taking these three components together creates the stimulus that causes the pattern of collaboration. By knowing the tool, the configuration and the script, the stimulus can be created to produce the pattern of collaboration.

In figure 3.1, we illustrate that a number of thinkLets together can form a certain process.

Referring to the patterns of collaboration, people in distributed settings move through similar reasoning processes. Although the patterns of collaboration are identical, engaging these patterns is not: for instance, due to the absence of face-to-face communication, participants have more difficulties with the interaction with others. This can result in other requirements of the tool, configuration and script.

Some previous studies on distributed meetings have pointed out that especially the converging pattern entails different requirements [Mittleman et al. 2000; Niederman et al. 1993]. While engaged in the converging pattern, participants and the facilitator tend to have difficulties in seeing restlessness, agreement or sub-group coalitions.

Designing standard processes using thinkLets can help in making it easier for facilitators to create predictable, repeatable results with respect to group behaviour. Consequently, teams can become more productive. However, to achieve this higher productivity, insight in the factors that make a team productive is essential.

3.5 Productivity

Since the emergence of Group Support Systems, a lot of research has been carried out to examine the effect of electronic interventions on team productivity [Pinsonneault and Kreamer 1989; Pinsonneault and Kreamer 1990; Dennis et al. 1991; McCleod 1992; Dennis and Gallupe 1993; Fjermestad et al. 1993; Benbasat and Lim 1993]. Together with this research, models and theories were offered about teamwork and group support systems [Jessup and Valacich 1993].
Briggs and Nunamaker have developed *Focus Theory* in which they have tried to 1) unify the existing theories and models, 2) explain the variety of productivity findings in literature and 3) predict and explain the effects of yet unbuilt technologies and yet untested interventions on team productivity [Briggs and Nunamaker 2002].

Focus Theory

Focus Theory was developed to give an answer to the question "what makes a team productive?". The reasoning of Focus Theory begins with the assumption that at a fundamental level, teams accomplish their goals by exchanging and deliberating about information [DeSanctis and Gallupe 1987]. Team members have to be able to engage in three processes to be productive: communication, deliberation and information access.

- *Communication* refers to the exchange of information and/or meanings among team members;
- *Deliberation* is defined as the cognitive processes required to form intentions with respect to the team goal. A goal is a desired end state, but an intention includes the goal along with some notion of actions required to achieve the goal, and the duration and intensity of action, etc. [Campbell and Prichard 1976; Ajzen 1985; Kuhl 1985; Tubbs and Ekeberg 1991];
- *Information access* is defined as the ability for team members to gain access to all data they consider valuable.

Figure 3.2 depicts these three processes. Each process requires certain attention, and thus cognitive effort. Over time human attention resources are limited. Therefore the three processes influence each other negatively: attention devoted to one process interferes with the attention for the other processes.

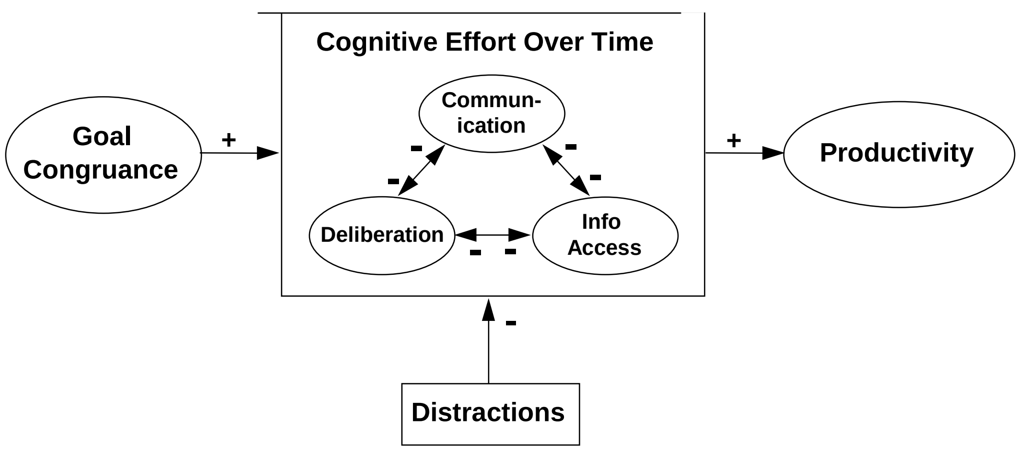

Figure 3.2: The constructs of Focus Theory [Briggs and Nunamaker 2002]

Furthermore, team productivity is also influenced by the degree of goal congruence. The degree to which the goal of an individual team member corresponds with the goal of the team is qualifying for the productivity: people will not work against their perceived self interest over the long run. Goal congruence influences the willingness of people to give attention (cognitive effort) to the three previously described processes. The higher the degree to which the individual goal corresponds with the team goal, the more team members will be willing to put more effort into communication, deliberation and information access.

Teams will be affected in their ability to give their attention to the processes by the level of distraction they are confronted with. Focus Theory defines distraction as "anything that interferes with the focus of team members' attention toward achieving their goals".

Focus Theory, as depicted in figure 3.2, is deceptively simple looking at this high level of abstraction. Behind this model, an extensive reasoning can be found to justify the unification of the existing literature and models [Briggs and Nunamaker 2002].

Focus Theory assumes a continuous balance between the attention that team members have to put in communication, deliberation and information access. If a participant is forced to give extra attention to for instance communication, it implies that the attention for deliberation and information access will diminish. Vice versa, simplifying the ability to communicate for participants means that they have to put less attention to communication and they can put more attention to deliberation and information access. The equilibrium of this balance is and cannot be defined in general because this point will differ from process to process and is dependent of several factors like group task, the participants themselves and the technology.

3.6 Conclusions

Collaboration within organisations has proved to be important to an increasing extent. The many ways in which collaboration can take place these days, has opened a world of possibilities for organisations. Group Support Systems have played and still do play an important role in group collaboration.
However, the success of GSS's is shaded by the decreasing affiliation with GSS in organisations that pursued a GSS. The reason for this can be found in the need for professional facilitators to operate the GSS. Making it easier for people to utilise a GSS facility is a possible solution. This can be effectuated by designing primary collaborative processes and to train practitioners to be self-sustaining in these processes with GSS. Briggs et al. defines these primary collaborative processes as thinkLets [2001]. ThinkLets are very helpful in designing these collaborative processes. However, the development of collaborative processes is still in its early stages and thinkLets are not yet widely used.
ThinkLets are developed to support same time same place meetings with or without the support of a GSS. However, there is an increasing demand for systems that support teams that are distributed in time and/or place. Knowledge about distributed teams and supporting of such teams has not been covered to a large extent in literature. Scientists agree on one point: The setting (e.g. distributed in time and place) in which a team collaborates has to optimally support the team achieving their goal as efficient and effective as possible.
In the design of standard processes, one has to bear in mind what makes a team productive. Focus Theory provides a good base to determine what makes a team productive. Focus Theory stresses that human attention is limited and that participants have to divide their attention over three processes: communication, deliberation and information access. The balance between these three processes has to be good in order to make a meeting productive. However, each process (and thus the risk management process as well) has its own optimum. Therefore, in the design of an approach for face-to-face and distributed risk identification we have to determine this optimum through experience.

In the design of a collaborative process for risk identification, we will use the conclusion above as a starting point.

Chapter 4 Research Approach

A great Roman statesman and philosopher once said:
"When a man does not know what harbour he is making for, no wind is the right wind."

Seneca, 4 BC - 65 AD

This chapter describes the strategy and structure of this research. It will first describe the adopted research strategy. Next, it will discuss the research instruments we used. Next, we will discuss the various sites where the research is carried out. The chapter will conclude in the structure of this research report.

4.1 Research strategy

The function of a research strategy is to outline the different steps that will be taken to answer the research question.

Choosing an appropriate research strategy is based on two aspects: the *nature* of the research problem and the *status of theory development* in the research field. These two aspects generally determine the way the research will be carried out: inductively or deductively. Adopting an inductive strategy implies that the research is focussed on theory building and exploration on the basis of historical data and empirical experiences on the phenomenon studied. A deductive strategy is chosen when a theoretical point of departure is preferred and the intention of the research is to test theory.

With respect to the *nature* of the research problem, we argue that our research topic as stated in the main research question represents an ill-structured problem [Sol, 1982]. Solving the problem of "designing a collaborative process to identify risks" in a purely deductive way is difficult and perhaps even impossible. This is reinforced by the fact that there is little *theory* available on this topic. Taking these arguments together, we argue that it is most appropriate to use an inductive strategy throughout this research. During the research, we move from a description of the problem situation towards prescription of an approach to solve these problems. Sol [1982] proposed a useful framework for the research described in this thesis report: the inductive-hypothetical strategy (see figure 4.1)

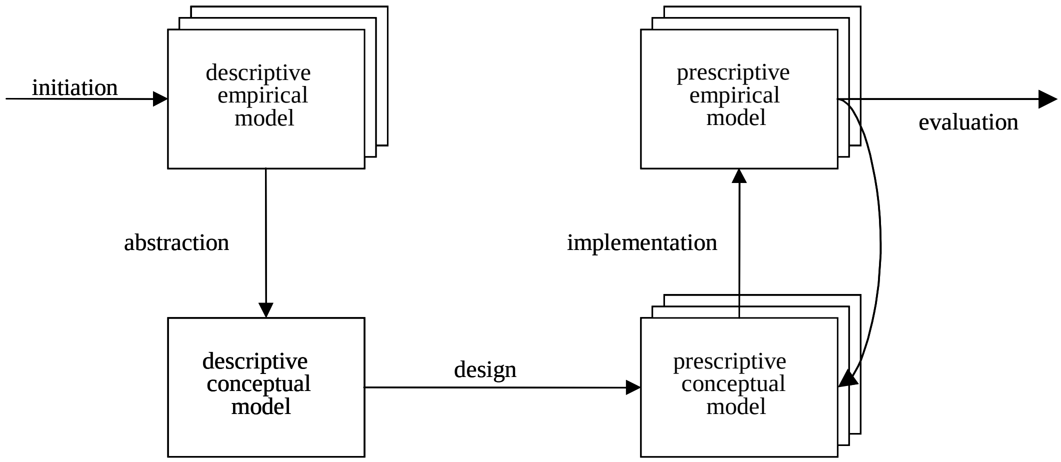

Figure 4.1: The inductive-hypothetical model [Sol, 1982]

The inductive-hypothetical model consists of five steps:

1. First, a number of initial theories are defined and used to investigate one or more empirical situations. This investigation should be focussed on the characteristics and problems encountered and will result in an empirical model.
2. Second, through abstraction of the empirical model, we construct a descriptive conceptual model. This models is the starting point for the design of one or a number of solutions for the encountered problems.
3. These conceptual models are then used to define a theory that should be capable to solve the problem situation: a prescriptive model. In figure 4.1, the definition of 'theory' is interpreted in a broad sense. Throughout this research, we define theory as 'a proposed solution for a problem situation'.
4. In order to test the prescriptive conceptual model, it is implemented in an empirical situation.
5. The results of the prescriptive empirical model are evaluated to determine whether the problem situation as defined in descriptive empirical model is solved sufficiently. If necessary, the prescriptive conceptual model can be adjusted to add additional requirements.

Although the inductive-hypothetical strategy is very useful, it does not give an indication of how the different steps should be carried out. Therefore, we need to define the instruments that we will use and the function of these instruments throughout this research.

4.2 Research instruments

Now the research strategy is defined, we need to determine how the actual research is carried out. This section will discuss the three main research instruments we used during this research: literature research, case studies and action research.

Literature research

This research was started with a thorough examination of the relevant literature on this topic and the search for relevant studies. The objective of this literature review was to get a general understanding of the research area. Literature played an important role in gaining first insights in the research topic and to determine what is known about the research topic and where the literature is falling short. Furthermore, literature contributed in the development of some initial theories.

Case studies

Since literature helped us to gain understanding of the research topic, we used the case study approach to complement our understanding in the field of the research. The reason for this choice is threefold and derived from Benbaset et al. [1987]. They give three arguments to employ case study research:

1. We want to study the phenomenon in its natural setting because we believe that the topic is too complex to examine in a constructed setting.
2. The research questions focus on the question of "how" and "why".
3. So far, little studies have been carried out on collaboration in Risk Management processes.

In this research, we use the case study approach to observe, explore en describe the research area from a specific point of view (collaboration). In this research, we will use one broad case study that functions as a learning case (see also table 4.1). The case study is meant for supplying the researchers with understanding and insights about the research field that can be applied in the development of the prescriptive models.

Table 4.1: The cases

	Case study	Action research
Case 1: ING Group	x	
Case 2: ING Corp IT		x
Case 3: Pro-Rail		x
Case 4: Students		x

Action Research

Although the case study approach addresses the questions "how" and "why", we are also interested in the question "how to". Where the case study approach is focussing on observing, exploring and describing the phenomenon, action research focuses more on an active role of the researcher within the phenomenon [Argyris and Schön 1989; Benbasat et al. 1987]. The researcher is not only observing but is also participating and even intervening in the theory application and testing environment. This means that the researcher is designing interventions in the situation that is studied. The researcher participates or intervenes in the situation to apply a theory to practice and evaluate the added value. This is illustrated in figure 4.2.

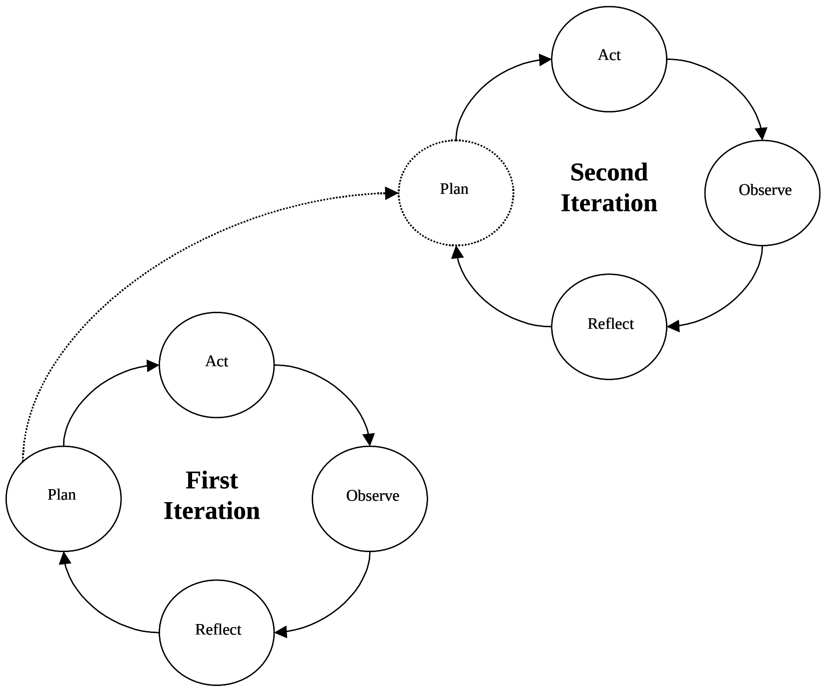

Figure 4.2: Action research strategy according to Zuber-Skerritt [1991]

As can be seen in figure 4.2, action research comprises four activities [Zuber-Skerritt, 1991]. These activities can be carried out in several iterations. 'Plan' concerns the exploration of the problem situation and the preparation of an intervention. 'Act' is the activity when the intervention is actually carried out in an empirical situation. To determine the effect or success of the intervention, data needs to be collected to evaluate the intervention. This is referred to as 'Observe'. 'Reflect' concerns the analysis of the data and the forming of conclusions with respect to the intervention that may serve as information for a new iteration.
In our research, we use action research in case 2, 3 and 4 as can be seen in table 4.1.

4.3 Research sites

The original assignment for this research was given by the Internationale Nederlanden Groep (ING Group), a global financial institution of Dutch origin offering banking, insurance and asset management to over 50 million private, corporate and institutional clients in 65 countries. Two of the four cases have been performed at the Operational Risk Management (ORM) department of the ING Group.

ProRail is the third case in this research. ProRail is a national organisation that builds, manages and maintains the Dutch railroad infrastructure on behalf of the Dutch government. We got the opportunity to perform a distributed risk assessment at ProRail.

The last case was an experimental with students. The students were graduates from Delft University of Technology, Faculty of Technology, Policy and Management.

The cases were performed with respect to the research questions (see also table 4.2). As a reminder, the research questions are:

Research question 1: The identification phase is the basis for a risk assessment. It is therefore key to define risks well and clear. What are the criteria for a usable and measurable risk definition?

Research question 2: What is a good collaborative design to get to a risk description that adheres to the determined criteria in 'same time same place' settings?

Research question 3: What is a good collaborative design to get to a risk description that adheres to the determined criteria in distributed settings?

Table 4.2: Research overview

Chapter 5	Chapter 6		Chapter 7		Chapter 8	
	Criteria (rq1)		**Collaborative design**			
			Same time same place (rq2)		Distributed (rq3)	
	Inductive	*Testing*	*Inductive*	*Testing*	*Inductive*	*Testing*
Case 1: ING Group	x		x			
Case 2: ING Corp. IT		X		x		
Case 3: Pro-Rail		(x)			x	x
Case 4: Students		(x)			x	x

x = main research case, (x) = sub research case

To address the research questions we used the cases to develop descriptive as well as prescriptive models. Consequently, the cases are used as inductive cases as well as test cases. Table 4.2 gives an overview of the cases and their function within the whole research. As can be seen in the table, some cases have a twofold function. An explanation for this lies in the fact that in some cases it was only possible to develop a descriptive model or to implement a prescriptive model to practice. Other cases were suitable for simultaneous implementation of a prescriptive model on one topic and development of a descriptive model on another topic.
In the remainder of this thesis report, we will present this table at the start of every chapter to explain and illustrate what we will discuss in the chapter in question. In table 4.2 we already added what the succeeding chapters will discuss.

4.4 Data collection and analysis

Approaching a research by using case studies is often criticised and accused for relying too much on subjective interpretation of the data that is collected. To rebut this criticism and to complete the subjective view of the researcher, we attempted to use triangulation across a range of data sources, both quantitative as well as qualitative. Furthermore we reflected on our observations and interpretations in collaboration with a number of experienced researchers and experts on the topic.

Throughout the research, we made use of a number of instruments to collect data. A first instrument for data collection concerned semi structured interviews. We used individual interviews for several purposes. We interviewed six Operational Risk Managers on what they thought that the criteria were for a risk description[3]. Furthermore, the same interviewees were used to find out why people had difficulties to come up with clearly described risks[4]. We used an interview to ask the ORM-process initiators for their opinion about the quality of the results of the process[5]. In particular in case 3 & 4, we interviewed participants who were engaged in the risk assessments to find out how they appreciated the way of working[6].

Besides interviews, we used observations to determine how participants think in terms of risks and the description of a risk. We used the observations in case 2, 3 and 4 to examine whether the prescriptive model actually solved the problem situation and in order to detect misconception and deficiencies of the model[7].

A final data collection instrument we used was a participant's questionnaire. The questionnaire was meant for the collection of data on the satisfaction of the participants on a number of topics. The questionnaire was developed in collaboration with other researchers and derived from preceding field studies. It was based on questionnaires that have been used successfully in field studies focussed on 'user satisfaction' [Briggs et al. 2003b] and the constructs of 'Focus Theory' [Briggs 1994]. The questionnaire was completed with questions aimed at the distributed way of working[8].

[3] See supplement A for the interview questions
[4] See supplement A for the interview questions
[5] See supplement B for the interview questions
[6] See supplement C for the interview questions
[7] See supplement D for the observation form
[8] See supplement E for the questionnaire

Chapter 5 Case Descriptions

This chapter will describe all the cases we used throughout this research. As we promised in chapter 4, we present the research overview table to illustrate the function of this chapter (table 5.1). This chapter will solely discuss the first column. The rest of the table will be discussed in the succeeding chapters.

Table 5.1: Research overview

	Criteria (rq1)		Collaborative design			
			Same time same place (rq2)		Distributed (rq3)	
	Inductive	*Testing*	*Inductive*	*Testing*	*Inductive*	*Testing*
Case 1: ING Group	x		x			
Case 2: ING Corp. IT		x		x		
Case 3: Pro-Rail		(x)			x	x
Case 4: Students		(x)			x	x

We will discuss the cases separately. Every case will be described on the following aspects:

- In which organisation, department or setting did the research take place;
- What was the problem;
- How did we perform the research;
- Which instruments did we use for data collection for the case.

5.1 Case 1: ING Group

We selected this case because it contained three performed risk assessments and the evaluation of these assessments provided useful base for the whole research.

Location

The first case was done at the ING Group's ORM department. The case had an explorative nature. The purpose of this first case was to explore the problem area.

Problem description

The ING Group's ORM department has noticed a problem in the risk identification workshops: participants are coping with difficulties in defining clear risks leading to a lower perceived quality of the results.

In chapter 1, we mentioned that the basis of the R&CSA process is the identification phase. Therefore, the identification phase should be designed in a way that 1) all potential risks are identified for the business unit or department that is assessed, and 2) the identified risks are described in an unambiguous way.

In order to come to unambiguous described risks in workshops, we first have to determine the criteria for such a risk description. This case was meant to inductively identify these criteria.

Research setting

The first case consisted of several individual interviews, evaluations of preceding projects together with a large literature study that will help us to explore the problem area of this research.

Data collection

The approach to determine criteria, that good risk descriptions have to adhere to, is split up in three parts:

- Literature: Books, articles and papers were studied, in order to find criteria to which a good risk description has to adhere.
- Expert Interviews: 6 Risk experts were interviewed and they were asked for criteria of a good risk description. Two risk experts were confronted with a random selection of risks, identified in pilots. They were asked to read the risks one by one and make a distinction between "good, clear risk descriptions" and "less clear risk description". During this process they were asked to argument why a risk belongs to a category.
- Evaluation preceding risk assessments: Throughout the ING-Group, a number of risk assessments have been carried out. The results of three assessments were available for research:
    1. Nationale Nederlanden (NN). NN is a Dutch insurance company. The assessment was workshop-based and conducted using a Group Support System provided by Delft University of Technology. Delft University of Technology was also responsible for the facilitation of the workshop.
    2. ING Bank N.V. Curaçao Branch. The R&CSA process at Curaçao was conducted using individual interviews. An internal operational risk manager performed the total assessment. This manager was also an auditor of the Curaçao Branch.
    3. ING Bank N.V. Buenos Aires Branch. In Buenos Aires, an internal operational risk manager facilitated the assessment for the whole Branch. The assessment was workshop-based.

The identified risks from these assessments are evaluated and an attempt was made to derive criteria from these results.

5.2 Case 2: ING Corporate IT

During the research on case 1, ING Corporate IT requested a risk assessment. This was a good opportunity to test and observe our empirical model we developed.

Location

The site of the second case was the Corporate IT department of the ING Group. The department is responsible for the IT policy (passwords, codes of conduct) and products (software, hardware) throughout the ING Group.

Problem description

The Corporate IT department of the ING Group wanted to do a Risk and Control Self Assessment (R&CSA) on a certain activity (the exact topic is classified information). In order to define the risk level of the activity, they had to consult several experts. In order to be able to come to a reliable statement with respect to the activity, the department wanted to be as complete as possible. Therefore, the identification phase was of high importance.

In Case 1, we defined a list of the criteria for a good risk description, however it is not self-evident that participants actually contribute such risk descriptions in workshops. So, considering the determined criteria for a good risk description, how should participants of the collaborative process be focussed on the contribution of clearly defined risks? This case is meant to determine a good collaborative design to get to a risk description that adheres to the determined criteria in "same time same place" settings.

Research setting

The department decided to do the risk assessment in two face-to-face workshops. The participants had to engage in three phases: identification, assessment and mitigation (as can be seen in figure 2.2). The first workshop was meant for the identification of risks and the other for the assessment and mitigation phase. An associate of Delft University of Technology who had experience with R&CSA workshops facilitated both workshops.

Data collection

The research for the answer of this question will be carried out using the following sources of information:

- Evaluation preceding risk assessments: the available results of three previous performed risk assessments are evaluated in order to try to determine a certain way of thinking among participants;
- Expert interviews: 6 operational risk managers were interviewed on their approach to focus participants on the contribution of clearly defined risks in workshops. Three of the interviewees were done with the operational risk managers from the preceding risk

assessments. The other three interviewees were operational risk managers who were concerned with risk assessments from which the results were classified;
- Industry's Best Practices: Experiences within the Risk Management business are investigated and reported.

These two sources of information will be incorporated in a recommendation of one or more new approach(es) for the identification phase. Practice has to point out which approach is the most appropriate in workshops. This is determined by
- Observations during workshops: participants are observed while they are contributing to a workshop. We will try to determine whether the approach actually eases the contribution of unambiguously described risks for participants;
- Expert consulting: risk experts determine the quality of the contributed risks.

5.3 Case 3: ProRail

Location

The third case was performed at ProRail, the national organisation that builds, manages and maintains the Dutch railroad infrastructure on behalf of the Dutch government.

Problem description

One project team within ProRail is responsible for the introduction of an electronic system for ticket control on all railway stations throughout The Netherlands. The introduction of electronic tourniquets at stations will have drastic consequences for the railway stations and their environments (like shops, passenger streams, etc.). To cover all relevant problem areas, the project team consists of about 15 experts on a diversity of disciplines. To gain insight in the consequences and risks of the introduction of this electronic system on all areas, a thorough risk assessment is recommended with all experts together.

However, the members of the project team appeared to have difficulties to plan a meeting all together. Their agendas were booked in such a way that it was practically impossible to plan a plenary meeting for a complete risk assessment. It was only possible to plan a two-hour face-to-face meeting. This is too short for a total risk assessment. Performing a risk assessment in a (partly) distributed way would be a solution for this problem but only when the team members were able to interact with each other.

Referring to the criteria for a good risk description, the question addressed in this case was: "Do these criteria also hold in distributed settings and moreover, does a distributed setting need a new approach to ensure that participants come to risks that adhere to the defined criteria?" In other words: what is a good collaborative design to get to a risk description that adheres to the determined criteria in distributed settings?

Research setting

We planned a week wherein participants were asked to contribute to an online risk assessment at any time. A total of 13 participants were engaged in all three phases of a risk assessment: identification, assessment and mitigation (see figure 2.2). Participants were all working from behind their own office-desk, from their home and even from behind a laptop using a wireless connection to the Internet. The distributed facilitation was done from three locations: Delft (NL), Amsterdam (NL) and Omaha (USA).

During the identification phase, the participants diverged to create a first list with risks. Converging to a shortlist with the most important risks was done in a face-to-face setting.

In this case we used the software from GroupSystems Online™ provided by GroupSupport.com to support the distributed participants. In the face-to-face meeting, we made use of the GroupSystems™ software.

Data collection

Performing the risk identification phase in a distributed way desires a different approach. For instance, the lack of verbal communication has to be covered to a certain extent and participants have to get detailed instructions on how to use the software. To adequately cover these aspects we consulted three persons who had experience with distributed ways of working. Finally, we pre-tested the whole setting to prevent failures or mistakes.

During the actual session, we observed the process. Difficulties with the software, network connections, functionality's etc. were observed and documented immediately.

When participants finished their contribution to the process, they were asked to fill in a questionnaire. The questionnaire was based on questions derived from the questionnaire that was developed for Focus Theory [Briggs 1994] and the Satisfaction questionnaire [Briggs et al. 2003b] completed with questions on the distributed way of working. We received 10 questionnaires.

After the participants finished the questionnaire, they were asked for some reactions regarding positive and negative experiences with respect to the software, the process, the distributed way of working.

5.4 Case 4: Students

Location

The final case was done with students from Delft University of Technology, Faculty of Technology, Policy and Management. They were all pursuing their masters degree. The case had an experimental nature.

Problem description

The third case described how team members could identify risks over a distance. However, the participants only created a first list with risks. Generation and consensus about a shortlist with the most important risks was done in a face-to-face setting. This fourth and final case of this research was primary meant to determine how to build a shortlist (converge) of the most important risks when participants are distributed.

Research setting

We confronted 7 students with a relative simple case description in order to avoid that they had to give excessive attention to the content. We wanted to focus mainly on the process, the reason for this will be discussed in the next paragraph. The case implied that the students had to imagine a situation in which they had to travel by car to a certain place on a Friday afternoon. They were asked to think about what could go wrong in this situation. The students were supposed to think about all aspects of the journey, for instance the breaking down of the car, traffic jams but also less obvious aspects.

In this final case, we made use of the GroupSystems™ Meeting Room software at Delft University of Technology. Although this software version is meant for face-to-face sessions, we created a virtual distributed setting with participants distributed in the faculty of Technology, Policy and Management.

Data collection

The experiences of case 3 resulted in a number of difficulties both in the process as well as the technology that had to be solved. As in case 3, we consulted three experts in order to find a solution for these problems.

During the actual session, we observed the process, the participants and the technology. Questions and difficulties from the participants regarding the process or the software were answered and solved immediately if possible. All these observations were documented carefully.

Regarding the simple case together with virtual character of the workshop (participants did not have a goal for the session and were asked to imagine themselves in the situation of the case) we decided not to hand out the questionnaire. This decision was made because the participants worked on a virtual case and would not be able to rate questions about for instance goal congruence.

After the session, participants were asked for their reactions with regard to the process, and the technology. This was done in a plenary meeting. Participants were asked to come up with difficulties and shortcomings that they experienced during the session. They were also asked to think about solutions for these difficulties and shortcomings.

Chapter 6: Criteria for a good risk description

In this chapter, we address the question what the criteria are for a good risk description. We first describe the actual problem with respect to risk descriptions. Table 6.1 illustrates which and how the cases are used in this part of the research.

Table 6.1: Research overview

	Criteria (rq1)		Collaborative design			
			Same time same place (rq2)		Distributed (rq3)	
	Inductive	*Testing*	*Inductive*	*Testing*	*Inductive*	*Testing*
Case 1: ING Group	x		x			
Case 2: ING Corp. IT		x		x		
Case 3: Pro-Rail		(x)			x	x
Case 4: Students		(x)			x	x

Case 1 functioned as learning case in which the problem area is explored and investigated. Subsequently, the criteria are presented after which we report the experiences with the criteria in practice (case 2, 3 and 4). This results in the final conclusions with respect to the criteria for a good risk description.

6.1 Problem Description

The problem with respect to risk descriptions has arisen from the ING Group's Operational Risk Management (ORM) department. They noticed a problem in the risk identification workshops: participants are coping with difficulties in defining clear risks leading to a lower perceived quality of the results. This quality of the results was perceived lower in some workshops because:

- The ORM department had the feeling that not all-possible risks were identified;
- The ORM department was not satisfied with the quality of the risk descriptions.

The basis of the risk management process is the identification phase. A comprehensive identification using a well-structured process is critical, because a potential risk not identified at this stage is excluded from further analysis, possibly leading to potential surprises resulting in financial losses, which, of course, should be avoided. Moreover, a comprehensive identification can also prevents any misunderstandings about identified risks and the exact meaning of the risks. Therefore, the identification phase should be designed in such a way that 1) all potential risks are identified for the business unit or department that is assessed, and 2) the identified risks are described in an unambiguous way.

In workshops or interviews, risks were often described too vague or too general according the ORM department. Risks that were identified appeared to actually be "events" (an event is a situation in which something has gone wrong), "controls" (we defined controls as the measurements that have been taken to reduce the risk) or "failing controls". This led to results containing risks, controls and events mixed together and described at different levels of quality (see also table 6.2).

Table 6.2: examples of poorly described risks (taken from case 1)

Risk	Deficiency
The risk of losing money	Too general
Employees will not work according to the standard procedures	Failing control
Former employees still have access to the office due to delayed processing of discharges	Failing control
Reprimand by the regulator	Poorly described, event

The aspects we mentioned above, leads us to conclude that:

- No clear view exists among participants what (operational) risks exactly are;
- Participants throughout the ING-Group don't really know what a clear, good risk description is.

Considering a clear, good risk description, how should participants in workshops be made aware of operational risks and what is the best way to focus participants on the contribution of clear and good described risks?

The section above resulted in the issue that a good risk description has to adhere to specific criteria. It is only possible to focus participants on the contribution of clearly described risks if these criteria are known. In this Chapter, we will address this question.

6.2 The research for risk description criteria

The majority of the research for risk description criteria has been done in case 1. The results will be presented here.

Expert Interviews

Six operational risk managers were interviewed in case 1. All the interviewees had difficulties determining the criteria. It could be sensed that all the interviewees had some criteria in mind but that it was very difficult to articulate them. The criteria the interviewees came up with were:

- Risks have to adhere to the two criteria impact and likelihood in order to be able to determine the risk level in the assessment phase;
- Risks have to be easily assessable on the existing two criteria impact and likelihood;
- Risks need to be clear to everyone participating in the workshop;
- Risks have to be recognisable to everyone participating in the workshop. This means that participants need to have a certain acquaintance with the risks.

All the interviewees mentioned one similar requirement with respect to the identification phase of the R&CSA process: risk-awareness. Participants should be made aware of operational risks in advance. Questions that should be addressed are: what is an operational risk, can we give some examples, and how should an operational risk be described. Furthermore, participants should be pointed out that operational risks can occur at all levels of an organisation including the participant's own department or business unit. Risk-awareness among participants can be seen as a criterion for the start of an R&CSA process.

The conclusion of this evaluation is, that there is a lot of indistinctness amongst participants, whether in a workshop or in an individual interview, about the level at which they were ought to think about risks and how they were supposed to contribute.

Two risk experts were confronted with a random selection of risks that were gathered from the preceding risk assessments. They were asked to sort these risks out into two categories: clearly described risks and less clearly described risks and to reason why a risk belonged to the category they chose. By documenting this reasoning, we tried to determine criteria. However, the risk experts were unable to determine whether a risk was good described or not. Their reason for this can be put down to the fact that the described risks were project-specific and described in project-specific terms. Therefore, the risk experts were unable to do an objective evaluation of the quality of the risks.

Previous performed risk assessments

We evaluated the results of three preceding risk assessments from case 1. The evaluation of the context (see section 5.1) and the results from the three preceding risk assessments made it clear, that these assessments were conducted under different circumstances.

First of all, the *quality* of the results cannot be determined objectively because they are project-specific and all the operational risk managers were satisfied with the results. Risks can be obscure for outsiders whereas insiders understand them perfectly.

Evaluation of the *risk descriptions* reveals that the identified risks are described in various ways. Some are described very briefly; others are described in several sentences. The level of the risk is also very diverse. With the level of a risk, we mean the level of the organisation in which the risk is present. Risks at business unit level can be described for that situation specifically, risks at the top of the organisation can only be described in broad terms because these risks can be split up in several 'sub'risks.

This diversification in the results can have several causes: the preparation of the assessment, the difference in circumstances under which the assessments were performed, the facilitation of the process, adjustments made after the assessment, etc.
For the reasons given in the section above, deducing criteria for a good risk description is very difficult. The results only reveal two general criteria:

- Risks have to be described in a simple way making it easy to be understood by other participants;
- Risks have to be described in a clear, unambiguous way in order to avoid wrong interpretations by stakeholders not present at the actual workshop.

We argue that the criteria that were derived from the expert interviews and previous performed risk assessments are not satisfactory. The theory in Chapter 2 is not sufficient as well. Therefore, additional literature was consulted.

Literature

Operational risk management and specifically risk descriptions are two areas that do not appear to have been covered to any great extent in the literature yet. The literature that is available describes the Risk and Control Self Assessment process in terms of the different phases, activities within these phases, facilitation of the process, etc. Two criteria can be found in every article or book about Risk Management: impact and likelihood [Van Grinsven and Vreede, 2003; Wade and Wynne, 1999; Tritter, 2000].

Wade and Wynne [1999] point out that participants should be given a definition of a risk because such risk definitions frequently point to the relation between risk and the objectives of an organisation. Giving the definition of a risk will help participants to frame their thoughts around a point of reference with which they should, hopefully, be very familiar with.

Alexander [2000] describes risks in a way that is best described by using the illustration in figure 6.1.

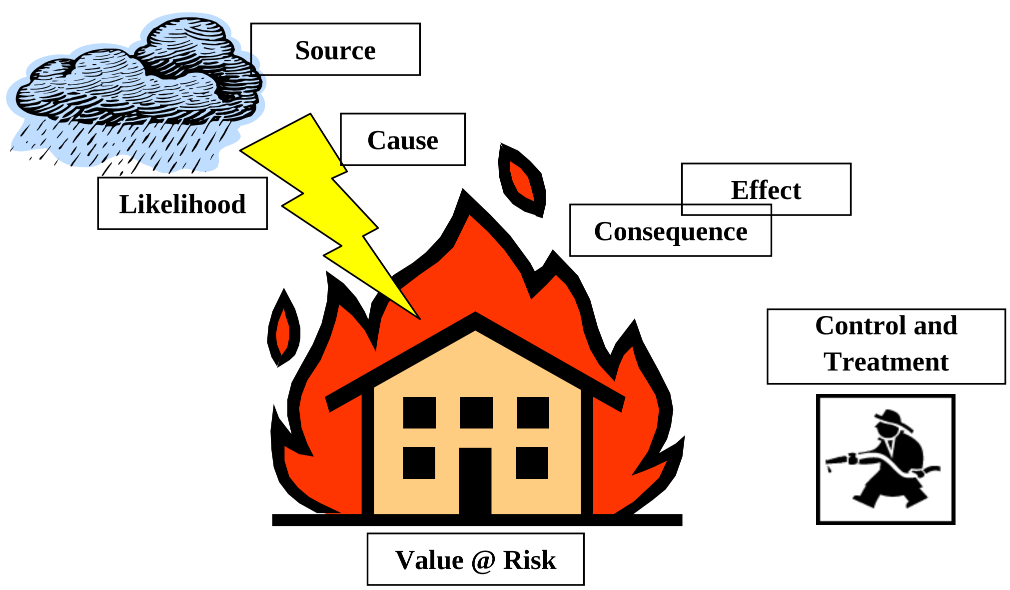

Figure 6.1: Value at risk

The figure depicts a number of aspects that are related to risks and risk management. First of all, there is always a certain value at risk: in this case the house you are living in. This "Value at Risk" is being threatened by certain situations that can occur, for instance a fire destroying your house. These potential situations are the causes why your value is at risk. These causes have a certain likelihood: the chance that the event actually occurs. The causes are on their turn caused by a source: a deeper, more structural cause why your value is at risk like the lightning that strikes your house. The consequences or effects are the "results" of the situations when something has gone wrong. Examples are the burning down of your house and the loss of your belongings. However, the fire brigade is on the scene to prevent your house from burning down and to extinguish the fire that is endangering your belongings. The fire brigade is the control and treatment of the risk. With this control, it is less likely that your value will be damaged or to a lower extent. Subsequently your value is at lower risk.

6.3 Criteria

The criteria that were derived from expert interviews, evaluation of previous performed risk assessments and additional literature (as described in the previous section) are combined and results in a list of criteria. Some of these criteria are redundant or have significant overlap with other defined criteria. Therefore, it would be superfluous or even confusing for participants when these overlapping criteria are mentioned during workshops.
Based on the research and leaving out redundant criteria, a list of nine criteria is defined. We argue that the determined criteria can best be divided in two categories: comprehension criteria and component criteria.

The comprehension criteria describe the preconditions of a risk description. The comprehension related criteria are:

- Risk-awareness among participants
- Every participant understands the risk description.
- Risks must be described unambiguously (in short, clear terms)
- The risk concerns the group's field of activity

The component criteria describe the aspects that are related to risks and risk management. These aspects can be seen as elements that should be part of the sentence that describes the risk. The component related criteria are:

- The presence of a *Value at Risk*
- An *event* : a potential situation in which the value is threatened.
- The *cause* of the event: the deeper lying, structural cause of the event.
- The *likelihood* of the cause: what is the chance that the event actually occurs.
- The *effect* or consequence of the potential situation: the potential damage.

The control and treatment of a certain risk is not a criterion for a clear risk description in the identification phase of the R&CSA process because the controls will not be identified until the assessment phase.

Comprehension criteria

In this section, the comprehension criteria are further explained.

Participants should be made *aware* of operational risks in advance before participating in a workshop. Explaining what operational risks exactly are in workshops is considered as a major problem because it is very time consuming and provokes a lot of discussion. A preliminary meeting explaining the definition of operational risks and the purpose of the R&CSA process prevents such discussions during the actual R&CSA workshops and ensures a good start of the identification workshop.

The second criterion: that every participant has to *understand* the risk description seems to be obvious and unnecessary but actually is of high importance in workshops. Participants need to fully understand and describe every risk that is discussed because these risks will be used by either the same participants or a new group of participants in later phases of the assessment. The understanding of the risk contains the recognition of the risk as well. The key objective is that workshop participants are able to relate each statement to their own situation at work.

The third criterion is that risks must be described *unambiguously* to prevent that risks are described incomprehensibly and thus unclear. Therefore, risks have to be summarised in just one or a few sentences (maximum of about 30 words). If risks are described with more words, it becomes harder to get a clear view of the actual risk.

The final comprehension criterion is that the risk should *concern the group's field of activity*. This criterion is meant to exclude discussions about risks that do not affect the department or business unit that is under assessment. If a discussion points out that risks are identified that do not concern the department or business unit and all participants agree on this, the risk doesn't need to be taken into account anymore and can be left out the assessment.

Component criteria

The component criteria are the elements that have to be part of a risk description. Using figure 6.1, the following risk description is made:

The risk that my house burns down due to the fact that it is struck by lightning resulting in the loss of all my personal belongings.

Table 6.3 shows the break down of this risk description

Table 6.3: Break down of a risk description

The risk that	my house	burns down	due to the fact that	it is struck by lightning	resulting in	the loss of all my personal belongings
Likelihood	*Value at Risk*	*Event*		*Cause*		*Effect*

The risk description is broken down into the five constituents (the criteria) of a risk description. First of all, there is a V*alue at Risk*, for instance a product, reputation, database systems or solvability. This *Value at Risk* is threatened by potential situations. We refer to the potential situations as an *event* like incorrect or illegal input or business disruptions. The occurrence of an *event* is induced by a certain *cause* (e.g. failure of systems or procedures, personnel mistakes, etc). The *likelihood* of this *cause* can be estimated in terms of the *likelihood* that the *cause* actually leads to the occurrence of an event. Furthermore, the occurrence of an event will have a certain *effect* on the *value at risk* (e.g. loss of possessions but also financial losses, loss of reputation, etc.).

Risks, described in such a structured way, contain the two factors likelihood and impact: respectively the chance of occurrence of a certain event and the effect or consequence of this event.

6.4 Applying the criteria to practice

The criteria above were determined using case 1. We tested these criteria in practice in case 2, 3 and 4 using an approach that was designed after the criteria were identified (see Chapter 7 and 8 for the approaches). We evaluate the criteria using observations and ex post experts interviews about the quality of the risks. The results are presented below.

Observation

Considering the component related criteria, it occurred several times that participants indicated that it was not necessary to describe a risk in full detail. The components that were left out the description were mainly the cause and effect. The participants believed the risk was described sufficiently and was understood by all participants.

After the identification of risks, the risks are assessed on likelihood and impact. In case 2 and 3, participants had considerable difficulties to assess a number of risks that did not adhere to the component criteria we defined in section 6.3. This led to a new discussion about the definition of these risks during the assessment phase. Such discussions are not desirable in the assessment phase and should be avoided.

Risks that did not concern the group's field of activity were hard to assess on likelihood and impact. Participants indicated that they lacked knowledge about these risks.

Participants tend to keep thinking in different ways: contributions could be categorised in (failing) controls, events and causes. However, when the participants converged the risks into a shortlist, the quality of the risks increased and risk were more and more described according to the criteria.

The presentation of figure 6.1 was perceived very positively. Participants mentioned that it made them more aware of what exactly a risk is. However, the results of the first brainstorm still resulted in a mixture of risks that were described in several ways.

Expert consulting

In order to determine the quality of the risks that were contributed in the workshops, we consulted risk experts. The experts responded that the quality of the risks was better than in previous workshops. However, some risks were still incomplete. Table 6.4 shows a selection of the risks resulting from the workshops in case 2 and 3. To illustrate what the risk experts meant, we look at the second risk of case 2: "Interception of data during transmission between client and host". Although this contribution is a risk, the missing components (according the defined component criteria) are the *cause* of this risk, the *effect* and a clear *value at risk*. Although the absence of these components reduces the quality of the risk, a comment needs to be placed: during the workshop, participants believed it was not necessary to describe every risk according to the component criteria when all the participants understood the risk (with respect to causes, effects and value at risk). However, sometimes the participants ran into difficulties in the assessment phase because a discussion rose about the risks that were less clearly described.

Table 6.4: Risks resulting from case 2 and 3

Case	Risk
Case 2	Reputation risk/loss of integrity due to a misunderstanding of the media regarding the openness of the network
Case 2	Interception of data during transmission between client and host
Case 2	Risks related to the decrease of the separation between private time and office hours for large groups of employees
Case 3	Shop owners demand compensation for their loss of income because his/her store will be behind the electronic gates
Case 3	The total planning is not feasible because the time required for the negotiation with the shop owners is hard to estimate in advance. This can delay the progress of construction

The risk experts also noted that some risks were still described in general and consequently less clear terms. An example is the third risk of case 2 in table 6.4. The term "risks related to" makes this risk description general because the description does not address one specific risk but a number of risks.

The two preceding comments from the risk experts suggest that participants have to stick to the criteria in order to contribute a clear risk.

6.5 Conclusion

In order to work towards a good and clear risk description, insight in what a risk exactly is, is important. Without this insight, it becomes harder to come to a good and clear risk.

In this research, we propose nine criteria for a good risk description. These criteria can be divided in two categories: comprehension criteria and component criteria. These criteria provide powerful insight into the factors that contribute to a good and clear risk description. An understanding of these factors and their relation with respect to a risk description should enable ones ability to describe good and clear risks.

The first experiences with these criteria reveal that they provide a usable guide toward the description of clear risks. Although it will appear to be unnecessary to pursue the criteria for every risk that is described, experience shows that risks that are not described according to the criteria often lead to discussions in later phases of the risk management process.

Further research

The use of the component criteria, together with the comprehension criteria can result in better risk descriptions. However, the fact that the criteria are determined does not necessarily imply that participants in workshops contribute risks that satisfy the criteria. Providing the participants with all the criteria instantly can even confuse and distract participants from providing all potential risks. A design-approach of a collaboration process in which participants are supported in the contribution of clearly defined risks would be of great use.

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Chapter 7 Risk identification in workshops

This chapter will address the question what the best collaborative approach is for the identification of risks that adhere to the criteria we defined in the previous chapter. Again, we present the research overview table (table 7.1) that illustrates which cases we used to address this question.

Table 7.1: Research overview

	Criteria (rq1)		Collaborative design			
			Same time same place (rq2)		Distributed (rq3)	
	Inductive	*Testing*	*Inductive*	*Testing*	*Inductive*	*Testing*
Case 1: ING Group	x		x			
Case 2: ING Corp. IT		x		x		
Case 3: Pro-Rail		(x)			x	x
Case 4: Students		(x)			x	x

We first describe the problem. Then we will discuss the research for and reasoning towards an answer to the problem. Case 1 functions again as an important source for this research (see also table 7.1). Based on the results, we designed two new approaches for the identification of risks in workshops. The new approaches enclose the criteria we defined in chapter 6. To test our approaches in practice, we used case 2. The results of the approach in practice will be presented before choosing the best approach and coming to final conclusions.

7.1 Problem description

Now the criteria for a good risk description have been determined, it is not self-evident that participants actually contribute risk descriptions that meet these criteria in workshops. So, considering the criteria for a good risk description, how should participants of the collaborative process be focussed on the contribution of clearly defined risks? This chapter will address this question.

7.2 Research results

Evaluation of preceding Risk Assessments

Determining a pattern in the risks the participants contributed could make it clear why people had difficulties with the formulation of clearly defined risks. The research was conducted by selecting a random number of identified risks from the preceding risk assessments (case 1, see section 5.1), mix them and evaluate the risk descriptions and try to determine certain similarities.

What emerged from this research was the repeatedly emergence of phrases with the words 'because' and 'due to'. Some examples of the identified risks:

- There are complaints from customers *because* of inaccurate or incomplete processing or verification of instructions.
- Uneven staff evaluation *due to* difference in evaluators criteria.

Words like 'because' and 'due to' indicate that something has happened by reason of something else. This could mean that participants are thinking in terms of "Cause-Effect" relations (see also figure 7.1).

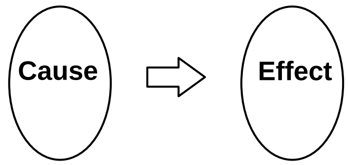


Figure 7.1: Cause-effect relation

Another notification is that all risk documents resulting from the risk assessments are a mix of risks, events (things that could go wrong), the sources of these events (e.g. inadequate procedures) and controls (measurements that reduce the risk).

Expert interviews

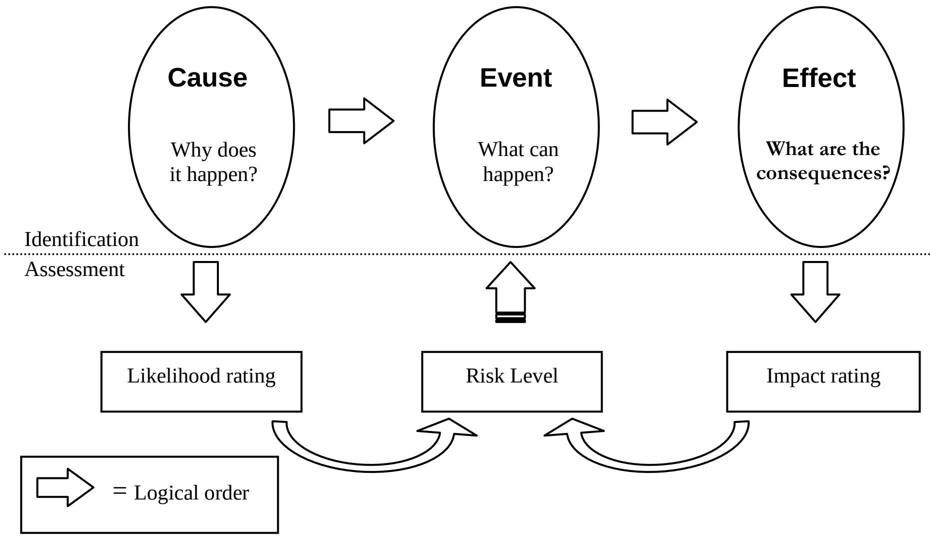
According to all the experts that were interviewed in case 1, the presence of *risk awareness* among participants is very important. Without the understanding of operational risks, it will be very hard to focus participants on the contribution of such risks. Explaining in advance (in a preliminary meeting or written briefing) to participants what operational risks exactly are and why insight in the operational risks is important avoids questions in that direction during the actual workshops. Furthermore, explaining the process and scope of the assessment in advance is also advisable.

Industry's best practices

The evaluation of preceding risk assessments together with the expert interviews provides some insight in the way that participants describe risks. Additional literature was consulted in order to justify our findings and to search for industry's best practices. An industry's best practices is a working method, or set of working methods, which is officially accepted as being the best to use in a particular business or industry, usually described formally and in detail [Cambridge Advanced Learner's Dictionary 2003].

A first best practice is more related to the preparation of the workshops than to the actual workshops. Creating risk awareness among participants in advance is very important for the success of the workshop. A preliminary meeting or briefing in which the purpose of the workshop, the various definitions (e.g. risks, controls) and the process are explained and discussed is of key-importance [Wade and Wynne, 1999; Hulett and Preston, 2000].

In literature and experiences with risk assessments, the confusion among participants whether they should contribute causes or events is explained using the model depicted in figure 7.2 [Tritter, 2000; AusAID 2000; ChandraShekhar et al., 2002; Weigand, 2002].



For example:

- Failing procedures
- Communication problems
- Inadequate HRM

- Internal/external fraud
- Delayed processing
- Business disruption

- Possible financial loss
- Loss of reputation
- Loss of clients

Figure 7.2: Cause-event-effect model

The model points out that in risk management, we are talking about different levels of risks. An event is a situation wherein something has gone wrong. This situation is caused by the malfunctioning, lack of, violation, inadequacy, etc. of procedures, day-to-day operations, management, etc. Risk Management focuses not only on the question "what has happened?" but specifically on "what *can* happen?". In that case, we talk about potential events. Determining the causes of this potential event means that you are looking at the sources of the risks. It is simple for a facilitator to focus the participants on these causes: simply by asking why problems occur and what factors are common across the full set of problems under discussion. This moves the participants into an analytical discussion where causation is the focus [Tritter, 2000]. The sources of risks defined as causes have a certain likelihood of occurrence. This likelihood illustrates the chance of occurrence of the event.
Furthermore, the event has a certain effect or consequence. Rating the consequences of an event means that you are rating the impact of the event. Together with the likelihood rating of the event, this will lead to the Risk Level of the event.
Rating the likelihood and impact of an event is not part of the identification phase. However, to determine a better way to focus participants on the contribution of clearly defined risks, it is important to know where and at what level participants are thinking.

A disadvantage of the model is that it still does not make clear the level on which participants should think. In other words: an event does have certain causes but on their turn, these are caused by other factors, etc. We refer to this as a cause-event chain. It is very difficult to determine where to stop thinking about cause-event chains.

7.3 Risk identification in same time, same place collaborative settings

The purpose of this chapter was to develop a good collaborative design to get to a risk description that adheres to the determined criteria in 'same time same place' settings. This is in line with the practical research objective: enhancing the risk identification phase of ING's R&CSA process to guarantee a higher quality of the results of the identification phase.

Preparation

The preparation of the R&CSA process actually is not part of this research but two aspects should be mentioned about the preparation of the risk identification phase.
A crucial point for the identification of risks is the risk-awareness among the participants. Identifying operational risks for a certain department or business unit requires that participants know what operational risks exactly are and what is expected from them. Making participants aware of operational risks before the actual identification phase takes place prevents discussion and lack of clarity. In general, convening a preliminary meeting or sending a document to participants in which the purpose of the meeting is explained together with a clarifying context prepares the participants for the meeting.

Process

The main resources in the identification phase are the people participating. Thus, in order to ask the right questions in the identification phase resulting in clearly defined risks, the facilitator must gain some insight in the way that participants think. The way in which participants make meaning out of something is referred to as framing [Clawson and Bostrom, 1996]. A frame is a template or pattern that participants mentally impose on a situation. Participants are all bringing their own frame to a meeting and it is the task of the facilitator to determine the best "group frame" [Clawson and Bostrom, 1996].
The evaluation of the preceding risk assessments led to the observation of the repetitive use of words like 'because' and 'due to' and subsequently figure 7.1 which depicts the cause-effect relation.

Together with the best practice study, this observation resulted in the determination of a frame like Clawson and Bostrom propose [Clawson and Bostrom, 1996]. Figure 7.2 depicts this frame in which participants tend to think in terms of cause-effect relations. However, this frame only clarifies the relations between the aspects: a cause leads to an event and this event results in a certain effect. The frame does not make clear how participants perceive these relations. The logic of the cause-event-effect relation does not always have to be logical to participants. Moreover, the evaluation of the preceding risk assessments and the conducted interviews point out that participants have severe problems with the identification of risks. Nevertheless, asking participants "what can go wrong" (events) in their department or business unit on a day-to-day basis is perceived less difficult. This question is easier to answer for participants because of their acquaintance with daily processes. Reasoning why these events happen and determining the "roots" of the problem stimulates participants to think about the causes and thus risks of these events. Furthermore, the effect from an event can only be estimated when the event is known (following the logical order).

The advantage of an approach based on the identification of events and the determination of the causes of these events is that participants are stimulated to think into more detail about the causes of an event. This instigates participants to think thoroughly about risks and the context of the risk.

The frame as depicted in figure 7.2 can be extended with the way in which participants think resulting in a final frame as depicted in figure 7.3. The white arrows represent the logical order; the black arrows represent the way in which participants are thinking.

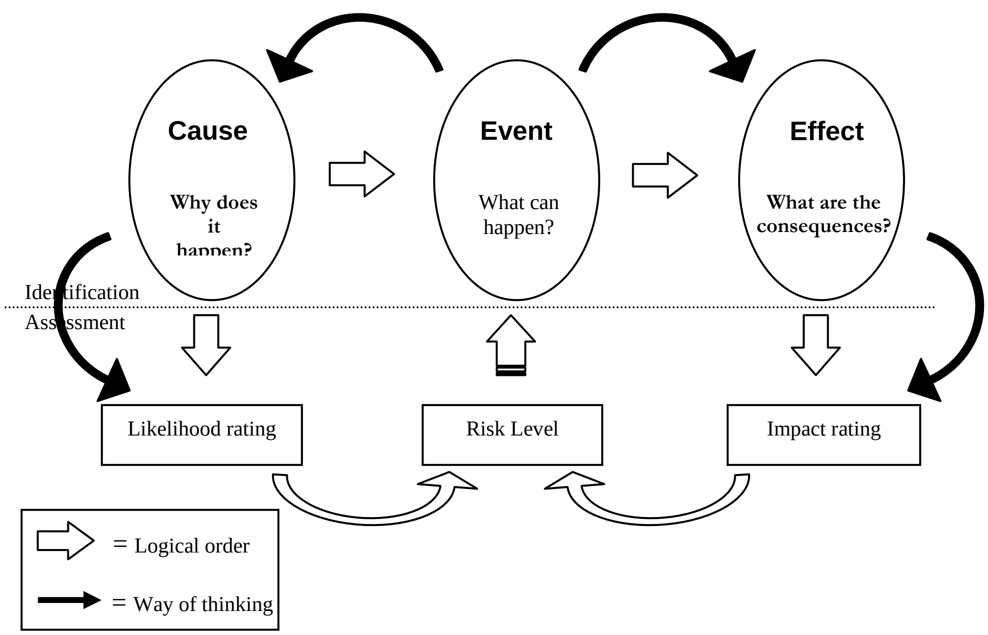


Figure 7.3: Participants frame

A disadvantage of the frame is already mentioned in the section about best practices (section 7.2): causes of events may have causes themselves, etc. This can result in a never-ending discussion about the causes of an event. How to avoid these discussions will be described in the section about the role of the facilitator.

Knowing the frame wherein participants think in workshops is a great advantage. However, know-how about the frame is not useful when no proper actions are taken to make use of the advantages of the frame. Additionally, the frame does not imply that participants will contribute clearly defined risks.
The identification phase at ING is split up in four activities. These activities are based on thinkLets (see also chapter 3 for an explanation of thinkLets):

1. DirectedBrainstorm: identification of risks for all relevant themes.
2. FastFocus: formulation of the most important risks.

3. PopcornSort: categorisation of the risks into the relevant themes.
4. BucketWalk: check the correct categorisation and clear meaning of each risk.

The identification of risks mainly takes place during the first two activities, so the first two activities are most important for the identification of clear risks. Consequently, especially these two activities should be designed in line with the frame of the participants as depicted in figure 7.3. Two new approaches are designed based on the first two steps in the identification phase.

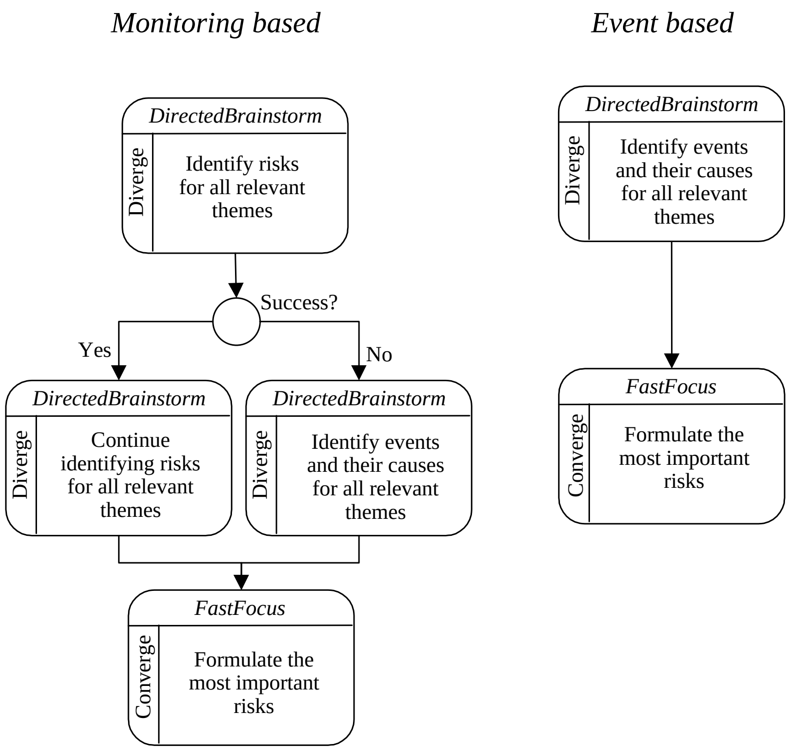


Figure 7.4: Two new approaches

The first approach, monitoring based, is depicted in figure 7.4 (left). Participants are asked to identify risks using the present approach: DirectedBrainstorm. During this activity, participants are prompted with the relevant themes (impact areas). While the participants are identifying risks, their contributions have to be monitored intensively. When it is noticed that participants tend to have difficulties with the identification of risks, the activity has to be stopped. The facilitator then has the choice of continuing the process in the current way or decide to give the participants a new direction. This new direction is based on the cause-event-effect relation: participants are asked to think about things that can go wrong in their department and identify the possible causes for these events. After participants have either defined risks or identified events and causes, the FastFocus activity is carried out to formulate the most important risks.

The second approach is event based (as depicted in figure 7.4 right). It is partly similar to the first approach. The difference is that the activity is not started with the identification of risks but it is started with the identification of events and causes immediately from the beginning.

During this activity, prompts will be given to the participants to focus them on the relevant themes. This activity is succeeded by the FastFocus to formulate the most important risks.

To determine the best approach for the R&CSA process, the advantages and disadvantages of the approaches have to be compared.

- First of all, asking participants to contribute events with the causes of these events creates a clarifying context making it easier for other participants to understand and recognise the situation that is described.
- Having a decision point in the process keeps the process open for adjustments and gives a certain freedom and flexibility to the facilitator in the design of the process.
- A disadvantage of asking the participants to identify events with their causes is that it becomes more time consuming to formulate the most relevant risks. A lot more discussion is needed to come to this formulation. However, participants tend to have more affinity with events and causes than with risks. Moreover, starting with a relatively easy task and gradually working towards a clearly defined risk can be easier for participants. This approach also makes participants more aware of the risks because they are expected to think about every event, every cause and the formulation of the exact risk.

Both approaches are useful, but there is a preference for the first option. The reason for this is that the first option keeps a certain flexibility in the process. The participants that are invited differ from business unit to business unit and it can not be said that they all think in the same way. For some participants it will be easier to contribute risks than for others. Keeping open some possibilities to change the design of the workshops can be very useful in certain situations.

Assigning the criteria

Adopting a new approach for the identification phase will not ensure the identification of clearly defined risks. We have determined to which criteria a good risk description has to adhere. The criteria were:

Comprehension related criteria:

- Risk-awareness among participants;
- Every participant understands the risk description;
- Risks must be described unambiguously (in short, clear terms);
- The risk concerns the group's field of activity.

Component related criteria:

- The presence of a *Value at Risk*
- An *event*: the cause of why the value is at risk: a potential situation;
- The *cause* of the event: the deeper lying, structural cause of the event;
- The *likelihood* of the cause: the chance that the event actually occurs;
- The *effect* or consequence of the potential situation: the potential damage.

Although some criteria are already covered in the process, we have to make sure that all nine criteria are covered in the process of risk identification. In chapter 3, we already mentioned that in order to be productive, teams have to engage in three simultaneous processes:

communication, deliberation and information access (see section 3.5). Each process requires certain attention and thus cognitive effort. Considering the limited cognitive effort of participants, we assume that it would be very hard for participants to contribute risks that adhere to all nine criteria. The cognitive effort to do this would be too large. Therefore, not all criteria can be covered at once. The criteria have to be assigned to activities (steps in the process). The succeeding section will describe this. The comprehension criteria are assigned to persons who are involved in the process, e.g. the Facilitator or Devil's Advocate[9]. The component criteria are assigned to the activities in the identification phase.

We already mentioned that the first criterion, risk awareness among participants, is best covered in a preliminary meeting. The facilitator has to make sure that a preliminary meeting is planned.

Second, making sure that every participant understands the identified risks is the task of the facilitator and the participants. The facilitator has to ask the participant whether they all understand the contributions and discuss the risks that are not clear to everyone. It is important that participants indicate when they do not or only partly understand a risk.

The third criterion, describing risks in clear and short terms, is the task of everyone who is involved in the process: the facilitator, the devil's advocate as well as the group of participants. Working towards a clear risk description is a collaborative process so everyone involved has to monitor that such risks are formulated.

The fourth criterion implies that identified risks have to concern the group's field of activity. In other words, the purpose of the workshop is to identify the operational risks within the defined scope. Other risks can be identified but discussions about these risks should be avoided. It should be discussed in advance what is done with these risks. These risks can be left out of the workshop, they can be "parked" or they can be transferred to the risk owner. Discussions about risks that lead to a cause-event chain (see section 7.2) should end when the scope of the assessment is exceeded. The devil's advocate and the group together have to determine whether a risk actually concerns the group.

The component criteria are covered in the process. The enhanced design-approach is depicted in figure 7.4. When the DirectedBrainstorm activity starts, the facilitator, the devil's advocate and even the initiator of the meeting (if present) should monitor the contributions. This activity is very dynamic and participants are generally contributing very much. The chance that participants are contributing in a different way than desired is therefore considerable. Close monitoring is required to avoid this stray from the subject. When the facilitator or devil's advocate is noticing that participants are not contributing clear risks, the activity has to be stopped. At this point, the facilitator has to decide what to do. He can either explain what is desired from the participants, or he can decide to use the different approach. A first important aspect of the new approach is to keep the contributions that are

[9] As we stated in chapter 2, the Devil's Advocate is a person who encourages the participants to take a balanced view of their own ideas, challenges the opinions of the participants with examples and own experience.

collected. When the latter is chosen, the facilitator has to explain to the participants why the activity was stopped and make clear what the new approach is.

As depicted in figure 7.4, the new approach is based on the cause-event relation derived from the participants frame (figure 7.3). The facilitator has to explain that the participants have to think about things that can go wrong within their department and the cause of this event. Prompts on the relevant themes can be given during the course of the activity.

When participants think they have contributed all important events in combination with the causes, the process can move on to the FastFocus activity. The FastFocus is split up in the FastFocus Selection and the FastFocus Reformulation.

During the FastFocus Selection, every participant may speak out the most important event that is written down in the list in front of the participant. Participants can also speak out a risk that is derived from a number of contributions that could be combined. When a participant has selected a risk, the facilitator has to make sure that every participant understands the risk. At the same time, the devil's advocate and the group has to consider whether the risk concerns the group's field of activity.

The FastFocus Reformulation is very important because it is the final step to a clearly described risk. The reformulation of the risk means that risks have to adhere to the five component criteria (Value at Risk, Likelihood, Cause, Event and Effect) and the comprehension criterion that is not covered yet: short ambiguous terms.

Table 7.2: The criteria embedded in the process

Activity	Objective	Responsibility
Preparation	Risk Awareness	Preliminary meeting/Facilitator
Directed BrainStorm	Cause-event relation	Facilitator/Devil's Advocate/Group
FastFocus Selection	Understanding	Facilitator
FastFocus Reformulation	Clear risk definition (adhering to the five component criteria)	Facilitator/Devil's Advocate/Group
	In short unambiguous terms	Facilitator/Devil's Advocate/Group

The FastFocus activity is the most important step within the new approach. The facilitator and the devil's advocate must constantly challenge the participants to think about the real causes of the event. Events can have several causes which, on their turn, are caused by more basic causes (the cause-event chain). The facilitator must guard this process because it is undesirable to have long discussions about causes and underlying causes. Cause-event chain discussions should end and summarised when the scope is exceeded. The facilitator has to support these discussions resulting in consensus among the participants and a satisfying formulation of the risks. These risks have to satisfy the determined criteria. The devil's advocate has to challenge the participants to think about the risks and to stimulate them to define these risks properly.

The result of the FastFocus is a set of clearly defined risks satisfying the criteria that are determined in the first part of this chapter. These risks can then be used in the succeeding activity: the PopcornSort. In comparison with the present approach of this activity, nothing has changed. The most relevant themes (categories) have been determined in the desk research and participants are asked to sort the risks into the relevant categories. When not all risks can be categorised, participants can determine additional categories. After the categorisation is completed, a BucketWalk has to point out whether all risks are placed in the right categories.

An important aspect of the identification phase is the possibility of iteration. During every activity within the identification phase, it should be possible to move back to a previous step. This makes it possible to for instance re-phrase risks if participants mention that a risk is not properly described.
The identification phase is finished when participants agree on the fact that all important risks are identified. The results of the identification phase are the basis for the next phase: the assessment.

7.4 Applying the new approach to practice

In case 2 and the face-to-face workshop of case 3, we tried both approaches in order to determine the most appropriate approach and to determine whether participants actually contribute risks that adhere the determined criteria.

What emerged from both cases was the shortfall of our recommended approach (figure 7.4, monitoring based). The causes for this were:

- Before the facilitator or Devils Advocate actually observe a stray from the contribution of clear risks, participants will be a number of steps further in their thinking and contributions. So the rapid process makes it harder to monitor the participants.
- The contributions of participants will always be a mixture of clear and less clear described risks. It was difficult to determine when participants had to be stopped to change the approach.
- In spite of the flexibility in the process with respect to the monitoring based approach (figure 7.4) it is not recommended to change the approach. When participants are stopped and asked to contribute 'causes and events' instead of 'risks', they will be rather confused.

The second approach was perceived better. Participants had less difficulty when they were asked: 'What can go wrong and what is the cause of this situation?'. They could more easily point out what they meant and what their concern was.

Although the participants perceived the second approach better, we observed that they had considerable difficulties with the formulation of clear risks in case 2. During the course of the workshop, it became clear that this was not due to the new approach but another aspect that is of high importance for the quality of the outcomes of the risk assessment: the scope. We have not discussed this topic so far and we will only briefly address this aspect. The scope (what will we discuss and what not) was taken to broad, resulting in the inability of participants to formulate clear risks. Risks that are described in general terms (e.g. "Risks related to the decrease of the separation between private time and office hours for large groups of employees") are also hard to quantify (on impact and likelihood) in the assessment phase.

In case 3, participants reacted positively with respect to the approach. Although some risks were discussed very extensively, the discussion always resulted in a clearly described risk. The way the facilitator and some participants were trying to get the risk as clearly described as possible can be seen as excessive but these discussions were functional for the understanding of all the participants.

7.5 Conclusions

The objective of this chapter was to determine a good collaborative approach to come to risk descriptions that adhere to the criteria as defined in chapter 6.

Chapter 6 concluded with nine criteria a risk description has to adhere to. We argue that the presentation of these criteria does not automatically guarantee the contribution of clear risks. The cognitive effort of the participants will be too high when participants are asked to contribute risks that adhere to the nine criteria. In order to solve this, insight in how participants think in a risk workshop is required.

Our research resulted in a model that explained and gives insight in how participants think in a risk workshop. The model illustrates that, regarding risks, participants tend to think in terms of causes, events and effects. On the basis of this model, we defined two new approaches and assigned all the criteria to these approaches. We tested both approaches in practice and chose the best one, the event based approach.

This approach has three main advantages. First, the approach is based on the evaluation of several risk assessments and therefore practical and easy to implement. Second, it helps a facilitator to direct a group of participants toward the contribution of clearly described risks. Last but not least, the approach not only results in clearly described risks but also makes participants more aware of what a risk exactly is.

Further research

Our approach proved to be very useful in risk assessment workshops. A disadvantage of performing risk assessments in workshops is that it is a time consuming and thus costly process. Although we do not address time or cost in this thesis report, experience shows that the identification phase generally takes approximately 2-3 hours. Moreover, planning a risk assessment workshop appeared to be very difficult.

It is thus an interesting area of research to explore the possibilities of performing the risk identification phase in a (partly) distributed way. This enables participants to work from behind their own desk. An important question in this distributed way of working is whether our approach also holds for this way of working.

Chapter 8 Risk identification in distributed settings

In the introduction and the background (respectively Chapter 1 and 3) of this thesis report, we already mentioned the increasing demand and possibilities for distributed ways of working. However, little research has been carried out on this topic. In this part of the thesis report, we focus our attention on distributed collaboration in risk management and, in particular on the risk identification phase.
This chapter contains the design of two new thinkLets. As depicted in table 8.1, we used case 3 and 4 as base for our designs. Case 4 also functioned as a case wherein the designs were tested.

Table 8.1: Research overview

	Criteria (rq1)		Collaborative design			
			Same time same place (rq2)		Distributed (rq3)	
	Inductive	*Testing*	*Inductive*	*Testing*	*Inductive*	*Testing*
Case 1: ING Group	x		x			
Case 2: ING Corp. IT		x		x		
Case 3: Pro-Rail		(x)			x	x
Case 4: Students		(x)			x	x

We designed a thinkLet for a distributed brainstorm on risks and one thinkLet to create a shortlist of key risks in a distributed environment. These two thinkLets will be discussed separately. They will be tested in practice and evaluated on their functionality, ease of use, cognitive effort for participants and user satisfaction in order to come to founded conclusions for a final design.

8.1 Problem situation

In chapter 6, we defined a set of criteria for a good risk description. Chapter 7 dealt with a collaborative design to get to the criteria in 'same time same place' settings. This design will not necessarily hold for a distributed setting due to for instance the absence of face-to-face communication. We strive for an approach that is independent of time and place, meaning that participants can collaborate whenever and wherever they want. This approach has to deal with many difficulties to counterbalance certain required aspects that are absent.
We can summarize this in the following research question: What is a good collaborative design to get to a risk description that adheres to the determined criteria in distributed settings?

8.2 Additional background

Chapter 3 provides a theoretical base for our research on distributed collaboration. To further elaborate on this subject, we need some additional background focussed on experiences in the field.

Literature

The experience with distributed teams is rather scattered. Distributed GSS and distributed ways of working is such a broad research area, that research is divided among dimensions like facilitation, participation, technology, etc.

In order to successfully design a distributed process, it is important to do this in such a way that the negative aspects of the factors that determine team performance are minimised as much as possible. One decisive aspect is the technology: Teamwork is important so technology must not form a barrier for participants [Vogel et al. 2000; Zhao et al. 2002; Romano et al. 1999; Turoff et al. 1993]. Lowering the barrier is supported by good instructions and mentioning that there is no other way to do or plan the activity [Romano et al. 1999]. It is recommended to do this in a preliminary same time same place meeting in which the project is kicked off and commitment can be confirmed [Romano et al. 1999].

Burke and Chidambaram [1996] suggest that distributed media may limit unnecessary and possibly distracting social interactions, which result in improved task focus. However, Hiltz et al. [1991] proclaim that groups that interact only in an online fashion, whether synchronous or asynchronous, may lack the necessary cues and mechanisms to coordinate their interactions. This claim is partly confirmed by Vogel et al. [2000] who suggest to stimulate action among participants from the start of the process through the planning of synchronous sessions.

Expert consulting

Throughout the world, there have been some researchers who gained experience with distributed collaboration. These experiences have been gained in synchronous as well as a-synchronous meetings. The consulted experts mentioned that activities that require relatively little group interaction in normal meetings, will not turn out to be very difficult in distributed settings. However, activities that require considerable interaction and collaboration (for instance getting agreement among team members and coming to conclusions with the group) will be difficult to perform.
We have taken the advices from the experts in account in the development of the new approach.

8.3 Risk Identification in distributed settings

Although literature provides some requirements and recommendations concerning teams working in distributed settings, it is seldom defined exactly which tools and what configuration is used.

In Chapter 7, we determined an approach for risk identification in same time same place settings. This approach proved to be very useful in workshops, therefore we decided to base our distributed approach on the same time same place approach.

Before we develop an approach for risk identification in distributed settings, we first try to predict the difficulties that will arise in the distributed setting. Adopting the distributed setting means that direct verbal interaction is no longer possible so all activities with some kind of required direct interaction will become harder. In the table below, we describe the thinkLets that we used in the same time same place approach together with a short description of the thinkLets. On the basis of this description, we determine some expected difficulties that have to be covered.

Table 8.2: thinkLets and the expected difficulties in distributed settings

ThinkLet	Same time same place setting	Expected difficulties in distributed setting
DirectedBrainstorm	All participants get a piece of paper and are asked to contribute one risk on the piece of paper. After they are finished, they have to hold their piece of paper in the air. The facilitator will switch the pieces of paper between the participants. The facilitator will prompt participants during this process to think in a certain direction.	• Due to the distributed setting, prompting participants will become difficult.
FastFocus	Participants are asked one by one to choose the single most important risk on their piece of paper. The risk is reformulated by the participant(s) and written down on a separate list.	• Asking the participants for their single most important risk • Putting these risks on a separate list while participants still have an overview of the risks on their 'piece of paper' • Reformulating these risks with the group
PopcornSort	The risks on the separate list are categorised in predefined categories.	
BucketWalk	The placing of the risks in the categories is checked.	• Agreement about the correct placing • Check understanding

An advantage is that thinkLets were originally developed for use in a Group Decision Room with the GroupSystems software. The thinkLets were defined according to the functionalities of the software. In the past decade, thinkLets have proved their value and functionality in accordance with the GroupSystems software [Briggs et al. 2001; 2003a; Vreede et al. 2003] by supporting facilitators in their guidance of the group. We therefore argue that using the GroupSystems software gives us a good starting point for the design of a distributed collaborative approach of the identification phase.

To cope with the difficulties we defined, we have to adjust the presently used thinkLets and try to make them suitable for a distributed approach. The previous chapters revealed that the first two thinkLets are most important: the DirectedBrainstorm and the FastFocus. To focus our research, we decided to translate these two thinkLets towards a distributed environment. We will discuss these two thinkLet separately (section 8.4 and 8.5).

8.4 Distributed DirectedBrainstorm

Translating the DirectedBrainstorm thinkLet towards a distributed setting means that we have to cope with the problem of prompting participants of a workshop. The present approach is that the facilitator monitors the contributions of the participants and gives a certain direction to the participants when the participants stray from the subject of the workshop. The facilitator effectuates this by saying "Now, try to think about….".
Because we exclude verbal communication with participants as much as possible, we have to find a way to solve this.

8.4.1 ThinkLet design

Practically, we have designed a new thinkLet. Following the thinkLet approach, we describe our approach according to the three components a thinkLet consist of.

Tool:

The Groupsystems™ software or GroupSystems™ Online:

- Electronic Brainstorm
- The Whiteboard function

Configuration:

- Participants may contribute comments (risks) at the pages in the Electronic Brainstorm tool.
- Participants are not allowed to delete or edit contributions.
- Prepare prompts on separate Whiteboard pages.
- Participants are not allowed to contribute any drawings on the Whiteboard.
- Participants are not allowed to view multiple pages of the Whiteboard.

Script:

1. Make sure the participant(s) are ready to start the session.
2. Start participant(s) in the Electronic Brainstorm.
3. When the number of new contributions is decreasing, switch the leader to the Whiteboard and select the prompt you want to use.
4. Match views with all participants, wait about 10 seconds and then stop the participants in the Whiteboard.

5. Repeat step 3 and 4 until the number of contributions no longer increases.

Due to the uniqueness of this new approach and the lack of comparable studies, we are not yet able to compare any findings on productivity and determine whether this approach is better than another. This requires more quantitative data. What we can do, is determining how participants rated on the processes and circumstances that determine team productivity according to Focus Theory (see Chapter 3). With these results, we can determine on which process we should give more attention in order to optimise the balance between the three processes participants are engaged in (communication, deliberation and information access). Optimising the balance influences team productivity positively. Making sure that goal congruence is high and avoiding distractions can also influence the team productivity in a positive way.

Furthermore, we are interested in how participants like the distributed way of working, how they think of it, whether they think it is more effective or productive, etc.
Another aspect of interest is the technology, in order to come to a usable approach, we also have to ensure that the technology is working properly.
A final aspect is the user satisfaction. The final opinion of participants regarding the session represents their opinion of the combination of all relevant aspects that are of influence on the process.

8.4.2 Distributed DirectedBrainstorm in practice I: Case 3

In case 3, the involved participants had little time to plan a face-to-face meeting to perform a full risk assessment. Therefore, we decided to plan an a-synchronous distributed meeting and use the Distributed DirectedBrainstorm thinkLet to gather a large amount of contributions and to make a first big step in the process.

As we stated above, we will evaluate our thinkLet on four aspects: productivity, appreciation of the distributed way of working, the technology that is used and the overall user satisfaction. These aspects will be discussed separately.

Productivity

In the next section we will address every aspect of Focus Theory separately (see also chapter 3). First we address the communication, deliberation and information access, followed by the goal congruence and distractions.

Communication

In general, participants responded positively with respect to the communication. Participants rated the ease of communication high: scores varied between 5.4 and 5.6 (see table 8.3). Agreement about the ease of communication was good except on the question whether it was easy to understand the contributions of other participants. The standard deviation was influenced negatively by one participant.

Table 8.3: Communication

Questions on Communication	n	m	Std
It was easy to understand the contributions of other participants	10	5.4	1.43
It was easy to make others understand my ideas	10	5.6	0.97
I had the feeling that other participants understood my ideas easily	10	5.6	0.70

n = number of respondents
m = average scoring of participants (7-point scale: 1=strongly disagree; 7=strongly agree)
Std = standard deviation

Based on the ratings of the participants in the questionnaire we conclude that with respect to communication: reducing the cognitive effort for participants to communicate makes it easy for participants to communicate with other participants and enables participants to put more cognitive effort in other processes.

Deliberation

The questionnaires reveal that although the overall score on deliberation is positive (scores ranging from 5.2 to 5.6, see table 8.4), there is a lot of disagreement among participants with respect to the activities that were performed to achieve the session goal, the duration and the intensity. This can be deduced from the relatively high standard deviations that resulted from the questionnaires (ranging from 1.14 to 1.25) but also from the interviews: four participants responded in the interview that some activities lasted too long and input got forced or attention decreased. However, not all participants put this comment forward.

Table 8.4: Deliberation

Questions on Deliberation	n	m	Std
The processes we used today were appropriate for this session	10	5.6	1.17
I feel satisfied with the way we went through today's activities	10	5.3	1.25
I am satisfied with respect to the procedures we used today	10	5.2	1.14

n = number of respondents
m = average scoring of participants (7-point scale: 1=strongly disagree; 7=strongly agree)
Std = standard deviation

Based on the results as described above, we conclude that in distributed settings, the deliberation is of high importance. The activities that have to be executed need to be clear and participants have to agree on these activities. Otherwise, participants have to give increasing attention to deliberation. A disadvantage is that the facilitator will not always be able to explain the intention of the activity immediately when he/she is distributed in time because his/her location can be in another time zone (office hours in America are starting when the Europeans return home) or the facilitator is busy with other activities.

Information access

The participants rated the ease of information access and the effort it took, positively (see table 8.5). The high standard deviation is due to one participant who rated 2 in both cases. Other participants all rated approximately 5. The reason for this is unclear. An explanation could be that the participants did not think information access was an issue in this risk assessment and therefore rated low on these questions. The interviews did not reveal any difficulties with the information access.

Table 8.5: Information Access

Questions on Information Access	n	m	Std
It was easy to access information	10	5.4	1.51
It took me little effort to get the information I needed	10	5.1	1.29
I had a good feeling with respect to the information that other participants contributed	10	5.3	1.06

n = number of respondents
m = average scoring of participants (7-point scale: 1=strongly disagree; 7=strongly agree)
Std = standard deviation

We argue that information access is not a big issue in the Distributed DirectedBrainstorm. The participants are asked to come up with all the operational risks they know about in their working environment. There is no information needed to contribute these risks. Therefore, we think that information access is less an issue in this approach.

Goal Congruence

Referring to table 8.6, the agreement about the conformance of the team goals with the individual goals was low (std of 1.14). A low rating of one particular participant led to this high standard deviation. However, the participants do subscribe to the goals of the session (mean of 6.2). The feeling about the goals that were set for the session fluctuated a lot among participants. Two participants who rated this question noticeably lower than other participants caused the high standard deviation. One of these two was the participant who also rated the first question low.

Table 8.6: Goal Congruence

Questions on Goal Congruence	n	m	Std
Today's goals were in conformance with my personal goals	10	5.8	1.14
I subscribe to the goals of this risk management session	10	6.2	0.42
I have a good feeling of the goals that are set for today	10	5.1	1.45

n = number of respondents
m = average scoring of participants (7-point scale: 1=strongly disagree; 7=strongly agree)
Std = standard deviation

An evaluation of how this participant rated on the other processes and user satisfaction (user satisfaction will be discussed later on in this section) reveals that he/she is more critical on the other questions in comparison to the other participants (in 21 of the 42 posed questions, the participant rated lowest). Obviously, the goal of the participant did not match the goal of the group. Consequently, this participant rated lower on a relatively high number of questions. Considering Focus Theory, the goal congruence is an input for the process and thus a fixed factor. Without a certain level of goal congruence, participants will put less cognitive effort into the process and consequently they will have more difficulties with the three underlying processes: communication, deliberation and information access. This results in a lower productivity rate. This stresses that the selection of participants should be done with care or more effort should be put on goal congruence.

Distractions

Distractions are hard to avoid in distributed settings because the facilitator is not physically present at the participant's location. Avoiding distractions is limited to avoiding distractions

with regard to the process because the facilitator cannot avoid that for instance someone enters the room and starts talking to the participant.
Regarding the process, the interviews with the participants revealed that prompting was experienced as a distraction. Participants lost their contribution they were writing on when the prompt was given by the facilitator. To avoid this, we should find a way to prompt participants without disturbing them too much in their process but ensuring that they get the prompt.

Distributed Collaboration

With respect to the distributed collaboration, participants responded positively to the questionnaire. All participants agreed on whether they were pleased with the electronic collaboration, they rated it 5.8 (see table 8.7a). Whether the electronic collaboration was appropriate for the goal of the session was evaluated positively by seven of the ten participants and moderate by the other three, resulting in a standard deviation of 1.37 (see table 8.7a). The participants perceived the electronic collaboration as practical, but two participants did not agree on this point. One of these two participants was the participant whose personal goal of the session did not match the groups' goal.

Table 8.7a: Distributed Collaboration

Questions on Collaboration	n	m	Std
The electronic collaboration with other team members pleased me	10	5.8	0.92
The electronic collaboration was appropriate for the pre-set team goals	10	5.9	1.37
I perceived the electronic collaboration with other team members as practical	10	5.8	1.14

n = number of respondents
m = average scoring of participants (7-point scale: 1=strongly disagree; 7=strongly agree)
Std = standard deviation

Participants responded that this new way of working increased the participation of the group. They rated this item 6.0 (see table 8.7b). Furthermore participating from behind one's own desk made the meeting effective (participants rated 4.7) and slightly more productive than a normal risk assessment. They rated this question 3.5 where 1 is highest.

In general, participants were positive about the distributed way of working for similar activities and were willing to participate again in a distributed setting. Rates were 5.8 and 5.7 respectively (see table 8.7b).

Table 8.7b: Distributed Collaboration

Questions on Collaboration	n	m	Std
The ability to participate in a risk management process from behind one's own desk increases the participation in risk management sessions	10	6.0	0.94
A risk management session from behind one's own desk is more effective than a normal meeting	10	4.7	0.82
A normal risk management session would have been more productive than a risk management session from behind one's own desk	10	3.5	0.53
For similar risk management activities, working from behind one's own desk is suitable	10	5.8	1.03
For the realisation of risk management sessions, I would like to work again from behind my own desk	10	5.7	1.06

n = number of respondents

m = average scoring of participants (7-point scale: 1=strongly disagree; 7=strongly agree)
Std = standard deviation

However, the results reveal three important dependencies. The support for working in a distributed way is influenced by the following three aspects.

First, the technology has to work properly. The opinion of participants with respect to the distributed way of working drops dramatically when the technology is malfunctioning. The possibility to participate this risk management process from behind one's own desk is evaluated very positive in the questionnaire (6.2) but this is influenced by a standard deviation of 1.87 (see table 8.7c). The disagreement is caused by the inability of one of the participants to participate from behind his/her own desk due to technical restraints. This resulted in the allocation of a low score.

Second, if the personal goal of a participant differs from the group's goal, the willingness to participate and thus the rating of these participants is lower. This can be hazardous for the progress of the group process.
Finally, the system we used required that the facilitator had to be online when participants logged in to the system. This led to diminished flexibility for participants in going online whenever they wanted. In the questionnaire (see table 8.7c), participants did not agree on the ability to participate at any time (std of 2.26). Two aspects can explain the reason for this disagreement: as we already discussed, one participant had to cope with technical restraints so he/she could not participate whenever he/she wanted. Another participant rated also low on this question. In a comment, he proclaimed that the facilitator influenced the flexibility of participation. This was due to the fact that the technology required that the facilitator had to start and shift participants in activities.

Table 8.7c: Distributed Collaboration

Questions on Collaboration	n	m	Std
The possibility to participate in this risk management process from behind my own desk pleased me	10	6.2	1.87
The possibility to participate in this risk management process at any time pleased me	10	5.7	2.26

n = number of respondents
m = average scoring of participants (7-point scale: 1=strongly disagree; 7=strongly agree)
Std = standard deviation

The ability to work together in a team from behind one's own desk is a relatively new phenomenon but with a lot of potential. Although the technology is still a restrictive factor in distributed ways of working, the willingness and cry for this way of working is becoming louder. Distributed teams will experience increasing participation, effectiveness and productivity rates.
The participants of our case confirmed these statements. Participants were curious about this new way of working and enjoyed working from behind their own desk. It gave them a head start for the face-to-face meeting. Practically all the interviewed participants enjoyed participating and recognised the value of the distributed way of collaboration. The majority of the interviewed participants experienced no difficulties in understanding the functionality of the system and was satisfied with the instructions they received.

Technology

The technology we used has proved its value in the course of time in same time same place settings [Briggs et al. 2001; 2003a; Vreede et al. 2003]. However, the technology has not yet been used on a large scale in distributed settings and especially in a-synchronous distributed settings. We used two functionalities of the software: the Electronic Brainstorm and the Whiteboard. We are interested in the question how the combination of the two functionalities is appreciated and what difficulties emerged.

The difficulties with respect to the technology that emerged from the research:

- Participants lose the contributions they are working on when they are prompted: when a prompt is started, the active participants will be confronted with the question whether they want to submit their contribution before closing. In other words, participants are unable to finish their contribution.
- Starting and stopping participants in the two functionalities of the software is an intensive process for the facilitator, especially when two or more participants are online simultaneously. This was also the case when individual participants had to be prompted.

Participants were more critical with respect to the process. First of all, they wondered why the DirectedBrainstorm activity contained so many electronic pages. In a same time same place setting, the number of pages is generally determined by taking the number of participants and add one extra page. This is done to be able to supply every participant with an electronic page and to avoid an information overload. Information overload is the situation that the electronic pages have such a large number of contributions on them, that participants are no longer able to gain insight in all the contributions. We followed this guideline in our Distributed DirectedBrainstorm.
In the distributed setting, the probability that all participants are online simultaneously is very small. Therefore, the number of pages can be diminished. An additional reason to diminish the number of pages is that the number of redundancies is low. In general, we observed that the participants who started the DirectedBrainstorm activity first read through all the separate pages before they actually started contributing. The low number of redundancies helps in avoiding an information overload. Consequently, the number of pages can be diminished.

Finally, after performing the activities, some participants indicated in the interview that they were wondering which other participants were participating in the project and which of them were online. The participants responded that a list with the team members and their status (online or offline) would increase their own commitment because they would not have the feeling that they were performing the activities alone.

User satisfaction

User satisfaction among the participants differed a lot. Whether the risk management session was worth the efforts and the time spent on it was rated positive (5.7 and 5.5 respectively) but agreement was scattered.
The satisfaction with the session process had a very high disagreement among participants (1.60). Two participants rated this question low. One of them had difficulties with

participation due to technical restraints; the other participant was the same who rated questions on the goal congruence low.
These two participants also influenced the rating about the feeling about the risk management negatively.

Table 8.7: User satisfaction

Questions on User Satisfaction	n	m	Std
This risk management session was worth my efforts	10	5.7	1.06
The result of this risk management session are worth the time I spent on it	10	5.5	1.18
I am satisfied with the session process	10	5.1	1.60
I have a good feeling about this risk management session	10	5.4	1.35

n = number of respondents
m = average scoring of participants (7-point scale: 1=strongly disagree; 7=strongly agree)
Std = standard deviation

8.4.3 Distributed DirectedBrainstorm in practice II: Case 4

In case 4, we invited a group of students to perform two steps in the risk identification phase: the Distributed DirectedBrainstorm and the Distributed FastFocus. In this section we will only discuss the Distributed DirectedBrainstorm. The lessons from case 3 together with the adjustments we made to the approach are:

- Goal congruence: participants have to agree on the group goal. Without this understanding, the willingness to participate in the group process will be low. Careful selection of participants is important. We solved this by eliminating this aspect and invited students who were willing to participate in this project.
- Distractions: the prompting was considered as disturbing. To avoid irritation among participants and losing of contributions, we adjusted the prompting mechanism. Instead of disturbing participants by disturbing the activity on which they are busy, we use a separate computer screen to give the prompt to the participants. This means that we use one process laptop and one communication laptop. We still use the Whiteboard function to present the prompt. However, this can also be solved with a sub-screen or communication console.
- Deliberation: Some participants remarked that the process lasted too long (for instance the time between prompts). This can be solved by monitoring the productivity of separate participants (e.g. number of contributions per time period). However, this individual monitoring is not possible with the software version we used. This aspect is a first recommendation for the software producer.

Observations

The activity elapses better when the prompts are given via the separate communication channel. Participants can contribute without being disturbed by the intruding prompt. The prompts were written in coloured letters to attract the attention of participants.

Participant interviews

Although the activity went by well, some participants responded that they sometimes did not notice the prompts at all. This was due to the fact that the prompts were given on the other screen and participants were highly focussed on the contribution of risks on the other screen. In spite of this, participants were very satisfied about this process and thought it created large possibilities for distributed teams.

8.4.4 Final design

The final design of our Distributed DirectedBrainstorm thinkLet is based on the experiences we gained with the thinkLet. We emphasise that the final design of the thinkLets is based on the functionality of the software. After the final design, we present some recommendations for the software.

Distributed DirectedBrainstorm

Tool:

The Groupsystems™ software or GroupSystems™ Online:

- Electronic Brainstorm
- The Whiteboard function

Two screens (or screen areas) per participant, this can be realised by taking two laptops or two desktop computers. We refer to them as Comp1 and Comp2.

Configuration:

- Participants may contribute comments (risks) at the pages in the Electronic Brainstorm tool at Comp1.
- Participants are not allowed to delete or edit contributions.
- Prepare prompts on separate Whiteboard pages on Comp2. Make sure the prompt is eye-catching for instance by making the font coloured.
- Participants are not allowed to contribute any drawings on the Whiteboard.
- Participants are not allowed to view multiple pages of the Whiteboard.

Script:

1. Make sure the participant(s) are ready to start the session.
2. Start participant(s) in the Electronic Brainstorm on Comp1.
3. When the number of new contributions is decreasing, switch the leader to the Whiteboard and select the prompt you want to use.
4. Match views with all participants on Comp2, wait about 10 seconds and then stop the participants in the Whiteboard.
5. Repeat step 3 and 4 until the number of contributions no longer increases.

We recommend two adjustments to the software to make the thinkLet even more successful and easier to execute:

- A facilitator console: the Distributed DirectedBrainstorm thinkLet is usable in any time any place settings. However, in different time different place settings, it is recommended that the facilitator has insight in the productivity of the participants that are online. This enables the facilitator to anticipate to the situation that a participant needs a new prompt. This facilitator's console can be further developed so that it starts the activity as soon as the participant comes online. Another development is that the facilitator does not have to notice the diminishing contributions but the console itself anticipates to the situation and starts the prompt.

- Another recommendation can be incorporated in the facilitator's console: a communication channel. The facilitator needs a certain functionality through which he can communicate (e.g. giving prompts) with the participant(s). This can be a small screen-area with a simple message area. When a message is send to a participant, the participant has to be made aware of the message by for instance a beep or a blinking message without being disturbed in his/her present activities.

8.5 Distributed FastFocus

Referring to table 8.2, the translation of the FastFocus thinkLet towards a distributed approach entails a number of difficulties. First we have to find a solution to make clear to the participants that they are required to choose their single most important risk on their electronic page. Another problem is a selected participant has to be able to put this risk on a separate list. Third, participants should be free to react to the contributed risk and finally, this has to result in a clearly described risk.

8.5.1 ThinkLet design

Like the DirectedBrainstorm thinkLet, we have designed a new thinkLet that is ought to cope with the difficulties.

Distributed FastFocus

Tool:

The Groupsystems™ software or GroupSystems™ Online:

- Electronic Brainstorm
- Categoriser
- The Whiteboard function

Two screens (or screen areas) per participant, this can be realised by taking two laptops or two desktop computers. We refer to them as Comp1 and Comp2.

Configuration:

- Participants are not allowed to contribute comments in the Electronic Brainstorm
- Participants are not allowed to delete or edit contributions.
- Participants are allowed to contribute one comment (risk) on the categoriser list.
- Prepare two instructions on two separate Whiteboard pages:
  1. Read all the contributions on your page on Comp1, determine which risk is most important according to your point of view. Reformulate that risk in the list on Comp2.
  2. One of your team members will contribute a risk that is most important according to his/her point of view in the list on Comp2. As soon as it appears, determine whether the risk is clear to you. React to the risk if the risk is not totally clear to you. You can react by double-clicking the risk.

Script:

1. Make sure the participant(s) are ready to start the session.
2. Start participant(s) in the Electronic Brainstorm on Comp1.
3. Start participant(s) in the Categoriser on Comp2.
4. Give one participant the rights to add a topic in the categoriser.
5. Start the selected participant in the Whiteboard on Comp2 on the page with instruction 1.
6. Start the other participant(s) in the Whiteboard on Comp2 on the page with instruction 2
7. Stop all participants in the Whiteboard tool.
8. Observe the discussion and propose or ask for a final formulation when the discussion subsides.

To test this thinkLet in practice, we invited students to perform this activity (for a detailed description, see section 5.4: case 4). As can be read in section 5.4 we selected a simple case for the participants so that they did not experience any difficulties with respect to the case and they could entirely focus on the distributed way of working. Regarding the simple case together with virtual character of the workshop (participants did not have a goal for the session and were asked to imagine themselves in the situation of the case) we decided not to hand out the questionnaire and base our evaluation of the Distributed FastFocus thinkLet on observations and ex post interviews with the participants. The next section will present and discuss the experiences with the thinkLet in practice.

8.5.2 Distributed FastFocus in Practice: Case 4

Observations

The observations led to the notice that the cognitive load of the deliberation (process) was too high and participants had considerable difficulty to understand their task and the instructions they received.

The first observation indicated that the lack of a separate communication channel between the facilitator and the participants was a problem. Participants should be able to pose questions and the facilitator should be able to give directions, instructions, etc. The lack of the information channel could also be sensed in discussions. The facilitator did not have the ability to facilitate discussions. For instance the discussion to work towards a clear risk description, it appeared to be very difficult for the facilitator to guide any form of discussion.

The approach is very intensive for a facilitator with respect to the software. For instance, switching participants from activity to activity, giving them instructions and changing the user privileges. Mistakes are made easily resulting in a lapse of the process.

Participant Interviews

The participants complained about the process. In spite off detailed instructions, it was still difficult for participants to work with two computer screens. Moreover, they were often confused about what they were expected to do or contribute. The participants missed the guidance of the facilitator in the activities they performed and in the discussions they entered.

Furthermore, the participants had two comments. First they questioned whether it was possible to gain consensus about the clearness of risk descriptions by using a voting method. Second, they argued whether it was possible at all to perform the whole identification phase in a distributed way.

8.5.3 Final design

The observations together with the participants' interviews lead to the notice that the approach requires too much attention and thus cognitive effort of the participants regarding the process (deliberation) and communication.
Reducing the cognitive load of the deliberation is hard to realise because the software does not have the appropriate functionality that our approach requires. Reduction of the cognitive

load of the communication is also difficult due to the lack of a separate communication channel.

The focus on deliberation and communication is mainly due to the restraints of the technology. The approach is designed according to the possibilities with the software instead of vice versa. In this case, the software clearly comes short. Therefore, we will not propose a better or enhanced design. We think that performing a distributed FastFocus is very difficult with a group. Group discussions are hard to facilitate and cost considerable cognitive effort of the participants. We propose two solutions for the problems that occurred:

- Either the software needs to be further developed to enable participants to do a FastFocus in a distributed way.
- Or a new research area has to be investigated: the area of how the FastFocus activity can be replaced by another distributed activity that is focussed on the extraction of a clean list of clearly described key risks from the Distributed DirectedBrainstorm.

8.6 Conclusion

The goal of this chapter was to address the question: What is a good collaborative design to get to a risk description that adheres to the determined criteria in distributed settings?

Defining risks with a distributed team is a complex task. The absence of face-to-face communication causes that other processes have to counterbalance this to keep a distributed team as productive as a co-located team. Focus Theory [Briggs and Nunamaker 2002] proposes a balance of cognitive effort between three processes that makes a team productive: communication, deliberation and information access. Our research revealed that the absence of face-to-face communication required extra attention (and thus cognitive effort) of participants on other forms of communication and the deliberation. The extent to which the communication and deliberation processes can be covered adequately in the design of a session is involved with the technology. The functionality and configuration of the technology appeared to be determinant for the cognitive load that participants had to put on the communication and deliberation processes.

Our research resulted in the development of two new thinkLets for distributed environments: Distributed DirectedBrainstorm and Distributed FastFocus. The thinkLets cover the first two steps in the risk identification phase: the identification of risks and the short-listing of these risks. Experience with both thinkLets revealed that the Distributed DirectedBrainstorm thinkLet is very useful for distributed teams. It provides a good base for the total assessment. Participants appreciate the distributed way of working and consider it as more productive, effective and leading to increased participation in comparison to co-located risk assessments. Regarding the Distributed FastFocus, we discovered that the technology we used was too restrictive with respect to communication and deliberation. The Distributed FastFocus thinkLet required too much cognitive effort from participants to execute this activity adequately.

Chapter 9 Conclusions

"If a man will begin in certainties he shall end in doubts; but if he will be content to begin in doubts he shall end in certainties."

Sir Francis Bacon, English philosopher, essayist and statesman, (1561-1626)

In this final chapter we will present and discuss our main findings resulting from chapter 6, 7 and 8. We will start (9.1) with a summary of our research, the accompanying results and our conclusions. Section 9.2 will discuss whether our results are applicable in a broader sense than our research area. In section 9.3 we will revisit our research approach and reflect on it. We will give some advices on further research in section 9.4 and subsequently we will present our concluding remarks in section 9.5.

9.1 Research summary

"We are moving towards an age of any time any place collaboration" [Nunamaker et al. 2001; Colemann 1995; Aytes et al. 1994; Hiltz and Turoff 1992; Niederman et al. 1993; Nunamaker et al. 1994; Turoff et al. 1994]. Collaboration is no longer restricted to a dedicated room in which a team works together. In today's organisations, teams are able to work together independent of the barriers of time and place.

In risk management, collaboration is important, as it is unlikely that one person has all the knowledge about all the risks. People must work in teams and collaborate to gain insight in all the (operational) risks. In comparison with an individual, combining the knowledge of team members is likely to result in a (more) complete picture of the risks an organisation or business unit is exposed to.

In this thesis we focussed on the combination of the two aspects described above: how can we support teams in their collaboration while they are working on risk management.

We addressed one main research question, which was split up into three research questions. The main research question within the master thesis was:

What is a good collaborative process to identify risks?

Splitting up the main research question in three research questions was done to specify our focus within the field of our research.

Research questions:

1. The identification phase is the basis for a risk assessment. It is therefore key to define risks well and clear. What are the criteria for a usable and measurable risk definition?
2. What is a good collaborative design to get to a risk description that adheres to the determined criteria in 'same time same place' settings?
3. What is a good collaborative design to get to a risk description that adheres to the determined criteria in distributed settings?

In our research we used the case study and action research approaches. To address the research questions, we used 4 cases. The first case was used as a case study, in the other cases we applied action research. This approach yielded our main conclusions. In the following section, we will present these main conclusions for every research question.

Research question 1

The identification phase is the basis for a risk assessment. It is therefore key to define risks well and clear. What are the criteria for a usable and measurable risk definition?

In order to come to clear risk descriptions, one must know what a clear risk exactly is. A clear risk description adheres to criteria. We determined nine criteria that provide valuable insight in the risk. The criteria are split up in two categories: comprehension criteria and component criteria.

The comprehension criteria describe the preconditions of a risk description. The comprehension related criteria are:

- Risk-awareness among participants
- Every participant understands the risk description.
- Risks must be described unambiguously (in short, clear terms)
- The risk concerns the group's field of activity

The component criteria describe the aspects that are related to risks and risk management. These aspects can be seen as elements that should be part of the sentence that describes the risk. The component related criteria are:

- The presence of a *Value at Risk*
- An *event* : a potential situation in which the value is threatened.
- The *cause* of the event: the deeper lying, structural cause of the event.
- The *likelihood* of the cause: what is the chance that the event actually occurs.
- The *effect* or consequence of the potential situation: the potential damage.

However, we argue that requiring from participants in collaborative environments to contribute risks adhering to the nine criteria is unfeasible. Following the logic from Focus Theory, the cognitive load of contributing such risks is too high. Therefore, we need an approach to come risk descriptions with a group that meet the determined criteria.

Research question 2
What is a good collaborative design to get to a risk description that adheres to the determined criteria in 'same time same place' settings?

The thinkLet framework [Briggs et al. 2003a] provided a good base to reduce the cognitive load for participants. Our approach is thinkLet based and designed for co-located collaborative environments. It should lower the cognitive load for participants by working towards a risk description that adheres to the determined criteria in a stepwise fashion (the event based approach is depicted in figure 7.4). Initial experiences show that, if followed accurately, the approach actually leads to clearer risk descriptions.

Research question 3
What is a good collaborative design to get to a risk description that adheres to the determined criteria in distributed settings?

Teams that are dispersed in time and/or place are becoming increasingly common in large organisations. We designed an approach for distributed teams that makes it possible for team members to participate at any time and any place. We designed two thinkLets for distributed settings. The approach enables team members to identify risks using the GroupSystems Online™ software. Due to the absence of face-to-face communication, team members have to put more attention and thus cognitive effort on communication and deliberation. Using appropriate technology can reduce this cognitive load. Initial experiences with our approach reveals that the participants appreciate working in a distributed way and that the risk identification in distributed settings provides a powerful base for the risk assessment. However, we were restricted to the technology we used in getting agreement about the most important risks and clear description of these risks. This resulted in the inability to execute this activity properly.

9.2 Exceeding the application area

In this research we used operational risk management as our main focus area. This area can be characterised as an area in development, especially in the financial service sector. This is not only due to international agreements between financial organisations but also the growing realisation that clear insight in operational risks is eminent for every organisation: if proper actions are taken, insight in operational risks is likely to result in considerable reduction of operational losses.
In this research, we have developed a guideline to gain insight in operational risks with a group. We first determined the criteria for a good risk description and subsequently developed two approaches to focus participants on the contribution of risks adhering to the determined criteria. One approach for risk identification in co-located situations and the second approach for risk identification in distributed situations. We focussed on risk identification *with a group* because knowledge about operational risks can be spread among employees. We selected three cases for our research at two organisations. The fourth case was done in a virtual environment with students. The organisations that we selected for our research operated in situations as described above:

The ING Group is a financial service organisation that has realised that insight in operational risks is important for the reduction of the operational losses. Moreover, operational risk management has become compulsory by the national regulator. However, the ING Group has more than 100,000 employees and it is unfeasible for one (ORM) department to gain insight in all the operational risks. Therefore, departments themselves have to gain insight in their own operational risks and a standard process with which these departments can gain these insights is required. In order to be self-sustaining, this process has to be easy and understandable for these departments.

ProRail is the national organisation that builds, manages and maintains the Dutch railroad infrastructure on behalf of the Dutch government. Decisions they make can affect thousands of day-to-day travellers. Therefore, decisions have to be made after thorough research for the risks involved, potential surprises, consequences, etc. Knowledge about these aspects is spread over various people.

Our results are based and tested in the cases we used in this research. It would be disappointing when the results can only be used in the two organisations. We think that the results can be used in a broader sense.

Regarding the determined criteria for a good risk description, we focussed our research on operational risks. We concluded that a good risk description had to adhere to two categories criteria: comprehension criteria and component criteria. To illustrate the latter, we used a simple risk description (see also figure 6.1 and table 6.3): 'The risk that my house burns down due to the fact that it is struck by lightning resulting in the loss of all my personal belongings'. We deliberately used this risk description to be able to apply our component criteria in a broader sense. The comprehension criteria are also applicable in a broader sense when working in a group. Participants always have to understand the risks and they have to be aware of the risks.
To conclude our applicability with respect to the criteria, we argue that a good described risk has to adhere to the criteria we determined, independent of organisation, industry, people involved, etc.

The design we developed for risk identification with a group in a co-located setting is based on the criteria we determined. It is focussed on reducing the cognitive load of requiring risk adhering to nine criteria, by a step-by-step approach. This approach is developed to be applicable throughout the whole ING Group. This meant that various business units would use the process. Describing the process in full detail would be ineffectively because no situation will be the same. The approach we designed describes the process in general terms. Consequently, we think that this approach can be used in various situations in which risk should be identified, including other risk areas like credit risk, chemical plant risks and environmental risks.

With respect to the distributed design, we have developed two new thinkLets, one for a Distributed DirectedBrainstorm and the other for a Distributed FastFocus. The first thinkLet proved its use in distributed settings and was perceived very positive by participants. As we described in our conclusions, the second thinkLet proved to be too complex for participants. ThinkLets are originally developed as building blocks for collaboration and should be applicable in different situations. In our research, we have described the Distributed DirectedBrainstorm in such terms, that it can be used in every situation where a Distributed DirectedBrainstorm is desired.

9.3 Approach revisited

In chapter 4, we described our research approach. In this chapter we argued that the inductive hypothetical strategy was most appropriate for our research. Now, at the end of the research, we can say we chose well. We addressed three research questions in which we used the inductive hypothetical model. To address our research questions, we always started with some initial theories that resulted in an empirical model. Abstracting led to the development of a conceptual model, which we used as a base for the conceptual model. To test our conceptual model, we implemented it in practice to test it. Evaluation of these tests sometimes resulted in adjustments in the conceptual model.

Complementary research instruments were case studies and action research. In our research, we selected four cases. We used one case as a case study to explore, observe and describe the research area. The other cases were used for action research. The first case provided us great insight in the research area. The decision for action research was made because we preferred an active role of the researcher.

The cases had a multifunctional character: some cases were used for inductive research to address one research question while simultaneously being a test case for another research question. A reflection on the instruments we used and especially how we used them, leads to the notice that multifunctional cases are practical because research purposes can be combined and the number of required cases can be diminished. However, this makes the research far more complicated, hard to separate and difficult to structure the results.

Apart from this notice, our experience with both case studies and action research is very positive. The case we selected for the case study approach provided great insight in the research area and was of great use during the total research. The action research approach enabled the researchers to participate and intervene in the testing environment. This was needed, especially in the application of the approaches we designed for co-located and distributed settings because sometimes, instant adjustments had to be made to the approach.

9.4 Limitations

Every research has its limitations, including this research. We distinguish two foremost limitations to our study.

First of all, we have performed a diverse research: we found criteria for a clear risk description, designed a collaboration approach for co-located teams to work towards risks that meet the criteria and finally we designed a collaboration approach to do this in distributed settings. This resulted in the fact that we did not collect enough empirical data to come to 'hard' conclusions. Our conclusions are based on first experiences. Further empirical testing and development should lead to comparison material, 'harder' conclusions and crystallisation and perfection of the determined criteria and designed approaches.

Second, we used GroupSystems Online for our distributed approach. We did not search, compare and choose the best software in the world for distributed collaboration. We based our decision for the GroupSystems Software on the successful experiences of scientists and practitioners throughout the world with the software.

9.5 Further Research

Further research related to this thesis report should include further empirical testing in the field of our findings. This could lead to a crystallisation and refinement of the criteria and the approaches. Furthermore, there is still a large area for research regarding distributed risk management. We only addressed part of the risk identification phase so there still is a long way to go. Getting agreement among team members over the borders of time and space remains a big challenge. The search and development of (new) technologies that reduce the cognitive load for participants will play a large role in this.

In the search for a way to converge in a distributed collaborative environment, an interesting area of research is convergence itself. What exactly is convergence, where does it depend on, what are the factors of influence, how is convergence accomplished, how can convergence be made easier, how can the quality of a convergence activity be determined? These are some of the questions that remain unanswered in our research but are worth investigating. Disentangling convergence and a thorough understanding of this phenomenon may be the only way to eventually be able to design this process for distributed collaborative environments.

9.6 In conclusion

In the early nineties, scientist already stated that with respect to teamwork 'we are moving towards an age of any time any place collaboration'. Now, more than a decade later, we can make up the balance.
With respect to face-to-face teamwork, the past decade can be characterised by the move towards collaboration processes in which teams are self-sustaining and no longer need the support of for instance a professional facilitator. Designing standard collaborative processes is called collaboration engineering.
Regarding distributed collaboration, the past decade can be characterised by the development of various systems that support individuals and teams to a certain extent. Email, chat programs, tele-/videoconferencing and virtual reality rooms are examples of systems that have become very popular in teamwork. However, these systems only support group work by providing communication tools. The Group Support Systems that support teams in their collaboration by providing communication as well as structure of the process, are still a scarcity. A recent trend in the Distributed Group Support Systems is, as in face-to-face teamwork, the move toward collaboration engineering: teams should be able to perform the activities themselves instead of making use of a system expert.

In our research, we designed two processes for the identification of risks. One design is focussed on face-to-face identification of risks, the other on distributed identification of risks. We took collaboration and productivity as a starting point for our research. What emerged from our research is that designing a collaborative process for distributed settings is more difficult than for face-to-face settings. Designing a process in which a team is self-sustaining (face-to-face settings) is one thing, creating a process in which an individual team member is self-sustaining is another (distributed settings). Although the essence of the process remains the same, it will be more difficult to keep the productivity at the same level because, considering Focus Theory, the cognitive load of the distributed approach is higher than the face-to-face approach.

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Supplement A: Evaluation Interview questions

1. Why did you perform an R&CSA process?
2. How did you design the identification phase?
3. Who did you invite?
4. How exactly did you focus the participants on the identification of clear risks?
5. Can you define any criteria a good risk description has to adhere to?
6. What difficulties did you run into?
7. How did you avoid/cope with these difficulties?
8. Looking back at the process, are you satisfied how it elapsed?
9. If no, which adjustments would you make to optimise the process?
10. What are, in your view, the most important aspects for the success of the process?

Supplement B: Risk Quality Interview

We made a selection of risks from various risk assessments. These risks are all written on separate pieces of paper. We would like you to examine these risks separately and determine whether the risk is described clear or less clear.
When you are categorising these risks, we would like you to answer the following questions:

1. In which category would you place this risk, clear described or less clear described?
2. Why does this risk belong to the chosen category?
3. Do you understand the risk? Why/why not?
4. If you place the risk in the "less clear described" category, what is wrong/lacking the risk description?
5. If you place the risk in the "clear described" category, what makes the risk description clear?
6. Can you summarise criteria you used while you were categorising?

Supplement C: Participants interview

1. What is your first reaction regarding today's risk management session?
2. Did you understand the instructions you received?
3. How did you experience working from behind your own desk?
4. What is your opinion of the distributed collaboration?
5. How did you experience the process we executed today?
6. Did you have any difficulties regarding the communication?
7. Did you experience any difficulties with the technology?
8. Can you think of any adjustments to the process, communication, collaboration etc. to improve today's risk management session?
9. Do you have any additional comments?

Supplement D: Observation form

1. What is the structure of the risk management session?
2. Looking at the contributions, how do participants describe the risks?
3. Can a certain pattern of thinking be determined?
4. How are participants working towards a clear risk description, when are they satisfied?
5. Considering the approach that is used to focus participants on the contribution of clear risks, how do participants react to the approach?
6. Can we determine any changes in the way participants work towards a clear risk description?

Additional observation questions in the distributed sessions:

7. How long are participants working on the various activities?
8. Are there any technical difficulties, how are they solved?
9. Considering the approach that is used to focus participants on the contribution of clear risks, are there any difficulties
10. Did we have any contact with the participants

Supplement E: Participants Questionnaire

1. I am male/female
2. My age is __
3. I have __ years of experience in risk management
4. In how many risk management sessions have you used similar tools or methods as we used in today's risk management session

Participants were asked to rate the following questions on a 7-point scale:
1=strongly disagree; 7=strongly agree

5. Today's goals were in conformance with my personal goals
6. This risk management session was worth my efforts
7. The result of this risk management session are worth the time I spent on it
8. I delivered a substantial contribution to the goal of this risk management session.
9. I felt myself comfortable with the goals of today's risk management session
10. Additional comments (written comments)

11. I have a good feeling of the goals that are set for today
12. Achieving the goals of today's risk management session makes me feel good
13. I subscribe to the goals of this risk management session
14. I was enthusiastic about the goals of today's risk management session
15. Additional comments (written comments)

16. It was easy to understand the contributions of other participants
17. It was easy to make others understand my ideas
18. I had the feeling that other participants understood my ideas easily
19. Additional comments (written comments)

20. The processes we used today were appropriate for this session
21. I feel satisfied with the way we went through today's activities
22. I am satisfied with respect to the procedures we used today
23. Additional comments (written comments)

24. I have derived more advantage from this risk management session than the effort it took me to participate in it
25. The value I gained from today's risk management session justifies my efforts
26. I am satisfied with the session process
27. I have a good feeling about this risk management session
28. I feel satisfied with respect to the processes we used in today's risk management session
29. I feel satisfied about the way we executed today's activities
30. Additional comments (written comments)

31. I think that the results of today's risk management session are good

32. I am satisfied with the results of today's risk management session
33. I feel satisfied about the quality of the risk descriptions
34. I feel satisfied about what we achieved today
35. When today's session was finished, I felt satisfied with the results
36. Additional comments (written comments)

37. I perceived the electronic collaboration with other team members as practical
38. The electronic collaboration with other team members pleased me
39. The electronic collaboration was appropriate for the pre-set team goals
40. The possibility to participate in this risk management process from behind my own desk pleased me
41. I appreciated working anonymously
42. The possibility to participate in this risk management process at any time pleased me
43. I am willing to spend just as much time on participating in a risk management process as I agreed on in advance
44. The free expression of ideas and preferences was functional
45. The ability to participate in a risk management process from behind one's own desk increases the participation in risk management sessions
46. A risk management session from behind one's own desk is more effective than a normal meeting
47. A normal risk management session would have been more productive than a risk management session from behind one's own desk
48. For similar risk management activities, working from behind one's own desk is suitable
49. For the realisation of risk management sessions, I would like to work again from behind my own desk
50. Additional comments (written comments)

51. It was easy to access information
52. I had a good feeling with respect to the information that other participants contributed
53. It took me little effort to get the information I needed
54. Additional comments (written comments)