

# Risk Management Affecting IS/IT Project Success Through Communicative Action

*Karel de Bakker, Albert Boonstra, Hans Wortmann*  
*University of Groningen, The Netherlands*  
*e-mail: karel@debee.nl*

## 1. Introduction

Project risk management has a prominent position in the framework of project management theory and methodology (Association for Project Management, 2006; Project Management Institute, 2008). The reason is that unexpected events will usually occur during a project (Turner, 1993; Pinto, 2007). Risk management is considered to be a tool to limit the impact of these unexpected events, or even to prevent these events from happening. Accordingly, it is generally assumed that risk management contributes to the success of the project (Olsson, 2007). However, empirical evidence regarding the contribution of risk management to Information Systems/Information Technology (IS/IT) project success thus far is not convincing. This empirical evidence is often based on assumptions about how risk management is supposed to work, assumptions that emerge as incorrect for most IS/IT projects (de Bakker et al., 2010).

According to Chapman & Ward (1997), project risk management positively influences project performance by *instrumental* effects: through creation of a contingency plan or by influencing project time, budget or design plan. These authors also mention a *social* effect: influencing stakeholders and stakeholder motives. In relation to the social effect, Chapman & Ward (1997) indicate three factors which potentially influence project performance in a positive way: better communication between stakeholders, better collaboration between stakeholders, and more creative thinking. Rijsenbrij et al. (1993) mention the creation of project team spirit as an additional effect of the project risk management process. Unfortunately, neither report elaborates on the presence, the causes or on the strength of this social effect. This makes the social effect of risk management on project success an interesting topic for current research. If the social effect exists, it may have important implications for IS/IT project practitioners. Practitioners may become aware that risk management helps them not only to collect information and support their decision making process, but also helps them to tune stakeholder perceptions and expectations, creating a commonly defined environment in which stakeholder actions are more effective. This may also contribute to the success of the project.

This paper addresses the following research question: “How do project stakeholders perceive the effects of project risk management on IS/IT project success?” This paper acknowledges the potential of instrumental effects of project risk management (Chapman & Ward, 1997). In addition to these instrumental effects, our approach studies the interactions between project stakeholders during the execution of project risk management activities and the effects of these interactions on project success. To be able to do so, building on the work of various authors, we will first investigate and define the project risk management process and the concept of IS/IT project success. A distinction is then made between risk management as *instrumental action* and risk management as *social action* by using concepts from the Theory of Communicative Action (Habermas, 1984; Habermas, 1987) as a theoretical lens for the research (Horner Reich & Yong Wee, 2006; Cicmil et al., 2009). This theoretical lens facilitates greater understanding of what happens during risk management activities and how this may influence IS/IT project success.

In order to explore the theoretical concepts of this study in practice, the relationship between project risk management and project success is studied through investigation of two Enterprise Resource Planning (ERP) system implementation projects. ERP projects are chosen because they consist of deliberate adjustments to the IT system (hardware, software, infrastructure and data) in combination with substantial changes of business processes. These projects contain a considerable amount of risk and uncertainty (Akkermans & van Helden, 2002; Ehie & Madsen, 2005), which makes the subject of project risk managements’ impact on project success especially relevant. Project risk management is usually based on the probability-based framework (Loch et al., 2002), which assumes reality is known, predictable and measurable. Therefore it could be claimed that uncertainty, which finds its origin in complexity or unpredictability (Holt, 2004) cannot be reduced by project risk management (Pender, 2001), because it is unknown, unpredictable and immeasurable. The results of this paper however demonstrate that certain project risk management activities may be able to reduce uncertainty, because the effects from project risk management activities may lead to increased predictability of stakeholder behaviour.

The contribution of this paper is two-fold. Firstly, analysis of the research data shows that project stakeholders deliberately use risk management activities to convey messages to other stakeholders, with the aim to influence other stakeholders’ behaviour. Secondly, risk management activities influence the stakeholders’ perception of the situation by synchronising their perception and making them more conscious of the context and of their responsibilities. Weick & Sutcliffe (2007) call this effect: “attention shaping”. In addition to the instrumental effect of project risk management that is generally considered to positively influence project success, this study finds that project risk management influences project stakeholders’

perceptions and behaviour. Based on in-depth stakeholder interviews, it is concluded that stakeholders perceive these effects as contributing significantly to project success.

## **2. Theoretical Background**

### *2.1. The traditional view on risk management and project success*

#### *2.1.1. Risk management in the positivists' tradition*

In this paper, project risk management is defined as per project management Bodies of Knowledge or BoKs (Association for Project Management, 2006; Project Management Institute, 2008), which are considered to describe the core knowledge of project management (Williams, 2005). According to these BoKs, project risk management consists of a sequence of related activities to make decisions based on information gathered about situations that may or may not occur (Boehm, 1991; Chapman & Ward, 1997; Pich et al., 2002). The sequence of activities that characterises project risk management consists of identifying risks, analysing risks, defining action, implementing action, and monitoring the situation (Del Caño & Pilar de la Cruz, 2002; Association for Project Management, 2004; Project Management Institute, 2008). Project management methodology presumes that the actions taken, as a result of risk management, contribute to the success of the project. The Project Management Body of Knowledge states it as follows: "Risk is an uncertain event or condition that, if it occurs, has an effect on at least one project objective. Objectives can include scope, schedule, cost and quality" (Project Management Institute, 2008: 275), and: "The objectives of Project Risk Management are to increase the probability and impact of positive events, and decrease the probability and impact of negative events in the project" (Project Management Institute, 2008: 274).

The project risk management process as described above, is an example of an instrumental problem solving method. Project risk management (as with project management in general) has its origin in the positivist tradition, where the world around us is assumed to be objective (i.e. factual, rather than opinionated) and can be explained by causal relationships (Williams, 2005; Cicmil, 2006). The project risk management process assumes that stakeholders act as one actor. This one actor influences the world, is fully informed and behaves rationally when making decisions aimed at project success. By taking the right actions following the decisions, also known as instrumental action (Koningsveld & Mertens, 1992), risk management is accordingly able to influence project success.

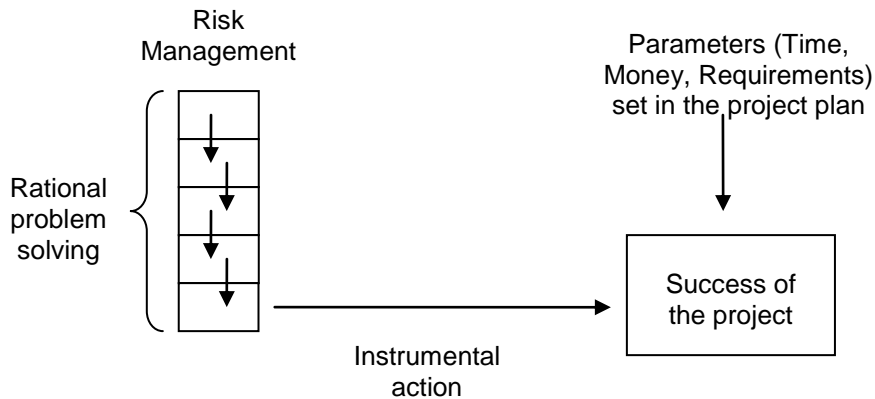
As an example, consider the following statement found in a project risk register as a result of a risk identification activity: "If the department that will be using the new ERP system will

remain as busy as they currently are, they will not be able to deliver real life test cases to the project, as a result of which the tests of the new ERP system cannot be performed and the project will be delayed by at least one month". This statement follows the standard structure of a risk description in terms of: cause (busy department), risk (no test data available) and effect (project delay) as described e.g. in Bartlett (2002). After performing the risk analysis, determining how serious this risk is perceived to be, and after the development of proper responses, instrumental action will be taken to try to ensure the unwanted situation will not occur. An instrumental action could be to hire temporary personnel in order to lower the departments' work pressure and to ensure the test data will be delivered on time.

The example illustrates that the risk management process is considered *instrumental* and data-oriented, i.e. it aims at collecting information to take a decision, followed by an instrumental action, and that it focuses on the completeness and correctness of the information, both influencing the effectiveness of the action. The process of how the data was collected, or by whom the data was collected, is, in this view, only relevant in relation to the quality of the collected data. *Social effects* are not considered; it is irrelevant how this process of data collection influences the way in which project stakeholders, including members of the department concerned, perceive the situation or how they respond to the risk individually or as a group.

#### *2.1.2. Project success in the positivist's tradition*

Closely related to this positivist view on risk management is the notion of project success. Success of a project is, in this context, objectively measurable by looking at time, budget and requirement parameters, which were defined at the outset of the project. Further, success of a project is assumed to be consistent for every project stakeholder, and success can be determined at the moment the project has produced its deliverables. A project plan is a written projection of what will happen in terms of specific activities and relations between activities, culminating into predicted values for three parameters; time, money and requirements. To determine the success of a project, it is evaluated against the actual parameter values at the end of the project. Research on the relationship between risk management and project success generally uses this project success approach (de Bakker et al., 2010). This view on risk management and project success, and their relation is presented in illustration 1.



*Illustration 1: Traditional (positivist) view on the relation between risk management and project success*

The discussion thus far has been restricted to risk management as instrumental action and project success as an objective result. It is argued below, that a broader view on risk management and project success is also possible. In particular, Habermas' theory of communicative action (Habermas, 1984, 1987) provides a theoretical framework which enables us to interpret risk management activities more broadly. These activities are also seen as ways to influence stakeholders' behaviours and opinions. Accordingly, project success is more broadly defined.

## *2.2. A broader view on project success and risk management*

Various authors (e.g. de Wit (1988), Wateridge (1998), Agarwal & Rathod (2006)) have pointed out the limitations of the approach to determine project success as an objective result of three parameters. Baccarini (1999) states that time, money and requirements are subsets of project success and may contribute to success. Thomas & Fernandez (2008) stress the difficulties related to defining project success. Based on their research, they propose a broader definition for the measurement of project success, in which success characteristics are determined by stakeholders themselves. Building on this, the use of project risk management and its influence on project success is investigated here, by adopting a broader project success definition. Project success is the outcome of a personal, individual evaluation of project characteristics by each stakeholder. This may include objectively measurable characteristics such as time, money and requirements, but may also include other characteristics such as stakeholder satisfaction and the future potential of the project result.

The project risk management process, as described in project management handbooks, is an example of a rational problem solving method (Koningsveld & Mertens, 1992; Kutsch & Hall, 2005), based on an instrumental view. For this process to be effective, it is necessary that all

prescribed steps are followed. For example Voetsch et al. (2004) and Bannerman (2008) have shown that the prescribed sequence of risk identification, risk analysis, planning actions and executing actions is rarely followed. Building on Besner & Hobbs (2006), this paper takes a further perspective on risk management, through identification of various risk management practices. These practices, or risk management activities, may or may not be used in a particular project, may or may not be executed in a fixed sequence, and these practices may individually, or in combination, have an effect on project success. Table 1 presents an overview of the differences between the traditional and the broader view on risk management and project success.

	<b>Traditional view</b>	<b>Broader view</b>
<b>Risk management</b>	Rational problem solving by related risk management activities (Chapman & Ward, 1997; Association for Project Management, 2004)	Single or related risk management activities influencing project stakeholders
<b>Project success</b>	Objectively measurable in terms of Time, Money, Requirements (Ropponen & Lyytinen, 2000; Association for Project Management, 2006)	An opinion of a project stakeholder on various project characteristics (e.g. de Wit, 1988; Turner & Cochrane, 1993)
<b>Influence relation</b>	Responses in an objective world, based on information resulting from the risk management process (Koningsveld & Mertens, 1992)	Risk management activities individually or in combination influencing the perception or behaviour of the stakeholder in relation to perceived project success

*Table 1: Differences between the traditional and the broader view on risk management and project success*

As a result of the broadening, we reject the assumption that effects of project risk management on project success are only caused by the results of rational problem solving methods. Instead, we propose that actions taken by participants in one or more risk management activities can have their own effects on project success. Further, based on the distinction made by Habermas (Habermas, 1984; Habermas, 1987) we propose that, in addition to instrumental action, social action may also influence project success.

### 2.3. Habermas' concepts of instrumental and social action

#### 2.3.1. Instrumental action

A project is an organisational format to create change (Association for Project Management, 2006). In the context of an organisation, change means transforming the current situation, which is identified as being problematic, into a new, non-problematic situation. Project management plans, executes and controls this process, and it is considered to be: "the dominant model in many organisations for strategy implementation, business transformation, continuous improvement and new product development" (Winter et al., 2006). The result of a project, being its deliverable or deliverables, is the solution to transform or change the problematic situation into the desired situation. In order to be able to create the project deliverables, a project plan is developed. A project plan is an action plan; a group of related actions that will produce the project deliverable(s) when collectively executed. In essence, a project plan provides direction and coordination for actions to be taken by individuals working towards project success.

Actions, executed by an individual with the aim of reaching success, which are based on the assumption that the actions will inevitably lead to the result (success), is what Habermas (1984) calls *instrumental action*. A project plan therefore is an instrumental action plan, which coordinates the actions by aiming at a pre-set goal (see paragraph 2.1.2). Project risk management, being a rational problem solving method (Koningsveld & Mertens, 1992; Kutsch & Hall, 2005), is *in itself* an example of instrumental action. It assumes one actor who bases his or her instrumental actions in an objective world on rational decisions that are the result of the project risk management process. Habermas (1984) calls this decision theory, a term that is also used often in project risk management handbooks and literature to describe risk management in general (e.g. Bernstein, 1996).

#### 2.3.2. Social action: strategic action and communicative action

Instrumental action assumes that one actor controls the situation (other actors present are assumed to have no personal goals and therefore their behaviour is completely predictable). Instrumental action is "non-social", meaning that there is no interaction between actors. In addition to instrumental action, Habermas describes two situations of social action; strategic action and communicative action. Social action assumes more than one actor in the process, each having their own motives. The behaviour of the other actors is no longer entirely predictable for a particular actor, because actors anticipate actions of other actors' and respond to these actions. If an actors' actions are coordinated by the intention to achieve this actor's own goal (similar to instrumental action), the action is named *strategic action*. Habermas (1984) calls this game theory, where goal achievement by one or more actors may be realised at the expense of others.

Where the actions of the actors are coordinated through seeking consensus instead of pursuing their own individual goals, Habermas (1984) refers to this type of action as *communicative action*. Communicative action is the action of an individual actor to create common understanding of the situation and seek collaboration with other actors. Language, Habermas refers in his work predominantly to spoken language, is the key element to reach understanding and consensus between actors. Communicative action can be applied to risks and the management of risk.

A risk, by definition, is not something that is real. "Risk is not the same as catastrophe, but the anticipation of the future catastrophe in the presence. As a result, risk leads a dubious, insidious, would-be, fictitious, allusive existence: it is existent *and* non-existent, present *and* absent, doubtful *and* real." (Beck, 2009). Risk is not an absolute situation, it is something that may happen, something which an actor predicts may take place. The exact meaning of the risk must be agreed upon through discussion between actors. Actions can be taken after this discussion has concluded. This makes project risk management a process to control the physical environment of a project, it also makes it a process to create and influence relations with other project actors, to communicate and to influence equally their perceptions and behaviour.

#### 2.4. Research question

This paper addresses the following question: "Does project risk management contribute to IS/IT project success?" Literature considers project risk management as being instrumental action, based on rational problem solving. In addition, the effect of project risk management is considered to be instrumental action. As mentioned earlier, research (de Bakker et al., 2010) has demonstrated there is limited evidence that project risk management contributes to IS/IT project success. Literature (Voetsch et al., 2004; Besner & Hobbs, 2006; Bannerman, 2008) demonstrates that project managers selectively apply certain project risk management activities, because in their view, not all risk management activities are considered to be effective. Therefore, the research question for this paper was rephrased as: "How do project stakeholders perceive the effects of project risk management on IS/IT project success?" Habermas' concepts of *instrumental action* and *communicative action* work as theoretical lens to seek to understand the effects that may be found.

At this point, we do not deny the fact that *strategic action* may also play an important role within the context of project risk management and project success. Strategic action is a topic that requires more research attention, especially in relation to the contracts that underpin the project. These contracts divide the project risks among various project stakeholders, creating different stakeholders' interests, which as a result also may influence stakeholders' behaviour.



To avoid an excessively wide scope for this paper, strategic action within the context of project risk management will be discussed in a separate paper. This paper focuses only upon communicative action as the concept to better understand the effect of risk management on IT project success.

### **3. Research method**

This research is exploratory in nature, as it seeks to define and understand relationships between risk management and project success as perceived by project stakeholders. The research approach is primarily inductive, as the research question is based on indications given in the literature regarding the use of project risk management (Besner & Hobbs, 2006), and the potential influence of project risk management on project success (Rijsenbrij et al., 1993; Chapman & Ward, 1997). Further, we are investigating contemporary events where there is no control over the environment. This makes case study the most suitable research strategy (Yin, 2003). Because of the exploratory character of the research and the research question aiming at investigating perceptions of various project stakeholders, interview is selected as the primary method of data collection.

Two ERP implementation projects, Project 1 (completed in October 2008) and Project 2 (completed in March 2009), provide the data for this study. Project 1 took place in a large, international operating company in the food industry headquartered in the Netherlands. Worldwide, the company operates from more than 100 locations, has over 17 000 people and net turnover close to US\$5 billion. The ERP system was implemented in two geographic locations in four organisational units (two production units, a sales unit and a financial unit) within the sector Consumer Products. The system is used to support a number of different food production processes and various financial activities. The project duration was 13 months.

Project 2 took place in the public utility housing sector. With around 100 employees, this public housing organisation owns and maintains around 6500 rental properties. Partly regulated and subsidised by central government, this organisation offers affordable housing for people with a low income. This project duration was 12 months. Both organisations decided to implement SAP, an ERP software solution, to support the organisations' primary processes. The cases Project 1 and Project 2 are literal replications (Yin, 2003).

For each project, three types of stakeholders are identified, a stakeholder being: "any group or individual who can affect or is affected by the achievement of the organisations' objectives" (Freeman, 1984). We identified and interviewed stakeholders representing the project

viewpoint (P), the IT supplier viewpoint (S) and the customer viewpoint (C). All three are important stakeholder groups, as each will be affected by the project result and they are each in a position to influence the project result (Pinto, 2007). In terms of Mitchell & Agle (1997) they all possess: power, legitimacy and urgency. All identified stakeholders have personal views on project success and each has its own role in the risk management process. This confirms why it is important to collect information from each stakeholder individually.

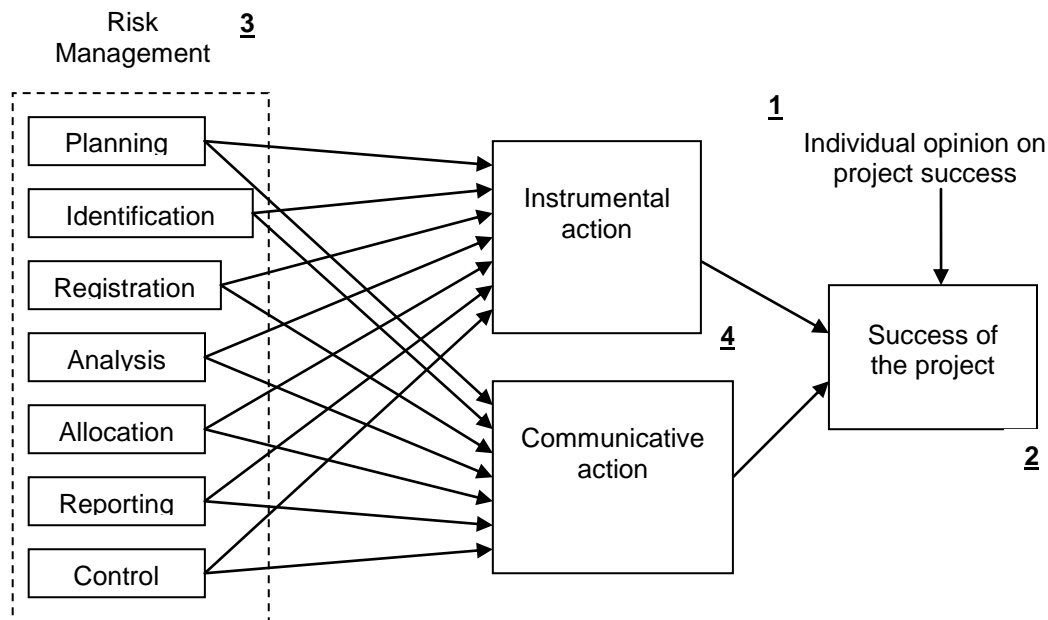
Separate interviews were held with the project manager and representatives of the IT supplier and customer organisation in each of the projects. Additional information was collected from documentation produced by the project, e.g.: project plans, progress reports, documentation from the risk management process and project newsletters. All interviews were recorded and a complete transcription was created. Triangulation (Yin, 2003) was done by comparing the information from the interviews with the information that was collected from project documentation, and by comparing interview information provided by different stakeholders from the same project. Interviews varied in duration from 1 to 1.5 hours.

All interviews were conducted using the same interview script (see Appendix A). The use of the interview script contributes to both consistency and reliability of this study. The interview script contains a combination of open and closed questions, focusing on three elements: the project result, how risk management was done and whether risk management influences the project result. In case of an affirmative answer to the latter question, the open question was asked to capture how, according to the stakeholder, risk management influences the success of the project. The format of an open question was chosen to avoid preconditioning of the stakeholders to whom questions were posed.

Information was collected between one to two months after the go-live of the new ERP system. This timing was chosen for various practical and theoretical reasons. Firstly, due to busy agendas during the go-live period, project stakeholders are permitting interviews only after that go-live was complete. Secondly, only after go-live can stakeholders provide initial opinions on the success of the project. Finally, in the period directly after go-live, projects often perform lessons learned sessions in which the project is evaluated. Interviews on the effects of risk management on project success conform well to this evaluation period. Stakeholders' experiences from the project are recent and therefore still "fresh", which contributes to the quality of the collected information. Where information is collected significantly after go-live, it is likely this information is influenced or tainted by memory recall bias.

In the first step of the interview (indicated by 1, illustration 2), the project stakeholder is asked what determines project success for this stakeholder personally. We approached IS/IT project

success, building on previously mentioned literature, as an opinion of a project stakeholder, which may include more items than timely delivery, delivery within budget limits and delivery according to requirements. In the second step (2, illustration 2), the stakeholder is asked to evaluate the project result, and to elaborate on the result in relation to his personal success definition.



*Illustration 2: The broader view of risk management in the empirical research situation*

In the third step (3, illustration 2) we present a list of seven risk management activities (Project Management Institute, 2008; Besner & Hobbs, 2006) and we ask each stakeholder which risk management practices (activities) were used, and if so, how they were used (Appendix B). In the fourth step (4, illustration 2) we asked each stakeholder if the employed risk management practice contributed to the result of the project, and if so, how this practice contributed to the project result. The question *how* the practice contributed to the project result was an open question, the stakeholder had to answer without any additional information or guidance from the interviewer. The analysis of the interview data focuses upon the information given by the stakeholder to this question, because it may provide a better understanding of how risk management influences project success. The analysis is done by means of pattern matching (Yin, 2003).

## 4. Results

Below are the results from the interviews with project stakeholders from the two projects. P1 and P2 represent the project managers' view of Project 1 and Project 2, S1 and S2 represent the IT supplier view and C1 and C2 represent the customer view.

### 4.1. Project success

Stakeholders from these two projects generally share the same opinion on what is important in relation to project success. Stakeholders from both projects agree upon stakeholder satisfaction being the most important success criterion. A project is a success if all stakeholders are happy with the outcome of the project. This is followed by requirements (deliver what you have promised) and long term contribution of the project result for the organisation, both being important criteria for project success. Project fun was generally considered the least important success criterion. The traditional success criteria of time and money score relatively poorly in these projects. The two projects studied were not time critical, nor had they any incentives in the contract for timely delivery. Both projects also had no incentives in their contracts in relation to delivery within budget. Time may be a more important success criterion in certain projects, for instance if the new ERP system replaces an old system for which the software licence is expiring on a specific date, or where contractual clauses are included to provide incentives for timely delivery. In such cases, timely delivery is much higher in the stakeholders' ranking of success criteria, as follows from preliminary results from other case studies.

Although individual opinions vary to some extent, all stakeholders considered their project successful. The reasons why stakeholders considered the project a success are broader than indicated by the project success criteria mentioned above. Furthermore, some stakeholders stated the success of their project "... depends on how you look at it." (C2). Table 2 presents an overview of the statements stakeholders gave in relation to the success of the project.

Stakeholder	Quotes on why the project was considered a success
Manager Project 1 (P1)	"The organisation resumed its original level of production just one week after the go-live of the new ERP system"
Manager Project 2 (P2)	"To my knowledge, the stakeholders are happy with what the project has achieved, so I consider it a big success. But if I include the fact we had to re-plan and recalculate the project, and that we used more time and money than we thought at the beginning, the project is not a big success. However, to me it is still a success."

IT Supplier Project 1 (S1)	"We had to work in a changing environment, a change of customer during the project, at a certain point we had 3 customers to report to, and we managed to deliver more or less on-time and on-budget. But the quality of the technical solution is not as good as it could be; we used quite a lot of shortcuts and workarounds, too many to my opinion".
IT Supplier Project 2 (S2)	"I say it is a success. The stakeholders are happy, and the customer has asked us to do the work in phase 2 of the project. And the first phase was not delivered on-time, nor on-budget. So, I'm happy, also because this (= working on phase 2) is good for our business and for our position in the market."
Customer Project 1 (C1)	"We did this in a little over a year, where normally this kind of project takes at least two years."
Customer Project 2 (C2)	"Well, it depends on how you look at it. The organisational change part, which was very difficult, was successful, and I'm very happy with that. But if you look at the quality of the delivered technical solution, you could consider the project a small failure."

Table 2: Quotes from stakeholders on project success

The stakeholder statements illustrate that project success is an individual and multidimensional evaluation of a situation, because project success may:

- relate to effects caused by the project, instead of project characteristics (P1)
- depend on the position of the stakeholder (S2)
- be related to the expectations of the stakeholder (C1, S1)
- depend on the position the stakeholder chooses to take (P2, C2)

These findings support the claims made by various authors, e.g. (Turner & Cochrane, 1993, Wateridge, 1998; Baccarini, 1999) that project success is not solely related to complying with pre-set levels of time and money and delivery according to specifications. For instance stakeholder satisfaction (P2) and future business opportunities (S2) also determine if individual stakeholders consider the project successful.

#### 4.2. How was risk management used?

Both project managers tried to make the project as predictable as possible by using experiences from earlier projects, and applying them to their projects. This *evaluation approach* to project risk management (de Bakker et al., 2010) states that experiences from earlier projects are evaluated and fed back into new projects with the aim "not to make the same mistake twice". Ropponen and Lyytinen (1997) state that a frequent and continuous use of risk management measures by project managers in various projects over time contributes

positively to the effectiveness of risk management in their own projects. Therefore, application of previous experiences may have contributed positively to the success of these two projects.

In addition, various project risk management activities from the risk management process as described in the project management BoKs (Association for Project Management, 2006; Project Management Institute, 2008) were used in both projects, but its use and intensity varies per project. Detailed information on the use of the various risk management activities according to this *management approach* to risk management (de Bakker et al., 2010) can be found in Appendix B. Project 1 applied risk management by executing the complete sequence of risk management practices four times during the implementation phase of the project (the phase preceding go-live with a total duration of 14 weeks). Project 2 did not follow the sequence of risk management practices and executed risk management practices only ad-hoc and primarily during the phase of the project (re)start-up.

#### 4.3. (How) did risk management contribute to project success?

Where stakeholders indicated during the interview that a certain risk management practice influenced the success of the project, the open question was asked how, in their opinion, the risk management practice influenced the success of the project. Table 3 presents an overview of the statements that interviewed stakeholders made about the relationship between the risk management practice that was used on the project and the influence on the success of that project.

<b>Risk Management Practice</b>	<b>Influence on project success (statement by stakeholder)</b>	<b>Statement made by:</b>
Risk management planning	<p>“By doing risk management planning, you inform project members you want to do risk management; you indicate risk management is important”</p> <p>“A planning is a tool to communicate the actions you (= the PM) want to take”</p>	Manager Project 1 (P1)
Risk identification	<p>“I have used it more often like the way we used it here, and I use risk identification (in combination with analysis) to create awareness”</p> <p>“Create a common view about the risk, and make it more objective”</p> <p>“If you have a common view, you are better able to focus your energy on lowering the risks”</p>	<p>Manager Project 1 (P1)</p> <p>IT Supplier Project 1 (S1)</p>

	<p>“Awareness and openness have given people direction”</p> <p>“People believe their concerns are heard, which improves their involvement”</p> <p>“You are able to share your concerns with others”</p>	
	<p>“We took some risky things out of the scope of the project and communicated that to everybody, so that expectations were clear”</p>	<p>Manager Project 2 (P2)</p>
	<p>“The brainstorm sessions create the effect that people become aware of risks, and it initiates action”</p>	<p>Customer Project 2 (C2)</p>
Risk registration	<p>“We did not write down all the risks in a register, but we wrote down what our plan was. And the plan was written, based on the risks we had identified. That helped a lot, because now it was clear for everybody what they could expect and what was expected from them”</p>	<p>Manager Project 2 (P2)</p>
Risk analysis	<p>“Defining impact is important because then people realise the consequences and knowing the consequences triggers them in starting action”</p>	<p>Manager Project 1 (P1)</p>
	<p>“Results from analysis may create agreement and acceptance among project members. If analysis shows that something might go wrong, but impact is limited, all members might say: OK, let’s accept it as it is. No big deal if it goes wrong”</p> <p>“Results from analysis may direct actions from members, because actions are taken only on important risks (priority)”</p>	<p>IT Supplier Project 1 (S1)</p>
	<p>“It was analysis including a direction for the solution. The project board and general management took decisions based on this information; this worked well”</p>	<p>Customer Project 2 (C2)</p>
Risk allocation	<p>“This is effective if it is combined with analysis and control. It is hard to allocate a risk to somebody who is not part of the project organisation; he is not responsible for the risk; the project is. But if you show them by analysis what the impact is, they might start working. And monitoring and control makes sure you can ask somebody about the status”</p>	<p>Manager Project 1 (P1)</p>
Risk reporting	<p>“risk reporting has been used to show the project board during the implementation, so risk could be seen diminishing throughout the project, not just before go-live”</p> <p>“risk reporting is either used to establish trust, or to ask for decisions from the board in relation to time, cost, scope of the project, decisions based on the risks”</p> <p>“these sessions also provides opportunity for reflection; during implementation you are so busy that now and then it is good to reflect on your actions and your position, and to determine what is really important”</p>	<p>Manager Project 1 (P1)</p>

	<p>“it is about creating a overall feeling that we are heading in the right direction”</p> <p>“it is used to create commitment for collaborative resolution of one or more risks”</p> <p>“it is to make people aware of the risk”</p> <p>“it is to show you take the risk seriously, and you are working to resolve it”</p>	
Risk control	<p>“If somebody reported a problem, including a request for the management of the project to take action, it was clear to everybody this was a serious problem”</p> <p>“The general management understood that something had to be done, that action was necessary. As a result, people were willing to take an extra step”</p> <p>“The action was assigned to the person who was able to take the action”</p> <p>“Because the action owner stated in the group he would take the action, he had a problem if there was no action taken; shame is an effective management instrument”</p> <p>“Now you are able to manage individuals”</p>	Manager Project 2 (P2)

*Table 3: Examples of stakeholders' statements on the effect of risk management practices*

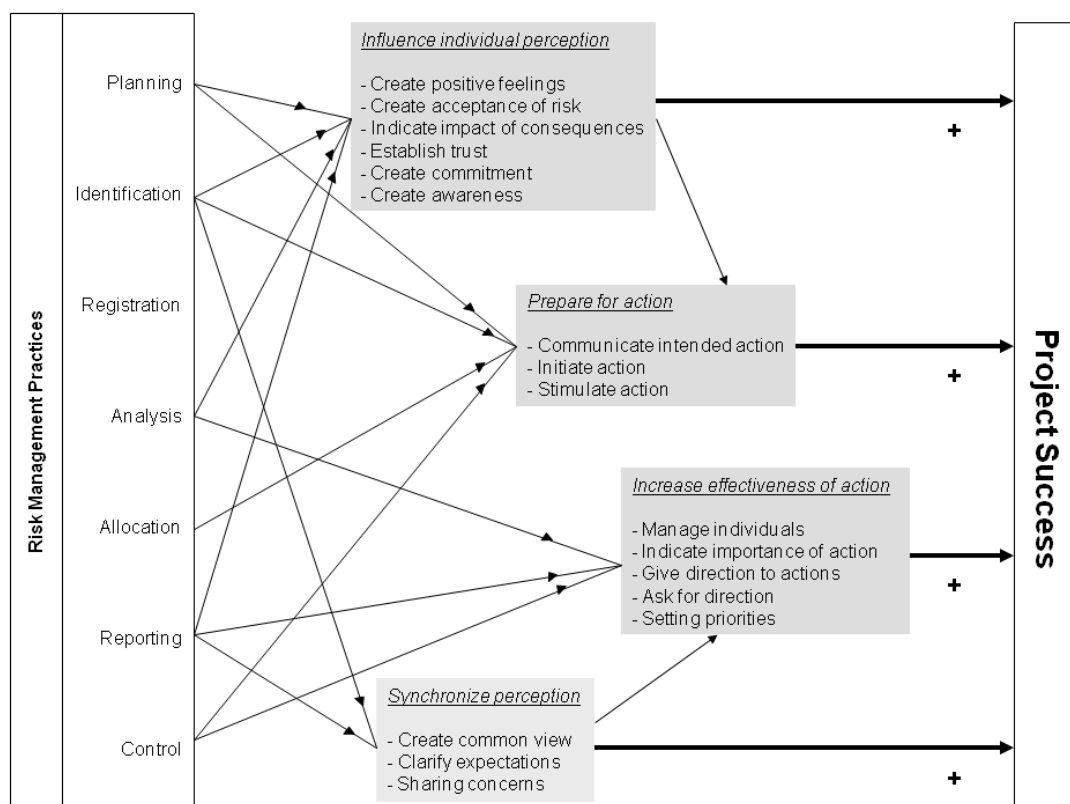
## 5. Analysis and discussion

The results presented in table 3 demonstrate various statements about how, according to stakeholders, risk management practices influence project success. As mentioned we are using the concepts by Habermas (1984, 1987) as a theoretical lens, about risk management influencing project success through better collaboration and communication. In order to be able to match the statements with the preliminary indications by Chapman & Ward (1997) and Habermas (1984, 1987), we first bring back all stakeholder statements to the essential claim or claims they make. For instance, the statement by S1, in relation to risk identification: “If you do this in a larger group, people become more aware of what is going on around them” is transferred into: “create awareness”. Statements containing two claims were split into two separate statements. For instance the statement on risk identification by C2: “The brainstorm sessions create the effect that people become aware of risks, and it initiates action” was split into: “create awareness” and “initiate action”. A conditional statement on risk identification like e.g. P1: “If you have a common view, you are better able to focus your energy on lowering the risks” was simplified: “IF common view THEN better focus energy”. Following this, we group



the claims based on if they refer to action (collaboration) or to perception (common understanding). See Appendix C for an overview of the list of effects.

A closer inspection of the list of effects demonstrates that we can group both the perception and the action statements into two subgroups. Some of the perception effects refer to influencing the individual perception of a stakeholder, e.g. “create positive feeling”, where other effects refer to the synchronisation of stakeholder perceptions, e.g. “sharing concerns”. Action effects can be divided in effects that prepare for action, e.g. “initiate action”, where other effects refer to increasing the effectiveness of the action, e.g. “setting priorities”. A drawing of the relations between risk management practices and project success through action and perception is presented in illustration 3.



*Illustration 3: Relations between risk management practices and project success from Project 1 and Project 2*

By traditional project management standards, neither of the two projects can be considered a success. For Project 1, the quality of the result is a serious issue, as is stated by S1 in the following way: “... the quality of the technical solution is not as good as it could be; we used quite a lot of shortcuts and workarounds, too many to my opinion”. In terms of functionality provided by the new system, in some cases functionality regressed. For example, C1 explained that in the original state there was an EDI (Electronic Data Interchange) solution for

the communication between the production sites and a transport company delivering the goods to customers. In the post project state people reintroduced the use of facsimile machines to communicate (C1: "... like we did 10 years ago ..."), because SAP does not yet support the EDI solution. For Project 2, time, budget and the quality of the result all are serious issues.

In contrast with the remarks made above on the success of the projects, all stakeholders consider their projects successful. In addition, stakeholders indicate that various risk management activities that were performed did contribute to the success of their project. Stakeholders from the two projects indicated risk identification, risk analysis and risk allocation as being the most influential risk management activities. Risk identification primarily creates awareness and a common view among project stakeholders. Actions taken by stakeholders are considered to be more effective in this commonly defined environment. Risk analysis relates to taking action. For example: if the outcome of the risk analysis indicates that probability of occurring and impact of the risk are high, this information is used by the project manager to convey the message to the risk owner that proper and immediate action is required. To conclude, the risk management practice "risk allocation" creates a control instrument for the project manager, because a person is made responsible for a risk.

## 6. Conclusions

By investigating the effect of project risk management on IS/IT project success, it was concluded that project risk management is defined in the literature as being an instrumental action based on rational problem solving. Research has demonstrated that this instrumental action has a limited positive effect on success in IS/IT projects (de Bakker et al., 2010). Therefore, we propose extending the instrumental view on project risk management through communicative action. Based on Habermas (1984, 1987), communicative action was defined as the action of an individual actor to create common understanding of the situation and collaboration with other actors. In order to get empirical corroboration of this theoretical broadening a case study approach was used. Stakeholders from two different ERP implementation projects were interviewed about the success of the project, the use of risk management in the project and the relationship between risk management and project success.

As a result of the case studies, the research question this research began with, namely: "How do project stakeholders perceive the effects of project risk management on IS/IT project success?" can now be described more precisely as: "How do project stakeholders perceive the effects of *individual* project risk management *activities* on IS/IT project success?". Project

stakeholders are clearly able to mention effects from individual risk management activities, such as risk identification or risk allocation, on project success. Results suggest that risk management activities not only lead to action, but also have effects on risk perception. These changes in perceptions influence the relationship between risk management and project success. Risk management practices influence the perception of the individual stakeholder within the situation by creating positive feelings, creating acceptance of risks and through establishing trust. Risk management practices are also able to synchronise the perception of stakeholders. In the projects investigated, these changes in perception both lead to stakeholder action, i.e. they stimulate action, and they increase the effectiveness of actions.

Risk management practices e.g. risk control, risk allocation and risk analysis also contribute to the stimulation of actions and/or the effectiveness of actions. Adjusted stakeholder behaviour and adjusted stakeholder perceptions, both originating from project risk management activities in which the same stakeholders participated, may be able to synchronize stakeholders' actions and perceptions, making the situation more predictable, in effect leading to less uncertainty. Stakeholders indicate all of these effects contribute to the success of the project.

#### *Limitations*

Evaluating the current status of this research, we identify the following actions that address the current limitations of the research and that will lead to further improvement. Firstly, there is currently a limited amount of research data that underpin the conclusions. Collection of data from additional case studies may be able to contribute to the stability and strength of the indicators presented in this research. Secondly; the collected research data represent the opinion of stakeholders, enhanced with information from project documentation. This means that the effect of risk management on project success is directly attributable to those effects as perceived by stakeholders. Given the case study research setting, the possibilities for "objective" validation of these perceptions are limited. Research in an experimental setting may provide additional support for the stakeholders' claim that risk management contributes to project success through influencing perceptions and actions of project stakeholders. Moreover, there is reason to presume that these effects are also apparent in non IS/IT project environments. Risk management activities influencing stakeholders' perceptions and actions could readily occur in other kinds of projects, e.g. in construction, in engineering and in product development.

#### *Further research opportunities*

Habermas' theory of communicative action appears to be a powerful theory to investigate effects of risk management practices on project success. In addition to the communicative effects that are mentioned in this paper, attention should be given to strategic action in

relation to risk management. Further, the theory creates opportunities for in-depth analysis of project communication. This in-depth analysis may include the analysis of communication between stakeholders during a risk identification session.

## 7. References

Agarwal N., & Rathod U. (2006). Defining “success” for software projects: An exploratory revelation. *International Journal of Project Management* 24(4), 358–370.

Akkermans, H., & van Helden, K. (2002). Vicious and virtuous cycles in ERP implementation: a case study of interrelations between critical success factors. *European Journal of Information Systems* 11(1), 35–46.

Association for Project Management (2004). *Project Risk Analysis and Management Guide (PRAM)*. APM Publishing.

Association for Project Management (2006). *APM Body of Knowledge*. APM Publishing.

Baccarini, D. (1999). The logical framework method for defining project success, *Project Management Journal* 30(4), 25-32.

Bannerman, P. L. (2008). Risk and risk management in software projects: A reassessment. *The Journal of Systems and Software* 81(12), 2118-2133.

Bartlett, J. (2002). *Managing Risks for Projects and Programmes*. Hook: Project Manager Today Publications.

Beck, U. (2009). Critical theory of world risk society: A cosmopolitan vision. *Constellations* 16(1), 3-22.

Bernstein, P. L. (1996). *Against the Gods: The Remarkable Story of Risk*. New York, NY: Wiley.

Besner C., & Hobbs B. (2006). The perceived value and potential contribution of project management practices to project success. *Project Management Journal* 37(3), 37–48.

Boehm, B. W. (1991). Software risk management: Principles and practices. *IEEE Software* (January), 32–41.

- Chapman, C. B., & Ward, S. (1997). *Project Risk Management*. New York, NY: Wiley.
- Cicmil, S., Williams, T., Thomas, J., & Hodgson, D. (2006). Rethinking project management: Researching the actuality of projects. *International Journal of Project Management* 24(8), 675-686.
- Cicmil, S., Cooke-Davies, T., Crawford, L., & Richardson, K. (2009). Complexity and the paradox of project control, in: *Proceedings of the 9<sup>th</sup> IRNOP conference*, Berlin Germany, October 11-13.
- De Bakker K., Boonstra A., & Wortmann H. (2010). Does risk management contribute to IT project success? A meta-analysis of empirical evidence. *International Journal of Project Management*, 28(5), 493-503.
- De Wit, A. (1988). Measurement of project success. *International Journal of Project Management* 6(3), 164–170.
- Del Caño, A., & Pilar de la Cruz, M. (2002). Integrated methodology for project risk management. *Journal of Construction Engineering and Management* 128(6), 473-485.
- Ehie, I.C., & Madsen, M. (2005). Identifying critical issues in enterprise resource planning (ERP) implementation. *Computers in Industry* 56(6), 545–557.
- Freeman, R. (1984). *Strategic management, a stakeholder approach*. Boston: Pitman.
- Habermas, J. (1984). *The Theory of Communicative Action – Reason and the Rationalization of Society*. Boston: Beacon Press.
- Habermas, J. (1987). *The Theory of Communicative Action – Lifeworld and System: A Critique of Functionalist Reason*. Boston: Beacon Press.
- Holt, R. (2004). Risk management: The talking cure. *Organization* 11(2), 251-270.
- Horner Reich, B., & Yong Wee, S. (2006). Searching for knowledge in the PMBOK guide, *Project Management Journal* 37(2), 11-26.
- Koningsveld, H., & Mertens, J. (1992). *Communicatief en Strategisch Handelen*. Muiderberg: Couthino.

- Kutsch, E., & Hall, M. (2005). Intervening conditions on the management of project risk: Dealing with uncertainty in information technology projects. *International Journal of Project Management* 23(8), 591–599.
- Loch, C. H., DeMeyer, A., & Pich, M. T. (2006). *Managing the Unknown*. New York, NY: Wiley.
- Mitchell, R., & Agle, B. (1997). Toward a theory of stakeholder identification and salience, *Academy of Management Review* 22(4), 853–886.
- Olsson, R. (2007). In search of opportunity management; is the risk management enough? *International Journal of Project Management* 25(8), 745-752.
- Pender, S. (2001). Managing incomplete knowledge: Why risk management is not sufficient. *International Journal of Project Management* 19(2), 79-87.
- Pich, M.T., Loch, C.H., & DeMeyer, A. (2002). On uncertainty, ambiguity and complexity in project management. *Management Science* 48(8), 1008–1023.
- Pinto J. K. (2007). *Project Management - Achieving Competitive Advantage*. Upper Saddle River, NJ: Pearson - Prentice Hall.
- Project Management Institute (2008). *A guide to the project management body of knowledge (PMBOK®)*. Newtown Square, PA: Project Management Institute.
- Rijsenbrij, D., Bauer, A., & Kouwenhoven, H. (1993). *Project Diagnose*. Utrecht: Cap Volmac.
- Ropponen, J., & Lyytinen, K. (1997). Can software risk management improve system development; An exploratory study. *European Journal of Information Systems* 6(1), 41–50.
- Ropponen, J., & Lyytinen, K. (2000). Components of software development risk: How to address them? A project manager survey. *IEEE Transactions on Software Engineering* 26(2), 98–112.
- Thomas, G., & Fernandez, W. (2008). Success in IT projects: A matter of definition? *International Journal of Project Management* 26(7), 733-742.

Turner, J. R. (1993). *The Handbook of Project Based Management*. Maidenhead: McGraw-Hill.

Turner, J.R., & Cochrane, R.A. (1993). Goals-and-methods matrix: coping with projects with ill defined goals and/or methods of achieving them. *International Journal of Project Management* 11(2), 93-102.

Voetsch, R. J., Cioffi, D. F., & Anbari, F. T. (2004). Project risk management practices and their association with reported project success. In: *Proceedings of 6<sup>th</sup> IRNOP Project Research Conference*, Turku, Finland, 680–697.

Wateridge, J. (1998). How can IS/IT projects be measured for success? *International Journal of Project Management* 16(1), 59-63.

Weick, K. E., & Sutcliffe, K. M. (2007). *Managing the Unexpected*. New York, NY: Wiley.

Williams, T. (2005). Assessing and moving on from the dominant project management discourse in the light of project overruns. *IEEE Transactions on Engineering Management* 52(4), 497-508.

Winter, M., Smith, C., Morris, P., & Cicmil, S. (2006). Directions for future research in project management: The main findings of a UK government-funded research network. *International Journal of Project Management* 24(8), 638-649.

Yin, R. K. (2003). *Case Study research*. Thousand Oaks: Sage Publications.

## Appendix A: Interview script questions

### Question 1

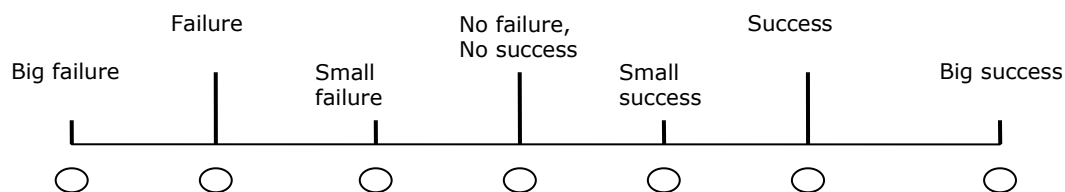
Please, consider the following six statements:

1. The project must finish on the date that is agreed upon
2. The project must comply with its financial limits
3. The project must deliver what is agreed upon in the project requirements document
4. People that work on the project must enjoy working on the project
5. Project stakeholders must be satisfied with the overall project result
6. The project result must have potential to support future organisational developments

Relate these statements to **this project**. Please rank the statements in order from “most important” to “least important”. Can you elaborate on why you chose this ranking in relation to this project?

### Question 2

How can **this project** according to your opinion be considered? This project to me is a...



Can you elaborate on your answer? In answering this question, please take into consideration how this answer relates to the mentioned statements of:

1. The project must finish on the date that is agreed upon
2. The project must comply with its financial limits
3. The project must deliver what is agreed upon in the project requirements document
4. People that work on the project must have enjoyed working on the project
5. Project stakeholders must be satisfied with the overall project result
6. The project result must have potential to support future organisational developments

### Question 3

In front of you, you see a list of risk management activities. Together we will walk through the activities. Can you indicate which of the following activities have been used during the project? Can you give characteristics for each of the activities about:

- **when** these activities were done, and how often?
- **what** was done?
- if **you were actively involved** in these activities?



*Question 4*

To your opinion, have the following activities influenced **the results of the project**:?

Activity	Influence
Risk Management Planning	Yes / No / NA
Risk Identification	Yes / No / NA
Risk Registration	Yes / No / NA
Risk Analysis	Yes / No / NA
Risk Allocation	Yes / No / NA
Risk Reporting	Yes / No / NA
Risk Control	Yes / No / NA

NA = Not Applicable (is based on the answers on question 3)

Can you relate the risk management activities that were used to the following statements:

<Risk management activity name> was of influence on:

1. The project must finish on the date that is agreed upon
2. The project must comply with its financial limits
3. The project must deliver what is agreed upon in the project requirements document
4. People that work on the project must enjoy working on the project
5. Project stakeholders must be satisfied with the overall project result
6. The project result must have potential to support future organisational developments

*Question 5*

Can you elaborate on **how** these activities have influenced the results of the project? Please elaborate each used risk management activity individually.

*Question 6*

Do you have any additional remarks to make, or where there things not discussed that are relevant for this project or for this research?

<end>

**Appendix B: Risk management practices in scope of this research and how they were used in the case projects**

Risk Management Practice	Description of the practice	Tools or appearance of the practice	
		Project 1	Project 2
Risk Management Planning	Writing a plan or writing a paragraph in the project plan <i>about how risk management will be executed</i> on the project (NOT an initial list of risks!)	A paragraph in the implementation plan	<none>
Risk Identification	Naming and identifying risks with the use of e.g. filling out questionnaires, consulting experts, doing brainstorm sessions, conducting interviews	Brainstorm sessions with project management team	A limited amount of interviews and brainstorm sessions, mainly during project restart-up
Risk Registration	Recording and maintaining the list of risks in e.g. a database, one or more documents, spreadsheets	Spreadsheet, maintained by the project manager	A list, not maintained during the project
Risk Analysis	Analysing risks, e.g. by estimating probability and impact, doing simulations (e.g. Monte Carlo), root cause analysis	Estimation of probability and impact in terms of high – medium - low by the project management team	Once, during project (re) start-up, in combination with proposals for directions to solve the risks
Risk Allocation	Appointing a person to be responsible for taking care of a particular risk	Allocation to individuals within the project management team	Risks are considered to be owned by the project management
Risk Reporting	Distributing information about risks and the status of risks to other people, e.g. by dedicated risk status reports or as part of project progress reports	Only from project management team to project board	Not specifically on risk. Risk was part of the progress reports.
Risk Control	Holding meetings with various people in which status and actions of risks are discussed	Integrated in the risk sessions of the project management team	Not specifically on risk. Risk was part of the overall project control.

## Appendix C: Effects on project success by various risk management practices

<b>Risk Management Practice</b>	<b>Effect contributing to project success</b>
	<b>Referring to action (collaboration)</b>
Risk Management Planning	Indicate importance of actions
Risk Management Planning	Communicate intended actions
Risk Identification	Initiate action
Risk Control	Initiate action
Risk Allocation	Initiate action
Risk Reporting	Setting direction
Risk Analysis	Direction of actions
Risk Control	Direction of actions
Risk Reporting	Setting priorities
	<b>Referring to perception (common understanding)</b>
Risk Identification	Create awareness
Risk Reporting	Create awareness
Risk Identification	Create common view
Risk Identification	Create commitment
Risk Reporting	Create commitment
Risk Identification	Sharing concerns
Risk Reporting	Clarify expectations
Risk Identification	Clarify expectations
Risk Reporting	Create positive feeling
Risk Analysis	Create acceptance of risk
Risk Reporting	Establish trust
Risk Analysis	Indicate impact
	<b>Conditional statements</b>
Risk Identification	IF common view THEN focus energy
Risk Identification	IF awareness THEN direction
Risk Identification	IF express concerns, THEN improve involvement
Risk Analysis	IF indicate impact THEN know consequences
Risk Analysis	IF know consequences THEN trigger action