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# Communicative Project Risk Management in IT Projects

*Karel de Bakker*

*Project management practitioners and scientists assume that risk management contributes to project success through better planning of time, money and requirements. However, current literature on the relation between risk management and IT project success provides hardly any evidence for this assumption. Nevertheless, risk management is used frequently on IT projects. Findings from new research provide evidence that individual risk management activities are able to contribute to project success through "communicative effects". Risk management triggers or stimulates action taking, it influences and synchronizes stakeholders' perceptions and expectations and it shapes inter-stakeholder relationships. These effects contribute to the success of the project.*

**Keywords:** Case Studies, Communicative Action, ERP, Experiment, Project Risk Management, Project Success.

## 1 Introduction

The question as to whether project risk management contributes to project success is, in the context of project management practitioners, essentially a question about the value of an instrument. An instrument that is employed by project managers during the planning and execution stages of a project, employed to secure project success, regardless of all manner of unexpected events and situations that may occur during project execution.

In order to answer the question, a research project [1] was conducted which was divided into four stages. The structure of this article embodies this staged approach, the first stage being a study of recent literature on the relationship between risk management and Information Technology (IT) project success. IT projects are well known for their frequent failure (see e.g. [2]), and because of the recommendation to use risk management more frequently in order to increase the success rate ([3]).

From the literature study it appeared that in order to answer the question about the contribution of project risk management to IT project success, an additional view on project risk management and project success is necessary. This additional view is developed in the second stage of the research. Exploration of the additional view is done in the third stage, by means of case studies of ERP implementation projects. Finally, in stage four, an experiment is conducted in which the influence of a single risk management activity on project success is investigated. This article concludes with a section on theoretical implications and implications for practitioners.

## 2 What does Literature tell us about Risk Management and IT Project Success?

The conducted literature study investigated 29 papers, published between 1997 and 2009 in scientific journals, reporting on the relationship between risk management and project success in IT projects. The study demonstrates two main approaches on how risk management is defined in the

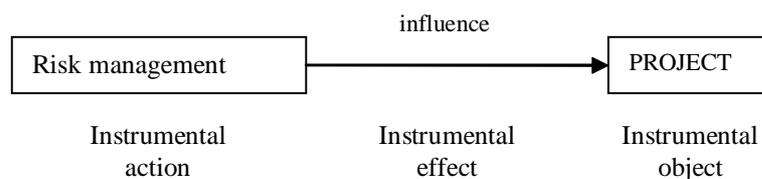
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literature, one of them being the *management* approach. The management approach considers risk management as being an example of a rational problem solving process in which risks are identified, analysed, and responses are developed and implemented. Evidence found in all investigated papers for the relationship between risk management and project success is primarily anecdotal or not presented at all.

Additional empirical findings indicate that the assumptions underpinning the management approach to risk management are often invalid. Firstly, IT projects contain risks for which there is no classical or statistical probability distribution available. These risks cannot be managed by means of the risk management process [4]. Secondly, project managers in IT projects show a tendency to deny the actual

““ Project management practitioners and scientists assume that risk management contributes to project success””



**Figure 1:** Traditional View on Risk Management and its Relation to the Project.

presence of risk; they avoid it, ignore it or delay their actions [5]. This behaviour is not in line with the assumed rational behaviour of actors. Thirdly, project stakeholders in general deliberately overestimate the benefits of the project and at the same time they underestimate the project risks at the start of the project [6]). Finally, various authors (e.g. [7]) indicate that the complete sequence of risk management activities is often not followed in projects, consequently the assumption of rational problem solving is incorrect.

Not only is there very little evidence from recent literature that risk management contributes to IT project success, empirical findings thus far indicate it is also unlikely that risk management is able to contribute to IT project success. Taking into consideration the remarks made by various authors about the limitations of IT projects, risk management is able to contribute to IT project success if the project: (1) has clear and fixed requirements, (2) uses a strict method of system development, and (3) has historical and applicable data available, collected from previous projects. The combination of the three mentioned criteria will only occasionally be met in IT projects. As an example we can consider the development of a software module of known functionality and function points by a software development organisation, certified on CMM level 4 or 5.

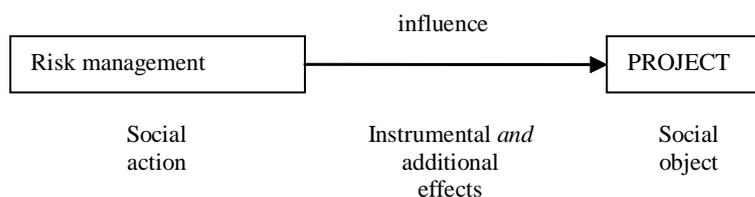
It remains remarkable that there is such a large gap between project risk management in theory and project risk management in practice. Findings from research indicate that the complete risk management process as described for instance in the PMI Body of Knowledge [8], is often not followed [9], or even that practitioners do not see the value of executing particular steps of the risk management process [7]. In addition, it is remarkable that both project management Bodies of Knowledge and established current lit-

erature ignore the results from research which indicate the assumptions and mechanisms that underpin project risk management only work in specific situations, or do not work at all. This should at least lead to a discussion about the validity of certain elements of the Bodies of Knowledge, and to the adjustment of the project risk management process, which is claimed to be founded on good practice [8] or even Best Practice [10].

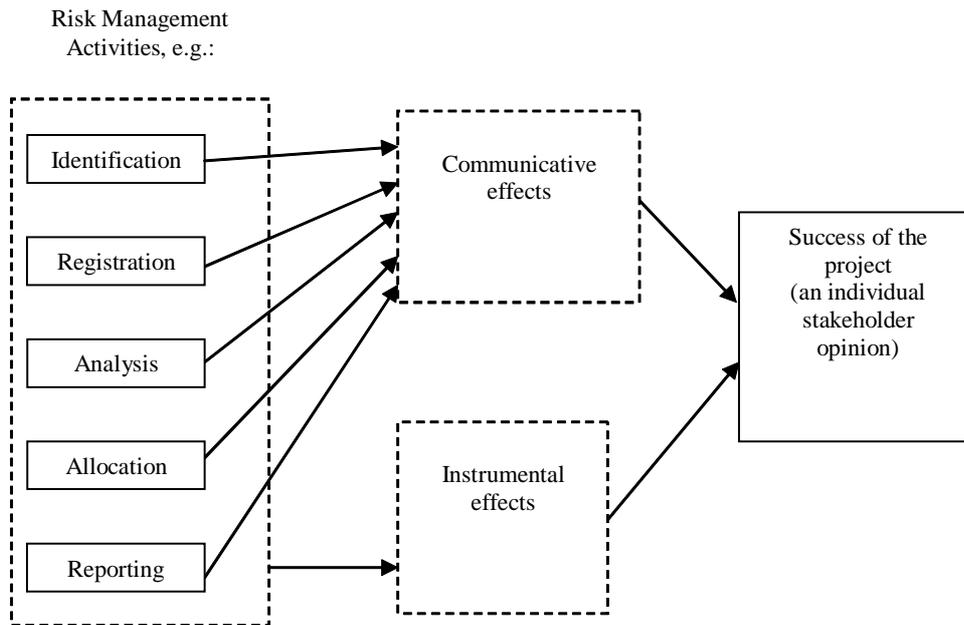
### 3 An Additional View to Project Risk Management

An important assumption in the current literature underpinning both project management and the way risk management influences the project and consequently project success, is the assumption that projects are taking place in a reality that is known, and that reality is responding according to the laws of nature the project stakeholders either know or may be able to know (see e.g. [11]). This so called instrumentalism assumption defines project risk management, its effects, and the object on which project risk management works, i.e. the project, in instrumental terms. Figure 1 depicts the relation between risk management and the project in traditional terms, in other words under the assumption of instrumentalism.

Risk management may work well in situations in which the object of risk management can be described in terms of predictable behaviour (the instrumental context), for instance controlling an airplane or a nuclear power plant, or a piece of well defined software that must be created as part of an IT project. Risk management is then an analytical process in which information is collected and analysed on events that may negatively influence the behaviour of the object of risk management. However, projects, and particularly IT projects, generally consist of a combination of elements that contain both predictable and human behaviour; the latter of



**Figure 2:** Adjusted (or New) View on Risk Management and its Relation to the Project.



**Figure 3:** Communicative and Instrumental Effects of Risk Management on Project Success.

which is not always predictable. The presence of human behaviour makes a project a social object, an object which does not behave completely predictably.

Furthermore, human behaviour, together with human interaction, plays a role in the risk management process itself. During the various activities of the risk management process, participants in these activities interact with each other. Risk management can then no longer be considered instrumental action, but should be considered social action instead. These interactions between participants in the risk management process may be able to create effects in addition to the assumed instrumental effects of risk management. Figure 2 presents this adjusted view on the relationship between risk management and the project.

This adjusted view, which considers risk management as being social action working on a social object, instead of instrumental action working on an instrumental object, leads to various changes in model definitions and assumptions compared to the traditional view.

The adjusted view considers project success to be the result of a personal evaluation of project outcome characteristics by each stakeholder individually (see e.g. [12]). Timely delivery, delivery within budget limits and delivery according to requirements, being the traditional *objective*

*project success* criteria, may play an important role in this stakeholder evaluation process, but they are no longer the only outcomes that together determine if the project can be considered a success. Therefore, project success becomes *opinionated project success*, and is no longer considered as something that can be determined and measured only in objective terms.

The adjusted view, considering risk management in terms of social action, implies that risk management is a process in which participants interact with each other. In addition to the traditional view, which considers risk management only in terms of instrumental action and instrumental effects, the additional view assumes that interaction between participants or social interaction exists, which may lead to additional effects on the project and its success (see Figure 3). This research refers to these effects resulting from interaction as “communicative effects”, and the research assumes that each risk management activity individually may be able to generate communicative effects and may therefore individually contribute to project success.

Generally speaking, this additional view on risk management creates an environment in which human behaviour and perception play central roles in terms of describing the effect of risk management and the success of the

“ New research provides evidence that individual risk management activities are able to contribute to project success through ‘communicative effects’ ”

## Risk Management

<b>Case</b>	<b>1</b>	<b>Sector</b>	Food industry
<b>Project description</b>	SAP system implemented on two geographic locations in four organisational units. System used to support a number of different food production processes and financial activities.		
<b>Duration</b>	13 months		
<b>Additional information</b>	Use of method for organisational change, not for project management. Time & Material project contract. External project manager, hired by the customer, and not related to the IT supplier.		
<b>Case</b>	<b>2</b>	<b>Sector</b>	Government
<b>Project description</b>	SAP system implemented on 40 locations. System used for production, issuing and administration of personalized cards that provide access to office buildings. SAP linked on all 40 locations to peripheral equipment (photo equipment, card printers)		
<b>Duration</b>	17 months		
<b>Additional information</b>	Internal project with internal project manager. Limited number of external personnel. No formal project contract. Limited Prince2 methodological approach, combined with organization specific procedures and templates.		
<b>Case</b>	<b>3</b>	<b>Sector</b>	Government
<b>Project description</b>	SAP system implemented on four locations. System used for scheduling duty rosters of around 3000 employees. Time critical project because of expiring licences of previous scheduling system.		
<b>Duration</b>	24 months (including feasibility study), 21 months excl.		
<b>Additional information</b>	Internal project with internal project manager. Limited number of external personnel. No formal project contract. Limited Prince2 methodological approach, combined with organization specific procedures and templates.		
<b>Case</b>	<b>4</b>	<b>Sector</b>	Energy
<b>Project description</b>	Creation from scratch of a new company, being part of a larger company. SAP designed and implemented to support all business processes of the new company. SAP system with high level of customization.		
<b>Duration</b>	9 months (for stage 1; time according to original plan, but with scope limited)		
<b>Additional information</b>	The ERP project was part of a much larger project. Fixed price, fixed time, fixed scope contract with financial incentives. Project manager from IT Supplier. Project restarted and re-scoped after failure of first attempt. Strict use of (internal) project management methodology, procedures and templates		
<b>Case</b>	<b>5</b>	<b>Sector</b>	Public utility (social housing)
<b>Project description</b>	ERP system based on Microsoft Dynamics Navision. Implemented to support various primary business processes, for instance: customer contact, contract administration, property maintenance		
<b>Duration</b>	12 months		
<b>Additional information</b>	Time and material contract. Project restart after failure of first attempt. Project manager from IT supplier organization. Limited Prince2 methodological approach.		

**Table 1A:** Overview of Seven investigated ERP Implementation Projects.

Case	6	Sector	Public utility (social housing)
Project description	ERP system based on Microsoft Dynamics Navision. Implemented to support various primary business processes, for instance: customer contact, contract administration,		
Duration	11 months		
Additional information	Time and material contract. External project manager, hired by the customer organization and with no formal relation to the IT Supplier. No formal project management methodology used		
Case	7	Sector	Petro-chemical industry
Project description	Divestment project. Selling all activities of one specific country to a new owner. Existing ERP systems related to the sold activities carved out of the company wide ERP system (mainly SAP) and handed over to the new owner.		
Duration	14 months (ready for hand-over as planned)		
Additional information	The ERP project was part of a larger project. The ERP project budget was low (less than 5%) compared to the overall deal (approx. 400 million EUR). Internal project manager. Fixed time project, but delayed several times because of external factors. Internal project management guidelines and templates used		

**Table 1B:** Overview of Seven investigated ERP Implementation Projects.

project. The additional view acknowledges the influence of stakeholders interacting with each other, and influencing each other through communication. By doing so, this additional view positions itself outside the strict instrumental or “traditional” project management approach that can be found in project management Bodies of Knowledge. However, the additional view does not deny the fact that risk management may influence project success in an instrumental way; it only states that in addition to the potential instrumental effect of risk management, there is a communicative effect. Given the limitations of the effectiveness of the instrumental effect, the influence of the communicative effect of risk management on project success may probably be larger than the influence of the instrumental effect.

**4 Results from Case Studies**

Seven ERP implementation projects were investigated for the presence of communicative effects as a result of the project risk management process. Presented here is a table (Table 1) with an overview of all investigated ERP implementation projects. A total number of 19 stakeholders from the various projects were interviewed. Data collection took place between one and two months after project completion.

Considering project success, two projects score low on objective project success because of serious issues with time, budget and requirements; both projects had a restart. Four projects score medium on objective project success, all having minor issues with one or more of the objective success criteria. One project scores high on objective project success. Variation on opinionated project success is low. Stakeholders from the two low objective success projects score lower on opinionated project success than stakeholders from the other five projects, but based on the objective success scores, the difference is less than expected.

ERP implementation projects that participated in the research were selected based on the criterion that they had done “something” on risk management. The sample of projects therefore does not include projects that performed no risk management at all. Risk identification is conducted on all projects, in various formats including brainstorm sessions, moderated sessions and expert sessions. Risk analysis was carried out in five projects, but only in a rather basic way; none of the projects used techniques for quantitative risk analysis. Other risk management activities, the use of which were investigated in the projects are: the planning of the risk management process, the registration of risks, the allocation of risks to groups or individuals, the report-

“ IT projects are well known for their frequent failure ”

<sup>1</sup> This typology of effects is based on The Theory of Communicative Action by Jürgen Habermas (1984) [13]. In order to avoid an excessively wide scope for this article, this theoretical background is not discussed here.

“ Risks in IT projects cannot be managed by means of the risk management process ”

ing of risks to stakeholders or stakeholder groups and the control of risks. Actual use and format of these practices vary over the projects.

The case studies’ results demonstrate that, according to stakeholders, project risk management activities contribute to the perceived success of the project. Risk identification is, by all stakeholders, considered to be the risk management activity that contributes most to project success. Furthermore, stakeholders provide a large number of indications on how risk identification, in their view, contributes to project success. Finally, risk identification is, by stakeholders, considered to be able to contribute to project success through a number of different effects; Action, Perception, Expectation and Relation effects<sup>1</sup>.

Risk identification triggers, initiates or stimulates action taking or making actions more effective (Action effect). It influences the perception of an individual stakeholder and synchronizes various stakeholders’ perceptions (Perception effect). It influences the expectations of stakeholders towards the final project result or the expectations on stakeholder behaviour during project execution (Expectation effect). Finally, it contributes to the process of building and maintaining a work and interpersonal relationship between project stakeholders (Relation effect). Risk reporting is another risk management activity that influences project success through these four effects. Other risk management activities also generate effects, but less than the

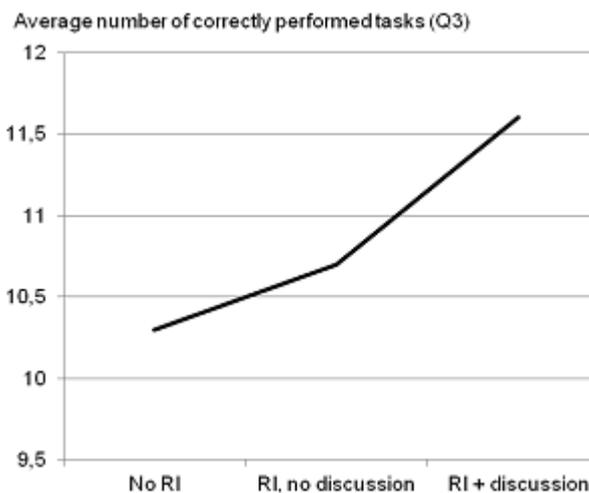


Figure 4: Trend Line, demonstrating the Influence of Risk Identification (RI) with or without Group Discussion on the Number of correctly Performed Tasks.

four effects mentioned with risk identification and reporting. The research data demonstrate a positive relation (both in quantity and in quality) between the effects generated through risk management activities and project success.

5 Results from an Experiment

The conclusion that individual risk management activities contribute to project success is based upon the opinions of individual stakeholders, meaning that the effect of risk management on project success is directly attributable to those effects *as perceived* by project stakeholders. Given the case study research setting, the possibilities for “objective” validation of these perceptions are limited. In order to create additional information on the effect of a specific risk management practice on project success, independently of various stakeholders’ perceptions, an experiment was developed with the aim to answer to the following sub-question: *Does the use of a specific risk management practice influence objective project success and project success as perceived by project members?*

Building on the results of the case studies, risk identification was chosen as the risk management activity for the experiment. Risk identification is the activity which, according to the results from the case studies, has the most impact on project success. Furthermore, a project generally starts with a risk identification session, which makes risk identification relatively easy to implement in an experimental setting. The experiment was conducted with 212 participants in 53 project groups. All participants were members of a project group where, in the project, each member had the same role. The project team had a common goal, which further diminished the chances for strategic behaviour of participants. The common goal situation provided the conditions for open communication and therefore for communicative effects, generated by the risk management activity.

All project groups that performed risk identification before project execution used a risk prompt list to support the risk identification process. 17 groups did risk identification by discussing the risks with team members (type 3 groups); 18 groups that did risk identification did not discuss risks with team members (type 2 groups). The control group projects (type 1 groups, 18 groups) conducted no risk identification at all before project execution. All project groups had to execute the same project, consisting of 20 tasks.

Results from the experiment demonstrate that project groups that conducted risk identification plus discussion

“ Human behaviour, together with human interaction, plays a role in the risk management process itself ”

<sup>2</sup> Jonckheere-Terpstra test: ( $J = 625, r = .36, p < .01, N = 53$ ).

““ The case studies’ results demonstrate that, according to stakeholders, project risk management activities contribute to the perceived success of the project ””

perform significantly better in the number of correctly completed tasks than the control groups that did not conduct risk identification at all. The number of correctly performed tasks is, in this experiment, one of the indicators for objective project success. A trend test<sup>2</sup> demonstrates a highly significant result, indicating that the number of correctly performed tasks increases when groups perform risk identification, but increases further when groups do risk identification plus discussion. Figure 4 illustrates this trend. Types of projects are on the X-axis. The Y-axis presents the average number of correctly performed tasks by the project team (Q3).

Perceived (opinionated) project success was measured by asking projects to grade the project result. The analysis of grades demonstrates some remarkable research findings. Project groups that did risk identification plus discussion (type 3) score significantly better on the number of correctly performed tasks than control groups (type 1). *After* project groups have been informed about their *own* project result (and their own result only), *all* project groups value their project result equally. There is no difference in grades assigned by project groups from any of the group types. The result of project groups that conducted risk identification plus discussion is objectively better, but apparently this better result is not reflected in the opinion of the project groups who conducted risk identification plus discussion.

It is remarkable to see that, directly after project execution, *before project groups are informed about their project result*, project groups who conducted risk identification plus discussion are significantly more positive about their result than groups that conducted no risk identification or risk identification without communication. The grades for project success given by project groups directly after project execution indicate that project groups attribute positive effects to risk management in relation to project success.

## 6 Conclusions and Implications

The main conclusion of this research is: Project risk management as described in handbooks for project management and project risk management [14][8] only occasionally contributes to project success if project risk management is considered solely in terms of instrumental action working on an instrumental object. If, on the other hand, project risk management is considered a set of activities in

which actors interact and exchange information, also known as communicative action, working on a social object, individual risk management activities contribute to project success because the activities may generate Action, Perception, Expectation and Relation effects. A positive relation exists between the effects generated through risk management activities and project success.

The experiment demonstrates that an individual risk management activity is able to contribute to elements of project success. For this effect to occur, it is not necessary to measure or to quantify the risk. For instance in a risk identification brainstorm, project stakeholders exchange information on what they individually see as the potential dangers for the project. Such an exchange of information may lead to adjustments of the expectations of individual actors and the creation of mindfulness [15]. Mindfulness includes awareness and attention; actors become sensitive to what is happening around them, and they know when and how to act in case of problems. This leads to a remarkable conclusion, which can be described as “the quantum effect” of project risk management, because its appearance is somewhat similar to what Werner Heisenberg in quantum mechanics described as the uncertainty principle.

Firstly; in order to influence the risk, *it is not necessary to measure the risk*. The experiment demonstrated that a risk prompt list, in which five risks were mentioned that were realistic, but all of which had very low probability of occurring, is enough to make project members aware of potential project risks and to influence their behaviour. As a result, the project groups who talked about the risks before project execution performed better and gave themselves a higher grade for the performance of their project. Secondly, as a result of this communicative effect, *it is impossible to measure risk without changing its probability*. The moment the risk is discussed, stakeholders become influenced and this consequently leads to an effect on the probability of the risk.

Based on the research findings the main implication or recommendation for practitioners is to continue the use of risk management on IT projects. However, this research provides some important recommendations that should be taken into account when risk management is used on IT projects. Practitioners should be aware that the assumptions underlying the project risk management process as de-

““ The main implication or recommendation for practitioners is to continue the use of risk management on IT projects ””

scribed in handbooks for project management (the instrumental view) are often not correct. Hence, only in specific situations, is the risk management process able to contribute to project success in terms of “on-time, on-budget” delivery of a predefined IT system. If project risk management is used in a situation in which the assumptions are not met, it will inevitably lead to a situation in which project stakeholders think that the project risks are under control, where in fact they are not.

However, individual risk management activities such as risk identification or risk allocation generate non-instrumental effects, possibly in addition to instrumental effects. These non-instrumental or communicative effects occur as a result of interaction (discussion, exchange of information) between project stakeholders during the execution of risk management activities. Communicative effects stimulate instrumental action taking by stakeholders, and the effects create a common view among project stakeholders about the project situation by influencing stakeholders’ perceptions and expectations and shaping the inter-stakeholders’ relationships. Practitioners should be aware that the creation of communicative effects can be stimulated by providing capacity for interaction during risk management activities. For instance; a risk identification brainstorm session or moderated meeting will generate more communicative effects than a risk identification session in which only checklists or questionnaires are used. For the communicative effects to occur it is not necessary that the complete risk management process is executed as described in handbooks for project management. Individual risk management activities each have their own effect on project success through the various communicative effects they may generate. The communicative effect contributes to project success, not only in terms of time, budget and quality, but also in terms of perceived success.

At the same time, practitioners should be aware that communicative effects with an effect on project success will not occur in every project situation, nor that the effect is, in all situations, a positive effect. If, for instance during risk identification, certain information about risks is labelled as being important for the project, where in fact these risks were relevant in an earlier project, but not in the forthcoming project, the risk communication can lead to project members to focus upon (what later will appear to be) the “wrong risks”. By focussing upon the wrong risks, project members are unable to detect and respond to risks that have not been identified; one of the cases (case 7) of this research provides an example of this type of problem. Furthermore, communicative effects with a positive effect on project success occur predominantly in situations where information is not used strategically. In situations in which information on risks is not shared openly, the positive communicative effect may not occur. One other case (case 4) of this research provides some indications that not sharing risk related information between customer and IT supplier leads to lower communicative effects, resulting in lower project success.

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