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How to Orchestrate IT Project Portfolios More Successfully - Application of a Theory-Driven Proactive Operational Risk Management Approach

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Research-in-progress

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ABSTRACT

Monitoring and managing thousands of IT projects simultaneously is extremely challenging for large consultancies or IT service providers wherefore a functioning and effective risk management approach is of pivotal importance. In this paper we illustrate the preliminary results of an ongoing longitudinal action research project. Invited by the CIO, the authors were embedded in a reorganization project of one of Europe's largest IT service provider's risk management office, responsible for several thousand IT projects. In this action research approach, the authors were able to contribute to the improvement of the existent risk management approach from a theoretical perspective as scientific consultants. First results indicate that the new proactive risk management led to a 25% reduction of critical project indexes in 2007. This research-in-progress paper will outline the applied action research approach and the current status of the ongoing project.

Keywords

project risk management, action research

RESEARCH OBJECTIVES AND QUESTIONS

One of the most challenging tasks IT project managers are confronted with is solving the problem of how to uncover, measure, and subsequently manage hidden, emerging, or latent risks in large IT software development projects. Finding a solution for this problem is even more difficult if one has to rely on reporting lines and project documentations. Unidentified or ignored risks have caused software development projects to fail or end in a disaster (Nash 2000). In extent literature, famous catastrophic project outcomes are reported such as the Taurus software development project for the London Stock Exchange (Bergman et al. 2002a; Bergman et al. 2002b), the software development project for the baggage-handling system at the Denver airport (Montealegre and Keil 2000), or the London ambulance computer-aided dispatch project (Beynon-Davis 1995). Although the aforementioned projects are not directly comparable with each other, a common denominator of all projects is that emerging risks within the projects have not been identified and communicated early enough wherefore appropriate countermeasures came too late or never happened at all to prevent the failing course of actions. Given the provided examples and many others more it is no surprise that a proactive risk management throughout the entire IT software development process is regarded as mandatory to increase the chance of delivering a successful product.

In this research-in-progress we analyze and consult one of Europe's largest IT service providers in its attempt to improve its risk management approach. The chief information officer (CIO) of this enterprise invited us to join the risk management reorganization team in order to contribute theory-driven solutions to the new risk management system. The intention is to establish a continuous proactive risk management process that supports the complete life-cycle of deals, projects and services and replaces several so far used, less coherent and structured approaches. A special emphasis is laid on the definition and traceability of countermeasures for preventing negative risk impacts. The authors have chosen an action research approach as their epistemological base due to their "embeddedness" and active role in the development project. Furthermore, the approach allows actively altering the researched object and testing the results of each action in a lab experiment like approach. *This project provides the authors the unique opportunity to a) develop theory-driven concepts to improve the communication and traceability of potential project risks, to b) implement the improved, new proactive risk management in IT software development projects, and c) measure the impact of the proactive risk management system on project success.*

The remainder of this paper is structured as follows: after providing some background information on IT project risk management aspects the most influential information systems concepts and theories are discussed that guided the authors during the development of the refined risk management approach. Then, the applied action research approach is illustrated as well as the technique of the conceptualization of the proactive risk management and the subsequent testing to allow for methodological transparency. In the concluding discussion of the findings the current results will be illustrated and the next steps in the ongoing research project will be outlined.

THEORETICAL FOUNDATIONS

Risk management aims at increasing a project's chance of success by explicitly addressing the uncertainties, potential hazards and other imponderabilities related to the project in the future (Hughes and Cotterell 2002). Boehm describes software project risk management by separating it into two main stages, risk assessment and risk control (Boehm 1991). The first stage, risk assessment, is a project-wide systematic approach to identify, analyze and prioritize project risk factors. The second stage, risk control, comprises risk management planning, risk resolution and monitoring (Boehm 1991). The crux of the matter lies in the identification of those risk factors that need to be controlled (Schmidt et al. 2001). Therefore the value of any risk management is dependent upon an effective and efficient method to assist project managers in identifying all significant risk factors (Schmidt et al. 2001).

The challenge of risk management is to minimize the personal bias in the reporting process and providing transparency of risks in projects. For instance, the commitment of a project manager to his or her project is essential for its success but it can jeopardize the outcome when the project manager adheres to its initial plan despite the fact that circumstances have changed and better alternatives have evolved. Here, an escalation of commitment takes place. It is marked by the continual commitment of additional resources into a failing course of action although negative information on the project development is available (Keil 1995; Staw 1976). In addition, the phenomenon of the "mum" and "deaf" effect represent a critical aspect on communication within the project as well as towards the management level. The mum effect occurs when one or more stakeholders who have information indicating a project is failing decide to remain silent and let the project continue. A study by Keil and Robey revealed that even when monitoring took place, the auditors censored themselves intentionally or unintentionally (Keil and Robey 2001). The deaf effect describes a situation in which a person in charge of preventing projects from a failing course of actions refuses to pay attention to the problem or risk (Keil and Robey 1999; Keil and Robey 2001).

Deaf and mum effect impedes any serious risk management approach that aims to increase a project's chance of success by explicitly addressing critical factors. It also ensures that de-escalation strategies are made available, aiming to reduce the commitment to previous decisions, and to enact an alternative action or plan (Montealegre and Keil 2000). A survey by Keil and Robey showed that factors such as regular evaluation of the projects, risk awareness, as well as separation of responsibilities for approving and evaluating projects encourage the transition from escalation to de-escalation (Keil and Robey 1999). Furthermore, top management was found to be the most common trigger for de-escalation, followed by internal as well as external auditors. Hence, risk management needs the mindset of a whistle blower to counter the mum and deaf effects and address the problem in order to find a solution as basis for initiating the de-escalation process (Dozier and Miceli 1985; Drummond 1996; Keil and Robey 1999). The intangible characteristic of IS projects and their dynamic development can lead to shift of technological and/or environmental requirements during the project life span. This adds an additional special challenge to the operative risk management (Abdel-Hamid et al. 1999; Zmud 1980). On this account, it is difficult for auditors to identify problem situations that may affect the success of the business venture (Smith and Keil 2003) so he or she might more likely withhold information due to uncertainty (as kind of mum effect) (Keil and Robey 2001). In fact, the lack of correct status information on a project is one of the major reasons for escalation in medium- to large-scale IS projects (Keil et al. 2000).

CASE DESCRIPTION AND RESEARCH METHODOLOGY

Case Description

The research takes place at one of Europe's largest IT service providers. The CIO of the enterprise has ordered a new, more sophisticated and proactive risk management approach in order to manage the project portfolio comprising a half dozen thousands projects more successfully. The service provider has implemented already a commercial risk management focusing on the financial accounting and controlling risks that are included in every business venture. A tool called RiskMan has been adopted, assisting the risk management process as it supports the registration, evaluation, analysis and communication of commercial risks. Quality gate checklists have been established for the quality gates 1 to 4 supporting the risk identification

and communication which provides an increased transparency of critical factors in the initial deal phase of new projects. In addition, a risk exposure and measurement tool (REM) provides an overview on the operational and commercial risks in a deal. Based on the existing tools, the CIO decided to establish a strategic project with the goal to provide and implement a unified, optimized, standardized, and integrated proactive operational risk management system throughout the company that starts in the deal phase of an new project and continues during the whole project life-cycle project and even beyond that if an ongoing service is established. The project started in February 2007 and is still ongoing. The project team was staffed with twelve members, recruiting ten representatives from different departments of the company and two scientific consultants. A clear scope of the project was derived from the goal set by the CIO to increase the transparency in deals, projects and services. This was achieved by expanding the quality check list on to quality gates 5 to 8, covering the project phase and 9 to 10 for the services phase. In addition, a new reporting system and monitoring mode was designed to ensure an up-to-date status on the development of the projects. The functionalities of the risk management tool were enhanced providing an ongoing risk identification and analysis in the project phase as well as a categorization of the deals and projects.

Research Methodology

To capture the performance and improvement of the development project, it was mandatory for the scientific consultants to apply a research method enabling them to actively participate in the changing process. In addition, the method had to possess the ability to adapt to the dynamic environment of IS projects (Coughlan and Coghlan 2002).

Methodological element	McKay & Marshall (2001)	Scope of application
Initiating	1. Identify: problem and research theme 2. Reconnaissance: problem context and research literature 3. Plan and design: problem solving and research questions	1. A kick-off meeting took place, a scope statement was issued and the research question was defined. Requirements by the IT service provider and AR were identified. 2. Significant company data and literature providing a theoretical base were collected. The compliance with the requirements of the IT service provider and AR were verified. 3. A milestone plan was issued, provided a timeline and structure for the problem solving and research process. The project team was selected as "project steering group", representing a "sparring partner" for the scientific consultants.
Iterating	4. Action steps 5. Implement 6. Monitor: problem solving and research 7. Evaluate in terms of problem alleviation and research questions 8. Amend plan based on 7	4./5. Actions were implemented according to the milestone plan. 6. Practitioners and scientific consultants tracked executed measures/actions and analyzed the data collected. 7. Findings were related to a theoretical base, linking theory with the practical experience. 8. Through the iterative process findings were incorporated in the risk management systems and field-tested in the pilot projects.
Closing	9. Exit, if: problem alleviated and research question resolved	9. The project was finalized as a stable economical problem solution was verified, linking the practical know-how to a theoretical base.

Table 7: Overview on the Action Research Approach

In order to meet these requirements the participatory action research (AR) approach was selected. AR addresses a significant management and/or research problem situation with the objective of finding a solution along with an understanding of how actions can change or improve the studied environment (Coghlan and Brannick 2001). In doing so, AR combines the theoretical approach to a research question with the practical element, as the researcher takes action and applies theories within the research project (Coughlan and Coghlan 2002; McKay and Marshall 2001). The key inspiration for the AR approach applied in this study refers to the framework provided by McKay and Marshall (2001), based on Checkland's

(1991) seven-step framework. In Table 7, the AR steps by McKay and Marshall (2001) are set into relation with the scope applied in this research.

	AR recommendation	AR application
Roles	Clarification of roles and responsibilities of researchers and practitioners is mandatory as well as the way in which their collaboration ought to develop over time (Baskerville and Wood-Harper 1996).	A scope statement has been issued in the beginning of the project clarifying the roles and authorities of all involved stakeholders.
Documentation	The data collection method and documentation style is a key discipline that distinguishes research form consultancy by audio-taping observations, using meeting minutes, or storing written recollections of practitioners (Baskerville and Wood-Harper 1996). A structured diary is recommended to keep track of all observations, events, ideas, and actions as they evolve over time (Jepsen et al. 1989). Such documentation is an essential part of any AR approach and serves as a quality indicator for the data collected (Iversen et al. 2004). Multiple data sources should be utilized and their origin and context should be documented to minimize potential bias and to allow for data triangulations (Yin 2003)	The following data collection techniques are applied within the project: (1) Weekly status reports were issued, (2) an open issue list was kept, a pilot project "watchlist" was set up, (3) a weekly conference call with the project team was established and (4) a monthly project team meeting took place and meeting minutes were made. The listed records form the basic elements of documentation. In addition, in-depth interviews were conducted and are documented in a diary along with other notes from conference calls and meetings.
Control	Control is an important factor as it aids the impartiality of the researcher. (Avison et al.) name three fields one should be aware of and report on: (1) control over initiation, (2) determination of authority and (3) degree of formalization (2001, 38).	The initiating IT service was setting up a team to realize the goal. Afterwards, the organizational responsibilities within the team were determined and a kick-off meeting took place clarifying the duties and responsibilities by the team members within the project. The details were documented in the scope statement which equals a framework agreement for the AR discussed in this paper.
Usefulness	Usefulness is acknowledged when the solution of the problem situation is of practical use (Checkland 1981). It creates a baseline upon which the findings can be evaluated and transferred (Baskerville and Wood-Harper 1996).	In the analyzed project, usefulness is measured by the reported project status (green, amber, red) on the factors of time, budget, and quality. The aimed at goal is to decrease the red statuses through the implementation of the proactive risk management system. If this is achieved, the system is regarded as being useful.
Theory	Theory addresses the question how the chosen framework supports the study and how findings can be set in relation to it (Iversen et al. 2004). A special characteristic of AR is that findings are often related to a specific situation and surrounding. The impartiality of the research can be supported by relating findings to scientifically recognized frameworks and theories. Baskerville and Wood-Harper highlight this key factor which distinguishes AR from consulting (1996).	The applied AR approach in this research is based on the extended framework of McKay and Marshall which also provides the theoretical basis on which the findings can be evaluated (2001).
Transfer	Transfer addresses the question of which conditions are required to transfer the findings to or adapt them into another context, since the context-dependency of AR sets a limitation on generalizing the findings (Baskerville and Wood-Harper 1996). Iversen et al. highlight five characteristics which may assist in defining a general scope of study: (1) the area of application, (2) conditions (e.g. time, resources), (3) an understandable approach, (4) necessary skill/capabilities and (5) a general approach to increase transferability (Iversen et al. 2004).	The applied AR approach considered the listed characteristics and uses the well-established framework of McKay and Marshall in combination with a solid theoretical base in order to increase the transferability of the findings towards at least, a mid-range theory contribution.

Table 8: Applied Action Research Generalization Process

The challenge in AR lies in the dual purpose of being part of an intervention and doing research at the same time (McKay and Marshall 2001). The researchers have to be sufficiently involved in the action to improve the problematic situation but, when necessary, have to stand back from the action and reflect on it in order to contribute new knowledge and insights to the project (Coughlan and Coghlan 2002). Action research focuses on a specific problem situation, which causes difficulties when attempts are made to generalize findings. Baskerville and Wood-Harper identified four detrimental factors to AR: (1) lack of impartiality of the researcher, (2) lack of discipline, (3) the process is mistaken for consulting, (4) context-dependency leading to difficulty of generalizing findings (1996). To prevent such pitfalls, Iversen et al. have formulated a criteria guide comprising roles, documentation, control, usefulness, theory, and transfer to proactively control and reduce the critical factors in their project (2004). In the following, these criteria will be introduced and examples will be given on how they were incorporated in the applied AR approach (Table 8).

Once the basic requirements were secured, the researchers have been granted access to the organization and were embedded into the development project for the proactive operational risk management system. From an AR research perspective, the assigned 10 project team members were our "project steering group" (Coughlan and Coghlan 2002). This ensured that the key members of the studied environment were committed to the AR and prepared to work with the researchers to achieve the communicated objectives. The AR approach supported the joint learning and close alignment between researcher and practitioners throughout the iterative research process from an inside perspective.

CURRENT STATUS OF THE PROJECT

An essential element of the operational proactive risk management system consists of quality gates (Q-gates), which are checklists, specially designed and tailored to ensure the right behavior for every form and phase of business case from standard to customized solutions. The Q-gate checklists represent the innovative and most critical element of the proactive operational risk management approach, the early-warning system. It is designed to provide continuous quality assurance and improvement. Q-gates are a preventive measure taken to avoid the escalation of commitment by applying the counter check principle, which states that two pairs of eyes are better than one. It reduces the likelihood of escalation and counters the mum and deaf effect as decisions cannot be made by a single person. This increases the probability that an accurate and detailed status is reported providing a transparency over all deals, projects, and services. Yet, the mum and deaf effect experienced by members of the project and the CIO of the company remain a critical factor in the execution of Q-gates. Hence, well trained and skilled project and risk managers with a standing in an organization are of vital importance for the success of Q-gates as whistle blowers.

Figure 1 gives an overview of the Q-gate process and lists the triggers for the execution of each Q-gate. It illustrates the Q-gate process, as it is subdivided into the deal phase (Q-gates 1-4), the project phase (Q-gates 5-8) and the service phase (Q-gates 9-10). The Q-gates 1-4 in the deal phase are already established throughout the company and only needed to be updated by the project team to ensure that the hand over from the deal phase to the project phase will be taken into account when designing the new Q-gates 5-10. The greatest challenge was drafting the first version of the Q-gates 5-8 for the project phase and the Q-gates 9-10 for the service phase. The project management institute standard was identified as the best foundation for the design of the Q-gate checklists 5-10.

The entire early-warning system requires a control level to schedule, execute, evaluate and track the results and measures stated when passing a Q-gate. A central risk office was established to manage the duties and responsibilities introduced with the new operative risk management, e.g. coaching the pilot projects. The feedback from the pilot projects verified that the early-warning system was positively acknowledged by the project managers, who viewed it as a supportive and helpful risk management instrument. They also confirmed that the counter check principle promoted by the early-warning system assists them in their decision-making. The project managers questioned the use of Q-gate checklists in small projects, which work with standard solution packages or simple change requests and do not require special risk analysis.

The decision of the project team to implement the early-warning system as the key element of the proactive risk management was confirmed through the feedback, given by the project managers of the pilot projects. For the team, the crucial point for the successful implementation of the proactive risk management approach was the reaction of the project managers to the counter check principle. The project manager's positive reaction encouraged the team to continue their efforts under the key-note of simplifying the workflow and increasing the productivity of the project managers. On that note the Q-gate checklists were reviewed and approved by the project team and the CIO.

In the first implementation stage the monthly reporting was established in the pilot projects. The risk office coached the project managers as they had difficulties in adjusting to the new key performance indicator (KPI) definitions. The team

members received a positive feedback by the project managers on the new reporting system and its design and functionality. With this positive response the team approved the further implementation of the reporting system. The risk office will support the next implementation phases, ensuring that all large-scale projects will establish project offices. These assist the project managers in issuing the necessary reports, maintaining the open issue list, tracking measures and executing Q-gates. The project office supervisor has the same occupational skills as the project manager and fulfills the role of a counter check. He/she acts as a sparring partner to the project manager with the objective of reducing the risk of escalating commitment and to counter the mum and deaf effect. Essential for a successful rollout of the new reporting and monitoring mode was the approval and support by the CIO and the promotion of an open minded corporate culture. The intention was and still is to encourage project managers to adapt and promote the negatively connoted whistle blower attitude throughout the company. The experiences and documentations of the pilot projects underline the need for a radical change in the corporate culture. Therefore, the team developed additional measures to ensure a successful implementation of the new risk management system. These measures included the unification of standards (e.g., categorization,) and a rollout of policies listing the main goals for project/service management. In January 2008, the next implementation stage of the reporting system and monitoring function was coordinated and aligned with the rollout of the "early-warning" system.

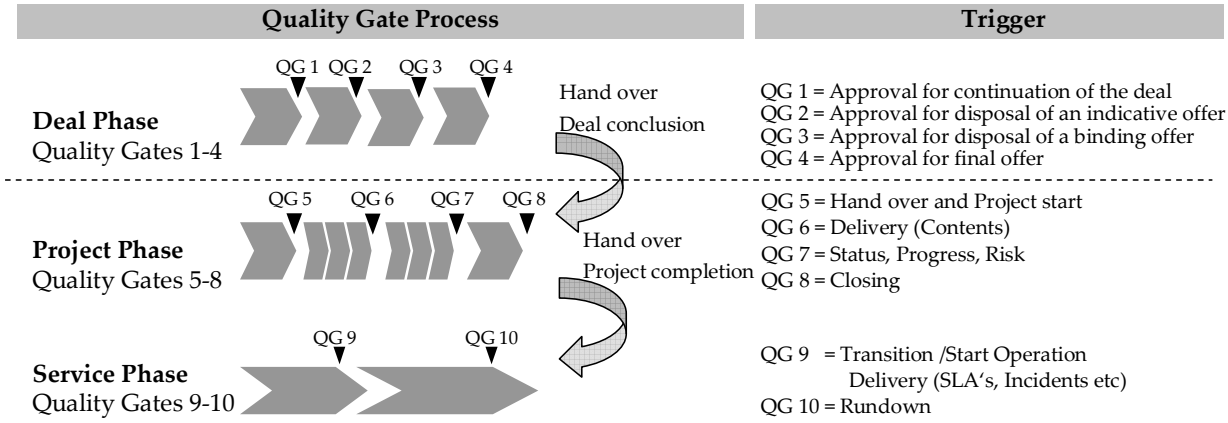

Figure 1: Quality Gate Process

CONCLUSION AND FURTHER RESEARCH AND POSSIBLE PRESENTATION CONTENT

The data collection and evaluation provided already a better understanding of the problem situation and encouraged the participants to find solutions by forming a collaborative and synergistic "scientists meets practitioners" alliance. With the help of the behavioral science concepts from IS literature (whistle blowing, as well as mum and deaf effects) as theoretical base, the AR researchers were able to start an iterative problem solving process within the project team leading to an adaptation of KPIs and quality gates with the goal to avoid deaf effects and mum effects and to encourage whistle blowing. In doing so, the new proactive operational project risk management system promotes an open communication style. Although it is still too early to significantly measure the success of the improved risk measurement approach, first results from 2007 compared with the statistics from 2006 revealed a 25% decrease of projects with a critical status (i.e., over time or over budget or both). However, between November and December 2007 the percentage of projects in a critical "red" status increased by 5 to 10% in comparison to the rest of 2007 which is actually a good signal since it indicates that the new proactive operational risk management approach reveals more pending risks than the previous approach.

Although the project is not completed yet and the research is still in progress, the new categorization of the projects along categories such as size and criticality already made a prioritization of the projects within the project portfolio possible. Our next steps will be to measure the effects of the complete roll-out of all instruments across all projects in the portfolio of the IT service provider in a positivistic research approach. The goal is to provide significant evidence for the effectiveness of the refined risk management approach due to concept applied which are motivated and deduced from IS literature.

At the workshop, the latest research results and data will be provided to discuss the research approach. The authors hope to have the ability to discuss possible ways to improve the work to make it a substantial theoretical contribution.

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