Business Process Management Journal

Emergent risks in business process change projects

Marlen Christin Jurisch Zuzana Rosenberg Helmut Krcmar

Emergent risks in business process change projects

Marlen Christin Jurisch, Zuzana Rosenberg and Helmut Krcmar
Department of Information Systems, Technische Universität München, München, Germany

Received 9 January 2015
Accepted 17 January 2016

Abstract

Purpose – Even today still many business process change (BPC) initiatives fail and cause high overruns for organizations undergoing BPC initiatives. It is therefore important that BPC practitioners and researchers understand the risks inherent in BPC projects, and that they adapt their risk management processes to account for and mitigate these risks. Thus, the purpose of this paper is to investigate which emergent risks matter in BPC project.
Design/methodology/approach – The authors adopted case survey methodology and investigated data from 130 case studies to show the nature and magnitude of relationships between organizational support risks, volatility risks, and BPC project and process performance.
Findings – The results show that organizational support risks influence both the overall BPC project performance and process performance. Whereas, volatility risks influence project performance but appear to have no direct impact on the process performance. Both organizational support risks and volatility risks show influence on project management practices.
Research limitations/implications – The study show several limitations that might be assigned to the case survey methodology, such as use of secondary data or publication bias.
Practical implications – The authors provide considerable support which emergent risks matter in BPC projects.
Originality/value – The contribution of this study takes several forms. It fills a gap in the literature concerning emergent risk factors inherent in BPC projects. The authors provided theoretical explanation of the effects of emergent risks on BPC project and process performance. And lastly, the authors have demonstrated the usefulness of case survey methodology in BPC research.

Keywords PLS, Case survey methodology, BPC performance, Business process change, Emergent risk
Paper type Research paper

1. Introduction

Despite the considerable experience gained over the last two decades, managing risks induced by improving business processes is still an on-going challenge for business process change (BPC) practitioners and researchers alike (Trkman, 2010; Cao *et al.*, 2001; Strebel, 1996; Kliem, 2000). An example of BPC failure due to the imposed risk of client change was the initiation of implementing an ERP system by FoxMeyer Drug Company striven for a competitive advantage. FoxMeyer invested in their change project $65 million expecting a save of $40-$50 million annually, as well as to gain competitive advantage (Jesitus, 1997). However, after its major client, Phar-Mor went bankrupt FoxMeyer signed a major new client contract, which required major changes to the projects. After the costs run over $100 million the project was declared as failure and within some time FoxMeyer went bankrupt (Jesitus, 1997). The literature provides many other examples of business process change failures due to imposed risks and concludes that most companies have no longer the luxury of funding BPC projects that

The authors thank SAP AG for funding this project as part of the collaborative research center "CVLBA – Center for Very Large Business Applications."

Business Process Management Journal
Vol. 22 No. 4, 2016
pp. 791-811

1463-7154
DOI 10.1108/BPMJ-01-2015-0002

are not showing the expected performance (e.g. Hammer and Champy, 1993; Al-Mashari *et al.*, 2001; Trkman, 2010). Delivering the expected performance from BPC initiatives thus remains a critical challenge for many organizations (Hill and McCoy, 2011).

Gemino *et al.* (2008) propose that project performance can be better understood by separating risks into two different categories. They suggest separating risks into earlier (a priori) risk factors, which might be estimated before a project begins, such as budget, duration, or inexperience of the team and later (emergent) risk factors, which evolve during the course of a project, such as client manager or executive sponsor change. By investigating the risks of an organizational change, Kanter *et al.* (1992) found two kinds of risks factors: external and/or internal, such as functional, financial, or general project risk factors. They conclude that these kinds of risk factors result in different degrees of changes, which influence the whole success of change initiative.

Several BPC researchers have focussed on a priori risks or critical factors influencing BPC success (e.g. Scott and Vessey, 2002; Trkman, 2010; Holland and Light, 1999; Motwani *et al.*, 2005; Jurisch *et al.*, 2012), whereas others have focussed on design and process of risk management (Kliem, 2000). However, emergent risks and their link to BPC performance remained rather unexplored (Trkman, 2010; Jurisch *et al.*, 2012). Moreover, improving our understanding of various emergent risks imposed in BPC projects are key to understanding how to conduct future BPC projects successfully (Olsson, 2007; Sarker *et al.*, 2006). Adding to the complexity of such projects, the success of BPC projects should not only be measured by the actual project performance but also by the performance of the changed business process (Jurisch *et al.*, 2014). Against this background, we aim to answer the following research question:

RQ1. Which emergent risks influence the performance of IT-enabled BPC projects and/or the performance of the changed business process?

To investigate how emergent risks affect the project and process performance of BPC initiatives, we employ a model of IT project performance proposed by Gemino *et al.* (2008) as our research model. We further adopted case survey methodology to investigate our research question, since it presents a powerful approach for identifying and statistically testing patterns across case studies (Larsson, 1993; Lucas, 1974). More so, case survey methodology draws on the richness of numerous case studies, which allows for wider generalization.

The paper is organized as follows. In Section 2, we describe our research model and propose our hypotheses. Section 3 describes the case survey methodology, including the literature search, coding of case studies, and data analysis. Section 4 presents the results and Section 5 discusses those results, their implications and limitations. We conclude the paper in Section 6.

2. Theoretical background and hypotheses development

In the following section we describe our research model of emergent risk and the corresponding hypotheses.

2.1 Research model of emergent risks

Gemino *et al.* (2008) propose a temporal model of IT project performance, which can be used to suggest a different categorization of IT project risk factors. They classify risks into risks factors that are present when a project is defined (a priori) and risk factors that either emerge or are revealed as the project is executed (emergent) (Gemino *et al.*, 2008). In general, they suggest that risks factors such as budget, duration, technical complexity, or inexperience of the team can be estimated at the beginning of the project and therefore refer to them as a priori risk factors. Emergent risk factors refer to the new risks that emerge during the course of a project and to the actions of project managers to deal with the risk and progress of the project (Gemino *et al.*, 2008). They identified two categories of emergent risks: first, organizational support risks; and second, project volatility risks. Organizational support risks involve executive sponsor support and user support (Gemino *et al.*, 2008). Depending on the circumstances, organizational support can be seen both as a risk (e.g. lack of management support) or as an important resource for project managers (e.g. high management support). For the purposes of our case survey, organizational support risks present "an aggregate measure of the lack of support that the project and the project manager […] were given by the base organization" (Gemino *et al.*, 2008). The second category of emergent risks includes volatilities in project targets (e.g. budget, schedule, etc.), key personnel, and external conditions (Sharma and Yetton, 2007; Gemino *et al.*, 2008). While such volatilities can have a strong impact on the performance of a BPC project, they are also frequently outside the direct influence of the project team. Given that BPC projects may plausibly fail as a result of problems concerning any one or any combination of these two emergent risk categories, we included both of them in the model to account better for variance in performance and to investigate their relative importance (see Figure 1). Since, we are interested on the direct

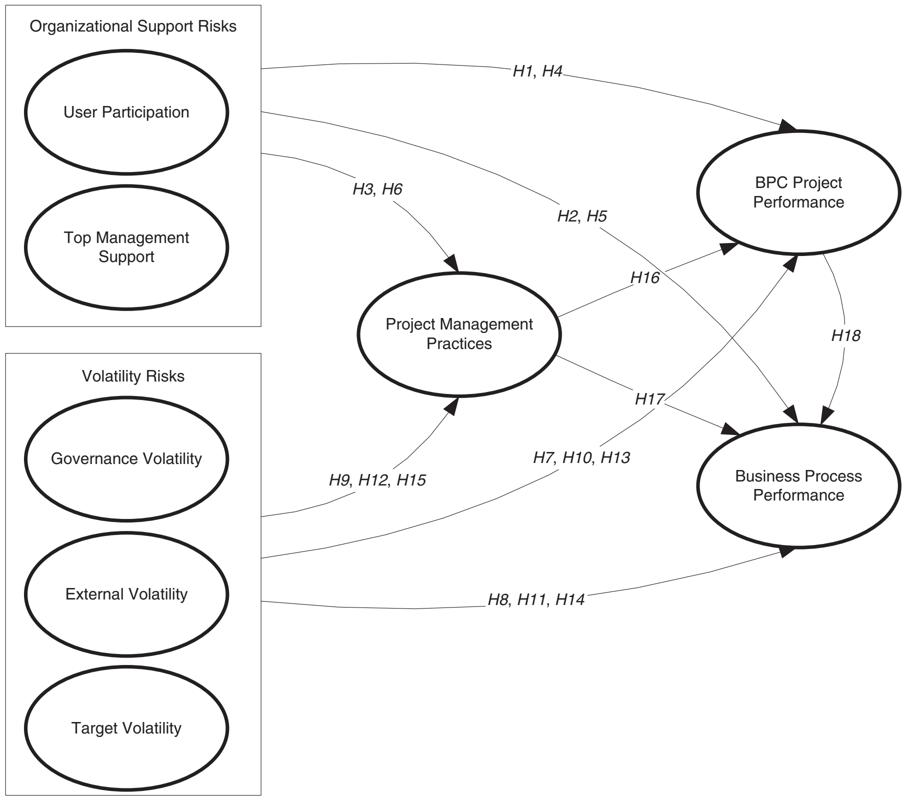


Figure 1. Research model and corresponding hypotheses

effect of emergent risks on the BPC project and process performance, we excluded a priori risk factors from our research model.

2.2 Hypotheses development

User participation. Following Gemino *et al.* (2008) we define user participation as three item construct: to what extent user could make changes in the project management process, the degree users were informed about the progress, and problems and the possibility to evaluate the work of the project management team. A number of BPC authors highlight the importance of user participation and empowerment in BPC project initiatives (e.g. Leverment *et al.*, 1998; Al-Mashari and Zairi, 2000; Newman *et al.*, 1998). For example a major UK health service provider notices that user participation is one of the most important factors for BPC project success (Leverment *et al.*, 1998). Providing appropriate information about the progress and status of the change project should be an essential part of the employee communication. Al-Mashari and Zairi (2000) found in the case of the SAP implementation at Manco there was almost no formal communication strategy and no possibility for the users to evaluate and get involved. This means virtually no user participation was given, which is one reason why the implementation was considered as failure. Newman *et al.* (1998) considered the change project at a large UK bank as success because of the active user participation and excellent training provided for the employees. Hence, a lack of user participation can result in failure of BPC project. Thus, we hypothesize:

H1. The higher the user participation the higher the BPC project performance.

User involvement is not only a major facilitator of the overall project success, but particularly important for the enhancement of the business process performance (Newman *et al.*, 1998; Lee and Chuah, 2001; Proctor and Gray, 2006; Paper *et al.*, 2001; Kemppainen, 2004). Empowering the users during a change program creates awareness for the value-creating core processes and thus helps to enhance the process quality (Newman *et al.*, 1998). A major industrial manufacturer in Hongkong notices that "worker's perception and understanding about their job" is essential for the quality of the products and services provided (Lee and Chuah, 2001). User participation is also crucial for customer understanding to enhance the customer satisfaction (Newman *et al.*, 1998; Proctor and Gray, 2006). During a large change project at Honeywell a new training philosophy was started with the result of educating employees about customer satisfaction and its importance for the value-creation (Paper *et al.*, 2001). Thus, we expect:

H2. The higher the user participation the higher the business process performance.

Harvey (1994) highlighted the importance of user participation as an important factor influencing project management practices. He reported an example from Lucas Industries, who conducted a large change project to get profitable again. The results were an agreement on the resources needed for the project, a detailed project plan and an agreement on the communication plan for the change project, which would not have been created without high user participation involvement (Harvey, 1994).

Hence, a lack of user participation can result in a weak project management practices. Thus, we expect:

H3. The higher the user participation the better the project management practices.

Top management support. Top management support in BPC projects means that the decision to change was supported by the top management of the respective organization at the project beginning, so the project was planned from the beginning on with the top management's involvement (Teng *et al.*, 1998). The necessity of top management in BPC projects was first mentioned by Hammer and Champy's (1993) work, who propose a steering committee of senior managers to initiate and lead the change project. The senior management of Contributions Agency had a lack of commitment to the project goals which caused that the organization failed to achieve all project goals (Harrington *et al.*, 1998). In contrast, Reuters started a major change project to create an effective customer service company. According to the CEO, top management support was vital for the whole project to transform the company (Harvey, 1994). The Western Provident Association believed that change must be driven top-down and noticed that top management sponsorship "ensured that the major changes in the organization were pushed through at each stage of the project" (Harvey, 1994). Similar experiences were established at CIGNA Corporation (Caron *et al.*, 1994) and Mobil Oil Australia, where the visible top management commitment was seen as key to the achievement of the radical changes (Martin and Cheung, 2002). Considering the high variance in the project performance between a lack of support and high top management support, we hypothesize:

H4. The higher the top management support the higher the BPC project performance.

Top management of American Express initiated a quality leadership program which helped them to increase efficiency, enhance effectiveness, and reduce the cost base (Ballou, 1995). According to Neely *et al.* (1995) business process performance can be measured through criteria such as efficiency and effectiveness. Another example of the change program at IBM in the early 1990s allowed them to achieve high improvements regarding the efficiency of the business processes, particularly in their cost structure (Weiler, 1995). A number of authors consider top management as essential success factor in achieving improvements in efficiency and effectiveness (Al-Mashari and Zairi, 1999; Dale, 1994; Weiler, 1995). Therefore, we hypothesize:

H5. The higher the top management support the higher the business process performance.

The linkage between top management support and project management practices has been discussed in BPC literature (e.g. Harvey, 1994; McAdam and Corrigan, 2001). If top management fails to provide the project management with the necessary empowerment, the project will not produce the anticipated results and project managers would not employ and use the appropriate methods and tools (Harvey, 1994). Thus, we hypothesize:

H6. The higher the top management support the better the project management practices.

Governance volatility. Governance volatility refers to the number of changes of the project manager, client manager, and executive sponsor during the project (Gemino *et al.*, 2008). A number of BPC authors (Newman *et al.*, 1998; Shin and Jemella, 2002; Hammer and Champy, 1993; Harvey, 1994) reported in their research that BPC initiatives with continuity in the project management, client management, and executive sponsorship personnel were smoothly accomplished and celebrated as success. Huq and Martin (2006) observed in a large US hospital a replacement of top and second-level management due to a pending merger (Huq and Martin, 2006). After the completion of the merger the interims management left the company and new appointed management continued the on-going BPC project with less expertise so that the final result was just a moderate success (Huq and Martin, 2006). Hence, if there is high volatility in governance, the BPC project will likely not meet its performance goals. Thus, we hypothesize:

H7. The lower the governance volatility the higher the BPC project performance.

Many BPC authors (e.g. Newman *et al.*, 1998; Shin and Jemella, 2002; Hammer and Champy, 1993; Harvey, 1994) reported that BPC projects with low governance volatility achieve cost savings, increase productivity, or improve the customer satisfaction. Other researchers (e.g. Huq and Martin, 2006; Kemppainen, 2004; Sarker and Lee, 2000) reported that the change of executive sponsors, project managers, or client managers is often connected with a delay in the schedule, increase of costs, or decrease of productivity. Regarding the change of the executive board in the implementation of an ERP system, governance volatility was both delaying the schedule and of high cost (Kemppainen, 2004). Similarly, Huq and Martin (2006) reported a delay in the schedule as consequence of high governance volatility. Therefore, we expect:

H8. The lower the governance volatility the higher the business process performance.

Kemppainen (2004) reported results from implementing a new ERP system in a global operating organization, where the initially sponsoring top management moved away from the project when the first problems regarding the high complexity of the change project were discovered. As a consequence, new board of executives including CEO was announced (Kemppainen, 2004). The new executive sponsors first initiate the change of the project management practices, especially the implementation plan and the project management tools and methods applied which took some time to get accepted (Kemppainen, 2004). Thus, the identified relation between governance volatility and project management practices leads to the following hypothesis:

H9. The lower the governance volatility the better the project management practices.

External volatility risks. External volatility is defined as a change in external factors, which are affecting the project (Gemino *et al.*, 2008). According to Gemino *et al.* (2008) these factors refer to the changes in the competitive environment, business strategy, supplier/vendor relationship, or a regulatory or governmental change. Several BPC researchers (e.g. Newman *et al.*, 1998; Shin and Jemella, 2002; Anderson and Woolley, 2004) reported that BPC projects with a consistent business strategy, well-defined supplier or vendor relationships and no or only few regulatory changes could successfully reach the planned improvements. Anderson and Woolley (2004) analyzed the reorganization and efficiency program of the suppliers of Unilever and measured improved product and service quality with a positive effect on customer satisfaction due to the reduction of external volatility. Hence, if there are only minor volatilities in external risks, the BPC project will likely meet its performance goals. Thus, we hypothesize:

H10. The lower the external volatility the higher the BPC project performance.

A number of authors (Currie and Willcocks, 1996; Kock and McQueen, 1996; Stemberger *et al.*, 2007; Palmberg, 2010) showed the difficulty of reaching improvements at the business process level in case of a high external volatility such as competition, regulation, strategy, or relationships. Declining results and pressure to improve profitability as new business strategy made it difficult to create employee commitment for the BPC project in a large logistic company (Palmberg, 2010). The result was a reduction in employee morale and satisfaction, and service quality (Palmberg, 2010). Knock and McQueen (1996) and Currie and Willcocks (1996) reported that some companies facing additional environmental changes during their BPC projects are forced to reduce the initial planned process improvement goals. Due to the increasing competition from insurance companies, Royal Bank only had the opportunity to increase profit by job reduction (Currie and Willcocks, 1996). Hence, high external volatility can impede the achievement of BPC goals. We therefore hypothesize:

H11. The lower the external volatility the higher the business process performance.

Organizations with high pressure coming from external factors have serious problems in establishing a continuous and consistent project management philosophy, as the BPC projects have to face and incorporate new changes (Currie and Willcocks, 1996; Kock and McQueen, 1996). For example, a large public sector organization in Brazil operating in construction industry changed its strategy due to the competitive pressure and established new project management tools to achieve the new goals (Currie and Willcocks, 1996; Kock and McQueen, 1996). However, due to the short development schedule, these new project management tools lacked the appropriate scope and functionality to generate sustainable results (Currie and Willcocks, 1996; Kock and McQueen, 1996). Hence, the identified relation between external volatility and project management practices leads to the following hypothesis:

H12. The lower the external volatility the better the project management practices.

Target volatility risks. Target volatility, in contrast to external volatility measures the changes in internal factors affecting the project (Gemino *et al.*, 2008). These internal factors are the number of project schedule changes, budget changes, or project scope changes (Gemino *et al.*, 2008). A number of BPC authors (Jackson, 1995; Huq and Martin, 2006; Al-Mashari and Zairi, 2000; Brown and Riley, 2000; Kemppainen, 2004) show the negative effect of high target volatility in terms of changes in schedule, budget, or scope on the overall project performance. Huq and Martin (2006) reported a delay in the project schedule of 6 months that caused the BPC benefits being not apparent for several years. Another example of TELECO (a pseudonym for a large US telecommunication company) showed that the BPC project was changed in scope and ultimately the CEO in favor of the project retired and was replaced by a new executive with the opposite opinion about it (Sarker and Lee, 2008). Finally, the new CEO stopped the project and declared it as failure since the anticipated targets could not be reached (Sarker and Lee, 2008). Therefore, we hypothesize:

H13. The lower the target volatility the higher the BPC project performance.

Several BPC authors (Newman *et al.*, 1998; Shin and Jemella, 2002; Hammer and Champy, 1993; Harvey, 1994) reported that BPC projects with low target volatility could achieve dramatic improvements in productivity, cost savings, and customer and employee satisfaction. High target volatility typically affects the business process performance of an organization (Huq and Martin, 2006; Jackson, 1995; Al-Mashari and Zairi, 2000). Exceeding the project budget increases the costs of a BPC project and can even result in a loss (Huq and Martin, 2006; Al-Mashari and Zairi, 2000). For example, Manco Group could not achieve many improvements due to the exceeding costs in the investment of $2.8 million for their BPC project (Al-Mashari and Zairi, 2000). Thus, we expect:

H14. The lower the target volatility the higher the business process performance.

Huq and Martin (2006) reported from a BPC project of a large US hospital, 14 gaps identified by the implementation team, which caused a delay of six months of the go-live date. Since new processes had to be developed, this change in schedule caused to update the project plan, adapt the project management practices for the new configuration of the software, testing, and documentation (Huq and Martin, 2006). Hence, the identified relation between external volatility and project management practices leads to the following hypothesis:

H15. The lower the target volatility the better the project management practices.

Project management practices. Previous research also suggests that the impact of these emergent risks can be managed and mitigated through project management practices (Barki *et al.*, 2001; Nidumolu, 1995; Wallace *et al.*, 2004; Gemino *et al.*, 2008). Project managers can take an active part throughout the course of a BPC project in counteracting these risks. Thus, emergent risks and project management practices are expected to be related to each other but also to influence project and process performance (Kettinger and Grover, 1995; Gemino *et al.*, 2008; Wallace *et al.*, 2004). Therefore, we hypothesize:

H16. The better the project management practices the higher the BPC project performance.

H17. The better the project management practices the higher the business process performance.

Lastly, previous research disclosed that in BPC projects the project performance strongly influences the performance of the changed business process (Jurisch *et al.*, 2014). Thus, we hypothesize:

H18. The higher the BPC project performance, the higher the business process performance.

Figure 1 summarizes our research model with the corresponding hypotheses.

3. Research method

We investigated these hypotheses using case survey methodology, which is a suite of quantitative techniques to synthesize research findings across multiple case studies (Glass, 1976; Hunter and Schmidt, 2004; King and He, 2005). Case survey methodology, also known as meta case analysis or content analysis is a widely accepted methodology in related research domains such as management, IT outsourcing, or recently in IS research (Jurisch *et al.*, 2013). According to several authors (Glass *et al.*, 1981; Hunter and Schmidt, 2004; Rosenthal and DiMatteo, 2001) case survey methodology enable researchers to estimate more reliable effect sizes than traditional review procedures, such as narrative or descriptive reviews. Furthermore, the results from case survey methodology are often treated as reliable, replicable and therefore suitable for theory development and hypotheses testing (Bullock and Tubbs, 1990; Rosenthal and DiMatteo, 2001). The choice of case survey methodology for our research satisfies four criteria proposed by Larsson (1993). First, the research domain produces a vast number of case studies (Yin and Heald, 1975), in our case BPC research field provides a large number of case studies reporting successes and failures of BPC initiatives. Second, this method is helpful if the unit of analysis is the organization (Larsson, 1993), i.e. the organization performing the BPC project. Third, if a number of impact factors is of interest (Jauch *et al.*, 1980). Fourth, if it is difficult to obtain primary data in the research domain. Following the recommendation by Larsson (1993), the process of our case survey analysis was performed in three major steps: literature search, coding, and analysis.

3.1 Literature search

Our sample consists of case studies reported in journals, conference proceedings, dissertations, working papers, book sections, and magazine articles. We included conference proceedings, dissertations, working papers, and magazine articles in our literature search to address the "file-drawer problem." The file-drawer problem refers to the observation that results of published studies may report overestimate effect sizes compared to unpublished studies (Rosenthal, 1979).

First, we conducted a systematic keyword search including keywords "business process reengineering," "business process transformation," "business process innovation," "continuous process improvement," "six sigma," and variants with the keyword "case study." We searched databases such as Emerald, EBSCO, ScienceDirect, JSTOR, ACM Digital Library. These databases included the major journals and conference proceedings in the business process management area, such as *Business Process Management Journal*, *Business Change and Reengineering*, *International Journal of Operations & Production Management*, or *Journal of Management Information Systems*. Dissertations and theses were found in the databases such as ProQuest and WorldCat. Book sections were found through traditional channels, i.e. libraries. Second, following recommendations by Webster and Watson (2002), we performed forward and backward searches. Working papers were found by screening the websites of key authors identified by forward and backward search and conducting keyword searches in Google Scholar. In a third step, we explored titles, abstracts, and keywords. We further included a study in the case survey analysis if it satisfies three criteria. First, the study investigates project and process performance. Second, the study reports information on the emergent risks. Third, the study provided a rich description of the events.

The resultant case survey analysis sample included 130 case studies published between 1992 and 2013. The resultant distribution across publication type was as follows: journals (86), conference proceedings (16), dissertations (4), book sections (22), magazine article (1), and working paper (1). Of these cases 93 were in private and 37 in public organizations. The cases varied in terms of sectors (e.g. finance, health, education, and manufacturing) and types of BPC projects (e.g. business process reengineering, business process transformation, business process innovation, continuous process improvement, and six sigma).

3.2 Coding

Our coding scheme consisted of variables representing aspects of the study design and several control variables (e.g. research designs, publication outlet, and time frames of the case studies). We relied on multi-item scales (at least two items) for each latent variable and five-point Likert scales to code each variable. This is consistent with theoretical reasoning of Srnka and Koeszegi (2007), who state that the coding of the case studies refers to the systematic assignment of codes (numbers) to units based on the coding scheme. Besides the eight variables discussed in this paper (e.g. emergent risks, project management practices, project, and process performance, etc.), our coding scheme included several additional variables. In total, our coding scheme comprised 44 variables and 137 items. This broader coding scheme allowed us to not only collect information on the variables analyzed within this article (e.g. risks, project performance, process performance, etc.), but also to gather information of other factors influencing BPC project success. More so, the broader coding scheme permitted us to spread some of the risks involved in case survey research.

The coding procedure was performed in three steps. In the first steps, two experienced raters coded several pilot cases studies with the list of codes to become familiar with the coding scheme. Afterwards, they met personally and compared their coding results for calibration purposes. In the second step, the raters independently coded each case study. In the second, we established weekly meetings and discussed any discrepancies until we had reached a consensus. According to Bullock and Tubbs (1990) this procedure helps to eliminate individual disparities. Resolving discrepancies in this way is said to be a "superior way to correct coding mistakes" (Larsson, 1993). In the third step, after both raters completed the coding, we established inter-coder reliability using Krippendorf's (1980) α. At the outset the results of Krippendorf's α was 0.77, which indicates a substantial agreement between the raters.

3.3 Analysis

The hypotheses are tested using the partial least squares (PLS) procedure. PLS is suitable to analyze the data due to the following criteria proposed by Chin and Newsted (1998) and (Chin, 1998): first, the hypotheses are grounded in specified impact factors; second, handles both formative and reflective epistemic relationships between the latent variables and its measures; and third, avoids the problems with small sample size. Diamantopoulos (2006) argue that PLS provides more accurate estimates of the paths among constructs, which are usually biased by measurement error when using techniques such as multiple regressions (Diamantopoulos, 2006). Furthermore, PLS procedure uses component-based estimation and facilitates the exploration of two models of a structural equation model, the measurement (outer) model, examining the relations of measurement variables and their latent variables, and the structural (inner) model examining the latent variables to each other (Diamantopoulos, 2006).

To ensure validity and reliability of our results, we followed the recommendations by Hair *et al.* (1998) and assessed the quality of the measurement model and structural model. This assessment analysis was performed in two stages. We employed SPSS and SmartPLS 2.0 M3 to assess the measurement and the structural model.

In the first stage, we assessed the quality of the measurement model including reflective and formative indicators. We proved the four widely used and well-defined assessment criteria for the measurement models with reflective constructs: content validity, indicator reliability, composite reliability and discriminant validity (Chin, 1998). These assessment criteria were verified by adopting explorative factor analysis (Krafft *et al.*, 2005). For the measurement models with formative constructs, we applied three assessment criteria: indicator relevance, multicollinearity, and nomological validity (Chin, 1998).

If successful and the latent constructs prove valid and reliable, stage two necessitates the assessment of the structural model. We employed three criteria recommended in PLS literature, i.e. the R^2-values, the effect size f^2, and the extent of significance and β-coefficients, to assess the explanatory and predictive power of the structural model. The central criterion for evaluating the structural model is the level of explained variance R^2 of the dependent constructs. R^2-values of 0.67, 0.33, and 0.19 for endogenous latent variables are substantial, moderate, or weak, respectively (Chin, 1998). To estimate the extent of β-coefficients, we used the PLS path algorithm procedure. For the significance of the path coefficients, we performed the bootstrapping re-sampling technique with 2,000 resamples (Efron and Tibshirani, 1993). The effect size f^2 investigates the substantive impact of each independent variable on the dependent variable (Cohen, 1988). Values of 0.02, 0.15, and 0.35 indicate a small, medium, or large impact, respectively (Chin, 1998). The effect size f^2 for the structural model was estimated by re-running several PLS estimations, excluding in each run one of the explaining latent constructs.

4. Results

The following section provides the results of the measurement model and the results of the structural model.

4.1 Measurement model

The assessment criterion content validity was verified by adopting explorative factor analysis (Krafft *et al.*, 2005). We used direct oblimin rotations to identify the loadings and the variance. Our results show a successful verification of the content validity, since the accumulated explained variance yielded 65.75 percent and the indicators of each construct charge on one factor.

By assessing the indicator reliability, the latent variable variance should explain at least 50 percent of the indicator and the factor loadings of latent manifest variables should be above 0.70 (Carmines and Zeller, 1979). Hulland (1999) furthermore suggests to eliminate indicators with factor loadings below 0.4. Our results show that the factor loadings were mostly beyond the acceptable value of 0.70 with the exception of five indicators (see Table I). We did not eliminate any indicators, as none of them was below the limit of 0.4.

According to Fornell and Larcker (1981) the composite reliability estimates the internal consistency of the indicators measuring a particular factor. The value of the internal consistency should be at least 0.60 (Bagozzi and Yi, 1988). Our results show support for the composite reliability, as the internal consistency of the six reflective constructs was at least 0.60 (see Table I).

The last assessment criterion discriminant validity refers to the appropriate patterns of inter-indicators of a construct and other constructs (Gefen *et al.*, 2000). The results of the average variance extracted (AVE) value is for all constructs beyond the recommended level of 0.50 (Fornell and Larcker, 1981). We further, determine the square root of the AVE values for each construct, which is seen as crucial value that should be higher than the correlations between it and all other constructs (Fornell and Larcker, 1981). Our data analysis disclosed that the squared roots were higher for all constructs thus successfully verifying discriminant validity.

Table I summarizes the results of the assessment of the quality of our measurement model and exhibits the factor loading, the AVE and the composite reliability.

Construct	Items	Sources adapted from	Loadings	AVE	Composite reliability
User participation (org. support risk)	The employees were satisfied with the quality of the information provided on the change	Kotter (1996)	0.939	0.960	0.979
	The employees understood how the change would affect them	Huizing *et al.* (1997) and Markus and Grover (2008)	0.926		
Top management support (org. support risk)	Top management ensured the availability of adequate resources throughout the change project	Grover (1999) and Grover and Kettinger (1995)	0.944	0. 798	0.888
	Top management commitment was still high at the end of the change project	Grover (1999) and Grover and Kettinger (1995)	0.632		
Governance volatility (volatility risk)	The project manager changed during the course of the change project	Gemino *et al.* (2008)	0.936	0. 901	0.948
	The executive sponsor (top management) changed during the course of the change project	Gemino *et al.* (2008)	0.728		
External volatility (volatility risk)	There was a change in the competitive environment that affected the project	Gemino *et al.* (2008)	0.612	0. 745	0.897
	There was a change in the business strategy that affected the project	Gemino *et al.* (2008)	0.734		
	There was a change in the supplier/vendor that affected the project	Gemino *et al.* (2008)	0.814		
Target volatility (volatility risk)	The project schedule changed during the course of the change project	Gemino *et al.* (2008)	0.838	0.811	0.928
	The project budget changed during the course of the change project	Gemino *et al.* (2008)	0.682		
	The project scope changed during the course of the change project	Gemino *et al.* (2008)	0.709		
Project management practices	The PM team managed project risks and implements proper measures to address them	Crawford (2005)	0.579	0. 642	0.843
	The PM team managed the needs, expectations, priorities and interests of project stakeholders	Grover (1999)	0.506		
	The PM team applied PM methods, tools and techniques to plan and manage the change project (e.g. project plan, frequent team meetings, etc.)	Gemino *et al.* (2008)	0.786		

Table I.
Factor loadings, AVE, and composite reliability

The first assessment criterion for the measurement models with formative constructs represents indicator relevance that determines which indicators contribute most substantially to the construct (Sambamurthy and Chin, 1994). In order to demine the indicator relevance, we compare each indicator's weight. We did not eliminate any indicator, as according to Bollen and Lennox (1991) in reflective measurement models, the factor loadings can be less than 0.40. To verify multicollinearity, which indicates the indicator's degree of linear dependency, we examined both the indicator's correlation matrix and the variance inflation factors (VIF). The correlation coefficients were partially high (i.e. the highest correlation coefficient was 0.845). However, multicollinearity did not actually bias the results as all VIF were below the recommended level of 10 (Eckey *et al.*, 2001). The nomological validity and relevance of indicators (Sambamurthy and Chin, 1994) were also verified using PLS software. We performed bootstrapping with 6,000 resamples for testing the statistical significance of path coefficients using *t*-tests.

In summary, the statistical analysis showed empirical support for the reliability and validity of the scales of the measurement models.

4.2 Structural model

The results of the evaluation of the structural model are presented in Table II. The results of R^2 of our structural values represent moderate values with 0.477 (project performance), 0.423 (process performance), and 0.332 (project management practices). The results of the effect sizes f^2 show a small, medium, and large impact of the independent variables on the dependent variables (ranging from −0.310 to 0.530) (see Table II). Thus, our results show support for hypotheses *H1*, *H3-H7*, *H13*, and *H15-H18*. Hypotheses *H2*, *H8-H12*, and *H14* were not supported in our study.

More specifically, our results show that organizational support risks have a stronger influence on the overall BPC project performance. In detail, user participation impacts BPC project performance (*H1*) and project management practices (*H3*). Top management support has a critical influence on project management practices (*H6*), BPC project performance (*H4*) and process performance (*H5*). The external volatility shows a significant impact on BPC projects (*H10*). On the contrary, target volatility has

Correlation	β	*t*-value	Significance	f^2
H1: user participation → BPC project performance	0.053	2.813	**	0.110
H2: user participation → Business process performance	0.011	0.285	ns	−0.006
H3: user participation → Project management practices	0.310	13.544	***	0.310
H4: top management support → BPC project performance	0.501	9.562	***	0.532
H5: top management support → business process performance	0.256	6.790	***	0.509
H6: top management support → Project management practices	0.178	8.456	***	0.172
H7: governance volatility → BPC project performance	0.170	3.670	***	0.061
H8: governance volatility → business process performance	0.025	1.275	ns	0.066
H9: governance volatility → project management practices	−0.051	1.725	ns	−0.051
H10: external volatility → BPC project performance	0.045	1.759	ns	0.037
H11: external volatility → business process performance	0.033	1.685	ns	0.059
H12: external volatility → project management practices	−0.044	1.740	ns	−0.043
H13: target volatility → BPC project performance	−0.313	11.557	***	−0.110
H14: target volatility → business process performance	0.013	0.542	ns	−0.006
H15: target volatility → project management practices	−0.311	12.196	***	−0.310
H16: project management practices → BPC project performance	0.283	6.653	***	0.183
H17: project management practices → business process performance	0.173	5.486	***	0.076
H18: BPC project performance → business process performance	0.580	15.442	***	0.530

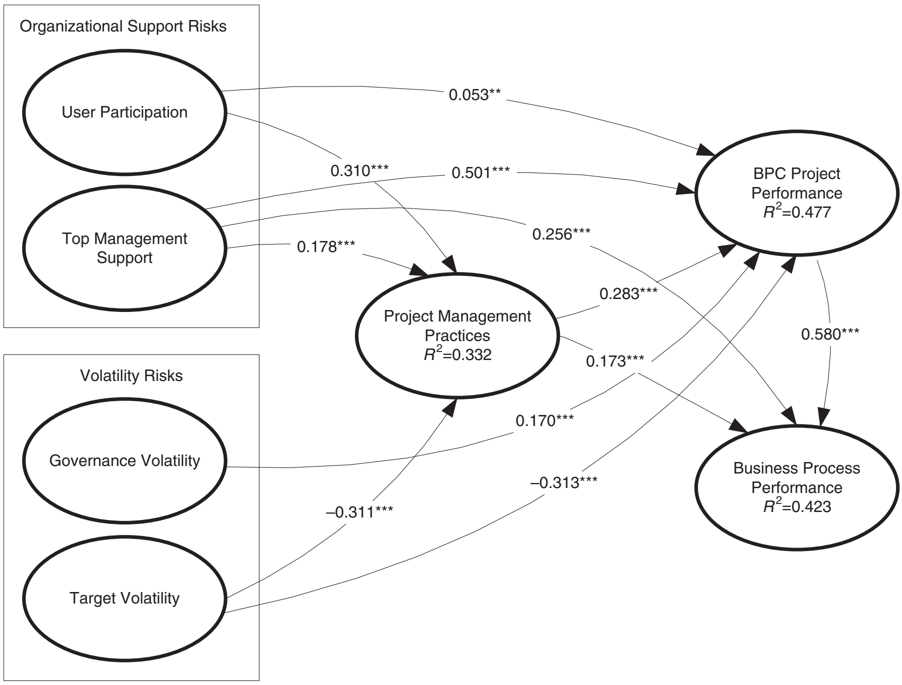
Notes: ns, not significant. β, PLS algorithm path weighting scheme; *t*-value, bootstrapping with 130 cases, 2,000 subsamples. ** $p < 0.01$ → *t*-value 2.576; *** $p < 0.001$ → *t*-value 3.291

Table II. Path coefficients, *t*-values, and effect sizes strong influence on project management practices (*H15*) and BPC project performance (*H13*). Governance volatility only has a significant influence on BPC project performance (*H7*). Hence, volatility risks influence project management practices and project performance but appear to have no direct impact on the process performance. Furthermore, our results also support the findings of Gemino *et al.* (2008) that project management practices have direct influence on BPC project performance (*H16*) and the changed process performance (*H17*). Lastly, our results also showed support for Jurisch *et al.*'s (2014) finding that the project performance has strong impact on the performance of the changed business process (*H18*). Hence, measuring BPC project success at the process level appears to be highly recommendable.

Figure 2 summarizes the results of the analysis with estimated path coefficients and associated *t*-values of the paths (Chin, 1998).

5. Discussion

Our results reported above make a number of contributions to research on emergent risks in BPC projects. First, our results suggest that organizational support risks have direct impact on BPC project performance, which indicate that higher user participation and higher top management support substantially improve BPC project performance. Furthermore, our results suggest that organizational support risks positively influence project management practices. These results thus partially confirm the findings reported by Gemino *et al.* (2008), who reported that organizational risks positively influences the project management practices, but on the other side do not have a direct impact on project product performance, which is in contrast to our findings.



Notes: $^{**}p<0.01$; $^{***}p<0.0001$

Figure 2.
Emergent risks impacting BPC project and process performance

Second, our results indicate that top management support positively influences business process performance, which is in line with Gemino *et al.* (2008). On the other hand, we could not support the hypothesis that also user participation directly influences business process performance, which is in contrast to findings of Gemino *et al.* (2008). The relationship between user participation and business process performance can be better explained by considering the mediating role of project management practices.

Third, our results indicate that there is no direct relationship between volatility risks and business process performance. However, this is also in contrast to findings of Gemino *et al.* (2008) who found that volatility risks have a direct impact on project process performance. Our results suggest that the relationship between volatility risks and business process performance can be similarly to previous point better explained by considering the mediating role of project management practices.

Fourth, our results show support for Jurisch *et al.*'s (2014) finding that the project performance has strong impact on the performance of the changed business process. Hence, measuring BPC project success at the process level appears to be highly recommendable.

With these results we established a more nuanced understanding of the emergent risks in BPC projects as well as empirically explained several relationships between emergent risks and business process performance and project performance. Furthermore, our study highlights the importance of studying moderating and mediating factors in BPC research to reconcile the magnitude of failure rates in BPC projects.

In interpreting the findings of this study, several limitations of case survey methodology need to be acknowledged. However, these limitations are very similar to those of other review methods. First, even we conducted an extensive literature search, we cannot guarantee that we identified all case studies. Furthermore, some case studies did not report the necessary information and thus, were not included in the case survey analysis. However, we are confident that any other case studies would not significantly affect our results. Second limitation refers to the publication bias, which means that significant results are more likely to be published than non-significant results (King and He, 2005). However, these published and significant results may not always be representative for the entire research population. Third, even though our coding results showed high inter-coder reliability, the process of designing scheme is bound to a certain degree of subjectivity. Any doubts in coding assignments were resolved by reaching a consensus. The fourth limitation refers to the sample size included in a case survey. According to King and He (2005) the statistical power of detecting a genuine effect size depends on the number of case studies included in a case survey. However, no information exists on the minimum sample size of a case survey. The last limitation of the case survey methodology is that it can be very time-consuming and cost-intensive to conduct. Even though Larsson (1993) argues that it is an inexpensive method, our own experiences suggest that the sampling and coding of case studies are rather resource-intensive stages.

6. Conclusion

This study was motivated by the insufficient understanding of emergent risks as one of the major cause for the high failure rates in BPC projects (Trkman, 2010; Cao *et al.*, 2001; Strebel, 1996; Kliem, 2000). The findings reported above make four main contributions to research in BPC domain. First, we extended the theory of BPC by identifying emergent risks impacting BPC project and process performance. More specifically, our results suggest that user participation, top management support, governance volatility, and target volatility are critical emergent risks in BPC projects.

Second, we provided a theoretical explanation of the effects of emergent risks on the BPC project and process performance. Since, this study empirically examined the nature and magnitude of relationships between organizational support risks, volatility risks, and BPC project and process performance. This is a useful beginning in helping practitioners to obtain a better understanding of emergent risks when planning and performing BPC initiatives.

Third, our research makes a methodological contribution. More specifically, we have demonstrated the usefulness of including case survey methodology in BPC research, as a promising approach to the development or extension of theories in BPC research. This is in line with other authors (Glass *et al.*, 1981; Hunter and Schmidt, 2004) who argue that case survey methodology enable researchers to estimate more reliable effect sizes than traditional review procedures, which in turn might increase summative validity of theories developed or extended in case studies. We thus posit that the case survey methodology can help BPC researchers to: first, establish summative validity for the theories developed in case studies; second, make these theories accessible to a wider BPC audience and thus increase their relevance; and third, enrich and strengthen the theoretical core of the BPC research community.

Last, by replicating the study of Gemino *et al.* (2008) in different domain, we further highlight the importance of replication studies in BPC research area. The need for replication has become apparent within medical science, where the reproducibility of the results have overturned their key results. Thus, reproducibility of results lies at the core of modern science.

References

Al-Mashari, M. and Zairi, M. (1999), "BPR implementation process: an analysis of key success and failure factors", *Business Process Management Journal*, Vol. 5 No. 1, pp. 87-112.

Al-Mashari, M. and Zairi, M. (2000), "Revisiting BPR: a holistic review of practice and development", *Business Process Management Journal*, Vol. 6 No. 1, pp. 10-42.

Al-Mashari, M., Irani, Z. and Zairi, M. (2001), "Business process reengineering: a survey of international experience", *Business Process Management Journal*, Vol. 7 No. 5, pp. 437-455.

Anderson, J. and Woolley, M. (2004), "Towards strategic sourcing: the unilever experience", *Business Strategy Review*, Vol. 13 No. 2, pp. 65-73.

Bagozzi, R.P. and Yi, Y. (1988), "On the evaluation of structural equation models", *Journal of the Academy of Marketing Science*, Vol. 16 No. 1, pp. 74-94.

Ballou, R.H. (1995), "Reengineering at American express: the travel services group's work in process", *Interfaces*, Vol. 25 No. 3, pp. 22-29.

Barki, H., Rivard, S. and Talbot, J. (2001), "An integrative contingency model of software project risk management", *Journal of Management Information Systems*, Vol. 17 No. 4, pp. 37-69.

Bollen, K.A. and Lennox, R. (1991), "Conventional wisdom on measurement: a structural equation perspective", *Psychological Bulletin*, Vol. 110 No. 2, pp. 305-314.

Brown, D.C. and Riley, M.J. (2000), "The application of BPR: a case study in construction", *Knowledge and Process Management*, Vol. 7 No. 4, pp. 217-223.

Bullock, R.J. and Tubbs, M.E. (1990), "A case meta-analysis of gainsharing plans as organization development interventions", *The Journal of Applied Behavioral Science*, Vol. 26 No. 3, pp. 383-404.

Cao, G., Clarke, S. and Lehaney, B. (2001), "A critique of BPR from a holistic perspective", *Business Process Management Journal*, Vol. 7 No. 4, pp. 332-339.

Carmines, E.G. and Zeller, R.A. (1979), *Reliability and Validity Assessment*, Sage Publications, Beverly Hills, CA.

Caron, J.R., Stoddard, D.B. and Jarvenpaa, S.L. (1994), "Business reengineering at CIGNA corporation: experiences and lessons learned from the first five years", *MIS Quarterly*, Vol. 18 No. 3, pp. 233-250.

Chin, W. (1998), "The partial least squares approach for structural equation modeling", in Marcoulides, G.A. (Ed.), *Modern Methods for Business Research*, Lawrence Erlbaum Associates, pp. 295-336.

Chin, W.W. and Newsted, P.R. (1998), "Structural equation modeling analysis with small samples using partial least squares", in Hoyle, R.H. (Ed.), *Statistical Strategies for Small Sample Research*, SAGE Publications, Thousand Oaks, CA, pp. 307-342.

Cohen, J. (1988), *Statistical Power Analysis for the Behavioral Science*, Lawrence Erlbaum Associates, Hillsdale, NJ.

Crawford, L. (2005), "Senior management perceptions of project management competence", *International Journal of Project Management*, Vol. 23 No. 1, pp. 7-16.

Currie, W.L. and Willcocks, L. (1996), "The new branch columbus project at Royal Bank of Scotland: the implementation of large-scale business process re-engineering", *The Journal of Strategic Information Systems*, Vol. 5 No. 3, pp. 213-236.

Dale, B.G. (1994), "TQM: an overview", in Dale, D.G., Boaden, R.J. and Lascelles, D. (Eds), *Managing Quality*, Prentice Hall International, Herts, pp. 3-33.

Diamantopoulos, A. (2006), "The error term in formative measurement models: interpretation and modeling implications", *Journal of Modeling in Management*, Vol. 1 No. 1, pp. 7-17.

Eckey, H.F., Kosfeld, R. and Draeger, C. (2001), *Ökonometrie*, Gabler Verlag, Wiesbaden.

Efron, B. and Tibshirani, R.J. (1993), *An Introduction to the Bootstrap*, Chapman & Hall, New York, NY.

Fornell, C. and Larcker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, Vol. 18 No. 1, pp. 39-50.

Gefen, D., Straub, D. and Boudreau, M.-C. (2000), "Structural equation modeling and regression: guidelines for research practice", *Communications of the ACM*, Vol. 4 No. 7, pp. 1-80.

Gemino, A., Reich, B.H. and Sauer, C. (2008), "A temporal model of information technology project performance", *Journal of Management Information Systems*, Vol. 24 No. 3, pp. 9-44.

Glass, G.V. (1976), "Primary, secondary, and meta-analysis of research", *Educational Researcher*, Vol. 5 No. 10, pp. 3-8.

Glass, G.V., McGaw, B. and Smith, M.L. (1981), *Meta-Analysis in Social Research*, Sage Publications, Beverly Hills, CA.

Grover, V. (1999), "From business reengineering to business process change management: a longitudinal study of trends and practices", *IEEE Transactions on Engineering Management*, Vol. 46 No. 1, pp. 36-46.

Grover, V. and Kettinger, W.J. (1995), *Business Process Change: Reengineering Concepts, Methods, and Technologies*, Idea Group Publishing, London.

Hair, J.F., Anderson, R.E., Tatham, R.L. and Black, W.C. (1998), *Multivariate Data Analysis*, Prentice Hall, Englewood Cliffs, NJ.

Hammer, M. and Champy, J. (1993), *Reengineering the Corporation – A Manifesto for Business Revolution*, HarperCollins, New York, NY.

Harrington, B., McLoughlin, K. and Riddell, D. (1998), "Business process re-engineering in the public sector: a case study of the Contributions Agency", *New Technology, Work and Employment*, Vol. 13 No. 1, pp. 43-50.

Harvey, D. (1994), *Re-engineering: The Critical Success Factors*, McGraw Hill, New York, NY.

Hill, J.B. and McCoy, D.W. (2011), "Key issues for business process management 2011", Gartner, Inc. Business, Stamford, CT.

Holland, C. and Light, B. (1999), "A critical success factor model for ERP implementation", *IEEE Software*, Vol. 16 No. 3, pp. 30-35.

Huizing, A., Koster, E. and Bouman, W. (1997), "Balance in business reengineering: an empirical study of fit and performance", *Journal of Management Information Systems*, Vol. 14 No. I, pp. 93-118.

Hulland, J. (1999), "Use of partial least squares (PLS) in strategic management research: a review of four recent studies", *Strategic Management Journal*, Vol. 20 No. 2, pp. 195-204.

Hunter, J.E. and Schmidt, F.L. (2004), *Methods of Meta-Analysis: Correcting Error and Bias in Research Findings*, 2nd ed., Sage Publications, Thousand Oaks, CA.

Huq, Z. and Martin, T.N. (2006), "The recovery of BPR implementation through an ERP approach: a hospital case study", *Business Process Management Journal*, Vol. 12 No. 5, pp. 576-587.

Jackson, S. (1995), "Re-engineering the post office", *New Technology, Work and Employment*, Vol. 10 No. 2, pp. 142-146.

Jauch, L.R., Osborn, R.N. and Martin, T.N. (1980), "Structured content analysis of cases: a complementary method for organizational research", *The Academy of Management Review*, Vol. 5 No. 4, pp. 517-525.

Jesitus, J. (1997), "Broken promises? FoxMeyer's project was a disaster. Was the company too aggressive or was it misled?", *Industry Week*, Vol. 246 No. 20, pp. 31-36.

Jurisch, M.C., Wolf, P. and Krcmar, H. (2013), "Using the case survey method for synthesizing case study evidence in information systems research: a methodological review", *9th Americas Conference on Information Systems (AMCIS), Chicago, IL, August 15-17*.

Jurisch, M.C., Palka, W., Wolf, P. and Krcmar, H. (2014), "Which capabilities matter for successful business process change?", *Business Process Management Journal*, Vol. 20 No. 1, pp. 47-67.

Jurisch, M.C., Cuno, J., Palka, W., Wolf, P. and Krcmar, H. (2012), "An integrative model of it-enabled business process change: causal structures in theory, research and practice", *Proceedings of Hawaii International Conference on System Sciences (HICSS – 45), IEEE Computer Society Press, Maui, HI and Los Alamitos, CA*, pp. 4297-4306.

Jurisch, M.C., Ikas, C., Palka, W., Wolf, P. and Krcmar, H. (2012), "A review of success factors and challenges of public sector BPR implementations", *45th Hawaii International Conference on System Sciences (HICSS 2012), IEEE, Maui Hawaii*, pp. 2603-2612.

Kanter, R.M., Stein, B.A. and Jick, T.D. (1992), *The Challenge of Organizational Change: How Companies Experience It and Make Leaders Guide It*, Free Press, New York, NY.

Kemppainen, I. (2004), "Change management perspectives in an ERP implementation", *ECIS 2004 Proceedings, Turku, June 14-16*.

Kettinger, W.J. and Grover, V. (1995), "Special section: toward a theory of business process change management", *Journal of Management Information Systems*, Vol. 12 No. 1, pp. 9-30.

King, W.R. and He, J. (2005), "Understanding the role and methods of meta-analysis in IS research", *Communications of the Association for Information Systems*, Vol. 16 No. 1, pp. 665-686.

Kliem, R.L. (2000), "Risk management for business process reengineering projects", *Information Systems Management*, Vol. 17 No. 4, pp. 66-68.

Kock, N.F. and McQueen, R.J. (1996), "Is re-engineering possible in the public sector? A Brazilian case study", *Business Change and Re-Engineering*, Vol. 3 No. 3, pp. 3-12.

Kotter, J.P. (1996), *Leading Change*, Harvard Business School Press, Boston, MA.

Krafft, M., Götz, O. and Liehr-Gobbers, K. (2005), "Die Validierung von Strukturgleichungsmodellen mit Hilfe des Partial-Least-Squares (PLS)-Ansatzes", in Bliemel, F. *et al.* (Eds), *Handbuch PLS-Pfadmodellierung*, Schäffer-Poeschel Verlag, Stuttgart, pp. 71-86.

Krippendorf, K. (1980), *Content Analysis. An Introduction to its Methodology*, Sage Publications, Beverly Hills, CA.

Larsson, R. (1993), "Case survey methodology: quantitative analysis of patterns across case studies", *The Academy of Management Journal*, Vol. 36 No. 6, pp. 1515-1546.

Lee, K.T. and Chuah, K.B. (2001), "A SUPER methodology for business process improvement: an industrial case study in Hong Kong/China", *International Journal of Operations & Production Management*, Vol. 21 No. 5, pp. 687-706.

Leverment, Y., Ackers, P. and Preston, D. (1998), "Professionals in the NHS – a case study of business process re-engineering", *New Technology, Work and Employment*, Vol. 13 No. 2, pp. 129-139.

Lucas, W. (1974), *The Case Survey Method: Aggregating Case Experience*, No. 1515, Rand Corporation, Santa Monica, CA.

McAdam, R. and Corrigan, M. (2001), "Re-engineering in public sector health care: a telecommunications case study", *International Journal of Health Care Quality Assurance*, Vol. 14 No. 5, pp. 218-227.

Markus, M.L. and Grover, V. (2008), "Consolidating knowledge on the journey of business process transformation", in Grover, V. and Markus, M.L. (Eds), *Business Process Transformation*, M.E. Sharpe, Armonk, NY, pp. 1-19.

Martin, I. and Cheung, Y. (2002), "Change management at mobil oil Australia", *Business Process Management Journal*, Vol. 8 No. 5, pp. 447-461.

Motwani, J., Subramanian, R. and Gopalakrishna, P. (2005), "Critical factors for successful ERP implementation: exploratory findings from four case studies", *Computers in Industry*, Vol. 56 No. 6, pp. 529-544.

Neely, A., Gregory, M. and Platts, K. (1995), "Performance measurement system design: a literature review and research agenda", *International Journal of Operations & Production Management*, Vol. 15 No. 4, pp. 80-116.

Newman, K., Cowling, A. and Leigh, S. (1998), "Case study: service quality, business process re-engineering and human resources: a case in point?", *International Journal of Bank Marketing*, Vol. 16 No. 6, pp. 225-242.

Nidumolu, S. (1995), "The effect of coordination and uncertainty on software project performance: residual performance risk as an intervening variable", *Information Systems Research*, Vol. 6 No. 3, pp. 191-219.

Olsson, R. (2007), "In search of opportunity management; is the risk management enough?", *International Journal of Project Management*, Vol. 25 No. 8, pp. 745-752.

Palmberg, K. (2010), "Experiences of implementing process management: a multiple-case study", *Business Process Management Journal*, Vol. 16 No. 1, pp. 93-113.

Paper, D.J., Rodger, J.A. and Pendharkar, P.C. (2001), "A BPR case study at Honeywell", *Business Process Management Journal*, Vol. 7 No. 2, pp. 85-99.

Proctor, T. and Gray, L. (2006), "Business process re-engineering in the public sector: a case study", *Euromed Journal of Business*, Vol. 1 No. 1, pp. 84-97.

Rosenthal, R. (1979), "The 'file drawer problem' and tolerance for null results", *Psychological Bulletin*, Vol. 86 No. 3, pp. 38-641.

Rosenthal, R. and DiMatteo, M.R. (2001), "Meta-analysis: recent developments in quantitative methods for literature reviews", *Annual Review of Psychology*, Vol. 52 No. 2, pp. 59-82.

Sambamurthy, V. and Chin, W.W. (1994), "The effects of group attitudes toward alternative GDSS designs on the decision-making performance of computer-supported groups", *Decision Sciences*, Vol. 25 No. 2, pp. 215-241.

Sarker, S. and Lee, A. (2000), "Using a case study to test the role of three key social enablers in ERP implementation", *ICIS 2000 Proceedings, Brisbane, December 10-13*, pp. 414-425.

Sarker, S. and Lee, A.S. (2008), "A case study of business process reengineering failure", in Grover, V. and Markus, M.L. (Eds), *Business Process Transformation*, M.E. Sharpe, Armonk, NY, pp. 251-271.

Sarker, S., Sarker, S. and Sidorova, A. (2006), "Understanding business process change failure: an actor-network perspective", *Journal of Management Information Systems*, Vol. 23 No. 1, pp. 51-86.

Scott, J.E. and Vessey, I. (2002), "Managing risks in enterprise systems implementations", *Comunications of the ACM*, Vol. 45 No. 4, pp. 74-81.

Sharma, R. and Yetton, P. (2007), "The contignent effects of training, technical complexity, and task interdependence on successful information systems implementation", *MIS Quarterly*, Vol. 31 No. 2, pp. 219-238.

Shin, N. and Jemella, D.F. (2002), "Business process reengineering and performance improvement: the case of Chase Manhattan Bank", *Business Process Management Journal*, Vol. 8 No. 4, pp. 351-363.

Srnka, K. and Koeszegi, S. (2007), "From words to numbers: how to transform qualitative data into meaningful quantitative results", *Schmalenbach Business Review*, Vol. 59, January, pp. 29-58.

Stemberger, M.I., Kovacic, A. and Jaklic, J. (2007), "A methodology for increasing business process maturity in public sector", *Interdisciplinary Journal of Information, Knowledge, and Management*, Vol. 27 No. 4, pp. 119-133.

Strebel, P. (1996), "Why do people resist change?", *Harvad Business Review*, Vol. 74 No. 3, pp. 86-92.

Teng, J., Fiedler, K.D. and Grover, V. (1998), "An exploratory study of the influence of the IS function and organizational context on business process reengineering project initiatives", *Omega*, Vol. 26 No. 6, pp. 679-698.

Trkman, P. (2010), "The critical success factors of business process management", *International Journal of Information Management*, Vol. 30 No. 2, pp. 125-134.

Wallace, L., Keil, M. and Rai, A. (2004), "How software project risk affects project performance: an investigation of the dimensions of risk and an exploratory model", *Decision Sciences*, Vol. 35 No. 2, pp. 289-321.

Webster, J. and Watson, R.T. (2002), "Analyzing the past to prepare for the future: writing a literature review", *MIS Quarterly*, Vol. 26 No. 2, pp. xiii-xxiii.

Weiler, J. (1995), "Ein Unternehmen Verändert sich – Business Reengineering und die neue IBM", in Weiler, J. (Ed.), *Die IBM-Kultur, Protokoll einer Unternehmenskrise*, Computewoche-Verlag, München, pp. 118-129.

Yin, R.K. and Heald, K.A. (1975), "Using the case survey method to analyze policy studies", *Administrative Science Quarterly*, Vol. 20, September, pp. 371-382.

About the authors

Marlen Christin Jurisch is a Research Assistant at the Chair for Information Systems, Technische Universität München. She received a BA in International Business from the University of Applied Sciences Dresden and her MA in Politics and Management from the University of Konstanz. Her research interests include business process change and public information management.

Zuzana Rosenberg is a Research Assistant at the Chair for Information Systems, Technische Universität München (TUM). She received her Diploma degree in computer science from TUM in 2008. She has focussed on business process optimization, software engineering, and IT management. Her research interests include modeling of complex systems, business process management, risk management, and strategic consensus. Zuzana Rosenberg is the corresponding author and can be contacted at: zuzana.rosenberg@in.tum.de

Dr Helmut Krcmar is a Full Professor of Information Systems and holds the Chair for Information Systems at the Department of Informatics, Technische Universität München, since 2002. His research interests include information and knowledge management, service management, business process management, and information systems in eGovernment.