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HOW BENEFITS FROM IS/IT INVESTMENTS ARE SUCCESSFULLY REALIZED: THE ROLE OF BUSINESS PROCESS KNOW HOW AND BENEFITS MANAGEMENT PRACTICES

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Research-in-Progress

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Abstract

Although organizations continue to make substantial investments in information systems and information technology (IS/IT), the successful realization of benefits from such investments has consistently been reported as one of the major organizational challenges. From a project perspective, this paper examines whether benefits management (BM) practices can be considered a viable approach to achieve the anticipated benefits. Drawing on resource-based theory (RBT) as well as the BM literature, we derive a structural equation model consisting of eight propositions. These propositions are tested using data collected from 454 projects. Our analysis of the data by means of partial least squares (PLS) finds that BM positively impacts benefits realization success (BRS). Specifically, organizations should acknowledge the importance of (1) benefits analysis, (2) benefits planning, and (3) benefits review when seeking to realize benefits. Furthermore, the findings suggest that benefits analysis is facilitated by the contextual constructs business process knowledge and business/IT communication. We also found a relationship between top management support and the contextual constructs. Collectively, the results have important theoretical and practical implications, as they provide quantitative evidence of how IS/IT investments should be managed to successfully realize benefits. Based on our results, we argue that BM is a basis for the successful realization of benefits. Nevertheless, organizations need to ensure that project teams have sufficient understanding of (1) the IS/IT, (2) the business, and (3) the interaction between IS/IT and the business. The latter is specifically the most challenging and most important competency that a project team can possess. We expect our research to spur organizations to instill a shared understanding of how IS/IT relates to the business and vice versa within their project teams, which will intensify BM's positive effect on BRS.

Keywords: Benefits management, business benefits, IS/IT investments, resource-based theory

Introduction

Benefits arising from investments in information systems and information technology (IS/IT) have been the subject of much debate in recent years. Many organizations invest heavily in IS/IT with the objective of realizing benefits after a successful IS/IT implementation. Since the 1950s, when organizations first used computers to improve their competitiveness (Ward 1986), investments in IS/IT have increased steadily, and Gartner forecasts that worldwide enterprise's IS/IT spending will reach $231 billion in 2010 (Gartner 2010). Today, organizations in virtually every industry rely increasingly on IS/IT. Nevertheless, few organizations achieve the intended benefits, which has remained a challenge. An example is provided in a 2003 article reporting on a major soft drink bottler's enterprise resource planning (ERP) endeavor (Barker et al. 2003). The ERP in which it invested seemed the solution to the bottler's problems, and it planned to realize benefits such as integrated communication. However, although "successfully" implemented (in terms of a running system), the ERP turned out to be grossly underused and was even considered a hindrance to the overall business.

One explanation for this dilemma can be found in literature on the productivity paradox, in which the "mismanagement of information and technology" is cited as a reason for organizations failing to achieve productivity gains from investments in IS/IT (Brynjolfsson 1993). In line with Brynjolfsson's argument, we argue that most organizations focus on the implementation of technology rather than on the realization of the expected business benefits. This might lead to a successful implementation of IS/IT in terms of time-frame and budget (as in the soft drink bottler's case), but not necessarily with realized benefits. In this context, several approaches to the achievement and maximization of the anticipated benefits from IS/IT investments have evolved under the term *benefits management* (BM), which is defined as "organizing and managing IS/IT initiatives so that potential benefits arising from the use of IT are actually realized" (Ward et al. 1996).

The research stream on BM is closely related to the ones on the business value of IS/IT and IS/IT implementation. Although BM and these two research stream are not mutually exclusive, there are some differences that justify BM as a research stream in its own right. Kohli and Grover (2008) define "IT value research" as research on the relationship between IT and organizational performance (e.g. Melville et al. 2004). These authors suggest that this research stream fulfils the following two conditions: there must be an (1) IT variable, IT management variable or manifestation and (2) an endogenous variable with an IT economic impact. As far as BM is concerned, condition (2) is not fulfilled, as BM research emphasizes various issues that arise when focusing only on variables that have an obvious and direct economic impact. An example of such issues is making unrealistic assumptions to claim sufficient financial benefits in order to provide the necessary return in relation to the costs (Ward et al. 2008). Consequently, BM research cannot be considered "IT value research". BM is also not independent regarding IS/IT implementation models usually involving phases such as the planning, analysis, design, implementation, testing, and maintenance (Haines et al. 2010). However, whereas research on IS/IT implementation focuses more on technical aspects, such as on-time completion, on-budget completion, and software functionality (Lee et al. 2010) or the software project's productivity and quality (Ramasubbu et al. 2008), BM focuses on the managerial investment objectives and how these can be realized with a successful IS/IT implementation. This also leads to a differing accountability: whereas the business department is accountable for realizing benefits, the IT department provides the basis for doing so by implementing the IS/IT (Peppard et al. 1999).

Despite the notion that BM is a key predictor of *benefits realization success* (BRS), researchers have to date not provided quantitative evidence for this in terms of a "theory for predicting" (Gregor 2006). Clearly, this must be clarified before implications for theory and practice can be inferred. In order to reduce this gap, we have developed a conceptual model of *benefits management success* (BMS) and have carried out an exploratory study using survey research methodology to answer the following research question: Does the execution of BM practices within a single project lead to increased benefits realization? The survey led to a total of 454 responses, the results of which are reported in this study. Unlike process theory, the proposed BMS model does more than just take typical event patterns into account (Pentland 1999). Our deepening understanding of how benefits should be managed, which has been gained through the collection and analysis of qualitative field data (Braun et al. 2010), has reinforced the need for knowledge on the antecedents of BM, which include people, management, and culture (Kohli et al. 2008). In the BMS model, we consider such antecedents as contextual constructs. We believe contextual constructs are necessary for BM to unfold its potential and to ultimately lead to the realization of benefits.

The remainder of this paper is organized as follows: The following section introduces the BM discourse. In the third section, we consider the extent to which the relatively new BM concept relates to the well-established research

streams on the *resource-based theory* (RBT) and *business/IT alignment* (BITA). In the fourth section, we derive the BMS model from the exogenous and endogenous variables that form it. We thereby differentiate between BM constructs and contextual constructs. Next, we provide an overview of the research methodology and the development of the survey instrument. This section is followed by the data analysis in section six, in which we first validate the measurement model and then proceed with the data analysis, using structural equation modeling. The concluding section summarizes the main findings and limitations of the study and provides an outlook for future research.

Antecedent Research on Benefits Management

Research on BM as a comprehensive approach began in the mid-1990s with an empirical study on industry practices in the UK (Ward et al. 1996). This study found that many organizations were not satisfied with the available methods for realizing benefits and therefore presented the Cranfield BM process model - one of the most widely used and cited models as a means of overcoming this hurdle. This model outlines the scope and nature of BM and consists of the following five stages: (1) Identifying and structuring benefits, (2) planning benefits realization, (3) executing the benefits realization plan, (4) evaluating and reviewing the results, and (5) discovering potentials for further benefits (Ward et al. 1996). In practice, the BM concept is comparatively new. It is therefore not surprising that few organizations have methodological BM standards in place to realize benefits from IS/IT investments. The results of further research, which extended the 1996 UK study, were presented in 2007. Although the adoption of BM had increased from 12% to 25% in the participating organizations, most organizations still needed to improve further, and only a minority of organizations had adopted a comprehensive approach to actively manage the benefits from their IS/IT investments (Ward et al. 2007).

Despite previous research endeavors (Al-Tameem et al. 2000; Ashurst et al. 2008; McKay et al. 2003; Päivärinta et al. 2007; Peppard et al. 1999; Peppard et al. 2007; van Lier et al. 2007; Ward et al. 2007; Ward et al. 1996), BM research can still be described as an evolving discipline. A 2009 literature review identified only 74 research papers as highly relevant to BM (60 journal articles and 14 conference papers). Of these, only nine articles focused on the BM process, while the remaining 65 dealt with only one of the stages of the Cranfield BM process model (Braun et al. 2009). Furthermore, academics have not analyzed BM success as such. Thus, most research has collected descriptive data on the state of BM practice (Bennington et al. 2004; Ward et al. 2007; Ward et al. 1996) or has applied case study research with the objective of examining how an organization can increase the likelihood that its planned benefits will be realized (Ashurst et al. 2008).

Understanding Benefits Management Success – Theoretical Background

As a promising solution to realize benefits, BM also finds support in RBT (Acedo et al. 2006; Barney 2001a; Barney 2001b; Mata et al. 1995), which postulates that the organization's internal resources are predictors of the economic situation and recognizes that an organization's resource position should be taken into consideration when strategic options are examined in order to create competitive advantage. Applying RBT to the general understanding of how organizations can ultimately exploit the benefits of IS/IT investments, one can argue that IS/IT investment as such does not provide any sustained advantage (Bharadway 2000), nor does it have any inherent value (Peppard et al. 2000). Instead, true value is not created by the mere possession of the resource IS/IT, but rather by an organization's ability to activate and exploit these resources (Ashurst et al. 2008). In this context, researchers also refer to "value conversion contingencies" (Davern et al. 2000), "conversion effectiveness" (Weill 1992), and "benefits realization capability" (Ashurst et al. 2008), which organizations can use to transform IS/IT resources into actual benefits.

This discussion is also in line with research on BITA, which postulates that organizations must leverage their IS/IT appropriately in order to contribute to achieving business objectives (McLean et al. 1976; Weiss et al. 2006). This notion is not new in the BITA research stream and was first documented in the 1970s by Ephraim McLean and John Soden (1976). In their paper on strategic planning for management information systems (MIS), the authors already noted that "no longer is it feasible – if it ever were – to have systems for their own sake" and that managers must "recognize that the MIS function is not an end in itself but a part – and hopefully a vital part – of the larger objectives and activities of the overall enterprise". Weiss et al. (2006) further argue that the crucial question for organizations to answer in this regard is: "How does IT contribute to business objectives?".

In line with these two research streams, we consider BM an essential capability to realize benefits from IS/IT resources. This is in line with Peppard et al. (2000), who state that the exploitation of IS/IT, i.e. the ability to maximize the benefits realized from the implementation of IS/IT investments, depends on the organization's BM capability. Thus, we propose that BM has the causal potential to increase benefits realization success. But whether or not this potential is actually exploited also depends on other conditions (Markus et al. 2008). We believe these conditions are best represented by the contextual constructs introduced in the following section. Consequently, BM is not the only, or even the most important, contributor to realizing benefits but must be complemented by top management support, business process knowledge, and business/IT communication.

Benefits Management Success Model

Based on this IS research in the well-established RBT and BITA research streams (and their relationships to BM), we present a model to measure to what extent BM can contribute to successful benefit realization. The theoretical framework of this study is exploratory because the review of prior literature could not identify a commonly accepted model for investigating BMS. However, several factors were identified during the literature research that have the potential to influence BMS and therefore shape our BMS model. In an exploratory field study done beforehand, we also found support for including the following constructs in our research model (Braun et al. 2010).

Contextual Constructs

Although not dealt with in relation to BM, *top management support* has been recognized within IS literature since the late 1970s. More than 30 years ago, Senn noted that "successful development, implementation, and operation of an MIS require the continued support and interaction with top corporate management" (Senn 1978). Other researchers noted that organizations in which the CEO was involved in the management of IT were more successful at realizing benefits and generating value from IS/IT investments (Jarvenpaa et al. 1991). Beath (1991) acknowledges the importance of top management support at the project level, stating that top managers are essential to successfully implement IS/IT due to their ability to bring about organizational change – a prerequisite for generating benefits from IS/IT investments. Therefore, we posit that *top management support* (TMS) is a contextual benefits realization success factor. In this study, we define TMS as the management's commitment to and interest in the project.

The second contextual construct draws on the line of argument that IS/IT investment as such does not provide any sustained advantage (Bharadway 2000), nor does it have any inherent value (Peppard et al. 2000). Organizations and their managers thus need to understand that even though IS/IT may have been a or *the* key enabler within successful projects, business benefits are ultimately derived from "understanding the business and committing it to change" (Earl 1992) and that IT impacts organizational performance via intermediate business processes (Melville et al. 2004). However, in order to change business processes in such a way that they ultimately lead to benefits, one must first gather *business process knowledge* (BPK). We define BPK as the knowledge associated with the business domain in which the IS/IT is to be implemented (Karimi et al. 2007).

The third contextual factor stems from effective communication within the project team. Following the notion of Tushman and Katz (1980), the IS/IT department as well as the business department can each be considered a specialized sub-unit that has evolved to deal with relatively homogeneous tasks: The IS/IT department focuses on the technical work environment, whereas the business department focuses on the functional work environment. As a result, each sub-unit develops its own locally defined languages and orientations that gradually evolve from interactions between the sub-unit's task demands. Since both sub-units are affected within an IS/IT project, as the implementation of new IS/IT implies changes to business processes as well as to technology, effective interaction in terms of communication between the IS/IT department and the business department becomes essential (Lee et al. 1995). This is also widely accepted in BITA literature, in which ongoing knowledge sharing is crucial (Khaiata et al. 2009; Luftman 2003). This line of argument leads to the following construct: *business/IT communication* (BITC), defined as the extent and quality of the communication between the IT project team and the business department.

These three constructs form Propositions 1 and 2 of our BMS model. First, we argue that TMS has a positive effect on BPK (P1). Only if top management provides sufficient resources in terms of a project team that has the capability to understand (1) the IS/IT, (2) the business, and (3) how the IS/IT relates to changes within the business, will sufficient BPK be achieved. Further, management might, for example, foster BPK by moving IT people into

business units and vice versa, establishing brown-bag lunch for IT and business department employees, and sending IT people on regular visits to sales offices and customers (Reich et al. 2000).

We also propose a positive relationship between TMS and BITC (P2). If top management shows active interest in the project, especially regarding the interrelationship between IS/IT and business, it is more likely that the project team will, via effective communication, make an effort to align the IS/IT and the business on project level. The management's interest thus creates expectancies and encourages the project team to communicate. Both propositions (P1 and P2) find support in the findings by Lee, Trauth and Farwell (1995), who state that IS professionals need to combine knowledge and skills in technology, management, and interpersonal skills. A close collaboration between the IT professionals and the business stakeholders is specifically needed with regards to benefits realization (Ashurst et al. 2008).

Benefits Management Constructs

Besides these contextual factors, appropriate management competencies must be applied prior, during, and after project execution in order to realize benefits. Traditional project management competencies that enable the project team to complete the project in time and on budget should therefore be complemented by the competencies to maximize the benefits realized from the implementation of the IS/IT investments (Peppard et al. 2000). Within our research model, we investigate the extent to which BM practices account for such competencies. Thus, we included the following BM constructs, which have mainly been derived from the Cranfield BM process model, as introduced in the section *Antecedent Research on Benefits Management*, in our model.

First, the *benefits analysis* (BA) construct, which is defined as the extent to which the benefits to be realized are transparent to the project stakeholders, accounts for the stage of identifying and structuring benefits. Project stakeholders can be defined as an individual or group of people who will benefit from the IS/IT investment, or are either directly involved in making the changes needed to realize benefits, or are affected by this (Ward et al. 2006). Transparency refers to the type of benefits to be realized, how they can be measured, and where in the organization they can be realized. In order to assess the benefits, the project team must have extensive knowledge of the business processes affected by the IS/IT project and must understand how these relate to one another. Furthermore, the iterative nature of establishing such transparency within the project team requires extensive communication between the IS/IT department and the business department. The dependencies between the BPK and BA on the one hand and between BITC and BA on the other are defined as Proposition 3 (P3) and Proposition 4 (P4) (see Table 1).

Based on the BA, the benefits realization must also be planned. This second stage in the Cranfield model is accounted for with the *benefits planning* (BP) construct, which we define as the extent to which the realization of benefits, which underpin the rationale for the IS/IT investments as well as for the business changes, is planned. This construct implies defining all the activities, interdependencies, timing, and responsibilities involved in managing the changes and realizing the benefits (Ward et al. 2006). An example of a BP activity is the development of a benefits dependency network (BDN) (Peppard et al. 2007; Ward et al. 2006). The BDN is an instrument to link the overall investment objectives and required benefits (the ends) with the necessary business changes (the ways) and the essential IT capabilities (the means) that enable these changes. The development of such a BDN leads to a clear statement of an investment's expected benefits, and the activities and IT capabilities required to achieve those benefits (Peppard et al. 2007).

In addition to the implementation of the IS/IT and the business changes, the benefits plan's achievement should be formally reviewed. In the process, organizations should assess whether each of the planned benefits have been achieved and, if not, whether any remedial action should be taken. As Ward and Daniel (2006) note, "one of the factors that differentiates successful from less successful companies in their deployment of IS/IT is the management resolve to evaluate IS/IT investments after completion". *Benefits review* (BR) was also considered the second most differentiating practice in a 2006 survey (Ward et al. 2007) and is defined as follows in our research model: The extent to which the realization of benefits is constantly reviewed during and after the project execution. In line with the sequence of the stages within the Cranfield model, we derived Proposition 5 (P5) and Proposition 6 (P6). Based on the results of our exploratory field study, we did not consider the stages to be purely sequential, i.e. BA leading to BP, and then BR. Instead, we believed that BA has a positive effect on BP and BR: even without BP, a BR is still possible, even though fewer benefits might be realized. Nevertheless, without ex-ante transparency regarding benefits (BA), BR is not possible.

Having outlined six constructs and their interrelationships, the question arises: Does the execution of BM practices within a single project lead to increased benefits realization? In order to answer this question, we introduce the final construct of our research model, *benefits realization success* (BRS), which is defined as the extent to which benefits are actually realized. We not only conceptualize benefits in monetary terms, but assume that they can be tangible and intangible. Again, the sequence of the Cranfield model's stages leads us to Proposition 7 (P7) and Proposition 8 (P8). We propose BP to have a positive effect on BRS (P7) because the process of BP as well as its results create awareness among the stakeholders that not the IS/IT resource itself leads to benefits, but the changes within the business. Parallel to the IS/IT implementation these business changes must also be managed accordingly, which can be accomplished based on BP. Further, we propose BR to have a positive effect on BRS (P8) as is allows organizations to identify any remedial actions if benefits are not realized as planned. Table 1 provides an overview of the propositions on which our research framework is based.

Table 1. Overview of Propositions

P1	Top management support will positively influence the project team's knowledge of business processes.
P2	Top management support will positively influence the communication between the IT project team and the business department.
P3	The project team's knowledge of business processes will positively influence a benefits analysis.
P4	Project sponsor / project team communication will positively influence a benefits analysis.
P5	A benefits analysis will positively influence a benefits planning.
P6	A benefits analysis will positively influence a benefits review.
P7	A benefits planning will positively influence the benefits realization success.
P8	A benefits review will positively influence the benefits realization success.

We decided not to consider stage 5 of the Cranfield BM process model (discovering potential for further benefits) as the exploratory research carried out beforehand (Braun et al. 2010) revealed that, as a unit of analysis, the project might lead to difficulties. The identification of additional benefits is in most cases no longer the project's objective, but is carried out in the line functions. In addition, we removed the construct representing stage 3 of the Cranfield BM process model (executing the benefits realization plan), as it did not have any effect on BMS. Thus, our BMS model does not account for the entire lifecycle viewpoint of benefits as the Cranfield BM model does.

Research Methodology

Research Instrument Refinement

The entire development process leading to the final survey instrument was conducted according to Straub, Boudreau, and Gefen's (2004) six steps. Purely reflective measures, selected for their empirical support in prior research, were used for each construct. Following Eisenhardt's (1989) recommendations, we also conducted an exploratory field study (Braun et al. 2010) in order to align the initial items pool with BM's current practice. Instrument refinement was then undertaken by means of an expert panel (semi-structured, face-to-face interviews), a Q-sorting exercise (Moore et al. 1991), and a Web-based pretest with 31 participants. Finally, all the items were embedded in survey questions, using a 7-point Likert type scale anchored by strongly disagree (1) and strongly agree (7). An overview of the survey questions can be downloaded at http://www.ebs.edu/uploads/media/BMS_Constructs_and_Measures.pdf.

Throughout the entire instrument development process, the three researchers discussed all the issues and formulated improvements and additions. This triangulation of researchers and methods (Denzin 2006) provides stronger substantiation of a valid and reliable instrument (Eisenhardt 1989).

Data Collection

The data collection for this study was done via an online survey for a six-month period from December 2009 until May 2010. The study participants were randomly chosen by means of keyword search (terms such as *benefits management*, *IT project management*, *portfolio management*, etc.), utilizing databases of professionals (i.e. XING and CompetenceSite), which allowed for a wide representation by industry and firm size. The keywords were compared to entries in the members' profiles, for example, fields labeled "interests" or "competencies I offer". After the identification of possible study participants, we then sent a personalized URL of the online survey to every identified individual. Participants, who had not yet completed the survey six weeks after the original invitation, received a reminder email. This use of Internet resources in data collections is gaining widespread interest among IS researchers (Allen et al. 2006). Whereas some researchers are interested in general and background information (Bolton et al. 2004), others intend to analyze data collected from sites (Snir et al. 2003). However, such access often has inherent legal issues, such as trespass or copyright violation (Allen et al. 2006). Manual access to Web communities to collect information about participants minimizes such legal issues, as the members can control how much information (e.g., email addresses) can be accessed. In addition, members in both communities have the possibility to deactivate the function to receive messages sent from the Web community.

We addressed the issue of *non-response bias* before the study by following Rogelberg and Stanton's (2007) recommendations. Additionally, we compared the early respondents to the late ones. The idea behind this approach is that late respondents are more likely to resemble non-respondents than early respondents (Armstrong et al. 1977). We defined early respondents (50.6%) as those who completed the survey within the first 30 days of receiving the initial invitation email. All those who completed the survey after the first 30 days were categorized as late respondents (49.4%). In the T-tests on the early and late responders, none of the research variables showed significant differences. Hence, we concluded that non-response bias does not threaten our findings.

As a result of our data collection efforts, the personalized survey URL was sent to a total of 2,147 individuals, of whom 454 completed the survey, which represents a 21.1 percent response rate. 359 of the non-respondents started but did not finish the survey. As all the survey questions required for our BMS model are mandatory, we do not need to exclude cases with missing or incomplete responses. The majority of the data records thus refers to IS/IT projects (59.91%). As BM is not only applicable for IS/IT projects but also for non-IS/IT projects, the sample also includes other project types, e.g. organizational projects (17.58%). Yet, even in non-IS/IT projects IS/IT is involved, but simply not as the main driver. The IT industry (20.74%) is most widely represented, followed by consulting (9.93%), the service sector (9.63%), and logistics (7.70%). The participants who assessed the project are mainly project managers (54.63%), who mostly lead project team members (7.93%), who are the second largest group.

Data Analysis

The research model and propositions were tested by means of *partial least squares* (PLS) (Chin et al. 2003; Hulland 1999; Tenenhaus et al. 2005; Wetzels et al. 2009). Since PLS is a component-based structural equation modeling technique, it is similar to regression, but has the ability to simultaneously estimate the structural model (i.e. the theoretical relationships between the various latent constructs) and the measurement model (i.e. the relationships between a specific latent construct and its indicators/items) (Esposito Vinzi et al. 2010). Frequently used in IS research, PLS is perceived to be particularly useful because it is robust regarding relatively lean sample sizes and non-normal distribution of the data (Ahuja et al. 2005; Hsieh et al. 2008; Igbaria et al. 1994). Furthermore, PLS supports exploratory research better and is especially suited when the focus is on theory development (Keil et al. 2000; Komiak et al. 2006). Given that this study is an early attempt to develop a theoretical model of BMS, PLS is appropriate to analyze the data.

Validation of the Measurement Model

The adequacy of the measurement model was assessed by the individual items' reliability, internal consistency between items, and the model's convergent and discriminant validity (Lewis et al. 2004; Straub et al. 2004). Cronbach's (1951) Alpha (CA) reliability estimates were used to measure the internal consistency reliability (Bollen 1989). In this study, the CA of every construct is greater than 0.8, which indicates that all the constructs in our model have a strong reliability (Nunnally et al. 1994). We also followed Chin's (1998) suggestions and calculated composite reliability (CR) as an alternative to CA. The CR values of all the constructs are also above the

recommended minimum of 0.7 (Nunnally et al. 1994). Convergent validity is demonstrated as a) the average variance extracted (AVE) values of all the constructs were higher than the suggested threshold value of 0.5 (Fornell et al. 1981) and b) all item-loadings were well above the 0.7 guideline and statistically significant at the 0.001 level (Hair et al. 2009). Evidence of discriminant validity could be found since a) the square root of all the AVEs were larger than interconstruct correlations, and b) all the construct indicators loaded more strongly on their corresponding construct than on other constructs (Chin 1998).

Common method bias (CMB) was evaluated by Harman's one-factor test exploratory method (Podsakoff et al. 1986). Results from this test showed that nine factors are present and that the most covariance explained by one factor is 49.77 percent, indicating that common method biases probably did not contaminate the results. In order to further examine CMB, we applied the confirmatory method (Liang et al. 2007; Podsakoff et al. 2003) and found that the indicators' average substantively explained variance is 0.798, while the average method based variance is 0.003. The ratio of substantive variance to method variance is about 252:1. As a result of the small magnitude and insignificance of the method variance, we contend that method-based variance is unlikely to be a serious challenge for this study (Liang et al. 2007).

Structural Model Results

After the measurement model's validation, the structural model was independently analyzed and the proposed relationships between the constructs were tested. Figure 1 shows the PLS structural model results. In assessing the PLS model, we examined the squared multiple correlations (R^2) for each dependent latent variable. Almost half of the variance of the endogenous dependent variable BRS (R^2=.492) is explained, which is large according Cohen's (1988) classification. Additionally, the model accounts for 44.6 percent of the variance in BP (R^2=.446) and 40.9 percent of the variance in BR (R^2=.409), which can also be considered large. In contrast, BA (R^2=.245), BPK (R^2=.179) and BITC (R^2=.255) show medium effects.

Using a blindfolding approach (Tenenhaus et al. 2005), we measured the cross-validated communality and redundancy indexes via a Stone and Geisser test (Geisser 1975; Stone 1974). The Q^2 results of both cross-validated communality and redundancy were greater than 0, suggesting that the model has good predictive validity. A post-hoc power analysis with the software G*Power 2 (Erdfelder et al. 1996) resulted in a value greater than 0.8, which implies that our model can detect small effect sizes (Chin 1998). The statistical significance of the structural paths was assessed using a bootstrapping procedure with 1,000 re-samples. The proposed relationships were considered supported if the corresponding path coefficients had the proposed algebraic sign and were significant. On the basis of the target t-test value of 3.29 (for $p < 0.001$, using two-tailed tests), we find that all path coefficients were significant (as shown in Figure 1). Finally, we calculated our model's goodness of fit (GoF) as suggested by Wetzels et al. (2009), who define the GoF as the square root of the product of AVE and R^2. The application of this formula leads to a GoF of 0.515, which exceeds the cut-off value of 0.36 for a large effect size with R^2 and allows us to conclude that our model performs well.

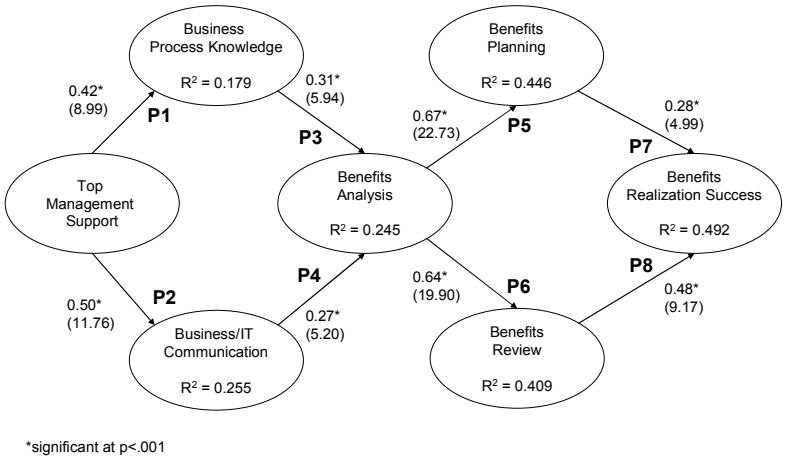

Figure 1. Benefits Management Success Research Model

We further conducted a separate PLS analysis on the combined dataset (presented above) and on the following groups to evaluate whether they helped to shape the results: (1) gender (female vs. male), (2) participant role, (3) age (the dataset was split using the median), and (4) project management experience (the dataset was split using the median). In the group comparisons regarding (2) the participant role (3) age, and (4) project management experience, all of the subset results were similar to the overall results. We can therefore conclude that these demographic variables are not significant factors. However, (1) gender did have effects. Interestingly, females evaluate the effect of BP on BRS (P7) as much stronger, while males evaluate the effect of BR on BRS (P8) as much stronger. Accordingly, for the female subgroup, the effect of BA on BP (P5) is also much stronger. In addition, in the female subgroup, the effects of the two contextual factors BITC (P4) and BPK (P3) on BA are much stronger than in the male subgroup. Nonetheless, the effect of the third contextual construct TMS (P1 and P2) shows no significant difference between the two groups. These differences between male and female are also supported when the new PLS bootstrapping approach to multigroup analysis, as suggested by Henseler et al. (2009), is applied. In applying this method to the two subgroups, we found that error probability for P3, P4, P5, P7 and P8 is > 0.80 to differ regarding the path coefficient of the two groups.

Discussion, Limitation and Outlook

The propositions on which the BMS model is based, are supported by our exploratory study. Our study contributes considerably regarding the significant positive relationship between the BM constructs. This finding provides a sound basis for arguing in favor of BM by showing that benefits are more likely to be realized with proper analysis, planning, and reviewing. Thus, BM can be considered an essential competency for exploiting the value of the IS/IT resources to be implemented. Our research also provides evidence that BM competency within the project team must be complemented by business process knowledge and communication skills. The project team must consist of members who understand the IS/IT, the business, and how the IS/IT relates to changes within the business. This understanding allows the team to overcome the boundaries in many project set-ups. This finding is in line with that of Peppard et al. (2000), who also analyzed the problem of value creation and concluded that organization must establish information exploitation competency. It is therefore necessary to include business analysts in project teams to analyze how the IS/IT relates to changes within the business and to "translate" between the two. Management can further foster the capability to manage the business/IT interface by, for example, moving IT people into business units and vice versa (Reich et al. 2000).

Another contribution stems from the detected differences between the two subgroups male and female. The rather large differences regarding five of the eight propositions in the BMS model (P3, P4, P5, P7, P8) can be considered a novel contribution, as gender differences have not been mentioned in prior BM research. Turning to the literature on gender differences in IS/IT in general (Johnson et al. 2008; Lindgren et al. 2006), we found support for males and females being attributed masculine and feminine characteristics. One might, for example, say that the IT industry – which accounts for the main empirical basis of this paper according to project type as well as industry – is regarded as masculine (Kvande et al. 1994). Lindgren and Packendorff (2006) focus their interest on how gender (i.e. culturally constructed notions on femininity and masculinity) is constructed in project work. They find that there are parts of project management thinking that could imply the increased importance of traditional femininities (such as teamwork, absence of hierarchies, etc.). Projects can also become arenas where individuals can demonstrate their abilities, strengths and professionalism by conforming to project goals. In this sense, a project is an exercise in masculine control (Kerfoot et al. 1998). Based on these findings, we specifically suggest that future research should explore how gender differences influence BM in more detail.

This study therefore has inherent limitations that must be considered when interpreting and applying its findings. There is a need to improve the BM constructs and the measures for these constructs. Given the increasing BM maturity of certain organizations, our research model might prove too simple and might call for further distinction. Further, our model only explains BA variance to a lesser extent, and future research might identify additional contextual constructs to further explain BM variance.

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