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THE ROLE OF INFORMATION TECHNOLOGY BUSINESS ALIGNMENT IN VALUE CREATION: A MULTIPLE CASE STUDY AMONG GERMAN BANKS

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Abstract

A key question in Information Systems research is how information technology creates business value. In this paper, our aim is to help reveal the role of alignment between IT and business resources in business value creation. In particular, we propose that the contribution of IT to business process performance should be investigated in the context of actual IT usage, with IT business alignment as a moderating variable. Also, IT flexibility should be explicitly considered. Using five case studies from the German financial services industry based on a causal model of IT business value creation reveals that the process of IT business value creation indeed strongly depends on the alignment between business and IT. But it also turns out that actual presence of business competencies is crucial and that even superior IT cannot compensate for business competency deficiencies.

Keywords: IT flexibility, IT usage, IT business alignment, competitive advantage

Introduction

The business value of information technology is a controversial topic in the academic literature. Although there seems to be a causal relationship between IT and profit, this relationship is rather indirect and complex and additional moderating factors are relevant (Lee 2001). Our aim is to contribute to the debate by discussing the business value of *IT* in the context of the business value of *business resources* and the alignment between business and IT in a comprehensive model.

Following Barua et al. (1995), we adopt a business process perspective to identify IT impacts on performance. Global measures such as firm performance or industry performance are subject to a large number of influencing factors (Wade and Hulland 2004). By taking the business process as our unit of analysis, we can measure the specific impact on business process performance of IT and business resources as well as the alignment between the two. According to Melville et al. (2004), organizational and IT resources have to be combined in business processes, which in turn leads to an outcome that fits a specific business environment.

Insights from alignment literature regarding the combination of business and IT can be used to inform research in IT business value creation. Alignment can affect organizational performance “by maximizing return on IT investment, by helping to achieve competitive advantage through IS, and by providing direction and flexibility to react to new opportunities” (Avison et al. 2004). One prerequisite for IT impacts on business value is the actual IT usage (Devaraj and Kohli 2003), that is, the extent to which the current IT is utilized. Another is its flexibility, which refers to how smoothly the IT can adapt and react to changes in the business environment. To support the dynamic and changing business environment most firms face, IT has to be strategically flexible enough to cope with uncertain changes or tactically flexible to realize optimization potential in the business process by modifying IT and/or process specifications (Duncan 1995). While the literature strongly suggests that IT (infrastructure)

flexibility is important for the value of IT to a firm (Byrd and Turner 2000), literature relating IT flexibility to competitive advantage is still rare.

Therefore, this paper investigates the impact of IT resources, business resources, the alignment between both, and their ability to adapt to changes on business process performance and competitive advantage to shed light on the interdependencies of the constituting elements in the value creation process. The paper is structured as follows. First, we discuss the resource-based view, alignment, and flexibility as main building blocks of our model. Based on this, we propose a comprehensive business value model. Then, indicators for testing the model in a series of case studies are derived from literature before the case study results are presented and discussed.

Literature Review

Our research model builds on three main pillars: resource-based view, alignment, and flexibility.

Resource-Based View

The resource-based view (RBV) focuses on the firm, as opposed to the industry, and explains differences in a firm's competitive position with resource heterogeneity among firms, thus explaining sustained competitive advantage (SCA) through the resources controlled by a firm. One root of the RBV is the work of Edith Penrose, who viewed the firm as a collection of productive resources guided by an administrative function (Penrose 1959). Rumelt (1984) specifies that a firm's competitive position results from bundles of *unique* resources and relationships protected by *isolating mechanisms*. The term describes mechanisms protecting uniqueness; examples are causal ambiguity, patents, and reputation, limiting the mobility, and imitability and substitutability of resources. According to Barney (1991), a resource has to be valuable, rare, non-imitable, and non-substitutable to provide for a sustainable competitive advantage (Barney 1991). Regarding IT, RBV thinking was employed to identify the conditions under which IT can be a resource fulfilling Barney's characteristics. In a recent article, Melville et al. (2004) distinguish between IT resources and complementary organizational resources that have to be combined into a business process to generate business value jointly. This research builds upon this work and integrates business competencies and IT competencies in a joint view.

Alignment

The concept of alignment was originally introduced by Henderson and Venkatraman (1993), who developed a strategic alignment model (SAM). In this context, the creation of value from IT investments requires an alignment between business and IT strategy. The SAM distinguishes between external and internal domains, where the former deals with strategy formulation reflecting the competitive environment and the latter is engaged in firm-internal choices such as the IT infrastructure configuration. The SAM depends heavily on cross-domain relationships between business and IT to achieve fit between the external and the internal domain and integration on both the strategic and operational levels.

According to Reich and Benbasat (1996, 2003), alignment is defined "as the degree to which the information technology mission, objectives, and plans support and are supported by the business mission, objectives and plans." This definition focuses on alignment as a state or outcome. Another research perspective focuses on the alignment process as one "in which managers participate in the exchange of knowledge" (Kearns and Lederer 2003).

Flexibility

While traditional RBV is engaged with the selection and analysis of valuable resources, the development and adaptation of resources to changing environments requires flexibility to adapt resource configurations rapidly (see, for example, Byrd and Turner 2001). That is why we propose to extend the IT value creation discussion by considering the impact of flexibility. In uncertain and changing business environments, where it is necessary to reconfigure and adjust rapidly, flexibility is a crucial aspect of success (Young-Ybarra and Wiersema 1999). IT plays a vital role in ensuring this ability to readjust and reconfigure. The resource portfolio must be adjusted in modern business environments to retain or gain a competitive advantage.

Bahrami (1992), in an investigation of Silicon Valley high-technology firms, states that flexibility is a *polymorphous concept* incorporating *defensive* and *offensive* characteristics. Offensive characteristics refer to the ability to exploit opportunities; agility

and versatility best describe this notion of flexibility. Defensive characteristics allow the firm to handle unexpected threats and endure negative effects, best described as *robustness* and *resilience*. Evans (1991) also sees flexibility as a polymorphous concept and provides deep insight into the different notions of flexibility. He introduces a 2×2 matrix of strategic flexibility concepts with temporal and intentional dimensions. The temporal dimension *ex ante/ex post* refers to the triggering outside event that requires some reaction by the firm. The intentional dimensions, offense and defense, refer to the intention of the actions taken by the firm, with offensive reflecting “creating and seizing an initiative” and defensive reflecting “guarding against predatory moves or correcting past mistakes.” Evans underlines that “the overarching issue underlying any application of the principle of flexibility is the aligned development of assets and capabilities in pursuit of dynamic objectives derived from evolutionary policy goals.”

While the approaches discussed are on flexibility in general, Byrd and Turner (2000, 2001) focus on the impact of IT infrastructure flexibility on competitive advantage. They propose a direct link between IT flexibility and competitive advantage, with IT flexibility consisting of technical infrastructure (choices pertaining to applications, data, and technology configurations) and human infrastructure (experience, competencies, commitments, values, norms of IT personnel).

Furthermore, Kumar (2004) introduces a framework for assessing analytically the business value of an IT infrastructure that explicitly considers IT flexibility and shows that the flexibility of an IT infrastructure can have a distinct impact on infrastructure business value, especially in turbulent environments.

Research Model

Based on the literature review, in this section we derive the structure of the research model, the causal relationships described, and the constructs operationalized. We specified the constructs *a priori* to shape the initial design of our research and to measure the constructs we used more accurately, as suggested in Eisenhardt (1989).

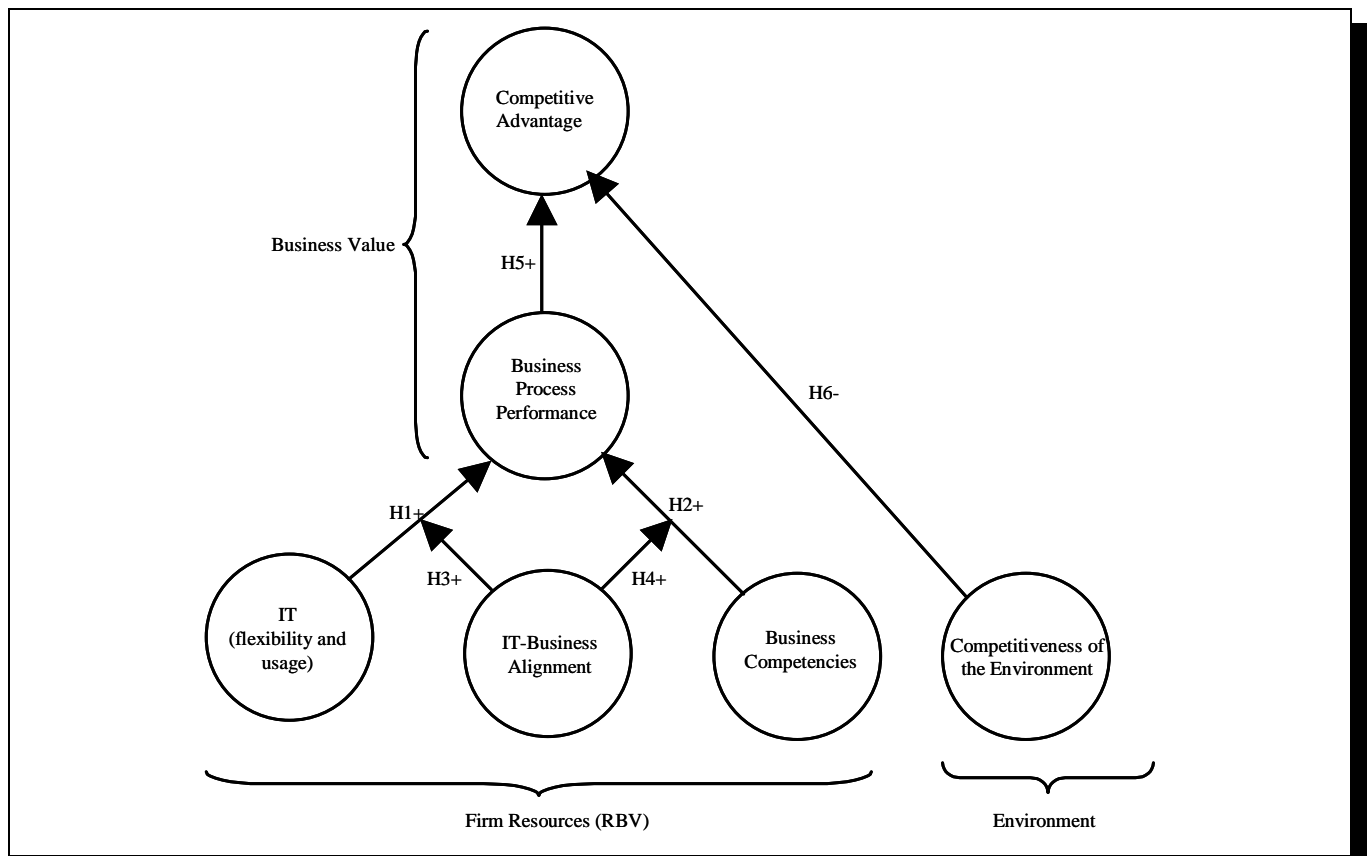


Figure 1. Business Value Model

Structural Model

Based on the considerations regarding the SAM, our business value model consists of an IT domain, a business domain, and a joint domain that covers the interaction between the two. Melville et al. (2004) define business value of IT as “the organizational performance impact of information technology at both the intermediate process level and the organization-wide level, and comprising both efficiency impacts and competitive impacts” (p. 287).

The competitiveness of the environment is also taken into account in establishing competitive advantage on the organizational level, since the possibility of establishing a unique competitive advantage in a highly competitive environment is much smaller than in an environment with little to no competition. Since firms operate in close interaction with their environment, the competitive position of the firm depends not only on the internal business process performance but also on the competitiveness of the environment.

The constructs IT and business competence, as well as business value, are split into several sub-constructs that are described in detail below.

Information technology covers the actual usage of IT (Devaraj and Kohli 2003) and the flexibility of IT (Byrd and Turner 2001). In contrast to the direct relation between IT flexibility and competitive advantage proposed in Byrd and Turner (2001), this linkage is broken up and the role of alignment between IT and business is incorporated as a moderating variable. In our model, both the flexibility of the IT infrastructure to allow a firm to adjust to a change in the environment and actual IT usage contribute to the overall business value.

This paper utilizes the ensemble approach to assessing IT (Melville et al. 2004) and analyzes the IT business value generation under consideration of organizational resources and alignment as mediator. IT itself is investigated regarding IT flexibility and IT usage with the aspects technology resources, human resources, and business relationships (Bhatt 2003; Teece et al. 1997).

Technology resources includes components such as IT infrastructure (shared technology and services) and business applications (e.g., purchasing and sales systems) (Kumar et al. 1998; Melville et al. 2004). **Human resources** refers to skills and experiences of the IT staff and are often seen as complementary to technology (Black and Lynch 2001; Brynjolfsson and Hitt 2003; Kumar et al. 1998). **Relationships** delimit the pervasive nature of IT and its close integration into business processes (Feeny and Willcocks 1998; Ross et al. 1996). The relationship aspect is not modelled in the IT construct but accounted for explicitly in the IT business alignment construct.

The construct **business competencies** consists of three main components: business or expert skills, which refer to the professional competence of the business department; the internal alignment between different *business* departments involved in the business process; and the ability to easily cope with changes (business flexibility) (Aubert et al. 1996; Hansen 1999; Kaplan and Norton 1996; Tiwana et al. 2003).

To achieve or measure **IT business alignment**, specific mechanisms have to be introduced. Lederer and Mendelow (1989) propose three main mechanisms: content, timing, and personnel. *Content* refers to the consistency between business plan and IT plan; *timing* addresses whether IT and the business plan are developed simultaneously or sequentially; and *personnel* concerns the involvement of management personnel in developing business and IT plans.

Reich and Benbasat (1996) propose an alternative definition of linkage. They define linkage in terms of *intellectual* and *social* dimensions. The intellectual dimension is a refinement of content linkage as defined by Lederer and Mendelow (1989), differentiating between internal consistency (IT mission is internally consistent with stated business mission) and external validity (plans are comprehensive and valid with respect to external business environment and IT environment). The social dimension is much broader, emphasizing that both IT and business should understand each others' objectives and plans (Teo and Ang 1999). Nevertheless, Reich and Benbasat do not include the timely dimension of Lederer and Mendelow.

As Teo and King (1997) point out, the business competence of the IT manager is a main contributing factor to overall IT alignment. They unify a contingency model and distinguish several types of planning integration between the business and IT department. Furthermore, Feeny and Willcocks (1998) identified trust and mutual respect as prerequisites of a “good” IT business relationship.

In general, **business process performance** can be measured in three dimensions: costs, quality, and time (Ray et al. 2004). It represents the efficiency with which internal processes are conducted to generate a desired output or service. Higher-level internal performance enables the firm to establish a competitive advantage (Droge et al. 2004).

Competitive advantage is the ability to transform operational efficiency, as measured by business process performance, into a market advantage. In our paper, the term *competitive advantage* refers to a firm’s ability to succeed in a given market (e.g., a region) (for an interesting discussion about the notion of competitive advantage, see Klein 2002).

Causal Relationships

Our structural model includes several hypotheses. Table 1 briefly describes the different causal relationships (H1 through H6) and presents references to the relevant literature.

Operationalization of Constructs

As suggested in (Eisenhardt 1989), the indicator questions have been derived mainly from validated questionnaires from literature, which are summarized in Table 2. The original questionnaire used by the authors in the case studies can be found online at <http://www.efinancelab.com/alignment/questionnaire.pdf>.

Analysis

Methodology

Conceptual and theoretical studies apply theory to explicate IT business value; analytic studies are used to develop models; and empirical studies are deployed for testing (Melville et al. 2004). One form of empirical studies often employed in IS research is case studies that investigate a phenomenon within its real-life context (Yin 2003). The following section presents case studies from the financial services industry. They focus on the interplay of IT and business resources in the context of a business process.

Table 1. Table of Causal Relationships

| No | Causal Relationships |
|----|---|
| H1 | A highly flexible and competent IT drives internal performance if good IT business alignment works as a moderating factor. Without well-established IT business alignment, a higher IT flexibility will not have a positive impact on the business process performance. This hypothesis is also supported by Bhatt (2003) (for competitive advantage as dependent variable) in an empirical analysis of U.S. manufacturing firms. He shows that infrastructure quality itself has no positive impact on a firm’s competitive position. Broad deployment of IT and high IT usage in a business process lead to higher business process performance (Devaraj and Kohli 2003; Lee 2001). IT business alignment works as a moderating factor. Without well-established IT business alignment, higher IT usage will not have a positive impact on business process performance. |
| H2 | Higher business competencies (consisting of business internal alignment, business flexibility, and business skills) foster business process performance (Hitt et al. 2001), moderated by a good alignment between business and IT units. |
| H3 | Higher alignment between IT and business fosters a positive impact of IT on overall business value. |
| H4 | A higher alignment between IT and business fosters a positive impact of business competencies on overall business value. |
| H5 | Higher business process performance (e.g., lower costs, higher quality) has a positive impact on achieving competitive advantage (Bhatt 2003; Klein 2002). |
| H6 | The higher the competitive pressure of a firm’s relevant market, the lower the likelihood that the firm can establish a competitive advantage and therefore produces business value (Lu and Ramamurthy 2004; Zhu et al. 2004). |

| Table 2. Constructs | |
|---|---|
| Construct (References) | Measure |
| IT Flexibility (Aubert et al. 1996) | a) Business skills of IT personnel b) Human resource specificity (knowledge indicators) |
| IT Flexibility (Duncan 1995) | a) Infrastructure characteristics (e.g., connectivity, data, applications) b) Management characteristics |
| IT Flexibility (Byrd and Turner 2000; Byrd and Turner 2001) | a) Technological knowledge b) Management knowledge c) Business knowledge d) Technical IT infrastructure |
| IT Usage (Devaraj and Kohli 2003) | Actual usage of IT applications/functions |
| IT Business Alignment (Teo and Ang 1999) | Critical success factors in aligning IT and business plans |
| IT Business Alignment (Avison et al. 2004) | Organizational structure |
| IT Business Alignment (Bassellier and Benbasat 2004; Bhatt 2003; Feeny and Willcocks 1998) | Mutual trust and understanding; consultation |
| IT Business Alignment (Reich and Benbasat 2000) | IT knowledge of business management |
| IT Business Alignment (Schulz 2001) | Knowledge exchange between units |
| Business Competencies (Hansen 1999; Tiwana et al. 2003) | Interconnectedness of organizational units |
| Business Competencies (Aubert et al. 1996; Kaplan and Norton 1996; Reich and Benbasat 2000) | Skill levels |
| Business Value/Business Process Performance (Venkatraman and Ramanujam 1987) | Process' owners satisfaction |
| Business Value/Business Process Performance (Ray et al. 2004) | Dependent variable: cost, quality, time |
| Business Value/Competitive Advantage (Sethi and King 1994) | Output-oriented approach |
| Business Value/Competitive Advantage (Bhatt 2003) | Relative performance with respect to the competitors for the past three years and absolute performance for the last three years (interest margin, market share) |
| Competitiveness of environment (Zhu et al. 2004) | Competition intensity |
| Competitiveness of environment (Knoll and Jarvenpaa 1994; Kraatz and Zajac 2001) | Turbulent environments |
| Competitiveness of environment (Li and Ye 1999) | IT impacts on performance considering environmental contexts |
| Competitiveness of environment (Lu and Ramamurthy 2004) | Environmental dynamism |

To achieve the necessary rigor, case studies must be prepared and carried out thoroughly. It is important during design and preparation to make explicit the research question, propositions, and unit of analysis; questions of *how* and *why* are considered appropriate (Yin 2003). The research question employed for this paper is: How do IT and business resources influence business process performance and contribute to competitive advantage? The propositions used in the cases are grounded theoretically (see

Table 1). The chosen unit of analysis, the credit process for small and medium enterprises (SME), is a specific business process as called for in the literature.

After the definition phase, we selected banks serving the credit market for SMEs to constrain variation within the sample (following Eisenhardt 1989).

We developed case and interview guidelines and discussed the approach within the research community prior to conducting actual interviews. Afterward, these guidelines were used for data collection in the case studies (Eisenhardt 1989; Yin 2003). Interviews were in two parts, one part with a semi-structured questionnaire to cover a wide variety of contextual variables and a second part with a structured questionnaire. The structured questionnaire measured the constructs of the business value model. Data were complemented by reports, other documents (e.g., process documentation) and the academic literature. Interviewees validated the collected data as well as the results. This procedure is in accord with the literature in case study methodology (Eisenhardt 1989; Lee 1989; Yin 2003). The unit of analysis is the SME credit process, comprising essentially the sales process and credit processing. In five cases studies, we interviewed the chief credit officers in charge of the process and other bank business managers.

Case Study Description: Environment

Several case studies were conducted in the German financial services industry. The German banking environment comprises three groups: private commercial banks, publicly owned savings banks, and credit cooperatives. The savings banks are owned by municipalities or county governments or even federal states. Savings banks and credit cooperatives typically have a strict regional focus, serving only clients within a specified region. Typically, these regions can be expanded only by mergers between two or more credit cooperatives or between multiple savings banks. There are no “mixed” mergers of savings banks and credit cooperatives.

There is nearly no competition among credit cooperatives or among savings banks due to the regional focus. Only in the border area of a given region do we find competition among a specific group of banks. The regional segmentation among savings banks is not congruent with the regional segmentation of credit cooperatives. Therefore, a credit cooperative can have more than one savings bank as a competitor in its region and vice versa.

Commercial banks are different from savings banks and credit cooperatives in that they serve any region they choose. Mergers or acquisitions between commercial banks and credit cooperatives or savings banks do not exist.

Most German banks are universal banks, offering a full range of financial products and services and following multichannel distribution strategies in a more or less consistent way (Beck et al. 2003). Regional branches remain exceptionally important to small savings and cooperative banks.

Case Study Description: Banking Sample

There is evidence in the literature that the business value of IT should be measured on a process level rather than on firm, industry, or even national level (Barua et al. 1995; Melville et al. 2004). Hence, in this study we focus on a specific business process, that is, “actions that firms engage in to accomplish some business purpose or objective” (Ray et al. 2004). The rationale is that a firm comprising several business processes may excel in some processes and is average or below average in others, which leads in total to some net effect at the firm level. We chose a bank’s business process of granting and managing credits for SME investments (credit process) as the unit of analysis for four reasons: (1) the credit process is a primary process of a bank with a direct value contribution; (2) there are a number of nonautomated activities in this process (compared to highly automated payment processes) requiring human business competencies and a need for alignment between IT and the business unit in different phases (e.g., development phase for automated activities to improve the existing process, operation phase for nonautomated activities); (3) homogeneity, as there are a bundle of different credit processes designed for different classes of customers (e.g., retail or large enterprises) with varying requirements for IT support or skills; and (4) an existing survey on this process provides data comparison options (Wahrenburg et al. 2005).

Table 3 summarizes the five banks covered in the case study.

| Name | Bank A | Bank B | Bank C | Bank D | Bank E |
|------------------------|---|---|--|--|---|
| Sector | Credit cooperative | Savings bank | Savings bank | Savings bank | Credit cooperative |
| Total assets | 1 billion € | 900 Mio. € | 130 billion € | 2.4 billion € | 1.6 billion € |
| Credit volume | 660 Mio. € | 420 Mio. € | Ca. 70 billion € | 1.1 billion € | 1.1 billion € |
| Competitive region | Rural area, weak regional economy | Rural area, governmental organizations and service sector are largest employer | Urban area, strong regional economy | Urban area, weak regional economy | Suburban area of agglomeration, strong regional economy |
| Main competitors | Three Savings banks | Credit cooperative, two major commercial banks | All large commercial banks, one credit cooperative | Regionally active commercial bank | Savings bank, regionally active commercial bank |
| Volatility of business | Large adaptation 2004: business process outsourcing of retail credit business; permanent adaptation for continuous process improvements | Large adaptation by mid 2004; since then: every four weeks fine tuning of processes | Adaptation when introducing new IT systems, else: rare adaptations | Permanent adaptations predominantly from internal business process optimization projects | Only small adaptations |
| Interviewees | Chief Credit Officer, Sales manager | Chief Credit Officer | Chief Credit Officer, Controller | Sales manager, IT manager and coworker, Chief Credit Officer, 4 credit process managers | Chief Credit Officer |

With the exception of Bank C, all of the banks have outsourced their core IT application for the credit process. While Bank C uses an external provider for data center operations, thus far the bank continues to use its own core IT application. All core IT applications have been in place for about 5 years. In our banking sample, three distinct providers are identified. Banks A and E use the same Provider F but different core applications; Banks B and C use Provider G; and Bank D uses Provider H.

Case Study Results

Based on the research model developed earlier, we first summarize the data gathered (Table 4) in the case studies and then interpret the data in the context of our model.

Next we investigate the compound impact of business competencies, IT, and IT business alignment on business process performance as proposed in our research model. As the cases of Banks A and D illustrate, IT shows itself to be a driver for business process performance on its own (H1), independent of the business skills deployed. Both banks show similar business competencies, but Bank A is able to achieve superior business process performance. In contrast to Bank D, Bank A shows an overall high value for IT usage, IT flexibility, and IT business alignment. With business competencies being comparably good in those banks, IT and IT business alignment seem to be the driving forces for superior business process performance in Bank A (H1, H3). It can be concluded that IT is, therefore, capable of generating an impact on business process performance on its own, which supports our first hypothesis (H1). We observe a relationship between IT flexibility and alignment, as Bank A with a better alignment is reported to be more flexible in terms of IT than all of the other banks. Regarding interaction with the service provider, often very formal and bureaucratic procedures were reported that limit the ability to react flexibly to a changing environment. Regarding the cooperation with external service providers, the managers all stated much higher satisfaction with internally produced IT services, which were all characterized by a substantially higher degree of informal interaction. The argument that better IT leads to better business process performance is fairly common (H1), but what about the impact of business competencies on the performance of the business process (H2)?

Table 4. Case Study Results

| | | Bank A | Bank B | Bank C | Bank D | Bank E |
|------------------------------|--|---|--|---|---|--|
| IT Flexibility | IT unit acts proactively | IT sometimes acts proactively and suggests better solutions | No | No | No | no |
| | IT unit reaction time to change requests | Fast | Moderate | Slow | Moderate | Slow |
| | Stability of systems | Stable and very few updates | Stable and very few updates | Stable and there are no updates | Unstable and frequent updates due to a major software change | Stable and very few updates |
| | IT changes due to business process requirements (e.g. efficiency improvements) | Few changes | Moderate | No changes, internal business process reengineering (BPR) has recently been completed | Frequent IT changes due to current BPR of credit process | Few changes |
| | Content with quality of IT changes? | Rather content | Moderate | Moderate, usually there's need for refinement | Rather not content | Moderate |
| IT Usage | Intensity of IT usage | High IT intensity in all parts of the business process | Moderate throughout the process | Moderate to low for sales, servicing, workout, high for risk management and credit decision | Moderate to high IT intensity throughout the business process | Moderate throughout the process |
| | Integration of IT systems | Only specific parts could be integrated better | Integration btw. sales and back office could be better | Integration btw. sales and back office could be better | Could be better overall | Integration btw. sales and back office could be better |
| | Workflow Management System | Deployed for parts of business process | None | None | None | None |
| Summary IT | | <i>Technology leader, fast, reliable, and flexible IT</i> | <i>Reliable IT, rather flexible</i> | <i>Stable and inflexible IT</i> | <i>Unstable (major IT change)</i> | <i>Stable and inflexible IT</i> |
| Business Competencies | Skill level of employees | Rather content for back office, moderate for sales | moderate | Could be higher, esp. in terms of flexibility | Rather content, could be higher in back office | Rather content |
| | Experience of employees (general banking) | 10-15 yrs | 10 yrs | 15 yrs and longer | 10-15 yrs | 12-15 yrs |
| | Experience of employees (credit banking) | 10-15 yrs | 5-10 yrs | 10 yrs | 2-10 yrs | 5-6 yrs |

| Table 4. Case Study Results (continued) | | | | | | |
|--|---|--|---|--|--|---|
| | | Bank A | Bank B | Bank C | Bank D | Bank E |
| Summary Business Competencies | | <i>Good skills, long experience</i> | <i>Moderate skills, moderate experience</i> | <i>Moderate skills, long experience, low flexibility</i> | <i>Good skills, short to moderate experience</i> | <i>Good skills, long experience</i> |
| IT Business Alignment | IT staff understands business needs | IT has clear understanding of business needs. | regularly not present | regularly not present | regularly not present | partly present |
| | Application coverage of business requirements | Applications cover all requirement | Application rarely covers requirements | Applications cover all requirements | Applications partly cover requirements | Applications partly cover requirements |
| Summary IT Business Alignment | | <i>Alignment leader, well aligned business and IT function</i> | <i>Weak alignment</i> | <i>Weak alignment, but IT applications cover all requirements</i> | <i>Weak alignment</i> | <i>Weak alignment</i> |
| Business Process Performance | Manual re-entry of data | Not necessary | Frequently, due to heterogeneity of systems | Present, especially between sales and back office | Frequently, due to a high number of independent systems | Present, due to parallel usage of applications |
| | Satisfied with credit process | Rather satisfied | indifferent | Rather satisfied | Dissatisfied, BPR project started | Rather satisfied |
| | Cycle time | 5-7 days | 17-18 days | 12 days | 10-13 days | 10-15 days |
| | Perceived quality improvement potential | Only few quality improvement potentials realized, a lot already realized | Some quality improvement potential could be realized | Very high, process could be conducted much faster if system integration was better | Some quality improvement potential could be realized | Some quality improvement potential could be realized |
| Summary Business Process Performance | | <i>Fast and satisfying process with few quality improvements left</i> | <i>Slow and moderately satisfying process with some improvement potential</i> | <i>Moderately fast and rather satisfying process with high improvement potential</i> | <i>Moderately fast and dissatisfying process with some improvement potential</i> | <i>Slow and moderately satisfying process with some improvement potential</i> |
| Competition | | moderate | strong | very strong | strong | strong |
| Competitive Advantage | | Margin 1.5-1.75%. | Margin 1-1.5%. | Margin 1.16% | Margin 1.5% | Margin 1.49% |

An initial examination of Banks B and D reveals a paradox: despite Bank B having better IT, its business process performance is weaker than that of Bank D. In this comparison, better IT would lead to a minor business process performance (the impact of H1 is negative). But taking the other factors into account reveals that both banks share weak IT business alignment (H3, H4). Therefore, in this case, IT business alignment cannot be the crucial factor. Looking at IT *and* business competencies (H1 *and* H2), Bank D performs well in business competencies but poorly in IT, whereas Bank B has good IT but only moderate business competencies. The performance of the business process of Bank B is even worse than that of Bank D; the negative impact of a lack of business competencies (H2) cannot even be covered by a good IT (H1). If one only examines IT and its impact on business process performance, one would see a paradox in this case: that weak IT leads to better business process performance than does good IT (the impact of H1 is negative). We argue, therefore, that one should always consider business competencies in determining the business value of IT as well.

As the case of Bank E demonstrates, good IT and good business competencies (H1, H2) can turn into a rather bad process (in terms of cycle time) if IT business alignment is weak (H3, H4). Therefore, despite that business competencies are a major driver for business process performance, the actual impact will be low absent good IT business alignment.

The impact of superior business performance on the competitive position of the firm (H5) is rather indistinct. The bank with the highest business process performance (Bank A) is indeed able to capture a slightly higher interest rate margin than the other banks, but it also operates in an environment with only moderate competitive intensity (H6). No distinct pattern of business process performance on the competitive position can be identified (H5).

In contrast to the inconsistent effect of IT (H1), IT business alignment (H3, H4) and business competencies (H2) show a consistently positive impact on business process performance, which in turn has no consistent impact on competitive advantage (H5). It is no surprise that the impact of the environment on competitive advantage (H6) seems to be a more relevant factor.

Discussion of Study Rigor

In this section, we discuss the case studies with respect to the requirements of a positivist method. According to Yin (2003), *construct validity* can be improved by three tactics. The first is the use of multiple sources of evidence, which provides multiple measures for the same phenomenon. In our case studies, we conducted interviews with 13 different people at 5 different banks (see previous section). In addition, we had access to several documents related to company background and reorganization of the credit process. Yin proposes as a second tactic, that key informants review the case study, which we have addressed in several steps: the research project was introduced and discussed with key informants in the banks before collecting data; this discussion was transcribed and sent to the key informants for review; and the responses to the structured questionnaire used in the interviews were transcribed and sent to the key informants and interviewees for review prior to our evaluation. Finally, Yin recommends maintaining a chain of evidence, which we did by deriving constructs and hypothesis from literature, discussing it with key informants, collecting case study data, and creating a case study database that allows us to trace back from conclusions to initial research questions.

We also addressed internal validity, external validity, and reliability. *Internal validity* refers to the fact that a relationship between two variables may or may not be inferred as causal. Pattern matching may be used to ensure internal validity (Yin 2003), which involves qualitative but logical deduction (Lee 1989). In our case studies, we compared collected statements with propositions derived from literature to detect support or nonsupport for theoretical propositions.

External validity refers to the generalizability of the findings. Case studies can be used to test a theory. A case study can confirm, challenge, or extend a well-articulated theory and is similar to the use of an experiment, because one instance of both methods is sufficient to reject propositions (Lee 1989; Yin 2003). Several instances are needed to support a theory. We have carefully chosen and documented the unit of analysis in this study, which at present is the only setting for which our findings are valid. A broad generalization of our conclusions is subject to replication of our research model in additional cases. The research model itself has been derived carefully from literature, challenged with the case study data, and is basically independent from the chosen industry and business process. Therefore, the results reflected in our model are at least indicative for other industries and business processes.

Reliability refers to the consistency and stability of the study across researchers and time. Yin (2003) proposes a case study protocol and a case study database to ensure reliability. A protocol is needed to guide the researcher in a standardized manner. In our case studies, this protocol consists of a proposal containing research questions, propositions, literature review, and measures

derived from literature. Furthermore, it consists of a semi-structured and a structured questionnaire, and a set of slides covering research objective, motivation, research model, unit of analysis, and methodology. We also created a case study database for covering the previously double-checked interview transcripts and questionnaires. The database allows an easy check for cross-references to other interviews.

Conclusion

The business value of IT remains difficult to assess. Our case studies revealed several interdependencies between value-creating factors in business processes that deserve further attention. The single most important aspect turned out to be mutual understanding between business units (e.g., sales and processing) and between the business units and the IT unit, which was reported to arise from frequent interaction and, as far as the IT unit is concerned, from the business orientation and basic business knowledge of the IT personnel. Furthermore, we find that the business value of IT should not be assessed without a broader look at the business competencies of a firm. Otherwise, the observations will be paradoxical.

We need to underline the limits related to the qualitative data available in the case study research method (see the “Methodology” section for a discussion on study rigor). As we could only derive qualitative data from the interviews, statistical proof of our hypotheses is not possible. Accordingly, this case study research represents the first step to develop and understand further the conjoint business value creation in banks’ business processes and is used as part of an empirical survey among Germany’s top 1,000 banks to cross-validate our findings.

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