December 2007

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THE IMPACT OF OPERATIONAL ALIGNMENT ON IT FLEXIBILITY – EMPIRICAL EVIDENCE FROM A SURVEY IN THE GERMAN BANKING INDUSTRY

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Abstract
Alignment and IT flexibility have been found to be crucial for a firm’s long-term success in many industries. This paper investigates how alignment and flexibility are interrelated at an operational level. Based on a survey with Germany’s Top 1,000 banks we show on a business process level that shared knowledge and mutual understanding (as dimensions of alignment) between IT unit and business department have a positive impact on IT flexibility. On the other hand, higher degrees of communication between business and IT units do not correlate with higher IT flexibility.

Keywords: IT Business Alignment, IT Flexibility, Dynamic Capabilities.

Introduction

Recent literature on IT value creation stresses the importance of both, IT business alignment and IT flexibility to gain and sustain a strong competitive position. On the one hand, alignment is considered to be a prerequisite for IT business value creation as a good interplay between a firm’s business and IT resources has been shown to contribute to improved organizational performance (Avison et al. 2004; Bergeron et al. 2004; Sabherwal et al. 2001; Tallon and Kraemer 2003). At the same time, a firm’s inability to realize value from IT can often be explained by a lack of (strategic) alignment (Henderson and Venkatraman 1993). On the other hand, especially in uncertain and changing business environments IT flexibility is a crucial enabler of a firm’s capability to respond to changing market demands and therefore to stay competitive. Accordingly, Byrd and Turner (2000; 2001) propose a direct link between IT flexibility and competitive advantage. But, what is the impact of alignment on flexibility?

Both aspects have received increased attention in the literature. Flexibility is widely considered to be a critical component for firm success (Sambamurthy et al. 2003). In a recent study, Wiggins and Ruefli (2005) stress that sustained competitive ad-
vantage may increasingly be a matter not of sustaining a single advantage but more of creating a sequence of consecutive advantages over time. Therefore, the ability to reconfigure and adapt resources to respond to a changing environment is an important source for a firm’s long-term success (Collis 1994; Teece et al. 1997). In order to support the dynamic and changing business environment most firms face, IT has to be strategically flexible enough to cope with uncertain changes and sufficiently flexible at the tactical level in order to achieve optimization potential in the business process by modifying IT and/or process specifications (Duncan 1995). In turn, strategic IT business alignment is seen as a dynamic process of continuous adaptation and change that can be interpreted as an organizational learning process that combines business and IT knowledge in order to support business objectives (Reich and Benbasat 1996). As both strands of literature emphasize dynamic aspects, we attempt to disclose the impact of IT business alignment on IT flexibility using the dynamic capabilities perspective of the resource-based view as theoretical foundation. Evans (1991, p. 85) 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”. Accordingly, we argue that the alignment of IT and business resources has an impact on the overall flexibility of a firm. Yet, to date, literature on the mutual interrelationship between flexibility and alignment is rare and concentrates on the strategic level. As strategies have to be implemented to be effective (Gordon and Gordon 2000) we propose to consider the largely neglected impact of operational alignment in daily business. Hence, the purpose of this paper is to explore the impact of operational alignment on IT flexibility to answer the question:

What is the impact of operational IT business alignment on IT flexibility?

Theoretically drawing on the dynamic capabilities view (DCV), we argue that operational alignment represents a capability of a firm and actual flexibility represents a firm’s capability to readjust and reconfigure capabilities and resources. Overall, we expect that a well developed alignment capability enhances the dynamic capabilities of a firm, reflected in IT flexibility, thus rendering alignment as an antecedent of flexibility. This statement, at an operational level, contradicts the findings of Chung et al. (2003) who see flexibility as an antecedent of alignment at a strategic level.

The paper is organized as follows. We first review the relevant literature on alignment and flexibility to then develop our research model. Subsequently, the model is empirically tested. Finally, we discuss limitations and implications of our results.

Theoretical foundation

The research model in focus of this paper builds on the dynamic capabilities view (DCV) and investigates the interrelationship between IT business alignment and IT flexibility. Therefore, we first introduce the DCV and then discuss the theoretical underpinnings of IT business alignment and IT flexibility.

Dynamic capabilities view (DCV)

The DCV, which has been developed along the capability-building perspective of the resource-based view (Makadok 2001), acknowledges the importance of valuable resources for a firm, but points out that resources are inputs into the production process that mostly do not create value on their own (Grant 1991). Resources must work together in order to create organizational capabilities referring to the ability to team resources. These capabilities can then implement competitive advantages (Barney 2001).

According to Amit and Schoemaker (1993, p. 35) capabilities “refer to a firm’s capacity to deploy resources, usually in combination, using organizational processes, to effect a desired end.” Teece et al. (1997) and later on Eisenhardt and Martin (2000) extend this somewhat static view of a capacity by introducing the notion of dynamic capabilities as a means to integrate, reconfigure, add, and release resources. Thus, dynamic capabilities are the means of a firm to respond to change.

In markets, where the competitive landscape is shifting, the dynamic capabilities by which firm managers “integrate, build and reconfigure internal and external competencies to address rapidly changing environments” (Teece et al. 1997) become the source of sustained competitive advantage due to their complexity, causal ambiguity, and path dependency. Wade and Hulland (2004) list several studies on IT and capabilities. These studies show manifold capabilities as every business develops own configurations reflecting their current situation and anticipated environment. In the following, we concentrate on two concepts that are both uniformly interpreted through the theoretical lens of the DCV: IT Business Alignment and IT Flexibility.
IT business alignment

The alignment literature in particular has addressed the role of linkage between the IT and the business domain as a prerequisite for IT business value creation. Accordingly, strategic alignment, which is the extent to which IT strategy supports and is supported by the business strategy (Reich and Benbasat 2003), was proposed in the Strategic Alignment Model (SAM) of Henderson and Venkatraman (1993).

Since then, strategic alignment has emerged as an important issue among researchers and practitioners alike (Tallon and Kraemer 2003). The basic proposition of alignment is that at least two factors such as business and IT strategy (strategic alignment) or business and IT structure (structural alignment) must be congruent to affect organizational performance (Bergeron et al. 2004). Therefore, alignment studies investigate congruence patterns.

Although the SAM encompasses both the strategic and the operational level of IT business alignment, most research focuses on the strategic level, leaving a gap at the daily structural or operational level (see review by Bergeron et al. 2004). Only few researchers to date have addressed structural or operational alignment.

Because strategies are only effective when implemented at the operational level (Feurer et al. 2000), we focus on structural IT business alignment, which reflects the functional integration at the structural level and represents the link between business and IT organizational structure, highlighting the importance of ensuring internal coherence between the organizational requirements and the delivery capability of the IT domain (Henderson and Venkatraman 1993).

Reich and Benbasat (1996; 2003) identify two alignment perspectives: the intellectual and the social dimension. The intellectual dimension is the state in which a high-quality set of interrelated IT and business plans exists and the social dimension is the state in which business and IT executives understand and are committed to the business and IT mission, objectives and plans. They define alignment “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 an outcome. Another research perspective focuses on the process of alignment and views alignment as a process “in which managers participate in the exchange of knowledge” (Kearns and Lederer 2003), or as a process of continuous adaptation and change that can be interpreted as an organizational learning process that combines business and IT knowledge in order to support business objectives (Reich and Benbasat 1996). This resembles the notion of a spanning capability that spans or integrates an externally-oriented detection of market requirements and the internally-oriented response to those requirements (Day 1994). Correspondingly, Sambamurthy and Zmud (1999) view alignment as a dynamic capability evolving as specific management processes engaged in adapting IT to business et vice versa, for example (see also Pavlou et al. 2004). This is also supported by a study of Reich and Benbasat (2003).

To summarize, in this paper, alignment is interpreted as a capability and is (1) addressed at the operational level and (2) understood as representing a specific state. Furthermore, specific dimensions of operational alignment according to the works of (Reich and Benbasat 1996; Reich and Benbasat 2000; Tiwana et al. 2003) are explicitly distinguished (details on the dimensions will follow in the construct specification section).

IT flexibility

In uncertain and changing business environments, flexibility has been denoted as a crucial aspect of success. IT plays a vital role in ensuring this ability to readjust and reconfigure. It has been shown that in uncertain and changing business environments, flexibility of a firm is a crucial aspect of success (Young-Ybarra and Wiersema 1999). Accordingly, Byrd and Turner (2000; 2001) 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). Evans (1991, p. 85) 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”. Furthermore, in his framework he distinguishes between ex ante and ex post and between offensive and defensive flexibility. Ex ante and ex post demark an event happening in the environment or in the firm that the focal firm has to deal with. Ex ante the event, the firm can proactively prepare for future events and increase its agility (offence) or robustness (defence). Ex post the event, the firm can react to the new circumstances by either taking corrective measures (defence) or exploiting new opportunities (offence).
Drawing on concepts from manufacturing flexibility (Koste and Malhotra 1999; Upton 1994) and from the DCV (Teece et al. 1997) we define IT flexibility as the ability to renew IT competences to match changing business requirements with little penalty in time, effort, cost or performance. Thus IT flexibility is interpreted as a capability. In this research, we focus on reactive (i.e. ex post) maneuvers as defined in Evans (1991).

**Prior research on the interrelationship of alignment and flexibility**

While the literature strongly suggests that IT (infrastructure) flexibility is important for the value of IT to a firm (Byrd and Turner 2000), research on alignment as a potential antecedent or enabler of flexibility is still rare. What connection is postulated between alignment and flexibility?

Knoll and Jarvenpaa (1994) found flexibility to be a substitute for alignment in dynamic environments. They stress that “the principle of flexibility explicitly assumes that the world is too dynamic for a static order between different organizational components” and propose a framework for IT flexibility, but do not go into further detail regarding the interplay of alignment and flexibility.

Alignment as a necessary antecedent of as well as a substitute for infrastructure flexibility has been discussed by Duncan (1995). She argues that planning alignment may on one hand be critical to infrastructure flexibility to enhance responsiveness of the IT and on the other hand it can also be regarded as a measure of foresight that reduces the need for flexibility. Her empirical study regarding flexibility and alignment takes only the planning component of alignment into account and lacks a distinct empirical answer on the interplay of flexibility and alignment.

More recently, Choe (2003) empirically investigated the role of perceived environmental uncertainty and alignment. He found that especially in uncertain environments, well arranged facilitators of alignment can contribute more to firm performance than in less uncertain environments.

Summarizing the prior research on the relationship between alignment and flexibility, we found contradictory propositions in the literature, with alignment both representing an enabler or an inhibitor of flexibility. This research is intended to shed light on these contradictory propositions to disclose the actual impact of alignment on flexibility.

**Research model**

As already mentioned in the introduction, an explicit empirical analysis of the contrarian impact of IT infrastructure flexibility on strategic alignment has been conducted by Chung et al. (2003), thereby modelling flexibility as an antecedent of alignment. They relate different dimensions of IT infrastructure flexibility, namely compatibility, connectivity, modularity, and IT personnel to alignment and the extent of IT usage and found that a relationship between three of four flexibility dimensions (connectivity, modularity, and IT personnel) and alignment existed. Among those dimensions the effect of IT personnel was the most significant. Drawing upon the DCV, we argue that both (operational) alignment as well as flexibility are capabilities of a firm and we conceptually model alignment as an antecedent of flexibility. We explore the effect of IT business alignment at an operational level on ex post IT flexibility with offensive and defensive characteristics (Evans 1991). Figure 1 depicts an overview of the relevant constructs in this model.
Methodology

Introduction

Our empirical research focuses on a specific business process, i.e., “actions that firms engage in to accomplish some business purpose or objective” (Ray et al. 2004). The rationale is that the analyzed constructs usually vary between different areas within a firm which would in total lead to some diffuse net effect when measured on firm level. The focus of this research is further narrowed to a single industry in order to control for unwanted side effects as suggested by Chiasson and Davidson (2005). Accordingly, we chose a bank’s business process of granting and managing loans for investments of small and medium-sized enterprises (“SME credit process”) as the unit of analysis for four main reasons: 1) the credit process is a primary IT-reliant bank process with a direct value contribution; 2) there are some non-automated activities (compared to highly standardized automated payment processes or consumer credits) requiring human business competencies and alignment between IT and business units; 3) homogeneity, as there are different credit processes designed for different classes of customers (e.g., SME, retail, large enterprise) with varying requirements for IT support or skills; 4) regulatory changes, changes in workflow and products, and a competitive environment require IT flexibility. In many banks, the SME credit process is supported by a comprehensive core application. Considering the IT artifact, we focus on the core application supporting the credit process as well as on the IT unit that operates and maintains the application.

Based on literature a questionnaire was developed and refined in several pre-tests and expert interviews. Afterwards, the managers responsible for the banks’ SME credit processes were identified from a mailing list used during a previous survey that in turn was based on statistics from Deutsche Bundesbank (German Federal Reserve Bank) and the Bundesverband deutscher Banken (Federal Association of German Credit Institutions). These managers were individually contacted by phone prior to sending out the questionnaire. In 2005, a paper-based questionnaire was sent to the German Top 1,000 banks (according to total assets). Overall, 136 analyzable questionnaires were returned (response ratio of 13.6%).

The research model depicted in Figure 1 has been operationalized and transferred into a structural equation model (SEM) to be analyzed with the Partial Least Squares (PLS) approach (Chin 1998; Wold 1985). The main reason for choosing PLS instead of other techniques is that PLS is more appropriate if theory is untested in an application domain or tentative (Rai et al. 2006). PLS is appropriate for our purpose, because there are only few empirical studies in the context of operational IT business alignment and IT flexibility.

Construct specification

The concept of IT business alignment is based on and influenced by a large number of factors. For this study, we adopt the social dimension of alignment from Reich and Benbasat (1996; 2000) and focus on the operational level of alignment.

The social dimension with its four sub-dimensions as suggested by Reich and Benbasat (2000) is applied with two modifications. First, in this survey Reich and Benbasats’ second enabler, “IT implementation success”, is not relevant since the core application has been in use for several years. Second, for the same reason, the connection dimension, referring to connections between IT and business in the development phase is not taken into account. Instead, we add a cognitive dimension capturing mutual understanding of IT and business unit (Tiwana et al. 2003). Each of these dimensions of operational alignment (shared knowledge, communication, and cognitive dimension) has been measured by the assessment of business managers using at least three indicators. Indicators derived from authors other than Reich and Benbasat have been matched to the categories for social alignment as described before. All indicators are described in Table 1.

Flexibility represents a highly polymorphous concept (Evans 1991), numerous conceptualizations exist to date, each focusing on specific aspects, which makes it difficult to derive indicators for empirical surveys. We adopt Evans’ flexibility framework (1991) but, since we focus on operational alignment, only ex post flexibility is discussed in this paper, resulting in the two constructs IT flexibility – offensive (ITF-O) and IT flexibility – defensive (ITF-D).

In our survey we focused on the human dimension of IT infrastructure flexibility (Byrd and Turner 2000) for two reasons. First, the human dimension was found to be the most significant factor of IT infrastructure flexibility (Byrd and Turner 2001; Chung et al. 2003). Second, as the respondents of our survey were business managers in charge, pre-tests have shown that it
would be too difficult for business managers to assess technological aspects of the IT infrastructure (like modularity, connectivity etc.).

Accordingly, because we are interested in the relationship between operational IT business alignment and the human dimension of IT infrastructure flexibility, we adopt the nominal view of IT (Orlikowski and Iacono 2001) where the analytical focus is not on technology. Since most of the indicators from Byrd and Turner’s (2000) human IT infrastructure flexibility dimension actually represent alignment indicators, they have not been found applicable for the flexibility construct in our research. Therefore, we retain the human dimension of flexibility as appropriate for our study but developed indicators as follows.

![Figure 2. Development of the Operational Alignment Construct](image)

Regarding the offensive ex post dimension of flexibility, depicted as liquidity and elasticity in Evans’s (1991) framework, we derived indicators measuring the ability of the IT to provide elasticity in exploiting business opportunities (e.g. by rapidly implementing new product variants) and implementing change requests issued by business units. Lacking indicators explicitly used in prior empirical studies, our indicators are based on the conceptual work regarding exploitive manoeuvres of Evans (1991) and have been inspired by two additional empirical studies. In research on supply-chain flexibility, Gosain et al. (2004) applied indicators to assess “offering flexibility”, which closely resembles ex post offensive flexibility, by assessing the ability to rapidly deploy new products. Analyzing strategic flexibility in IT alliances, Young-Ybarra and Wiersema (1999) used indicators to assess the responsiveness to business-driven changes. All indicators have been adapted to the banking domain based on expert interviews and insights from pre-tests.

To evaluate the defensive dimension (corrigibility and resilience), we developed indicators to evaluate the ability of the IT unit to apply corrective means when errors in the main applications occur, based on the reasoning in (Evans 1991) regarding corrective manoeuvres. Table 1 in the appendix depicts all indicators applied in this research model.

Results

The evaluation of the PLS estimation of the research model is conducted in two steps. First, the outer/measurement model relating empirical indicators to constructs is assessed. Then quality criteria for the inner model are investigated. For this model, the full data sample including 136 cases has been used for model estimation. This number clearly exceeds the minimum number of samples recommended by four times when applying the rule of thumb put forward in Chin (1998).

Prior to the PLS estimation we conducted a non-response test. Following Chan et al. (1997) we distinguished between respondents who returned the questionnaire without reminder and those who returned the questionnaire after a reminder (Worren et al. 2002). We employed the Kruskal-Wallis test and found no significant non-response bias. Furthermore, all results have shown to be representative regarding firm size (measured in total assets).
**Measurement model**

The quality of the reflective measurement model is determined by (1) convergent validity, (2) construct reliability and (3) discriminant validity (Bagozzi and Yi 1988).

*Convergent validity* is first analyzed by investigating indicator reliability. In the tested model, all loadings are above the recommended 0.7 parameter value (cf. Table 2 in the appendix) and significant at the 0.001 level except of IB2 (significance tests were conducted using the bootstrap routine with 500 samples)(Chin 1998). In the case of IB2, the loading is only marginally below 0.7 and the indicator has thus been retained.

Composite reliability for constructs composed of more than a single indicator should be greater than 0.6 (Bagozzi and Yi 1988). All constructs in our model exhibit a composite reliability above the recommended threshold, reflecting a good correlation between the indicators and their construct (Table 2).

Discriminant validity is assessed by calculating the Average Variance Extracted (AVE). An AVE larger than 0.5 is recommended (Chin 1998). All constructs in the research model show an AVE above the recommended 0.5 threshold (Table 2). Furthermore, the square root of the AVE for each construct is larger than the correlations between the constructs, testifying high discriminate validity (Table 2).

**Structural model**

For PLS estimation, the centroid weighting scheme has been used since we are primarily interested in the relationships between the latent variables. Sellin and Keeves (1994) suggest that path coefficients should be at least 0.1 and highly significant.

As shown by Figure 3, the interrelationship between both the alignment dimensions of shared knowledge and cognition and the flexibility perspectives are significantly positive. In contrast, the communication dimension seems not to be interrelated with IT flexibility. These results are closely examined in the discussion section.

**Discussion**
This paper strives to disclose the impact of operational alignment on IT flexibility from an DCV perspective. In general, a positive impact of operational alignment on both offensive and defensive IT flexibility has been found. From a theoretical viewpoint, spanning capabilities (alignment) have been found to support dynamic capabilities.

The research question addressed in this paper is: What is the impact of operational alignment on IT flexibility? In this empirical analysis of three different dimensions of operational alignment, a positive relationship between the extent of shared knowledge and defensive as well as offensive IT flexibility has been found. This underlines the relevance of shared knowledge for establishing a flexible IT. But it is not only shared knowledge that contributes to flexibility. Cognitive aspects as, for example, mutual understanding, have been discovered to be of equal importance for IT flexibility. On the other hand, communication, our third dimension of operational alignment, has not been found to have a distinct impact on flexibility. More formal and informal exchange does not indicate higher flexibility, but, in turn, fewer communication also does not necessarily lead to lower flexibility. Instead of formal and informal communication acts, more tacit aspects (shared knowledge and cognition) foster flexibility. But those are presumably also more difficult to measure and to establish.

The contrasting findings on this sub-construct level can also provide for an explanation of the contradictory findings in prior studies. If alignment is reduced to a pure communication issue, no relationship between (communication) alignment and IT flexibility is detected. As a result, Duncan (1995), restricting her conception of (strategic) alignment to planning issues and consistency of IT and business plans could not provide a distinct empirical answer. Considering our findings, we argue that those studies that incorporate “more tacit” knowledge/cognition factors (trust etc) also found a significant relationship between alignment and flexibility. To put it more generally, applying the social dimension of alignment may elicit a significant relationship between alignment and IT flexibility while studies which focus on the intellectual dimension do not detect this relationship. This has some support by Reich and Benbasat (1996) who state that written plans, reports, etc. are infrequently used and therefore often do not reflect the current state of affairs. Therefore, intellectual measures of alignment focusing on contents may not correlate with flexibility measures.

Finally, some limitations to this study have to be discussed. First, flexibility and alignment were measured at one point of time. Therefore, the results do not reflect dynamics of alignment and flexibility. Second, the operational alignment construct has found limited attention in prior literature. Therefore, the construct was developed, based on items derived and structured from the literature.

Regarding further research on alignment and IT flexibility, we suggest to extend the model to cover also the effects of alignment and IT flexibility on competitive advantage. Nevertheless, this paper to our knowledge represents one of the first papers to address the interrelationship between operational alignment and IT flexibility not only at a conceptual but also empirical level.

References


Collis, D.J. "Research Note: How Valuable Are Organizational Capabilities?" *Strategic Management Journal* (15:Special Issue) 1994, pp 143-152.


## Appendix

Table 1. Indicators (scales: 5 = totally agree – 1 = totally disagree)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Latent Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Related Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>IB1: The employees of the IT unit are able to interpret business-related</td>
<td>Alignment - shared knowledge (ITBA-SK)</td>
<td>2.99</td>
<td>0.949</td>
<td>(Broadbent et al. 1993), Proposition 12/13</td>
</tr>
<tr>
<td>problems and develop solutions.</td>
<td></td>
<td></td>
<td></td>
<td>(Reich et al. 1996; Reich et al. 2000)</td>
</tr>
<tr>
<td>IB2: The employees of the IT unit know the SME credit business process.</td>
<td></td>
<td>2.75</td>
<td>1.046</td>
<td></td>
</tr>
<tr>
<td>IB3: The IT unit implements change requests according to the requirements</td>
<td>Alignment – communication (ITBA-Comm)</td>
<td></td>
<td></td>
<td>(Hansen 1999; Reich et al. 2000)</td>
</tr>
<tr>
<td>of the business unit.</td>
<td></td>
<td>3.14</td>
<td>0.886</td>
<td></td>
</tr>
<tr>
<td>IB4: There exist meetings on a regular basis between IT unit and business</td>
<td></td>
<td>2.01</td>
<td>1.059</td>
<td></td>
</tr>
<tr>
<td>unit to control change processes.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IB5: There exist meetings on a regular basis between IT unit and business</td>
<td></td>
<td>1.90</td>
<td>1.003</td>
<td></td>
</tr>
<tr>
<td>unit for business process improvements.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IB6: There exist meetings on a regular basis between IT unit and business</td>
<td></td>
<td>1.84</td>
<td>0.930</td>
<td></td>
</tr>
<tr>
<td>unit to ensure an effective and efficient change process.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IB7: There is extensive communication between IT and business unit.</td>
<td></td>
<td>2.27</td>
<td>1.058</td>
<td></td>
</tr>
<tr>
<td>IB8: There exists a lot of mutual trust and respect between IT unit and</td>
<td>Alignment – cognitive relationship (ITBA-Cog)</td>
<td>3.11</td>
<td>1.005</td>
<td>(Chung et al. 2003; Luftman 2003; Teo et al. 1999)</td>
</tr>
<tr>
<td>business unit.</td>
<td></td>
<td></td>
<td></td>
<td>(Broadbent et al. 1993; Luftman 2003)</td>
</tr>
<tr>
<td>IB9: A change is implemented in close interaction between business and IT</td>
<td>Alignment – offensive (ITF-O)</td>
<td>2.37</td>
<td>0.978</td>
<td>(Evans 1991; Gosain et al. 2004; Young-Ybarra et al. 1999)</td>
</tr>
<tr>
<td>unit.</td>
<td></td>
<td>2.21</td>
<td>0.919</td>
<td></td>
</tr>
<tr>
<td>IB10: IT unit and business unit are equal partners when it comes to core</td>
<td></td>
<td>2.57</td>
<td>1.181</td>
<td></td>
</tr>
<tr>
<td>application changes.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IB11: IT unit and business unit regularly consult each other.</td>
<td></td>
<td>2.28</td>
<td>1.136</td>
<td></td>
</tr>
<tr>
<td>IF1: The IT unit is able to alter the loans processing systems for</td>
<td>Flexibility – offensive (ITF-O)</td>
<td>3.32</td>
<td>1.000</td>
<td>(Evans 1991)</td>
</tr>
<tr>
<td>reconsidering new loan products</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IF2: The IT unit is able to realize workflow changes within the loans</td>
<td>Flexibility – defensive (ITF-D)</td>
<td>2.45</td>
<td>0.909</td>
<td></td>
</tr>
<tr>
<td>processing systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IF3: The IT unit reacts flexible to change requests from the business</td>
<td></td>
<td>2.31</td>
<td>0.841</td>
<td></td>
</tr>
<tr>
<td>unit.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IF4: The IT unit realizes change requests from the business unit in</td>
<td></td>
<td>2.32</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>appropriate time.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IF5: If there are critical bugs in the IT applications, they get fixed in</td>
<td></td>
<td>3.32</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>a timely manner.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IF6: If there are non-critical bugs in the IT applications, they get</td>
<td></td>
<td>2.45</td>
<td>0.909</td>
<td></td>
</tr>
<tr>
<td>fixed in a timely manner.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2. Composite Reliability (CR), Average Variance Extracted (AVE) of Latent Variables, and Loadings of Indicators

<table>
<thead>
<tr>
<th>LV</th>
<th>CR</th>
<th>AVE</th>
<th>Indicator</th>
<th>Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITBA-SK</td>
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Table 3. Correlations of Latent Variables and AVE Square Root

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<th>ITBA-Cog</th>
<th>ITF-O</th>
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1 Shaded cells show square root of AVE.