

The impact of information technology deployment on trust, commitment and value creation in business relationships

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Computer applications, Information science, Organizational culture

Abstract

To strengthen their position in today's highly-competitive and fast-paced business environment, supplier firms often engage in relationships with their customers. Recent advances in information technology offer new ways of managing inter-organizational relationships. In this paper, a model conceptualizing the impact of information technology deployment on inter-organizational buyer-seller relationships is developed. Using an empirical study of 61 German firms engaged in customer-supplier relationships, this paper also gives some empirical evidence for the developed framework. With regard to relationship management, intra- and inter-organizational information technology deployment has different effects on relationship atmosphere and on the relationship's value creation. The findings give new insight into the role of information technology in value-creation in business-to-business relationships. Managerial implications and future research questions in this area are also discussed.

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An executive summary for managers and executive readers can be found at the end of this issue

1. Customer-supplier relationships

Increasing evidence suggests that business relationships are of paramount importance for firms because such relationships can create value for both parties involved (e.g. Achrol, 1997; Anderson *et al.*, 1994). However, value creation depends on special relationship characteristics, including trust and commitment (Morgan and Hunt, 1994).

Apart from focusing on business relationships, practitioners and scholars have explored and exploited modern means of information technology (IT). Competitive advantage, for example, can be generated through the employment of state-of-the-art IT (Clemens and Row, 1991; Mata *et al.*, 1995; King and Teo, 1996; Palvia, 1997). According to Buxmann and Gebauer (1999), IT is one of the key success factors in any organization. As such, business relationships are affected by IT developments, e.g. internal order handling, e-commerce, and electronic data interchange (EDI), to name a few. Despite research on a general marketing level (e.g. Good and Stone, 2000), the impact of IT on relationships, and their social aspects in particular, have not been discussed sufficiently. Exempted from this statement is the work on EDI and relationships (e.g. Angeles *et al.*, 1998).

This paper addresses this issue by analyzing IT's impact on business relationships, combining the classical relationships variables (trust, commitment and value creation) with the IT variables. Therefore, this paper's main research question is: *RQ1*. What impact does IT deployment have on inter-organizational relationships?

In answering this question, we contribute to existing literature by combining two research streams. We also offer insight into potential advantages and faults of IT deployment in business relationships. In the next section, definitions and dimensions of IT are discussed. Thereafter, the conceptual model is developed before the results of our empirical study with 61 German supplier organizations is presented. Finally, we examine further research areas and managerial implications.

2. Information technology

Engaging and exploiting the opportunities offered by IT is one of the hot topics for almost any modern organization. The importance of IT within a business environment increased significantly



during recent years. We use a definition of IT, which combines the definitions of Martin *et al.* (1999, p. 24) and www.whatis.com:

Information technology is a term that encompasses all forms of technology utilized to create, capture, manipulate, communicate, exchange, present, and use information in its various forms (business data, voice conversations, still images, motion pictures, multimedia presentations, and other forms, including those not yet conceived).

In other words, this definition of IT includes computer hardware, software, and communication systems, whereas some authors also include personnel and resources dedicated to supporting these capabilities (King *et al.*, 1989; Stump and Sriram, 1997).

Advanced inter-organizational systems have a major impact on the way business is done in organizations (Buxmann and Gebauer, 1999). Ives and Mason (1990) say that IT enables organizations to customize their services instead of standardize them. IT can be internally oriented or outwardly directed (Stump and Sriram, 1997). Information systems that do not directly involve external organizations are called internal IT. Internal IT falls into the domains of office and factory automation systems that organize work more efficiently. While almost any organization has implemented these internal systems, many organizations have begun using IT to manage information between organizations. With the emergence of the Internet and other wide area networks, the technological basis for connecting a firm's internal IT with outside computer networks is created. Shared IT is often used between suppliers and customers, but sometimes also involves competing organizations, research institutions, or consultancies. An overview is given in Figure 1.

2.1 Internal IT

The category of internal IT encompasses all information systems that are only used within the organizational boundaries. These systems can support the entire organization, or specific tasks or functions within the organization.

Applications that are basically used inside the organization are office automation, transaction processing systems, enterprise resource planning systems, data warehousing systems, groupware applications, intranets, and executive information systems. Table I illustrates the major benefits of the different types of internal IT applications. These are the information function, communication function, and decision support.

2.2 Shared IT

None of today's corporations exist as isolated entities. Companies are part of a marketplace where

Figure 1 Types of information systems and their classification

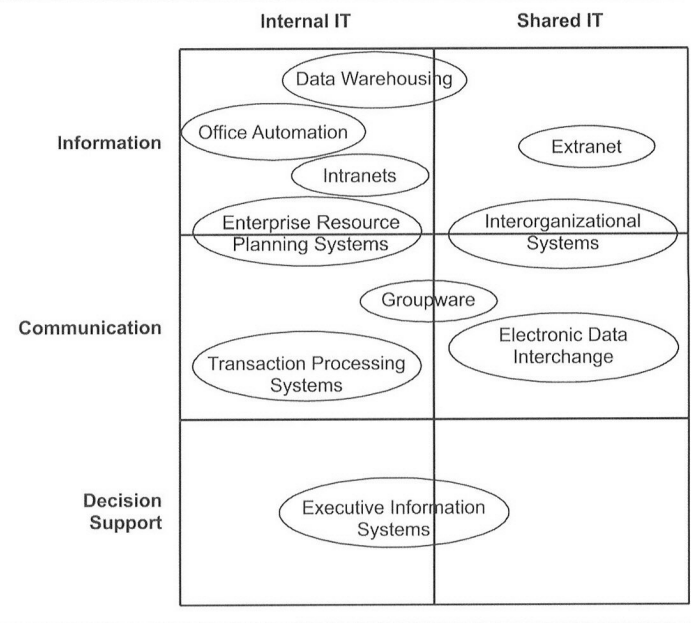


Table I Applications of internal IT and their benefits

Office automation	Reduction of processing time Improvement of quality Reduction of time-consuming routine work
Transaction processing	Reduction of overhead Faster response to customer demands
Enterprise resource planning	Force business process reengineering Reduction of cost Improvement of customer service
Data warehousing	Improved customer care Better planning of future developments
Groupware	Improved flow of information Reduction of redundant work Improvement of work-quality
Intranets	Provide additional organization-intern services Improved flow of information Better customer service
Executive information	Improved strategic planning Executive decision-making support Improvement of customer orientation

different types of organizations come together and exchange information, services, and goods. Shared IT relates to computer and communication technology, which supports doing business between a corporation and organizations outside its boundaries (Jonston and Vitale, 1988). These organizations can be geographically dispersed and utilize modern network technology. The shared use of IT helps to support an organization's interactions with other organizations, i.e. buyers and sellers (Applegate *et al.*, 1996).

Interorganizational systems, EDI and extranets are the most popular shared IT tools. Table II shows these applications of shared IT and the

Table II Applications of shared IT and their benefits

Interorganizational systems ^a	Reduction of transaction costs Increased customer responsiveness Increase efficiency Differentiated products and services Increased bargaining power
Electronic data interchange ^b	Reduction of costs for order processing Reduction of inventory and inventory costs Elimination of labor-intensive tasks Enhanced communication
Extranets	Strengthens closeness between participating organizations Reduction of operational costs Enhanced communication Reduction of cooperation costs

Notes: ^a For a detailed discussion of the benefits of interorganizational systems see McFarlan (1984); ^b In-depth information about the benefits of electronic data interchange can be found in Scala and McGrath (1993) and Kumar and Cook (1996). Their theories about the benefit of electronic data interchange are supported by field studies of Mukhopadhyay *et al.* (1995) in the automotive and Venkatraman and Zaheer (1990) in the insurance industry. Teo *et al.* (1995) conducted a similar study for Tradenet in Singapore

benefits to an organization engaging in these technologies.

3. Conceptual model and hypotheses

Business relationships and IT are not separate isolated elements of business. Based on the above discussion, it is clear that information systems can have an important role in business-to-business relationships. At the very least, IT has a potential to influence relationships.

3.1 IT and trust

Customer trust is a central variable in most relationship models (Wilson, 1995). Based on various contributions to the definition of trust (Doney and Cannon, 1997; Geyskens *et al.*, 1996; Moorman *et al.*, 1992), we define customer trust as the extent to which a customer believes that the supplier is honest, benevolent, and competent.

Internal use of IT makes the supplier's processes more reliable because it supports decision making, production planning, and quality management by improving the scanning and monitoring of the internal and external environment (Dewett and Jones, 2001). Utilizing the advantages of these ITs enables the supplier to provide customers with high-quality products and services, and ensures timely delivery, which, in turn, results in higher customer satisfaction. The customer perceives accomplishments by the supplier as competence

and willingness of the supplier to serve the customer's needs. As such, the customer's trust will increase. On the firm level, Stump and Sriram (1997) found empirical support for the positive impact of IT use and an overall closeness of buyer-seller relationships. They argue that mutual trust can result from IT investments. In addition, Roberts and Mackay (1998, p. 176) see the role of IT "as a key enabler for competitive advantage through cementing relationships".

Research also suggests that timely, accurate and direct communication between buyers and sellers has a positive impact on trust. Several studies have highlighted that IT deployment – in particular, the use of the Internet – enables the seller to process information faster, more accurately and more reliably to the customer (e.g. Lancioni *et al.*, 2000; Philip and Pedersen, 1997).

H1. Higher employment of internal IT on the supplier side leads to higher customer trust.

Shared information systems enable the supplier organization to look into or even take control over specific aspects of the customer's operations. Thus, specific risks are embedded in the use of shared information systems as the partners involved become more vulnerable. Therefore, the customer has to be willing to take these risks to engage in shared employment of information systems. Overall, "trust is a key ingredient in establishing and maintaining successful inter-organizational systems (IOS)" (Meier, 1995, p. 145). Customer's trust reduces these feelings of vulnerability (Boon and Holmes, 1991). Also, higher levels of trust advance information exchange, which might, in turn, establish the need for shared IT.

H2. Higher customer trust leads to higher employment of shared IT.

3.2 IT and commitment

A second measure of relationship atmosphere is customer commitment, which is defined as the customer's durable intention to develop and sustain the relationship with the supplier in the long term (Anderson and Weitz, 1992; Moorman *et al.*, 1992). Customer commitment can be described along four dimensions:

- (1) Loyalty.
- (2) Willingness to make short-term sacrifices.
- (3) Long-term orientation.
- (4) Willingness to invest in the relationship (Anderson and Weitz, 1992; Ganesan, 1994; Geyskens *et al.*, 1996; Gundlach *et al.*, 1995).

Supplier investments in internal IT are investments in the future. They often provide long-term benefits rather than short-term pay-offs. The customer perceives these investments as

improvements in product and service quality, and in delivery, a perception that in turn leads to higher value propositions for customers (Vlosky *et al.*, 2000). Thus, customers may see IT activities on the supplier side as investments in customer service. This perception is often confirmed by lower prices and better services in business practice (Venkatraman and Zaheer, 1990; Mukhopadhyay *et al.*, 1995). We can therefore expect customers to be committed based to suppliers with significant IT investments.

H3. Higher employment of internal IT on the supplier-side leads to higher customer commitment.

The implementation of shared information systems (such as EDI) includes considerably high costs for purchasing the system and training employees (Philip and Pedersen, 1997). Efficient use of the shared system often makes modifications of major business processes on both the supplier and customer side necessary. Initial investments are therefore needed for the new technology. During this time, alternative suppliers might be able to supply the same good at a lower cost and it becomes highly sensible for other suppliers to intrude on the relationship. For these reasons, shared IT is only implemented when the partners invest in the relationship, take short-term sacrifices and have a long-term orientation.

H4. Higher customer commitment leads to higher employment of shared IT.

3.3 IT and value creation in relationships

“Each relationship exists and is maintained for some overall functional purposes” (Håkansson and Turnbull, 1982). In industrial relationships, these purposes relate to the direct or indirect realization of economic goals (Håkansson and Johanson, 1993; Anderson *et al.*, 1994; Walter *et al.*, 2001). In other words, when establishing inter-organizational relationships, firms anticipate mutual benefits arising either immediately in the specific relationship (direct functions), or from its impact on future business or on other relationships (indirect functions). From the supplier’s perspective, direct functions of business relationships are the creation of higher profits from the products and services offered (profit function), growth of trade volumes (volume function), and the possibility to sell, e.g. over-capacity (safeguard function) (Cunningham and Homse, 1982; Kalwani and Barayandas, 1995). Indirect functions include cooperative development of new products or processes (innovation function) (Wikström, 1996), assistance to attract new customers and to enter new markets (market function), information about future developments

in the customer’s market (scout function) (Cunningham and Homse, 1982), and the facilitation of access to important third parties (access function) (Håkansson, 1987). These functions are presented in Figure 2, which is adapted from Walter *et al.* (2001). Direct and indirect functions create value in customer-supplier relationships. The fulfillment of these functions is an important factor in successful business relationships and helps supplier organizations draw sustainable competitive advantages from customer relationships.

Internal use of IT on the supplier side speeds up internal communication, reduces administrative overhead, and allows cost reduction in production. This enables the supplier to serve the customer with the demanded volume of products or services or at a low price. Stump and Sriram (1997) show that buyer investments in IT (“shared IT”) lead to contracting numbers of suppliers, which means more volume for the remaining suppliers.

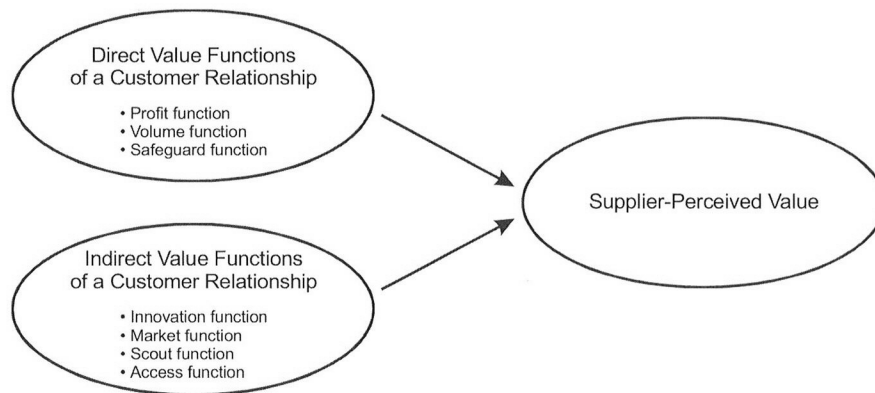
IT also allows a supplier to process innovations efficiently, which, in turn, could be rewarded by the customer through more involvement in new product development, more sales volume or further access to information. Ozer (2000) argued that IT can increase and improve, e.g. speed, productivity, collaboration, communication and coordination in new product development projects. Therefore, suppliers may achieve more value from their customer relationships through internal efficiencies caused by IT.

H5. Higher employment of internal IT leads to higher value creation in the relationship.

Inter-organizational shared information systems replace traditional means of communication and make communication more efficient. They help organizations overcome problems of distance and time. In addition to electrifying traditional communication, advanced inter-organizational systems, like shared enterprise resource planning systems or shared knowledge management systems, provide new ways of doing business across organizational boundaries. Pride and Ferrell (1989) state: “. . . without an adequate information system, an organization cannot be customer-oriented.” These advantages explicitly address and enable value-creating functions within business relationships because more information can flow efficiently between the organizations (Vijayarathy and Robey, 1997) and time is freed up for interaction as routine tasks are taken over by shared IT systems.

H6. Higher employment of shared IT leads to higher value creation in the relationship.

Figure 2 Value-creating functions of a customer relationship



3.4 Internal and shared IT

Employment of shared IT in a relationship requires both the supplier and the customer to implement IT. Realizing an efficient internal IT system involves establishing the technical infrastructure, allocating resources, assigning responsibilities, and developing expertise on both the support and user sides. These internal achievements will support the establishment and use of information systems shared between suppliers and customers. As such, internal information systems serve as the basis for (normally more complex) shared IT solutions.

H7. Higher employment of internal IT on the supplier side leads to higher employment of shared IT.

3.5 The conceptual model

Empirical findings suggest that partners trust each other in successful relationships (e.g., Mohr and Spekman, 1994; Moorman *et al.*, 1992; Morgan and Hunt, 1994). The customer's belief in the supplier's honesty, goodwill, and competence serves as grounds on which a customer shares innovation and market-related information as well as offers a customer access to important actors. Also, trusting customers may offer single source agreements to their suppliers. Therefore, customer trust increases direct and indirect value creation (Walter and Ritter, 2003).

In addition to trust, commitment has been identified as an important antecedent for successful inter-organizational relationships (Dwyer *et al.*, 1987; Gundlach *et al.*, 1995; Morgan and Hunt, 1994). Committed customers will offer more value to their suppliers through their contribution to the ongoing relationship. Mohr and Spekman (1994) have shown the positive impact of customers' commitment on sales (i.e. direct functions). Indirect functions, such as collaborative innovation development, are

also likely to be fulfilled when partners are committed (Walter and Ritter, 2003).

H8. Higher customer trust leads to higher value creation in the relationship.

H9. Higher customer commitment leads to higher value creation in the relationship.

As shown in several empirical studies, trust and commitment are not independent of each other in inter-organizational relationships: Trust of a relationship partner has a positive impact on relationship commitment (Ganesan, 1994; Geyskens *et al.*, 1996; Moorman *et al.*, 1992; Morgan and Hunt, 1994).

H10. Higher supplier trust leads to a greater supplier commitment.

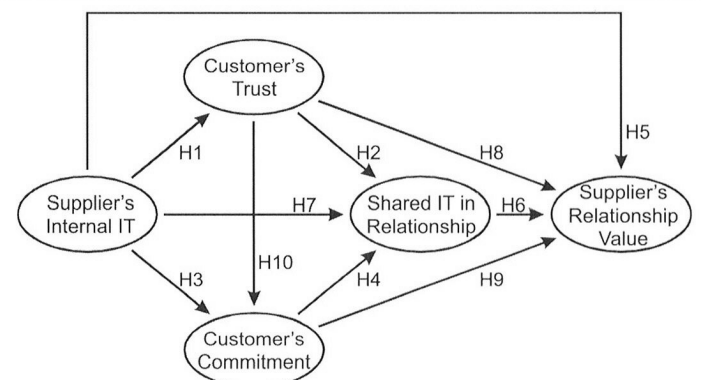
Figure 3 illustrates the conceptual model of this study.

4. Empirical study

4.1 Data collection

In order to obtain empirical evidence, a database of 2,000 companies was used to select respondents. An initial fax described the subject of the study and requirements for respondents. The

Figure 3 Conceptual model of this study



second page of the fax was a form for the organization to indicate its willingness to participate, and 162 companies expressed an interest in participating in this study. These firms received the standardized questionnaire either via regular postal mail or by downloading the questionnaire from the study's Web page. A total of 61 questionnaires were completed.

As already mentioned, the focus of this study was not a specific industry group, company size or type. The goal was to gain an initial and general understanding of the impact of IT on inter-firm relationships. The participating industries are:

- building and construction (13);
- food (4);
- IT (4);
- mechanical engineering (6);
- metal processing (5);
- services (8);
- trade (10);
- transportation (4); and
- others (6).

The average number of employees per company is 244. The companies in this sample have an average of 61 years in business. Respondents were sales executives with a profound knowledge of the relationship in question.

4.2 Operationalization

All constructs were measured by multiple items rated on a seven-point Likert scale. Corresponding items for one construct were tested for reliability and validity. We required item-to-total correlations above 0.30 (Kumar *et al.*, 1995) and Cronbach's Alpha values above 0.7 (Nunnally, 1978) for this study. The factor analysis for each measurement of the sub-constructs had to result in only one factor explaining more than 50 per cent of the variance. If all requirements are satisfied, the items of the sub-constructs were aggregated by calculating the scale mean. After aggregating the items, the sub-constructs of each construct were tested again using the same criteria. The sub-constructs satisfying the requirements were condensed into one measure for each construct by calculating the mean. Table III provides an overview of the scales (the corresponding items are listed in the Appendix).

One interesting result appears with the operationalization of shared IT. Here, the items are split into two factors, one representing IT-based communication with the customer and the other summarizing intensive information exchange around the customer and its processes. Therefore, we have two measures for shared IT in the remainder of the paper: shared communication IT and shared process IT. Table III shows that all measurements meet the given requirements. Thus, our scales appear to be valid.

4.3 Results

In order to analyze *H1* and *H3* (the effect of internal IT on trust and commitment), we looked at the correlations between the constructs. As expected, internal IT is positively related to trust ($r = 0.243$, $p = 0.033$) and commitment ($r = 0.214$, $p = 0.052$). A correlation analysis with the two variables, trust and commitment ($r = 0.508$, $p = 0.000$), supports *H10*, which is in line with results from other empirical studies. Combining the influence of internal IT and trust on commitment, the regression analysis reveals that the impact of internal IT is insignificant (see Table IV). As such, trust is a much more powerful predictor of commitment than internal IT. Even though positively related, internal IT has to be rejected as an antecedent of commitment. A possible explanation is that other variables may mediate this relationship. Furthermore, other important antecedents could be included, such as relationship management, task performance and personnel qualifications (Helfert and Vith, 1999; Walter, 1999) as well as adaptations (Brennan and Turnbull, 1997; Hallén *et al.*, 1991).

Tables V and VI show the results of the regression analysis, which was carried out in order to test the impact of internal IT, trust and commitment on shared IT (*H2*, *H4*, and *H7*).

In both cases, a major impact on the shared use of IT comes from the internal use (*H7*). Firms that use IT inside the company are much more likely to use it in business relationships as well. Therefore, we can assume that experience in handling IT and the investments already made in IT systems tend to determine the use of IT in relationships. Commitment also has a significant impact on shared communication and process IT (*H4*), which gives support to our arguments that a long-term view is needed to justify investments into IT. Furthermore, shared IT use is apparently not a function of trust (*H2*). We suggest that the exchanged content be analyzed in further studies, because it might not be the overall usage of IT but the quality of information that varies with the level of trust between two firms.

Tables VII and VIII show the results of the regression analysis for testing the hypotheses related to relationship value creation (*H5*, *H6*, *H8* and *H9*).

Our analyses show that internal and shared IT have no significant impact on direct and indirect value creation in the observed business relationships – except for one very interesting exemption. Shared process IT has a significant negative impact on indirect value creation. This is contrary to our *H6*. We can only speculate at this point that implementation of shared process IT may lead to inflexibility owing to the high costs of

Table III Construct measurements

Construct	Indicator (number of items for sum scale)	Item-to-total correlation	Cronbach's Alpha	Explained variance by one factor	Item-to-total correlation	Cronbach's Alpha	Explained variance by one factor
Internal IT	Information management (4)	0.72	0.92	80.9	0.64	0.79	71.4
	Communication (4)	0.65	0.85	69.2	0.57		
	Decision support (4)	0.60	0.84	68.6	0.71		
Shared communication IT	Communication (4)	0.58	0.84	68.2	0.62	0.76	80.9
	Decision support (4)	0.48	0.83	67.0	0.62		
Shared process IT	Information management (4)	0.52	0.84	68.8	0.63	0.74	65.6
	Insight and control: our side (4)	0.47	0.83	67.6	0.57		
	Insight and control: customer's side (4)	0.51	0.80	62.4	0.50		
Trust	Benevolence (4)	0.45	0.70	53.6	0.52	0.74	67.0
	Competence (2)	0.61	0.72	80.5	0.56		
	Direct measure (1)	–	–	0.68	–		
Commitment	Loyalty (2)	0.50	0.66	74.8	0.57	0.77	60.9
	Short-term sacrifices (3)	0.49	0.70	62.7	0.60		
	Long-term orientation (2)	0.50	0.66	75.2	0.62		
	Investments (2)	0.63	0.77	81.7	0.57		
Direct Value Functions	Volume (3)	0.37	0.64	59.4	0.46	0.62	72.8
	Profit (2)	0.59	0.74	79.6	0.46		
Indirect Value Functions	Innovation (2)	0.73	0.85	86.7	0.41	0.67	50.4
	Market (2)	0.76	0.86	87.8	0.48		
	Access (1)	–	–	–	0.44		
	Scout (1)	–	–	–	0.48		

Table IV Results of the regression analysis with commitment as dependent variable

Independent variable	Standardized β coefficient	R^2	F-value
Internal IT	0.072 ^{n.s.}	26.3	9.837***
Trust	0.491***	1.14	

Dependent variable: commitment
 Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Table V Results of the regression analysis with shared communication IT as dependent variable

Independent variable	Standardized β coefficient	R^2	F-value
Internal IT	0.490***	28.8	4.997***
Trust	-0.172 ^{n.s.}		
Commitment	0.210*	1.14	

Dependent variable: shared communication IT
 Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Table VI Results of the regression analysis with shared process IT as dependent variable

Independent variable	Standardized β coefficient	R^2	F-value
Internal IT	0.336**	22.5	3.588**
Trust	0.052 ^{n.s.}		
Commitment	0.219*	1.14	

Dependent variable: shared process IT
 Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

change and decreasing personal contact (negative for innovation). Also, shared process technology might indicate strong adaptation toward this one customer, which precludes service for other customers (negative for market and access

Table VII Results of the regression analysis with direct value functions as dependent variable

Independent variable	Standardized β coefficient	R^2	F-value
Internal IT	-0.134 ^{n.s.}	65.8	13.364**
Shared communication IT	0.047 ^{n.s.}		
Shared process IT	0.082 ^{n.s.}		
Trust	0.273*		
Commitment	0.639**	1.14	

Dependent variable: direct value functions
 Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Table VIII Results of the regression analysis with indirect value functions as dependent variable

Independent variable	Standardized β coefficient	R^2	F-value
Internal IT	0.025 ^{n.s.}	36.2	3.857*
Shared communication IT	0.176 ^{n.s.}		
Shared process IT	-0.373*		
Trust	0.448**		
Commitment	0.277*	1.14	

Dependent variable: indirect value functions
 Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

function). We found no support for our $H5$ and $H6$ and cannot say that more extensive use of IT will lead to higher value creation for the supplier. The two important input factors for a successful relationship are trust ($H8$) and commitment ($H9$). Only if the customer trusts the supplier and is committed to him, is the customer willing to allow more value creation for the supplier.

Before drawing conclusions, we shall look at the limitations of this study:

- First, we have only a limited database of data from 61 firms. Therefore, we consider these to be initial results on this highly-debated issue.
- Second, the data comes from a diverse set of firms. Our attempt was to gain an overview of the situation and not to analyze industry-specific issues. However, the use of IT may be quite different across industries.
- Third, we had to develop new measures for the use of IT in relationships. The fit criteria indicate that we have put together a valid set of items, but further studies need to validate these measures in other settings.
- Fourth, we were particularly interested in the supplier's point of view, and have gathered information about the supplier's firm and its view on the relationship. Obviously, the use of IT in a relationship is determined by both the supplier and the customer. More data about the customer's use of IT should therefore be included in further studies.

5. Discussion and outlook

The existence of IT in an organization or relationship does not guarantee the creation of additional value. Trust and commitment have a significant impact on value creation. As such, we have to conclude that value creation is a function of the relationship atmosphere and not of the technology employed. The results also suggest that the implementation of IT in a relationship is more determined by the technology inside the firm than the relationship atmosphere variables. Our approach of introducing IT into a relationship model seems to have been at least partly rejected by the data. This, however, stands in contrast to our experiences within firms where, frequently, trust and commitment are given as the key preconditions for the use of IT applications in relationships.

A possible reason for this contradiction might be found in the newness of the technology. As experiences and capabilities are not evenly distributed around the firms, there is the likelihood that only the "IT innovators" have implemented shared IT systems to date. This would explain why internal IT determines shared IT employment rather than trust and commitment. As technology spreads and becomes more understood and available, other firms might implement IT also.

A similar argument can be applied to value creation. Given the newness of the technology, firms might not have been able to exploit the advances of the technology or may even have made fatal mistakes by implementing it into the "wrong" relationships. These possibilities might blur our

results. Furthermore, IT carries the danger of impersonalising relationships, which, in turn, could lead to reduced trust, commitment and value-creation. This argument has found some support in our analysis, given the negative impact of shared process IT on value creation.

Overall, we see a quite diffuse picture of IT in relationships at the moment. This leads to further research questions:

RQ2. How do users deal with IT?

It would be insightful to analyze user expertise and attitudes towards IT, and the impact of those constructs on IT employment and value creation in a relationship.

RQ3. What factors foster the employment of IT in relationships?

In our study, we looked at the supplier's internal IT systems, customer trust and commitment as input factors for IT employment in the relationship. However, there are other factors that contribute to IT employment, including the counterpart perspectives: customer's internal IT, supplier trust and commitment. We therefore should move from a supplier perspective to a mutual understanding and analysis of the relationship. Second, the nature of the transactions in the relationship might determine the usefulness of shared IT. Where standardized products are exchanged in high volume, IT might facilitate a timely delivery. On the other hand, where highly customized products are developed, IT might only help to arrange meetings. Third, another factor could be satisfaction with the IT, i.e. the reliability of the system and user-friendliness.

RQ4. What factors foster the employment of IT in the firm?

As we have seen, shared IT can only be exploited when it can be used on both ends. It is therefore important to understand what role a strategy for IT employment plays and how top management impacts IT.

RQ5. Under which conditions does the developed model hold true?

Even though our model has not been fully supported by the data, we are unable to reject it due to the limited database and the arguments presented earlier. However, our general model might be subject to certain conditions under which it will prove valid. These conditions might stem from relationship-specific areas (e.g. symmetric relationships) or from industry-specific issues (e.g. technology-orientated industries, competition).

Future research may address these questions. Based on the research carried out for this paper, we can conclude that employing shared IT in a

relationship does not automatically create value for the supplier. The investments need to be considered carefully, as shared IT can be sunk costs in a relationship and may even have negative effects.

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Further reading

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Appendix

Table AI

Construct	Indicator (number of items)	Item
Internal IT – To which degree is internal IT used in your organization for the following tasks? (1 = not used at all; 7 = strongly used)	Information management (4)	Search for information Storage of information Refining of information Distribution of information
	Communication (4)	General communication between employees Calendaring and scheduling Support of meetings Coordination of cooperation
	Decision support (4)	Strategic support Quality improvement Improvement of flexibility Problem solving
Shared IT 1 – To which degree do you use shared IT in the relationship with this customer for the following tasks? (1 = not used at all; 7 = strongly used)	Information management (4)	Search for information relevant in this relationship Storage of information relevant in this relationship Refining of information relevant in this relationship Distribution of information relevant in this relationship

(continued)

Table A1

Construct	Indicator (number of items)	Item
	Communication (4)	General communication with the customer Calendaring and scheduling with the customer Support of meetings with the customer Coordination of cooperation with the customer
	Decision support (4)	Strategic planning with this customer Quality improvement with this customer Improvement of flexibility with this customer Problem solving with this customer
Shared IT 2 – Please comment on the following statement concerning shared use of IT with the customer (1 = strongly disagree; 7 = strongly agree)	Insight and control: our side (4)	Shared IT gives us insight into the customer's data Shared IT gives us insight into the customer's processes Shared IT allows us to control the customer's processes Shared IT gives us insight into the customer's know-how
	Insight and control: customer's side (4)	Shared IT gives the customer insight into our data Shared IT gives the customer insight into our processes Shared IT allows the customer to control our processes Shared IT gives the customer insight into our know-how
Trust – Please comment on the following statements concerning your relationship to this customer (1 = strongly disagree; 7 = strongly agree)	Benevolence (4)	We are sure that this customer wants us to benefit from the relationship This customer is concerned only about his own problems With major issues we can count on this customer This customer tries to take advantage from our relationship without considering our goals
	Competence (2)	This customer trusts us when we are conducting services, which he cannot do himself This customer perceives us to be professional and motivated
	Direct measure (1)	This customer trusts us completely
Commitment – Please comment on the following statements concerning your relationship to this customer (1 = strongly disagree; 7 = strongly agree)	Loyalty (2)	This customer is very loyal to us This customer feels highly obligated to us
	Short-term sacrifices (3)	This customer would not conduct business with others for our disadvantage This customer is willing to accept temporary disadvantages for maintaining our relationship To this customer, our relationship is more important than short-term profit
	Long-term orientation (2)	It is very likely that we will be still conducting business with this customer in two years This customer sees the exchange of products and services as part of our long-term relationship
	Investments (2)	This customer is willing to make investments for working with us in the long-term This customer is willing to invest time and money in establishing and growing our relationship
Direct value functions – To which degree do you achieve the following goals with this customer? (1 = not at all; 7 = completely)	Volume (3)	High turnover with this customer Continuous turnover of products with this customer Increasing turnover in this customer relationship
	Profit (2)	High profit margins with this customer Constant profit margins with this customer
Indirect value functions – To which degree do you achieve the following goals with this customer? (1 = not at all; 7 = completely)	Innovation (2)	Use of this customer to create new ideas for products Use of the customer's application know-how for product improvement
	Market (2)	Recruitment of additional customers through this customer Use of information about potential new customers
	Access (1)	Collaborative recruitment of new customers
	Scout (1)	Increasing your company's reputation by cooperating with this customer