

Trust, Commitment and Value-Creation in Inter-Organizational Customer-Supplier Relationships

Ricky Ryssel
Siemens Business Services Management Consulting,
Carl-Wery-Straße 18,
81739 München,
Germany
Tel: +49 (89) 636-48887
E-mail: ricky.ryssel@mch20.sbs.de

Thomas Ritter
School of Management
University of Bath,
Bath BA2 7AY,
U.K.
Phone: +44 (1225) 32-33 19,
E-Mail: t.ritter@bath.ac.uk

Hans Georg Gemünden
Institute of Technology and Innovation Management
Technical University Berlin,
HAD 29,
Hardenbergstr. 4-5,
D - 10623 Berlin,
Germany
Phone: +49 (30) 314-23 796
E-Mail: hans.gemuenden@tim.tu-berlin.de

Abstract

To strengthen their position in today's highly competitive and fast paced business environment more and more supplier firms engage in relationships with their customers. These inter-organizational relationships have proven to create value for both parties involved. However, the management of such relationships requires resources and is a complex task. Recent advances in information technology offer new ways of managing inter-organizational relationships. The impact of those intra-organizational and inter-organizational information systems for creating value in business-to-business relationships has not been explored so far. In this paper, a conceptual model about the impact of information system deployment on value-creating functions of inter-organizational buyer-seller relationships is developed.

Based on an empirical study with 60 German firms engaged in customer-supplier relationships this paper also gives some empirical evidence for the developed framework. It is argued that with regard to relationship management intra- and inter-organizational information technology deployment has different effects on relationship atmosphere (i.e. trust and commitment) and on the value creation in the relationship.

The findings give new insights into the role of information technology for value-creation in business-to-business relationships. Future research questions in this area are also discussed.

Introduction

Organizations are facing fast paced changes of their business environment. Drucker (1992) says that “Change is the only constant in an organization's life.” This change relates to evolving customer needs, evolving technologies for meeting customer needs, and evolving managerial practices (Porter, 1997). Correspondingly, corporations enforce efforts to face these three characteristics of change and strive to create competitive advantage. Porter (1980), p. 35-39 identifies three generic strategies to create this competitive advantage: (1) Producing goods or services at low costs (*overall cost leadership*); (2) Offering unique products or services (*differentiation*); and (3) Centering organizational efforts around specific customer groups, product sets, or geographical areas (*focus*). Organizations will be more successful if they focus on obtaining and maintaining inter-organizational relationships with a specific group of customers (Gemünden, 1981, p. 14-15; Anderson and Narus, 1991; Kotler, 1994, p. 204; Ford, 1997; Porter, 1997; Wells, Fuerst and Choobineh, 1999). It is within these relationships that value is created for both the customer and the supplier (Walter, Ritter and Gemünden, 1999).

In addition to the importance of relationships, it is suggested that competitive advantage is generated through the employment of state-of-the-art information technology (Clemens and Row, 1991; Mata, Fuerst and Barney, 1995; King and Teo, 1996; Palvia, 1997). According to Buxmann and Gebauer (1999), information technology is one of the key success factors in any organization. Internal information technology is described best as falling into the two domains of office automation systems and factory automation systems. These systems target on making office work more efficient. Thus they support cost leadership strategy but also allow firms to focus and to differentiate. While almost any organization has implemented these internal systems, today many organizations start using information technology to manage information between organizations. 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 information technology enables organizations to customize its services instead of following the trend of standardization.

Despite the advances in both areas, relationship management and information technology, research is lacking evidence on the interdependence of information technology employment, relationship atmosphere (i.e. trust and commitment), and relationship value (i.e. the fulfillment direct and indirect functions). We know little about the way in which information technology has an impact on relationship management and vice versa. Therefore, this impact will be discussed in this paper. Our main research question is:

What impact has information technology on relationship management and inter-organizational value creation?

In order to address this question the authors classify the two types of information technology. *Internal information technology* is used at one party of the relationship only while *shared information technology* spans organizational boundaries. Using this classification of information technology, the authors break down the question stated above into the three parts:

1. *How does internal information technology impact relationship characteristics such as trust and commitment?*
2. *What are the antecedents of shared information technology?*
3. *What is the effect of information technology on relationship value?*

The paper is organized as follows: In the next section we will give an overview of value creating functions of supplier-customer relationships. Then, elements of information technology are discussed. Thereafter, we will develop our conceptual model by discussing our hypotheses. Results of our empirical study with 60 German supplier organizations will then be presented. Concluding, we provide an outlook on further research areas.

Value-Creation in Customer-Supplier 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, p. 15-24; Anderson, Håkansson and Johanson, 1994, p. 1-4 and p. 8-9). In other words, establishing these inter-organizational relationships, firms anticipate mutual benefits, which result either immediately in the specific relationship (*direct or primary or first order functions*) or from its impact on future business or on other relationships organizations are engaged in (*indirect or secondary or second order functions*) (Anderson, Håkansson and Johanson, 1994; Håkansson and Johanson, 1993; Gemünden, Schaettgen and Walter, 1992). From the supplier's perspective, direct functions of business relationships are 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*) (Henderson, 1974, p. 26-27; Cunningham and Homse, 1982; Backhaus, 1990, p. 156-157; Kalwani and Barayandas, 1995). Indirect functions include cooperative development of new products or processes (*innovation function*) (Gemünden, 1981; Wikström, 1996), assistance to attract new customer and to enter new markets (*market function*) (Gemünden, Walter and Helfert, 1996, p. 25; Walter, 1998, p. 25-29), information about future developments in the customer's market (*scout function*) (Cunningham and Homse, 1982), and facilitation of access to important third parties (*access function*) (Håkansson, 1987; Gemünden, Schaettgen and Walter, 1992). These functions are presented in figure 1, which is adapted from Walter, Ritter and Gemünden (1999) and discussed in detail in the following.

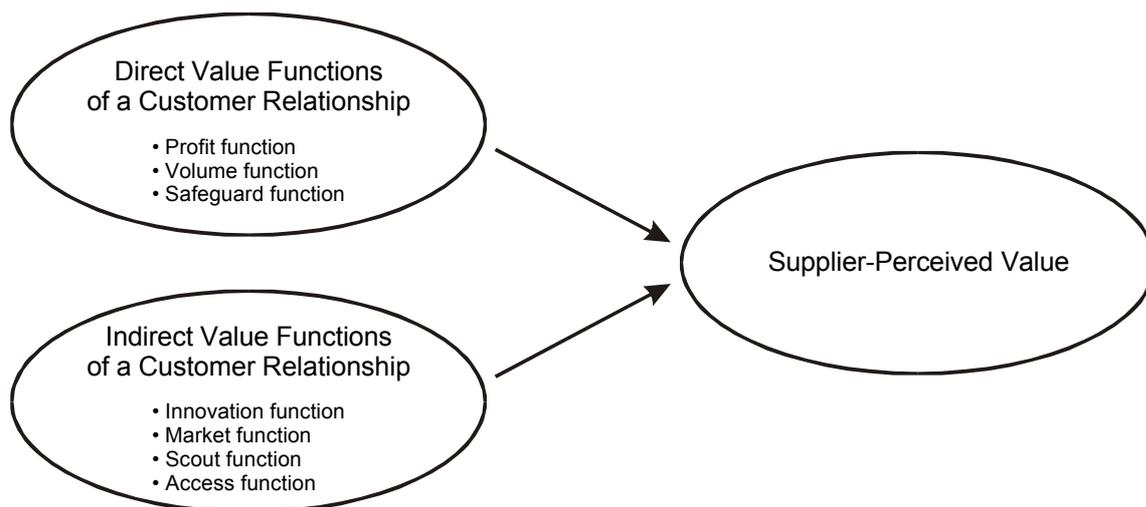


Figure 1: Value-creating functions of a customer relationship

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 to draw sustainable competitive advantage from customer relationship.

Information Technology

Engaging in and exploiting the opportunities of information technology is one of the hot topics for almost any modern organization. The importance of information technology within a business environment increased during the last years. Based on this, we use a definition of information technology, which combines the two definitions from Martin, Brown, DeHayes, Hoffer and Perkins (1999), p.24 and www.what-is.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 the early times of information technology, computers were basically used stand-alone. They were not linked to any other systems within the organizations or spanning organizational boundaries. All data needed to be fed into the computer manually, either by typing it in or using storage devices like punch cards or magnetic tapes. Today, with the evolved opportunities of networking, almost always computers within a particular organization are linked within a computer network. If an organization consists of several physically dispersed units, these units are most likely connected to the network, too. As these information systems do not directly involve external organizations, we call all systems used only within a particular organization *internal information technology*. With the emergence of the Internet and other wide area networks, the technological basis for connecting outside organizations to an organizations computer network was given. Not only the technological capability to connect different organizations with information technology, but also economic reasons let organizations employ information technology spanning the organizational boundaries. This *shared information technology* is often used between suppliers and customers, but sometimes also involves competing organizations, research institutions, or consultancies.

Internal Information Technology

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

Applications, which 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 1 illustrates the major benefits of the different types of internal information technology applications. These functions are i.e. information function, communication function, and decisions support.

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

*Table 1: Applications of internal information technology and their benefits
Shared Information Technology*

None of today's corporations exists as an isolated entity. Companies are part of a marketplace where different types of organizations come together and exchange information, services, and goods. Shared information technology 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 utilizing modern network technology, distance is not much of a matter anymore. The shared use of information technology helps to support an organization's interactions with other organizations, i.e. buyers and sellers (Applegate et al., 1996).

Interorganizational systems, electronic data interchange and extranets are the most popular members of the group of shared information technology.

Table 2 shows these applications of shared information technology and the benefits for an organization engaging in these technologies.

Interorganizational Systems	Reduction of transaction costs Increased customer responsiveness Increase efficiency Differentiated products and services Increased bargaining power
	For a detailed discussion of the benefits of interorganizational systems see McFarlan (1984)
Electronic Data Interchange	Reduction of costs for order processing Reduction of inventory and inventory costs Elimination of labor-intensive tasks Enhanced communication
	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, Kekre and Kalathur (1995) in the automotive and Venkatraman and Zaheer (1990) in the insurance industry. Teo, Tan, Wei and Woo (1995) conducted a similar study for Tradenet in Singapore.
Extranets	Strengthens closeness between participating organizations Reduction of operational costs Enhanced communication Reduction of cooperation costs

Table 2: Applications of shared information technology and their benefits

Summary

This part of the paper gave an overview of the different kind of information systems, which can be found in a modern business organization. The systems were classified with regard of their application in the organization and their economic benefits of were discussed. An overview of the different types of information technology and their classification is given in Figure 2.

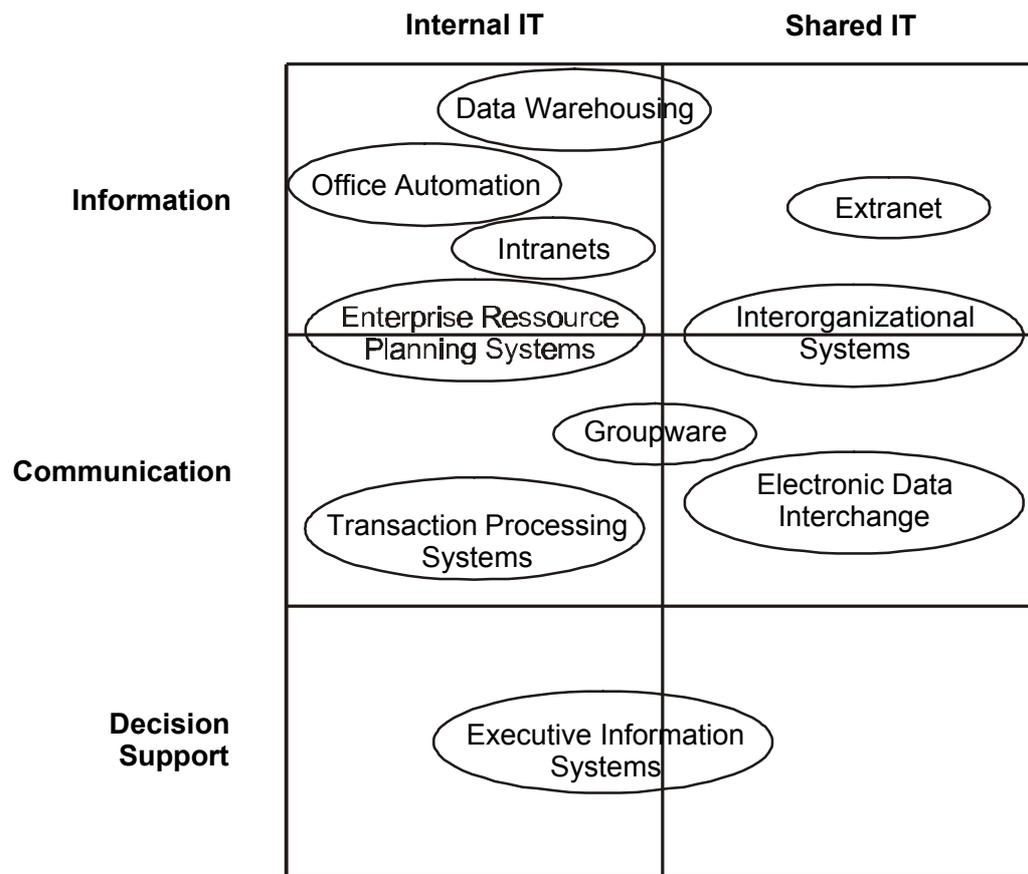


Figure 2: Types of information systems and their classification

Based on the information in this chapter, it is obvious that information systems can take an important role in business-to-business relationships. The question how information technology can influence business to business relationships and i.e. the relationship value in buyer-seller relationships will be discussed in the next part of this paper.

Conceptual Model and Hypotheses

Business relationships and information technology are not separated and isolated elements of doing business. In most customer-supplier relationships, information technology is being employed in some way. In this part of the paper the authors develop their hypotheses about the impact of information technology on relationships and i.e. on relationship value of inter-organizational customer-supplier relationships.

Firstly, we will look at customer's trust as this is a central variable in most relationship models (Wilson, 1995). Based on various contributions to the definition of trust (Doney and Cannon, 1997; Geyskens, Steenkamp, Scheer and Kumar, 1996; Moorman, Zaltman and Deshpandé, 1992; Walter, 1998) we define customer's trust as the extent to which a customer believes that the supplier is honest, benevolent, and competent.

Internal use of information technology makes the supplier's processes more reliable because it supports decision-making, production planning, and quality management. Utilizing the advantages of these information technologies enables the supplier to provide the customer with high quality products and services and ensures timely delivery, which in turn results in

high customer satisfaction. These accomplishments are perceived by the customer as competence and willingness of the supplier to serve the customer's needs. As such the customer's trust will increase.

Hypothesis 1:

Higher employment of internal information technology on the supplier-side leads to higher customer's trust.

A second measure of relationship atmosphere is customer's commitment, which is defined as the durable intention by the customer to develop and sustain the relationship with the supplier in the long term (Anderson and Weitz, 1992; Moorman, Zaltman and Deshpandé, 1992, p. 316). Customer's commitment can be described along four dimensions: loyalty, willingness to make short-term sacrifices, long-term orientation, and willingness to invest in the relationship (Anderson and Weitz, 1992; Ganesan, 1994; Geyskens, Steenkamp, Scheer and Kumar, 1996; Gundlach, Achrol and Mentzer, 1995).

Supplier's investments in internal information technology are investments in the future. They often do not provide short-term pay-off but long-term benefits. The customer perceives these investments as improvements in product and service quality and delivery. Thus, customers may see information technology related activities on the supplier side as investments in serving the customer better. This perception is often confirmed by lower prices and better services in business practice (Venkatraman and Zaheer, 1990; Mukhopadhyay, Kekre and Kalathur, 1995). Thus, we can expect customers to be committed based on experienced supplier IT investments.

Hypothesis 2:

Higher employment of internal information technology on the supplier-side leads to higher customer's commitment.

As shown in several empirical studies, trust and commitment are not independent from each other in inter-organizational relationships: Trust in a relationship partner has a positive impact on relationship commitment (Ganesan, 1994; Geyskens, Steenkamp, Scheer and Kumar, 1996; Moorman, Zaltman and Deshpandé, 1992; Morgan and Hunt, 1994; Walter, 1998). Therefore, we can include the following hypothesis in our model.

Hypothesis 3:

Higher supplier trust leads to a greater supplier commitment.

Let us now turn to shared information technology. Employment of shared information technology in a relationship requires information technology at both ends, at the supplier and the customer. Realizing an efficient internal information technology system involves establishing the technical infrastructure, allocating resources, assigning responsibilities, and developing expertise on the support side as well as on the user side. 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 information technology solutions.

Hypothesis 4:

Higher employment of internal information technology on the supplier-side leads to higher employment of shared information technology.

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 partners involved become more vulnerable. Therefore, the customer has to be willing to take these risks to engage in shared employment of information systems. Customer's trust reduces feelings of vulnerability (Boon S. D. and Holmes, J. G., 1991). Also, higher level of trust advances a greater information exchange (Zand, 1977), which might establish the need for shared information technology.

Hypothesis 5:

Higher customer trust leads to higher employment of shared information technology.

The implementation of shared information systems is combined with considerably high costs for purchasing the system and training employees. Efficient use of the shared system often makes modifications of major business processes on the supplier side as well as on the customer side necessary. Thus, initial investments are needed for the new technology. During this time, alternative suppliers might be able to supply the same good for lower costs and the relationship is highly sensible for other suppliers to intrude the relationship. As such, shared information technology is only implemented when the partners invest in the relationship, take short-term sacrifices and have a long-term orientation.

Hypothesis 6:

Higher customer commitment leads to higher employment of shared information technology.

Gemünden, Walter and Helfert (1996) have established a basic model of relationship atmosphere and relationship success, which is based on research of the IMP-Group. From the original four components of relationship atmosphere they identified trust and commitment as the only ones, which have direct impact on relationship success. Empirical studies by Morgan and Hunt (1994) and Walter (1998) confirmed these findings. The empirical study by Helfert (1998) reconfirmed the impact of trust and commitment on relationship success.

Empirical findings suggest that partners trust each other in successful relationships (e.g., Mohr and Spekman, 1994; Moorman, Zaltman and Deshpandé, 1992; Morgan and Hunt, 1994). The customer's belief in the supplier's honesty, goodwill, and competence can serve as the basis for the customer to share innovation-related and market-related information and to offer a customer access to important actors. Also it could be the basis for single source agreements as the customer does not feel to be at risk. Therefore, customer's trust increases direct and indirect value creation (Walter and Ritter, 2000).

In addition to trust, commitment has been identified as an important antecedent for successful inter-organizational relationships (Dwyer, Schur and Oh, 1987; Gundlach, Achrol and Mentzer, 1995; Morgan and Hunt, 1994). Committed customers will offer more value to their suppliers as their contribution to the on-going relationship. Mohr and Spekman (1994) have shown the positive impact of customers' commitment on sales (i.e. direct functions). Also indirect functions are likely to be fulfilled (such as collaborative innovation development) when partners are committed (Walter, Ritter and Gemünden, 1999).

Hypothesis 7:

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

Hypothesis 8:

Higher customer commitment 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 overcoming problems of distance and time-inhomogeneity. In addition to just 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) even says that "...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 and time for interactions is freed up as routine tasks are taken over by shared information technology systems.

Hypothesis 9:

Higher employment of shared information technology leads to higher value creation in the relationship.

Internal use of information technology on the supplier side of a customer-supplier relationship 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. It also allow a supplier to process innovations efficient which in turn could be rewarded from the customer through more involvement in new product development, more sales volume or further access to information. Therefore, suppliers may achieve more value form their customer relationships through internal efficiencies caused by employing information technology.

Hypothesis 10:

Higher employment of internal information technology leads to higher value creation in the relationship.

Figure 3 illustrates the conceptual model of this study.

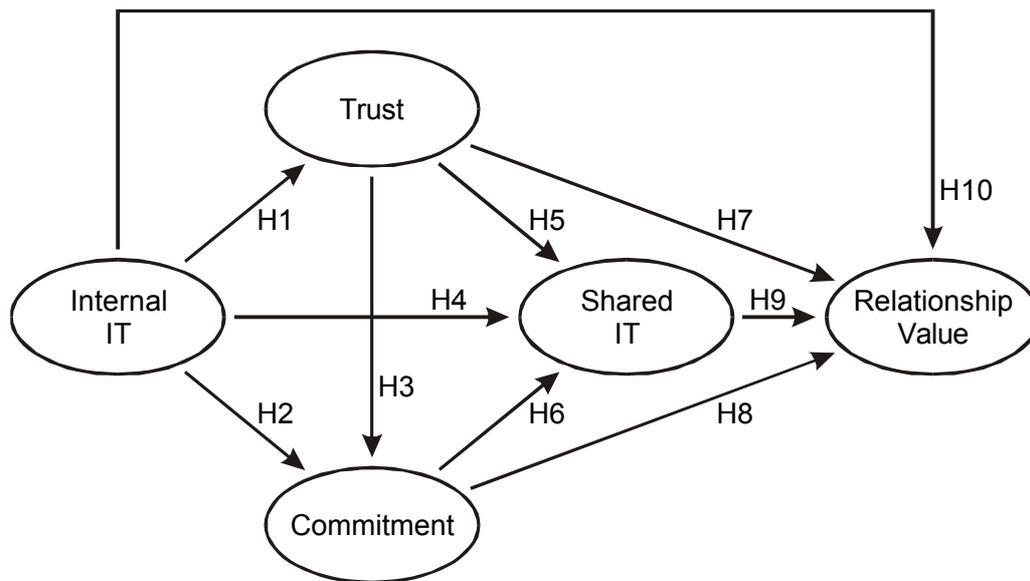


Figure 3: Conceptual model of this study

Structure of the Empirical Study

Data Collection

In order to get some empirical evidence for our conceptual model a database of 2,000 companies was used to select respondents. The initial information fax described the subject of the study and requirements for respondents. The second page of the fax was a form for the organization to indicate their willingness to participate or not and to name a contact person if different from the person of initial contact. 162 companies showed interest in participating in this study. These firms received the standardized questionnaire either via mail or could download the questionnaire in pdf-format from the study's web page. Overall 60 questionnaires were completed.

As already mentioned before, the focus of this study was not on a specific industry group, company size or type. The goal was to gain an initial and general understanding of the impact of IT. The participating industries are building and constructing (13), food (4), information technology (4), mechanical engineering (6), metal processing (5), services (8), trade (10), transportation (4), and others (6). The company-sizes (number of employees) are distributed corresponding to the following data: 1-50 employees (16), 51-100 employees (12), 101-150 employees (7), 151-200 employees (4), 201-300 employees (4), 301-500 employees (2), and more than 500 (4). The average number of employees is 244. Concerning the companies' age the study shows the following distribution: 0-25 years (16), 26-50 years (15), 51-75 years (13), 76-100 years (6), 101-125 years (7), and more than 125 years (2) The average company age is 61 years.

Operationalization

All constructs were measured by multiple items. Items were to be answered on a seven-point Likert-type rating scale. The seven steps are represented by the numbers 1 to 7. Corresponding items for one construct were tested for reliability and consistency. We demand Item-to-Total correlations above 0.30 and Cronbach's Alpha values above 0.6 for this study. The factor analysis for each measurement of the subconstructs was demanded to result in only one factor explaining more than 50% of the variance. In case all requirements are satisfied, the items of the subconstructs were aggregated by calculating the scale mean. After

aggregating the items, the subconstructs of each construct were tested again using the same criteria. The subconstructs satisfying the requirements were condensed in one measure for each construct by calculating the mean.

Table 3 provides an overview of the scales (the corresponding items are listed in the appendix).

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)	.72 - .88	.92	80.9	.64	.79	71.4
	Communication (4)	.65 - .77	.85	69.2	.57		
	Decision support (4)	.60 - .77	.84	68.6	.71		
Shared IT 1	Information management (4)	.52 - .78	.84	68.8	.47	.74	66.3
	Communication (4)	.58 - .75	.84	68.2	.50		
	Decision support (4)	.48 - .79	.83	67.0	.75		
Shared IT 2	Insight and control: our side (4)	.47 - .56	.83	67.6	.40	.57	70.1
	Insight and control: customer's side (4)	.51 - .73	.80	62.4	.40		
Trust	Benevolence (4)	.45 - .56	.70	53.6	.52	.74	67.0
	Competence (2)	.61 - .61	.72	80.5	.56		
	Direct measure (1)	-	-	-	.68		
Commitment	Loyalty (2)	.50 - .50	.66	74.8	.57	.77	60.9
	Short-term sacrifices (3)	.49 - .58	.70	62.7	.60		
	Long-term orientation (2)	.50 - .50	.66	75.2	.62		
	Investments (2)	.63 - .63	.77	81.7	.57		
Direct Value Functions	Volume (3)	.37 - .65	.64	59.4	.46	.62	72.8
	Profit (2)	.59 - .59	.74	79.6	.46		
Indirect Value Functions	Innovation (2)	.73 - .73	.85	86.7	.41	.67	50.4
	Market (2)	.76 - .76	.86	87.8	.48		
	Access (1)	-	-	-	.44		
	Scout (1)	-	-	-	.48		

Table 3: Construct measurements

Table 3 shows that all but one measurements meet the given requirements. Even though the measurement of shared IT 2 undercuts the 0.60 limit for Cronbach's alpha, we will still use this construct based on the fact that all other criteria are satisfied.

Results

In order to analyze hypotheses 1 and 2, we performed a regression analysis, which is shown in table 4. As expected internal information technology is positively related to trust and commitment. The low explanatory power of internal information technology is also very much expected because a firm's internal information technology use is only one of many inputs into customer's trust on the relationship level. Other important antecedents would

include management task performance and personnel qualifications (Helfert and Vith, 1999; Walter, 1999) as well as adaptations (Brennan and Turnbull, 1997; Hallén, Johanson and Seyed-Mohamed, 1991).

Dependent variable	Standardized coefficient	β	R^2	F-value
Trust	.243*	5.9		3.505*
Commitment	.214*	4.6		2.741*
Independent variable: Internal IT				
* $p < .10$, ** $p < .05$, *** $p < .01$				

Table 4: Results of the regression analysis with shared IT 1 as dependent variable

A correlation analysis with the two variables trust and commitment confirmed our hypothesis H3. These variables show a highly significant correlation (correlation .508, significance .000).

The following two tables show the results of the regression analysis, which we carried out in order to test the hypotheses H4, H5, and H6.

	Standardized coefficient	β	R^2	F-value
Internal IT	.492***	30.1		5.307***
Trust	-.084 ^{n.s.}			
Commitment	.195 ^{n.s.}			
Dependent variable: Shared IT 1				
* $p < .10$, ** $p < .05$, *** $p < .01$				

Table 5: Results of the regression analysis with shared IT 1 as dependent variable

	Standardized coefficient	β	R^2	F-value
Internal IT	.303*	21.0		3.272**
Trust	.008 ^{n.s.}			
Commitment	.265 ^{n.s.}			
Dependent variable: Shared IT 2				
* $p < .10$, ** $p < .05$, *** $p < .01$				

Table 6: Results of the regression analysis with shared IT 2 as dependent variable

In both cases it becomes clear that a major impact on the shared use of information technology comes from the internal use (H4). It appears that shared information technology use is not a function of trust (H5) and commitment (H6). Firms, which use information technology inside the company, are likely to use it within relationships as well. Therefore, we can assume that it is the experience in handling information technology as well as the investments already made in information technology systems, which most determines the use of information technology in relationships.

The following two tables show the results of the regression analysis for testing the hypotheses H7, H8, H9, and H10.

	Standardized coefficient	β R^2	F-value
Internal IT	-.123 ^{n.s.}	66.3	13.364** *
Shared IT 1	.003 ^{n.s.}		
Shared IT 2	.132 ^{n.s.}		
Trust	.262**		
Commitment	.632***		

Dependent variable: Direct Value Functions
* $p < .10$, ** $p < .05$, *** $p < .01$

Table 7: Results of the regression analysis with direct value functions as dependent variable

	Standardized coefficient	β R^2	F-value
Internal IT	.079 ^{n.s.}	30.1	2.929**
Shared IT 1	-.069 ^{n.s.}		
Shared IT 2	-.168 ^{n.s.}		
Trust	.373**		
Commitment	.296*		

Dependent variable: Indirect Value Functions
* $p < .10$, ** $p < .05$, *** $p < .01$

Table 8: Results of the regression analysis with indirect value functions as dependent variable

Our analyses show that information technology has no significant impact on value creation in the observed business relationships. As such we found no support for our hypotheses 9 and 10. We therefore cannot say that more extensive use of information technology will lead to higher value creation for the supplier. The two important input factors for a successful relationship are trust (H7) and commitment (H8). Only if the customer trusts the supplier and is committed to him, the customer is willing to allow more value creation for the supplier.

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

- Firstly, we have only a limited database. We gathered data from 60 firms, which allow us to have produce initial results on this highly debated issue.
- Secondly, the data come from a diverse set of firms. Our attempt was to gain an overview of the situation and not to analyze industry-specific issues. However, across industries the use of information technology seems to be quite different.
- Thirdly, we had to develop new measures for the use of information technology in relationships. The fit criteria indicate that we have put together a valid set of items. But further studies need to validate our measures in other settings.
- Fourthly, we were particularly interested in the supplier's point of view. Therefore, we have gathered information about the supplier's firm and its view on the relationship. But obviously, the use of information technology in a relationship is determined by both the supplier and the customer. We should therefore include more data about the customer's use of information technology in further studies.

Discussion and Outlook

The existence of information technology in an organization or a relationship does not guarantee the creation of additional value. As seen, trust and commitment show 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. Also our results suggest that the implementation of information technology in a relationship is more determined by the technology inside the firm than the relationship atmosphere variables. As such it seems that our approach of introducing information technology into a relationship model was rejected by the data. This, however, stands in contrast to our experiences within firms where frequently trust and commitment are stated as the key preconditions for information technology applications in relationships.

A possible answer to 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 "information technology innovators" have implemented shared information technology systems up to date. This would explain why internal IT determines shared IT employment rather than trust and commitment. As technology spreads out and becomes more understood and available, other firms might implement information technology by as well.

A similar argumentation 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 even have made fatal mistakes by implementing it into the "wrong" relationships. These possibilities might blur our results. Furthermore, IT carries also the danger of impersonalizing relationships, which in turn could lead to reduced trust, commitment and value-creation. Again it would be a matter of wrong application.

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

- How do the users deal with information technology? We measured mainly what the supplier does with the information technology at hand. It would be very insightful to analyze user expertise and user attitudes towards IT and the impact of those constructs on IT employment and value creation in a relationship.
- What factors foster the employment of information technology in relationships? In our study we looked at supplier's internal IT systems, customer's trust and commitment as an input factor for IT employment in the relationship. However, there are other factors, which contribute to IT employment. Firstly, the counterpart perspectives, namely customer's internal IT, supplier's trust and commitment. We therefore should move from a supplier perspective to a mutual understanding and analysis of the relationship. Secondly, 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. In contrary, where highly customized products are developed, IT might only help to arrange meetings.
- What factors foster the employment of information technology 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 information technology employment plays and how top management support impacts on IT.

- Under which conditions does the developed model hold true? Even though our model has not been fully supported by the data, we still do not want 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 this research 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.

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Appendix

Construct	Indicator (number of items)	Item
Internal IT		To which degree is internal information technology 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 information technology 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
	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 the following statement concerning shared use of information technology with the customer: (1:= strongly disagree; 7:= strongly agree)
	Insight and control: our side (4)	Shared information technology gives us insight into the customer's data Shared information technology gives us insight into the customer's processes Shared information technology allows us to control the customer's processes Shared information technology gives us insight into the customer's know-how
	Insight and control: customer's side (4)	Shared information technology gives the customer insight into our data Shared information technology gives the customer insight into our processes Shared information technology allows the customer to control our processes Shared information technology gives the customer insight into our know-how

Construct	Indicator (number of items)	Item
Trust	Benevolence (4)	Please comment the following statements concerning your relationship to this customer: (1:= strongly disagree; 7:= strongly agree)
		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
Competence (2)	Direct measure (1)	This customer tries to take advantage from our relationship without considering our goals
		This customer trusts us when we are conducting services, which he cannot do himself
Commitment	Loyalty (2)	This customer perceives us to be professional and motivated
		This customer trusts us completely
	Short-term sacrifices (3)	Please comment the following statements concerning your relationship to this customer: (1:= strongly disagree; 7:= strongly agree)
		This customer is very loyal to us
	Long-term orientation (2)	This customer feels highly obligated to us
		This customer would not conduct business with others for our disadvantage
Investments (2)	This customer is willing to accept temporary disadvantages for maintaining our relationship	
	To this customer, our relationship is more important than short-term profit	
Direct Value Functions	Volume (3)	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
	Profit (2)	This customer is willing 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
Indirect Value Functions	Innovation (2)	To which degree do you achieve the following goals with this customer? (1:= not at all; 7:= completely)
		High turnover with this customer
	Market (2)	Continuous turnover of products with this customer
		Increasing turnover in this customer relationship
	Access (1)	High profit margins with this customer
Scout (1)	Constant profit margins with this customer	