The Role of IT in Customer Satisfaction in Inter-Organizational Relationships

Thomas Ritter (corresponding author)
Department of International Economics and Management
Copenhagen Business School
Howitzvej 60
DK – 2000 Frederiksberg, Denmark
Tel (direct): +45 3815 2532
Tel (secretary): +45 3815 2515
Fax: +45 3815 2500
Email: tr.int@cbs.dk

Thilo A. Müller
Institute of Technology and Innovation Management
Technical University of Berlin
Hardenbergstr. 4 – 5, HAD 29, 10623 Berlin
Tel: +49 30 314 26088
Fax: +49 30 314 26089
Email: thilo.mueller@tim.tu-berlin.de

Hans Georg Gemünden
Institute of Technology and Innovation Management
Technical University of Berlin
Hardenbergstr. 4 – 5, HAD 29, 10623 Berlin
Tel: +49 30 314 26090
Fax: +49 30 314 26089
Email: hans.gemuenden@tim.tu-berlin.de

HANS GEORG GEMÜNDEN, professor, chair of the Department of Technology and Innovation Management at the Technical University of Berlin, Germany.

THILO A. MÜLLER, lecturer for marketing at the department of Technology and Innovation Management at the Technical University of Berlin, Germany.

THOMAS RITTER, associate professor at the Department of International Economics and Management, Copenhagen Business School, Denmark.

Paper submitted to the
17th Annual IMP Conference at the Norwegian School of Management BI,
Oslo, Norway, 9th – 11th September 2001

The Role of IT in Customer Satisfaction in Inter-Organizational Relationships

Abstract

There is an increasing use of modern information technology (IT) in nearly all parts of business life – and inter-organizational relationships are no exemption from this. However the role of IT in relationships is not really understood so far. In this paper we analyze the role of IT in relation to customer satisfaction in business-to-business relationships. We argue that the way in which a customer is treated IT-wise will influence the way the customer is satisfied with a supplier. However, IT satisfaction is assumed to be only one part of the overall satisfaction besides other satisfaction dimensions such as product and service. An empirical study of 131 supplier-customer relationships reveals that IT satisfaction is a separate dimension of the overall satisfaction. Furthermore IT satisfaction has a positive impact on perceived relationship value and trust. The degree of IT use and supplier's IT know-how are identified as important antecedents of customer's IT satisfaction. Overall, IT satisfaction is an important influencer of inter-organizational relationships. Managerial implications and further research questions are discussed at the end of the paper.

INTRODUCTION

In the recent past, customer satisfaction has attracted a lot of interest based on findings that satisfied customers are the key to repeat sales, positive word of mouth and customer loyalty, thus leading to a strong competitive position, higher market share and profit (Bearden and Teel, 1983; Fornell, 1992; Fornell et al, 1996). This research stream has mainly applied the concept to consumer goods and services (an overview is given by Oliver, 1996). Recently, customer satisfaction has been introduced into business market research (e.g. Tikkanen, Alajoursijärvi and Tähtinen 2000, Walter, Müller and Helfert 2000) especially as part of the relationship quality construct (Crosby, Evan and Cowles 1990, Naude and Buttle 2000, Wilson and Jantrania 1996). Homburg and Rudolph (2001) developed a measurement tool for customer satisfaction in industrial markets based on an international sample of over 1600 responses.

Another research stream discussed the impact of information technology (IT) on management. Of particular interest for our study is research undertaken in business-to-business settings. Hereby, it has been argued that information technology has an unclear relation to success of business relationships as it can have positive and negative effects (e.g. Angeles, Nath and Hendon 1998).

However, the two streams have not been combined so far. This is surprising as it can be expected that the way in which IT is used in a relationship will influence the customers' satisfaction with a given supplier. Therefore, in this article we focus on customers' satisfaction with information technology used in the relationship with a supplier. Hereby, we are interested in three issues: Firstly, in what relation does IT satisfaction stand with the other suggested satisfaction dimensions? Secondly, what impact has IT satisfaction on key relationship variables? And finally, what are the drivers of IT satisfaction?

The paper is organized as follows. In the next part we introduce theoretical concepts used in this research and also develop hypotheses of how these constructs are related to each other. Thereafter, we present results form an empirical study. Finally, managerial implications and further research questions are discussed.

THEORETICAL CONSTRUCTS AND HYPOTHESES

Customer Satisfaction

Customer satisfaction has attracted considerable attention in the last two decades (cf. Anderson and Sullivan 1993, Churchill and Suprenant 1982, Oliver and DeSabro 1988). Customer satisfaction is defined as the degree to which a supplier meets a customer's expectations (Homburg and Rudolph 2001). Due to the existence of relationships in business markets customer satisfaction "should be understood as a *relationship-specific* rather than a *transaction-specific* construct" (Homburg and Rudolph 2001, p. 16). Even though there is a tendency towards a cumulative view of satisfaction, i.e. to evaluate the general level of satisfaction based on all experiences with a firm (Garbarino and Johnson 1999, Sharma, Niedrich and Dobbins 1999) there have also been attempts to establish the different factors which constitute and contribute to the overall judgment. It has been argued that customer satisfaction is a multi-factorial construct. Based on the results from Homburg and Rudolph (2001) we use five satisfaction factors in this study: Satisfaction with products, order processing, complaint management, technical service, and salespeople.

Customer IT Satisfaction

The term information technology "includes computer hardware, software, and communication systems, as well as the personnel and resources dedicated to supporting these capabilities" (Ozer 2000, p. 388). This definition goes further than information technology as "software and/or hardware that can transform, store or transmit information at rapid speeds" (Good and Stone 2000 based on Gerstein 1987).

In recent years information technology has entered nearly all areas of life and business relationships are no exemption from this. As such information technology becomes part of the interaction between suppliers and customers and therefore, both sides will be satisfied or not with the employed IT. Even in cases where no IT is used in a relationship the two firms will have an expectation about the "ideal" state. The IT side of business relationships will influence the way in which the partners deal with each other and therefore, we strongly believe that IT satisfaction will have in influence on a customer's overall satisfaction.

Hypothesis 1: IT satisfaction contributes to the customers' overall satisfaction with a supplier.

However, there are no experiences about how IT satisfaction will influence overall customer satisfaction. We will explore the relation between IT satisfaction and customer satisfaction rather then developing a hypothesis about the conceptualization here. There are three possibilities which we can explore (see figure 1):

- Firstly, as IT is new and somewhat different from existing interaction tools it could be that IT satisfaction is a new dimension of satisfaction. In other word, overall satisfaction becomes a second-order construct with traditional customer satisfaction and IT satisfaction as dimensions.
- Secondly, IT could be a new factor of satisfaction that stands on the same level as the suggested satisfaction factors. This would mean that customer satisfaction remains a one-dimensional constructs as suggested by Homburg and Rudolph (2001).
- Thirdly, IT satisfaction is a cross-factorial phenomena which does not establish it's own factor but is incorporated into the existing factors as it changes the way in which all activities are performed.

==========
Insert figure 1 about here
==========

Customer Trust

Trust has been confirmed as one of the most important constructs in business relationships (cf. Crosby, Evans and Cowles 1990, Garbarino and Johnson 1999, Helfert and Gemünden 1998, Mohr and Spekman 1994, Moorman, Zaltman and Despandé 1992, Morgan and Hunt 1994, Schurr and Ozanne 1985, Smith and Barclay 1993, Wilson 1995). Summarizing various conceptual approaches, Walter, Müller and Helfert (2000) define "customer trust as the customer's belief in the supplier's benevolence, honesty and competence to act in the best interest of the relationship in question."

Satisfaction serves as the basis for trust because it offers the customer a positive past experience on which trust can be build (Ganesan 1994, Geyskens, Steenkamp and Kumar

1996). This effect has been empirically supported by Walter, Müller and Helfert (2000). We believe that the same stands true for customer IT satisfaction: If the customer has experienced that the supplier is willing and able to use IT in the relationship in a reliable and predictable way, i.e. the customer is perceiving high customer IT satisfaction, he or she is more likely to trust in the supplier.

Hypothesis 2: The higher a customer's IT satisfaction in the relationship, the higher is the customer's trust.

Customer Relationship Value

Value has been discussed as a new way of analyzing and understanding business markets (Anderson and Narus 1998). Hereby, several contributions have been made in terms of the construct itself, its antecedents and its consequences (Ravald and Grönross 1996, Grönross 1997, Walter, Ritter and Gemünden 2001). In general, value refers to "the trade-off between benefits and sacrifices perceived by a customer, regarding all aspects of the business relationship with a supplier" (Walter, Müller and Helfert 2000).

Given that value is a perception of benefits and sacrifices we argue that satisfied customers are likely to evaluate a relationship better, i.e. the difference between benefits and sacrifices is higher. Indeed, studies show that customer satisfaction lead to stronger buyer-seller relationships (Walter, Müller and Helfert 2000). The same logic can be applied to IT satisfaction: If the customer is satisfied with the IT solution in the relationship he or she is likely to include this satisfaction into his or her value judgment of the relationship.

Hypothesis 3: The higher a customer's IT satisfaction in the relationship, the higher is the customer's perceived relationship value.

IT use

We define IT use as the degree to which IT is employed in a relationship. Even though we have seen rapid developments in the IT use in relationships we are still in an introduction and experimental phase in which no all relationships employ IT and where not all IT solutions used are somewhat optimal. Therefore we can expect a large variation in use and satisfaction. However, we can expect that only if things have actually changed

in the relationship, the customer will be satisfied (presuming that the change was positive). Also, as IT solutions are introduced over time it is very likely that an intensified use of IT will accumulate experience about when and how to use IT which also leads to higher satisfaction. Such an effect has been shown with electronic data exchange systems (EDI where the level of EDI implementation significantly predicted customer's perception of the overall success of the EDI system (Angeles, Nath and Hendon 1998).

Hypothesis 4: The higher IT use in the relationship, the higher IT satisfaction.

IT know-how

The construct IT know-how captures the degree of knowledge, expertise and skills a firm has. The IT solutions used in the relationship have to be implemented and maintained by the two firms involved. This requires some expertise and knowledge, which enables the firms to actually implement the solutions, to use them professionally and to solve problems efficiently. As we are analyzing dyadic relationships we believe that IT know-how from both sides will make it easier to establish a suitable solution all are satisfied with.

Hypothesis 5: (a) The higher IT know-how of the supplier, the higher IT satisfaction.
(b) The higher IT know-how of the customer, the higher IT satisfaction.

Our hypotheses are summarized in figure 2.

==========
Insert figure 2 about here
==========

EMPIRICAL STUDY

Data Collection

Data were collected in the U.K. in December 2000. Respondents reported on one relationship with a supplier of their choice. The only restriction was that the supplier must be the producer of the product so that we do not have distributors in the sample. Overall, 132 questionnaire were filled in. The average firm in the sample made £70mio turnover in 1999, has 550 employees and spent £90,000 in information technology in

1999. The suppliers employed typically 200 people. The relationships started on average 7 to 8 years ago and the respondents were typically involved in the relationships for between 2 and 4 years. In the relationship 5 persons form the customer and 6 persons form the supplier were typically involved.

Measures

In this study all constructs are measured using seven point multiple-item scales (see appendix A for a complete list of items). Due to the size of the dataset we used traditional psychometric approaches to evaluate the scales. Each scale was tested for reliability and validity using Cronbachs alpha, item-to-total correlations and factor analysis. Hereby, we employed the generally used cut-off values of .70 for Cronbachs alpha, .30 for item-to-total correlations and 50 percent explained variance of the first factor (Homburg and Giering 1996, Kumar, Scheer and Steenkamp 1993, McAllister 1995).

For the measurement of *customer satisfaction*, Homburg and Rudolph (2001) suggest a seven factor model evaluating a customer's satisfaction with products, salespeople, product-related information, order handling, technical service, interaction with internal staff, and compliant handling. Based on their finding that product-related information and interaction with internal staff (not salespeople) are of lesser importance we concentrated on the reminding 5 factors. For each factor a selection of the original items was used. All scales were tested using Cronbach's alpha and factor analysis with satisfactory results (see appendix A).

Satisfaction with the information technology (IT satisfaction) employed in the relationship was measured with 11 items. These items capture various areas in which IT can potentially be used in relationships, e.g. information management, communication, coordination, and go across all five satisfaction factors discussed earlier. Also this scale shows acceptable reliability and validity.

In addition to the individual factors of satisfaction, *overall customer satisfaction* was measured using a 4-item scale. This scale evaluates the general satisfaction of the customer with the supplier in relation to their expectations and ideal state of affairs. Cronbach's alpha (= .87) and factor analysis (71,2 percent explained variance) indicate an acceptable fit of the scale.

The *customer's trust* was measured by the 5 items used by Walter, Müller and Helfert (2000). These items are based on scales from Kumar, Scheer and Steenkamp (1995) and Ganesan (1994) and relate to honesty, benevolence, and competence of the supplier. This scale was found reliable in accordance to findings in the other studies (Cronbachs alpha = .76., explained variance = 53.3%).

In general, *customer relationship value* is regarded as the trade-off between benefits and sacrifices (Anderson and Narus 1998, Ravald and Grönross 1996, Walter, Ritter and Gemünden 2001, Wilson 1995). We used the 4 item scale suggested by Walter, Müller and Helfert (2000) relating to different aspects of this trade-off (Cronbach's alpha = .85, explained variance = 69.7%).

IT know-how was measured both for the supplier and the customer. In both cases, two items were used which relate the IT know-how to the state-of-the-art and to competitors. Furthermore, one item measured the extent to which the firm is developing own solutions when standard solutions fail to meet requirements. These two scales show sufficient Cronbach's alphas (.77 for the customer and .87 for the supplier) and factor analysis results (69.7% and 79.7% explained variance).

The *use of IT* in the relationship under question was measured with 4 items. These items are designed to evaluate to which degree IT has had an impact on the relationship. The four items can be summarized as Cronbach's alpha is .82 and the factor analysis resulted in one factor explaining 65.6% of variance.

Results

IT Satisfaction and Customer Satisfaction

All items measuring satisfaction were entered into a factor analysis. The result shows clearly a six factor solution based on Kaiser's criteria (see appendix A): five factors are identical to the suggested factor structure by Homburg and Rudolph (2001). The six factor includes all IT satisfaction items. Therefore, we can conclude that satisfaction with IT build a separate factor and is not a cross-factorial phenomena.

In order to analyze customer satisfaction further we calculated the mean of all items for each factor and entered these values into a further factor analysis. This analysis resulted in a single factor solution suggesting that all factors can be combined to one construct

(see table 1). However, factor loading for IT satisfaction is very low. Also Cronbach's alpha indicates that the IT satisfaction factor has some problems in the scale even though no threshold value is violated: item-to-total correlation for IT satisfaction is just above the recommended limit of .30 and Cronbachs alpha can be increased by taking IT satisfaction out of the scale. This result supports two possibilities, i.e. IT could be a factor or a new dimension. It is too early to draw final conclusions on this matter as it warrants further investigations.

==========
Insert table 1 about here
==========

In addition to the above analyses we performed a regression analysis with overall customer satisfaction as dependent variable and the six satisfaction factors as independent variables. The results as reported in table 2 support our idea that every factor contributed to the overall evaluation. It is interesting to note that IT satisfaction has the lowest impact on the overall evaluation.

==========
Insert table 2 about here
==========

Antecedents of IT Satisfaction

In terms of antecedents, degree of IT use and IT know-how of the supplier and the customer were analyzed with the following results (see table 3):

- IT satisfaction increases with the degree to which the use of IT has changed relationship management. If IT use was seen as a means to change the relationship satisfaction is the result.
- The IT know-how of the supplier is a positive contributor to IT satisfaction as well. Customer feel more satisfied with suppliers which have state of the art IT technology and high standing experiences regarding IT.
- The customer's IT know-how has a non-significant impact on his IT satisfaction. Besides a positive correlation of the two constructs it shows no impact in the

regression analysis. This might be based on two interpretations: On one hand, IT knowledgeable customers are able to establish an IT solution which satisfies them. On the other hand, customers with high IT know-how know what they can get and thus, are more difficult to satisfy. Finally, it is also possible that the customer just no blames him- or herself if IT related things are dissatisfactory.

==========
Insert table 3 about here
==========

Impact of IT Satisfaction

Two potential results of IT satisfaction have been discussed: Trust and relationship value. In order to analyze the impact of IT satisfaction on these two variables regression analyses were used. The results are reported in table 4.

==========
Insert table 4 about here
==========

As we can see IT satisfaction contributed to trust and relationship value in a relationship. We can therefore conclude that IT satisfaction shows the same impacts like other satisfaction factors. Even more important, IT satisfaction adds towards the explanation of these key relationship variables as it has a significant impact besides “traditional” satisfaction. As such IT may get more attention in the future as a means to increase customer satisfaction.

DISCUSSION AND OUTLOOK

The results of this study underline the importance of IT and customer’s satisfaction with IT in two ways. Firstly, we have shown that customers include their satisfaction with IT into their overall satisfaction judgment. Secondly, customer’s IT satisfaction has an impact on customers trust and perceived relationship value. This impact is an additional one to the impact of the already established satisfaction factors. As such, underperformance in the IT area can have negative effects not only on satisfaction itself

but on the relationship itself. Furthermore, results indicate the two antecedents are important: the degree of IT use and the supplier's IT know-how. We can conclude that first of all IT needs to be important in the relationship in order to contribute to satisfaction. Even more important is the result that suppliers need IT know-how to satisfy their customers. Interestingly, the customer's IT know-how shows an insignificant impact on IT satisfaction. It seems to be that customers do not blame their own inabilities when problems arise. Or – on the contrary – IT knowledgeable customers are harder to satisfy and easier to dissatisfy.

From a managerial perspective, this study allows some implications. First and most importantly, IT matters. The way in which IT is handled in the relationship has an impact on the customer's evaluation of the relationship. As such a pure concentration on the offering and the traditional interaction with the customer is not sufficient. It appears that suppliers have to care about the IT solutions they offer to their customers in their relationships because this determines their satisfaction level.

Secondly, suppliers need to develop experiences with IT in relationships in order to offer suitable solutions and to increase customer satisfaction. This is a complex and complicated task as experiences are rare. But it could prove as a competitive advantage in the future if firms develop IT expertise early. It is also important for suppliers to note that blaming the customer's inability to establish IT in the relationship will not lead to any success as customers do not take this into consideration when determining their satisfaction.

This study also poses some further research questions. As mentioned earlier our results on the nature of IT satisfaction within the overall customer satisfaction was inconclusive to the extent that our data only partly suggested IT satisfaction as a new dimension or a new factor. Further data should be collected to analyze this matter.

As we are still in the introduction phase of IT in relationships we also suggest to analyze IT satisfaction at a later time – say 2 years – in order to detect any changes which might occur along with IT developments. On the point it might be interesting to study new economy firms as opposed to old economy firms in our study. Due to their IT openness and IT expertise there might be differences in the way they perceive IT satisfaction.

Overall we are convinced that IT and its role in inter-organizational relationships will stay on the agenda. This topic will co-evolve with the discussion of the role of e-trade platforms which will also change relationships and networks.

ACKNOWLEDGEMENT

The authors wish to thank Dr. Achim Walter for his conceptual input. The financial support from The British Council and the German Academic Exchange Service (DAAD) is gratefully acknowledged.

REFERENCES

Anderson, Eugene W. and Mary W. Sullivan (1993), "The Antecedents and Consequences of Customer Satisfaction for Firms," Marketing Science, 12 (2), 125-143.

Anderson, James C. and James A. Narus (1998), "Business Marketing: Understand What Customers Value," Harvard Business Review, 76 (6), 53-61.

Angeles, Rebecca, Ravinder Nath, and Donald W. Hendon (1998), "An Empirical Investigation of the Level of Electronic Data Interchange (EDI) Implementation and its Ability to RPedict EDI System Success Measures and EDI Implementation Factors," International Journal of Ohysical Distribution & Logistics, 28 (9/10), 773-793.

Bearden, W. O. and J. E. Teel (1983), "Selcted Determinants of Consumer Satisfaction and Complaint Reports," Journal of Marketing Research, 20 (February), 21-28.

Churchill, Gilbert A. and Carol Suprenant (1982), "An Investigation into the Determinants of Customer Satisfaction," Journal of Marketing Research, 19 (November), 491-504.

Crosby, Lawrence A., Kenneth R. Evans, and Deborah Cowles (1990), "Relationship Quality in Service Selling: An Interpersonal Influence Perspective," Journal of Marketing, 54 (July), 68-81.

Fornell, C. (1992), "A National Customer Satisfaction Barometer: The Swedish Experience," Journal of Marketing, 56 (January), 6-21.

Fornell, C., M. D. Johnson, E. W. Anderson, J. Cha, and B. E. Bryant (1996), "The American Customer Satisfaction Index: Nature, Purpose and Findings," Journal of Marketing, 60 (October), 7-18.

Ganesan, Shankar (1994), "Determinants of Long-Term Orientation in Buyer-Seller Relationships," Journal of Marketing, 58 (April), 1-19.

Garbarino, Ellen and Mark S. Johnson (1999), "The Different Roles of Satisfaction, Trust, and Commitment in Customer Relationships," Journal of Marketing, 63 (2), 70-87.

Gerstein, M. S. (1987), The Technology Connection. Reading MA.: Addison-Wesley.

Geyskens, Inge, Jan-Benedict E.M. Steenkamp, Lisa K. Scheer, and Nirmalya Kumar (1996), "The Effects of Trust and Interdependence on Relationship Commitment: A Trans-Atlantic Study," International Journal of Research in Marketing, 13 (4), 303-317.

Good, David J. and Robert W. Stone (2000), "The Impact of Computerization on Marketing Performance," Journal of Business and Industrial Marketing, 15 (1), 34-56.

Grönross, Christian (1997), "Value-Driven Relational Marketing: From Products to Resources and Competencies," Journal of Marketing Management, 13, 407-419.

Helfert, Gabi and Hans Georg Gemünden (1998), "Relationship Marketing Team Design: A Powerful Predictor for Relationship Effectivenenss.,". Atlanta.

Homburg, Christian and Annette Giering (1996), "Konzeptualisierung und Operationalisierung komplexer Konstrukte - Ein Leitfaden für die Marketingforschung," Marketing - Zeitschrift für Forschung und Praxis, 18 (1), 5-24.

Homburg, Christian and Bettina Rudolph (2001), "Customer Satisfaction in Industrial Markets: Dimensional and Multiple Role Issues," Journal of Business Research, 52 (1), 15-33.

Kumar, Nirmalya, Lisa Scheer, and Jan-Benedict E.M. Steenkamp (1993), "Powerful Suppliers, Vulnerable Resellers, and the Effects of Supplier Fairness: A Cross-National Study.," .

Kumar, Nirmalya, Lisa K. Scheer, and Jan-Benedict E. M. Steenkamp (1995), "The Effects of Supplier Fairness on Vulnerable Resellers," Journal of Marketing Research, 33 (February), 54-65.

McAllister, Daniel J. (1995), "Affect and Cognition-Based Trtust as Foundation for Interpersonal Cooperation in Organizations," Academy of Management Journal, 38 (1), 24-59.

Mohr, Jakki and Robert Spekman (1994), "Characteristics of Partnership Success: Partnership Attributes, Communication Behaviour, and Conflict Resolution Techniques," Strategic Management Journal, 15, 135-152.

Moorman, Christine, Gerald Zaltman, and Rohit Deshpandé (1992), "Relationships Between Providers and Users of Market Research: The Dynamics of Trust Within and Between Organisations.," Journal of Research in Marketing, 29 (August), 314-328.

Morgan, Robert M. and Shelby D. Hunt (1994), "The Commitment-Trust Theory of Relationship Marketing," Journal of Marketing, 58 (Juli), 20-38.

Naude, Pete and Francis Buttle (2000), "Assessing Relationship Quality," Industrial Marketing Management, 29 (4), 351-361.

Oliver, R. L. (1996), Satisfaction: A Behavioural Perspective on the Consumer. New York: McGraw-Hill.

Oliver, Richard L. and Wayne DeSabro (1988), "Response Determinants in Satisfaction Judgements," Journal of Consumer Research, 14 (March), 495-507.

Ozer, Muammer (2000), "Information Technology and New Product Development," Industrial Marketing Management, 29, 387-396.

Ravald, Annika and Christian Gronross (1996), "The Value Concept and Relationship Marketing," European Journal of Marketing, 30 (2), 19-30.

Schnurr, Paul H. and Julie L. Ozanne (1985), "Influences on Exchange Processes: Buyer's Preconceptions of a Seller's Trustworthiness and Bargaining Toughness.," Journal of Consumer Research, 11 (March), 939-953.

Sharma, Subhash, Roland W. Niedrich, and Greg Dobbins (1999), "A Framework for Monitoring Customer Satisfaction: An Empirical Illustration," Industrial Marketing Management, 28, 231-243.

Smith, Brock J. and Donald W. Barclay (1993), "Team Selling Effectiveness: A Small Group Perspective," Journal of Business to Business Marketing, 1 (2), 3-32.

Tikkanen, Henrikki, Kimmo Alajoutsijarvi, and Jaana Tahtinen (2000), "The Concept of Satisfaction in Industrial Markets: A Contextual Perspective and a Case Study from the Software Industry," Industrial Marketing Management, 29, 373-386.

Walter, Achim, Thilo A. Muller, and Gabriele Helfert (2000), "The Impact of Satisfaction, Trust, and Relationship Value on Commitment: Theoretical Considerations and Empirical Results," in IMP Conference, David Ford and Sheena Leek and Pete Naude and Thomas Ritter and Peter Turnbull (Eds.) Vol. CD. Bath.

Walter, Achim, Thomas Ritter, and Hans Georg Gemünden (2001), "Value-Creation in Buyer-Seller Relationships: Theoretical Considerations and Empirical Results from a Supplier's Perspective," Industrial Marketing Management, 30 (4), 365-377.

Wilson, D. and S. Jantrania (1996), "Understanding the Value of a Relationship," Asia-Australia Marketing Journal, 2 (1), 55-66.

Wilson, David T. (1995), "An Integrated Model of Buyer-Seller Relationships," Journal of the Academy of Marketing Science, 23 (4), 335-345.

APPENDIX A: Measures

Customer Satisfaction Factors (1 = strongly dissatisfied, 7 = strongly satisfied)

[A := Cronbach's alpha; EV := explained variance by first factor]

Satisfaction with supplier's **products** (A=.88, EV=81.2)	F1	F2	F3	F4	F5	F6
Reliability of the products (e.g. constant performance, quality)	**.80**	.30				
Operating efficiency of the products (min. rejection rate)	**.81**			.37		
Fulfillment of technical demands	**.71**					
Satisfaction with supplier's **order processing** (A=.93, EV=88.0)						
Estimated delivery dates		**.89**			.31	
Adherence of delivery dates		**.90**		.32	.28	
Management of order process		**.78**			.45	
Satisfaction with supplier's **complaint management** (A=.82, EV=73.6)						
Dealings with complaints not related to products		.30	**.73**			
Accessability of person/department dealing with complaints			**.75**			
Understanding of complaints			**.62**			
Satisfaction with supplier's **technical service** (A=.91, EV=85.0)						
Availability of service		.28		**.76**		
Technical quality of service				**.83**		
Cost-performance ratio of the technical service				**.78**	.34	
Satisfaction with supplier's **salespeople** (A=.87, EV=66.4)						
Frequency of visits from that supplier		.26			**.76**	
Continuity of personnel			.28		**.84**	
Time to react to your visit requests				.28	**.73**	
Relationship managers' knowledge about conditions of product use					**.84**	
Support in solving problems			.29		**.75**	
Satisfaction with **information technology** (A=.97, EV=75.4)						
Supplier's product information on the internet/via email						**.85**
Supplier's service information on the internet/via email						**.87**
Order processing on the internet/via email						**.85**
Complaint possibility on the internet/via email						**.83**
Relationship managers' knowledge about the internet/via email						**.85**
Communication with this supplier via internet and email						**.86**
Scheduling of meetings via internet and email						**.90**
Coordinating product and service exchange via internet and email						**.89**
Coordination innovation activities via internet and email						**.88**
Search for relevant information via internet and email						**.80**
Distribution of relevant information via internet and email						**.92**

Overall Customer Satisfaction (1 = strongly dissatisfied, 7 = strongly satisfied) (Mean = 4.37, SD = 1.40)

- Compared with ideal state of affairs, we are very satisfied with this supplier.
- All in all, we are very satisfied with this supplier.
- Our firm is not totally satisfied with this supplier. (reverse scored)

- Compared with our expectations, we are not satisfied with this supplier. (reverse scored)

IT Use (1:= strongly disagree; 7:= strongly agree) (Mean = 4.42, SD = 1.76)

- IT is intensively used for the communication between both firms.
- IT has been of no use in this relationship. (reverse scored)
- IT is not widely used in this relationship. (reverse scored)
- IT has had minimal influence on how we deal with this supplier. (reverse scored)

Supplier's IT Know-how (1:= strongly disagree; 7:= strongly agree) (Mean = 4.04, SD = 1.71)

- This supplier has state-of-the-art IT systems.
- This supplier develops individual IT solutions if standard solutions fail to meet the requirements.
- Compared with other suppliers, this supplier is very experienced in IT systems.

Customer's IT Know-how (1:= strongly disagree; 7:= strongly agree) (Mean = 4.22, SD = 1.70)

- Our firm has state-of-the-art IT systems.
- Our firm develops individual IT solutions if standard solutions fail to meet the requirements.
- Compared with our competitors, our firm is very experienced in IT systems.

Relationship Value (Mean = 4.83, SD = 1.29)

- Under consideration of all advantages and efforts in this relationship: How do you consider the value of this relationship? (1:=very low value, 7:=very high value)
- The value of this relationship is very high in comparison with relationships to competing suppliers. (1:= strongly disagree; 7:= strongly agree)
- Overall this supplier relationship is very valuable for our firm. (1:= strongly disagree; 7:= strongly agree)
- How high do you rank the value of all products and services purchased from this supplier? (1:=very low, 7:=very high)

Trust (1:= strongly disagree; 7:= strongly agree) (Mean = 4.44, SD = 1.20)

- When making important decisions, the supplier is concerned about our welfare.
- When we have an important requirement, we can rely on the supplier's support.
- We are convinced that this supplier performs its tasks professionally.
- The supplier is not always honest to us. (reverse scored)
- We can count on the supplier's promises made to our firm.

Figure 1: Potential conceptualizations of IT satisfaction as part of overall satisfaction

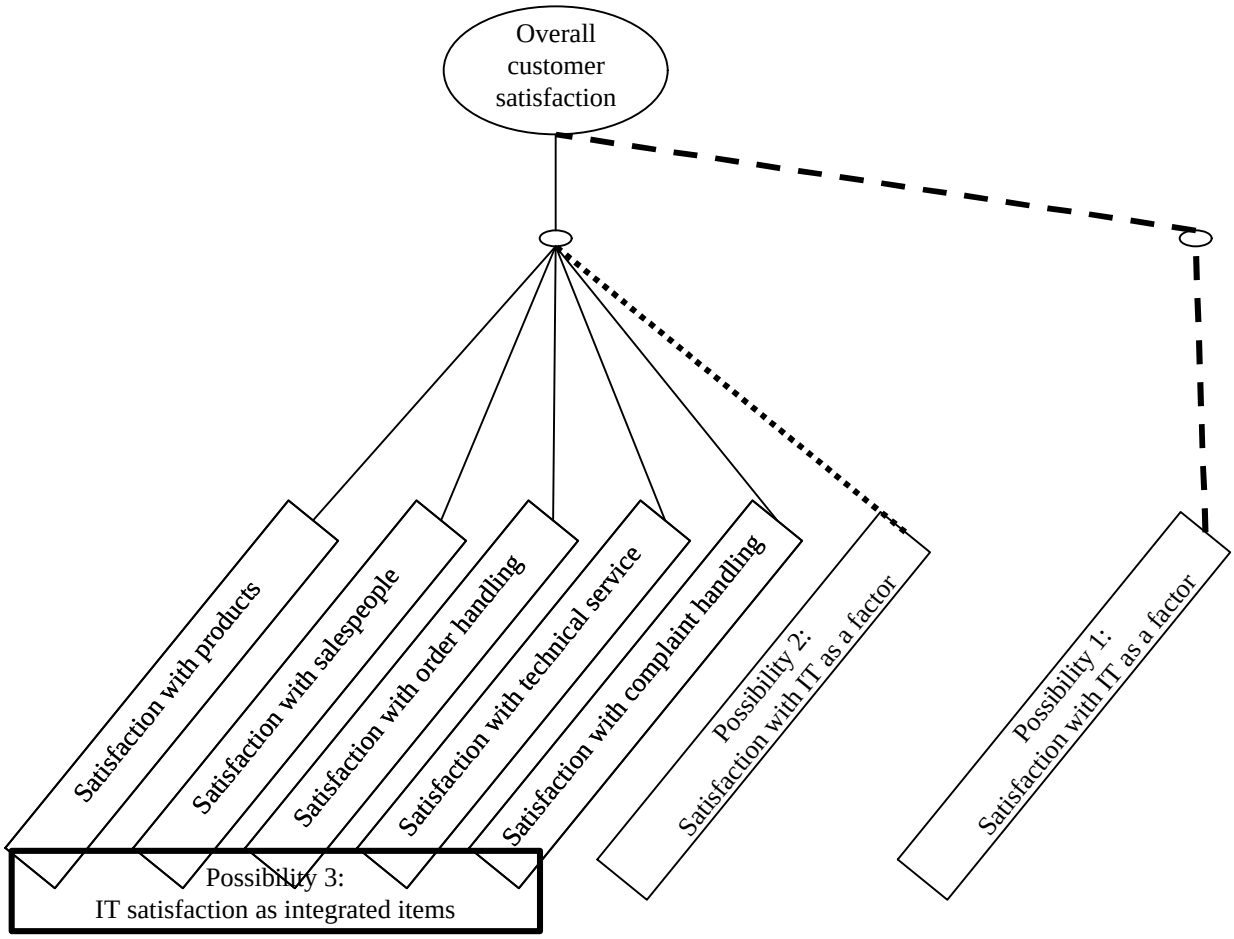

Figure 2: Theoretical framework

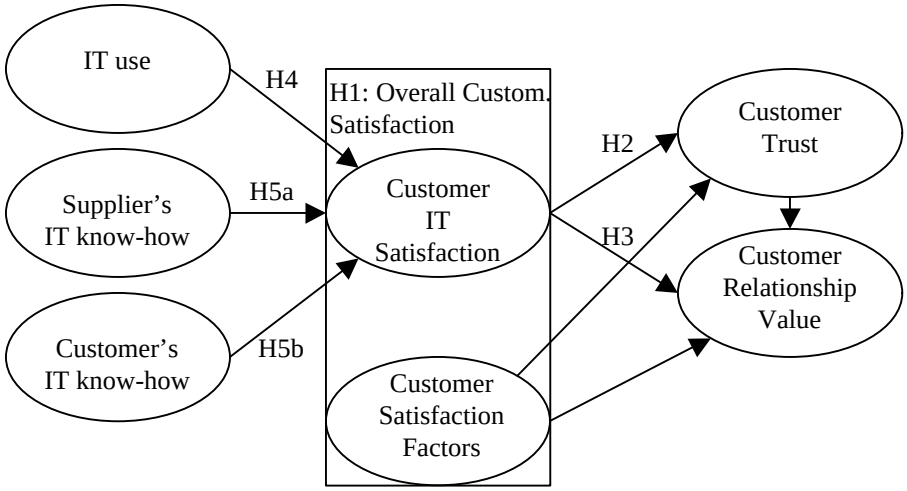

Table 1: Customer satisfaction scale analysis

Factor	**Item-to-total correlation**	**Factor score**
Products	.66	.80
Order	.61	.74
Complaint	.67	.81
Service	.76	.86
Salespeople	.66	.81
IT	.31	.42
	Cronbachs Alpha = .82	Explained variance = 56.9

Table 2: Results of the regression analysis (customer satisfaction)

Dependent variable: Customer Satisfaction **Independent variables**	**Standardized beta coefficient**	**Significance level**
Products	.43	.000
Order	.39	.000
Complaint	.43	.000
Service	.30	.000
Salespeople	.24	.001
IT	.14	.034
	R^2 = 67.8	

Table 3: Results of the regression analysis (IT satisfaction)

Dependent variable: IT Satisfaction **Independent variables**	**Standardized beta coefficient**	**Significance level**
Degree of IT use	.53	.000
Supplier's IT know-how	.22	.008
Customer's IT know-how	-	n.s.
	R^2 = 42.2	

Table 4: Results of the regression analysis (IT satisfaction)

Dependent variable	Trust	Value
Independent variables		
Customer satisfaction factors	.60 (.000)	.34 (.000)
Customer IT satisfaction	.12 (.054)	.11 (.075)
Trust	--	.31 (.000)
	R^2 = 42.9	R^2 = 40.8