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The Importance of Technology Trust for B2B Electronic Commerce

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Abstract

Whereas the traditional notion of trust primarily focuses on trust in a trading partner, trust in e-business also incorporates the notion of trust in the infrastructure and the underlying control mechanisms (technology trust), which deals with transaction integrity, authentication, confidentiality, and non-repudiation. We argue that value creation in B2B e-commerce is heavily dependent on technology trust. Given the absence of adequate metrics to capture the technology trust in B2B e-commerce, this research develops and validates measures for technology trust, captured both as perceived benefits and also as B2B e-commerce performance. Our empirical results strongly support the hypothesis that technology trust is essential for successful B2B e-commerce.

1. Introduction

The Internet has revolutionized the capacity to share information across organizations, resulting in radical transformations of organizational practices for procuring supplies, delivering goods and services, and carrying out financial transactions. The Internet era has also witnessed the parallel inception of a major directional change in interorganizational relationships that encompasses relational contracting, working partnerships, and trust-based relationships (Dwyer, Schurr and Oh, 1987). The prominence of trust in e-business has been widely touted by practitioners and academicians alike (Heil, Bennis and Stephens, 2000; Keen, 2000). Consequently, Internet-based B2B e-commerce applications potentially result in profound changes in the patterns of organizational uses of technology, interorganizational relationships between trading partners, and reliance on close coordination to create value. Therefore, the role of interorganizational trust has become of fundamental importance for value creation in B2B e-commerce.

The literature on trust in interorganizational relationships has shown that trust is a key factor for relationship success. Trust is important in exchange relations because it is a key element of social capital (Mayer et al. 1995), and it has been related to desirable outcomes such as supplier performance (Zaheer et al. 1998), satisfaction (Geyskens et al. 1998), competitive advantage (Barney and Hansen, 1994), and other favorable economic outcomes (Ba and Pavlou, 2001). Whereas the traditional notion of trust focused on trading partner relationships, trust in e-business also incorporates the notion of technology trust, which is defined as 'the subjective probability by which organizations believe that the underlying technology infrastructure is capable of facilitating transactions according to their confident expectations. Drawing upon the rich trust literature and recent conceptualizations for the role of trust in e-commerce (e.g. Lee and Turban 2001, Tan and Thoen 1998), trust is viewed both from social (trading partner trust), and also from a technological perspective (technology trust). This view is consistent with other researchers who proposed institutional-based trust (McKnight et al., 1998) and structural assurances (Zucker, 1986). In this study we examine the new character of trust, aiming to provide theoretical and empirical insights on the following questions: (1) What is the nature and role of technology trust in B2B e-commerce? (2) How can technology trust create value in B2B e-commerce?

2. Theory Development

This paper focuses on the new dimension of trust (technology trust) and its impact on business value in B2B e-commerce. The focus on *particular transactions* suggest that trust in B2B e-commerce covers several targets that need to be trusted for a transaction to occur according to an organization's expectations. Therefore, the novel character of trust focuses both on (a) technology trust and also on (b)

trading partner trust. The conceptual framework specifying the proposed research hypotheses is shown in Figure 1.

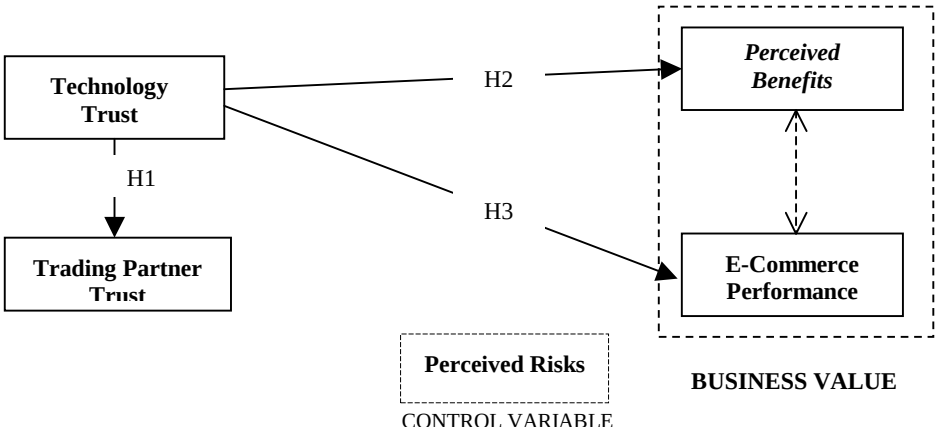

Figure 1: *Conceptual Framework and Research Hypotheses*

2.1 Technology Trust

Technology trust is based on technical safeguards, protective measures, and control mechanisms that aim to provide reliable transactions from timely, accurate, and complete data transmission (Cassell and Bickmore, 2000). Technology trust also applies digital signatures, encryption mechanisms (public key infrastructure), authorization mechanisms (User IDs and passwords), and best business practices that enforce regular audit, top management commitment, standards, and contingency procedures (Bhimani, 1996; Jamieson, 1996; Parker, 1995; Marcella et al., 1998). Hence, we define technology trust as 'the subjective probability by which organizations believe that the underlying technology infrastructure is capable of facilitating transactions according to their confident expectations'. The proposed construct of technology trust in B2B e-commerce is comparable to conceptualizations from other researchers in business-to-consumer e-commerce. For example, Tan and Thoen (1998) used the term 'control trust' to refer to embedded protocols, policies, procedures in e-commerce that help to reduce the risk of opportunistic behaviors among consumers and Web retailers. Similarly, Lee and Turban (2001) measured trustworthiness of Internet shopping based on consumer evaluations of technical competence and Internet performance levels (such as speed, reliability, and availability).

Source	Confidentiality	Integrity	Authentication	Non repudiation	Access Controls	Availability	Best Busines Practic
Bhimani 1996	Privacy	Accuracy	Genuine	Acknowledgement	Unauthorized access	Allows Authorized Access	Auditin
Jamieson 1996	Protection from unauthorized Reading, copying	Completeness	Originality	Non-denial	Protects Transmission Media	Protection from hackers	Standar Written policies Procedu
Marcella et al, 1998	Protection against Disclosure	Reliability	Authoritative Valid	Acknowledgement	Protects Manipulation	Authorized access	Risk analysis Contin Procedu
Parker 1995	Privacy	Not being Altered	Being true		Authorized access	Right to use	High q standar

This study identifies seven types of technology trust shown in Table 1. They include transaction confidentiality, integrity, authentication, non-repudiation, access controls, availability, and best business practices (Jamieson, 1996; Marcella et al., 1998; Parker, 1995). First, confidentiality mechanisms aim to protect e-commerce transactions and message content against unauthorized reading, copying, or disclosure using encryption mechanisms. Second, integrity mechanisms provide transaction accuracy and assurance that the e-commerce transactions have not been altered or deleted. Third, authentication mechanisms provide transaction quality of being authoritative, valid, true, genuine, worthy of acceptance or belief by reason of conformity to the fact that reality is present. Fourth, non-repudiation mechanisms protect the originator of e-commerce transactions and uses acknowledgement procedures applying digital signatures. Fifth, availability mechanisms protect transactions against weaknesses in the transmission media and protect the sender against internal fraud or manipulation by using authorization mechanisms such as User IDs and passwords. Sixth, access control mechanisms provide authorization mechanisms thereby assuring that transactions are sent and received without interruption. Finally, best business practices focus on policies, procedures, standards, and top management commitment that enforce regular audit, and ensure the smooth functioning of B2B e-commerce.

2.2 Trading Partner Trust

The traditional view of trust in the trading partner is defined as ‘the subjective probability with which organizations assess that another organization will perform

potential transactions according to their confident expectations'. This study identifies three types of trading partner trust. First, competence trust emphasizes reliance on trading partners' skills, technical knowledge, and ability to fulfil B2B e-commerce contracts. Second, predictability trust emphasizes belief in a trading partner's consistent behaviour that provides sufficient knowledge for other trading partners to make predictions on the other organization's reliability, honesty, and predictability (Lewicki and Bunker, 1996). Finally, goodwill trust emphasizes reliance on trading partners' care, concern, and benevolence that allows a trading partner to make commitments and further invest in mutual relationships (Mayer, Davis and Schoorman, 1995). Ratnasingam (2002) describes the evolution of trading partner trust from one stage to the next stage.

Following the notion of institutional trust (McKnight et al. 1998), technology trust can be viewed as an instance of situational normality in the sense that the underlying technology infrastructure facilitates normal transactions according to the organization's confident expectations. Hence, technology trust should be positively related to trading partner trust since situational normality as a dimension of institutional trust affects inter-partner trust.

H1: Technology trust is positively associated with trading partner trust.

2.3 Technology Trust and Perceived Benefits

Perceived benefits refer to business value received by organizations that have adopted e-commerce. We identified three types of perceived benefits -- perceived economic, perceived relationship-related, and perceived strategic benefits (Doney and Cannon, 1997; Fearson et al., 1998; Ganesan, 1994; Morgan and Hunt, 1994; Nath et al., 1998; Riggins and Rhee, 1998; Senn, 2000; Smith and Barclay, 1997). First, perceived economic benefits are derived from the automated processes that contribute to direct savings in costs and time. Second, perceived relationship-related benefits refer to positive trading partner trust relationships in the form of open communications, information sharing, cooperation, and commitment. Finally, perceived strategic benefits refer to closer ties between trading partners, and improved reputation that increases business continuity an organizational performance.

The proposed link between trust and perceived benefits is popular among scholars who have studied trust in organizations using e-commerce technologies. The relationship also draws from the literature on security services in e-commerce (Jamieson, 1996; Lee and Turban, 2001; Palmer, Bailey and Faraj, 2000). Technology trust draws from e-commerce technologies, third party services, and organizational actors (auditors, security analysts, and top management personnel) who are committed to enforcing best business practices. Most e-commerce technologies are embedded in automated security protocols that enable firms to

ensure partner authentication. Implementing encryption mechanisms protects online transactions from being intercepted, manipulated, and deleted, thus contributing to transaction integrity (Marcella et al., 1998; Riggins and Rhee, 1998; Senn, 2000). Transaction integrity leads to economic benefits from savings in time and costs (Nath et al. 1998). For example, Mukhopadhyay, Kekre and Kalathur (1995), conducted a study of nine Chrysler assembly centers and found that EDI improved the quality of information sharing and reduced inventory, transportation, and administrative costs.

Authorized login procedures, e-mail acknowledgments, and confirmations provide confidentiality, authentication, and non-repudiation security services that contribute to business value. Such functional acknowledgments in the form of email feedback, or other e-commerce protocols provide reliable and timely feedback mechanisms that increase trading partner satisfaction and contribute to relationship-related benefits. Organizations who demonstrate skills in producing high-quality goods, products, and services thus achieve high levels of trustworthiness. B2B e-commerce applications thus enable product and service differentiation, tighter links with trading partners, and overall business value.

H2: Technology trust is positively associated with perceived benefits in B2B e-commerce.

2.4 Technology Trust and E-Commerce Performance

In this study, e-commerce performance is evaluated in two ways. First, an economic view that deals with transaction volume, dollar value, sales, and profit, contributing to tangible value. Second, a relational view examines the extent of organizational commitment in business relationships resulting in intangible value.

Technology trust contributes to increased e-commerce performance in several ways. Efficiency benefits from technology trust concentrate on reducing transaction costs, derived from speed and automation of e-commerce technologies. In addition, these applications provide real-time tracking information technologies where technology trust allows firms to log into the supplier's extranet web site, track shipment details, and estimate arrival dates of the goods they ordered (Riggins and Rhee, 1999). Subsequently, trustworthy firms are able to satisfy their end customers' needs by delivering the goods on time, thus contributing to increased customer satisfaction and relationship-related business value. Increased satisfaction from technology trust in turn leads to perceived strategic benefits and actual economic benefits, increasing the volume, diversity, and dollar value of e-commerce transactions (Doney and Cannon, 1997; Iacovou et al., 1995; Smith and Barclay, 1997). Tallon et al. (2000) argue that 'management practices' have an important role in the process of IT strategies intent towards a firm's business value, suggesting that best business

practices can increase technology trust and ultimately influence B2B e-commerce performance.

H3: Technology trust is positively related to increased performance in B2B e-commerce.

2.5 Control Variables

Perceived Risks. Perceived risks refer to potential weaknesses, barriers and losses faced by organizations that have adopted e-commerce. Risks can either occur internally or externally, by human or non-human (e.g. technology-related risks), accidental or intentional and could be caused by disclosure, destruction, modification of e-commerce transactions, and by denial of service attacks from hackers (Das and Teng, 1996; Jamieson, 1996; Marcella et al., 1998). Ring and Van de Ven (1994) also classified risks as performance risks derived from the technology versus relational risks. This study identifies three types of perceived risks. First, perceived technology performance-related risks refer to misuse of e-commerce technologies, incompatible infrastructure, and uncertainties of e-commerce operations. Second, perceived relational risks refer to trading partner's lack of knowledge, exercising opportunistic behaviors, conflicting attitudes, and reluctance to change. Third, perceived general risks refer to poor business practices, environmental risks, and lack of standards and policies. Therefore, this paper controls for the effect of trading partner trust and perceived risks on perceived benefits and e-commerce performance.

3. Research Methodology

The proposed model was empirically tested on a sample of 2500 organizations provided by **www.greatlists.com** using a survey methodology. These organizations were chosen on the basis that they have been actively using e-commerce technologies. The associations these organizations have with their trading partners include exchange relationships in multiple industries. The questionnaire was targeted at top-level management because they are best positioned to assess their organization's e-commerce activities, performance, and collective trust perceptions. The participants were asked to respond based on their perceptions of their relationships with a self-selected trading partner.

3.1 Measure Development

Other than the technology trust construct, all measures were adapted from the literature, even if they had to be modified to reflect the study's specific context. These measures were adapted following standard psychometric scale development procedures (Bagozzi and Phillips 1982). In cases in which the construct measure required significant deviations, the items were adapted following the conceptual definition. All items were measured on five-point Likert scales anchored at 'strongly disagree' (1), to 'strongly agree' (5) and 'neither agree nor disagree' (3) neutral point.

A three-stage procedure was employed following the recommendations of Straub (1989) for developing and validating new measurement instruments. First, we specified the domain of technology trust by reviewing the extant literature. Following this review and based on the proposed conceptual definitions, a preliminary version of the instrument was generated, which was assessed for content validity. In terms of the dimensionality of technology trust, a literature review revealed that technology trust has been viewed as a unidimensional construct. To test the measurement adequacy of technology trust and the other four constructs, the questionnaire was used as a semi-structured questionnaire in a case-study research (Ratnasingam and Klein, 2001) that refined the instrument. Second, we conducted several formal pretests, which assessed the measurement properties of the proposed scales and refined several items. Finally, we proceeded with a confirmatory study that validated the measures for their reliability and convergent and discriminant validity.

Technology trust was measured using twenty items to include different trust and security-based mechanisms drawing upon the descriptions of Jamieson (1996), Marcella et al. (1998), and Parker (1995). Given the newness of this measure, seven dimensions of technology trust were captured following Bhimani (1996) and Jamieson. *Confidentiality* examined privacy and security mechanisms, *integrity* examined the accuracy of business transactions, *authentication* examined trading partner's characteristics that uniquely identify transactions, *non-repudiation* assessed transaction feedback mechanisms, *availability* examined system availability and information for authorized partners, *access controls* examined access to authorized trading partners, and *best business practices* examined institutional standards, policies, and top management commitment.

Perceived benefits were measured using seventeen items drawing from the descriptions of Fearson et al. (1998), Nath et al. (1998), and Senn (2000) using three different dimensions - economic benefits, strategic benefits, and relationship-related benefits. E-commerce Performance (PERF) was measured using ten items following Doney and Cannon (1997), Iacovou et al. (1995), Morgan and Hunt (1994), and Smith and Barclay (1997) and captured two performance dimensions - monetary value and relational performance. Trading Partner Trust (PTRUST) was measured with nineteen items following the descriptions of Doney and Cannon, (1997), Ring and Van de Ven, (1994), Smith and Barclay, (1997), and Mayer et al (1995), and captured competence, predictability, and goodwill trust. Finally,

Perceived Risk (RISK) was measured using twenty-two items and covered three different risk dimensions - technology-related risks, relational risks, and general risks.

3.2 Pretest and Survey Administration

The survey instrument went through two phases of extensive pretesting before administration. First, the instrument was reviewed by faculty for comprehensiveness and clearness. Second, IT managers and senior executives were asked to complete the questionnaire and provide feedback. Based on these pretests, the survey instrument was revised for coherence, and it was mailed to the selected 2,500 organizations. The invitees were informed that the goal of the survey was to understand the concept of trust in electronic marketplaces, and they were assured that the results would be reported in aggregate to guarantee their anonymity. Given the study's need to assess collective organizational perceptions, the key respondents were asked to evaluate the perceptions of the entire group of people responsible for their firm's e-commerce efforts. To motivate organizations to respond, the respondents were offered a report that summarized the results of the survey and compared their company against other firms. A second wave of mailing was sent to the non-responding companies three week later. Finally, 40 responses were received via telephone interviews conducted by one of the authors.

3.3 Response Rate and Nonresponse Bias

Out of the 2,500 participants, 120 letters were undeliverable, and 288 responses were obtained resulting in an effective response rate of 12.1%. Nonresponse bias was assessed by a comparison of sample statistics to known values for the population between (a) respondents and non-respondents and (b) early and late respondents. Early respondents were identified by selecting those that responded during the first week (53%), against those responding later (47%). These tests were based on sample characteristics – (a) organization size, (b) annual revenue, and (c) number of employees, and the actual scale responses. Both tests showed no significant differences for these three characteristics at the $p<0.1$ level; therefore, the risk of non-response bias to the internal validity of this study's results is restricted.

3.4 Measure Validation

The questionnaire items were initially submitted to an exploratory factor analysis and item-to-total examination. All items tapping the same construct had high

correlations, whereas items tapping different constructs had significantly lower correlations. Measure validation was initially examined for reliability analysis by computing Cronbach's alpha coefficient for each construct. All measures have extremely high levels of reliability, all above a 0.88 level. Next, a formal three-step sequence for assessing convergent and discriminant validity was employed. First, factor analysis was conducted (with rotations) to detect high loadings on hypothesized factors and low cross-loadings. Second, given the large number of questionnaire items, the factors were set to the expected number of constructs, and the survey items were reduced to their principal constructs. Third, principal components analysis was used as the extraction method for confirmatory factor analysis with Varimax rotation. All items load significantly on their hypothesized factors, and using the 0.40 rule-of-thumb almost all cross-loadings are low, explaining 51% of the total variability. In sum, all items load on their hypothesized factors, which provides evidence of convergent and discriminant validity (Bagozzi and Yi 1982). Hence, the responses to the multi-item measures generated an overall factor for each of the five constructs based on their weighted average.

4. Results

4.1 Technology Trust and Trading Partner Trust

H1 posited a positive relationship between the two dimensions of trust. The correlation coefficient between technology trust and trading partner trust was 0.37 ($p<.01$), rendering support for H1.

4.2 Technology Trust and Perceived Benefits

Table 2 shows the results of the regression analysis with perceived benefits as the dependent variable ($R^2=.36$, $F=75.2$, $p<.001$). The impact of technology trust on perceived benefits is significant ($b_1=.52$, $t=10.06$, $p<.001$), validating H2. The control effect of trading partner trust was significant ($b_2=.15$, $t=2.99$, $p<.01$), validating previous research, while the effect of risk was positive, yet non-significant. Multicollinearity was not a serious concern since all relevant checks returned a tolerance value above 0.70.

4.3 Technology Trust and e-Commerce Performance

As shown in Table 2, technology trust (b_4=.43, t=7.43, p<.001) is positively associated with e-commerce performance, rendering strong support for H2. Partner trust was a significant control variable on e-commerce performance (b_5=.21, t=3.78, p<.001), supporting the extant literature. The control effect of perceived risk was substantial and partially significant (b_6=1.89, p<.1). Multicollinearity was not a serious concern since all relevant checks returned a tolerance value above .70. Finally, the variance explained by this regression was particularly high (R^2=.53, F=105.2, p<.001), suggesting that the proposed independent factors largely influence B2B e-commerce performance.

Table 2: *Regression Analysis Results*

Variables	Construct	Perceived Benefits	t-value	Performance	t-value
Independent	Technology Trust	0.517	10.06***	0.426	7.43***
Control	Partner Trust	0.150	2.99**	0.213	3.78***
	Perceived Risks	0.06	0.73	0.07	1.89
	R-squared	0.359	0.355 (adjusted)	0.534	0.526 (adjusted)
	F ratio	$F_{3,284}$ = 75.2***		$F_{4,283}$ = 105.2***	
Note: * p < 0.5, ** p < 0.01, and *** p < 0.001					

5. Discussion

By rendering empirical support to the proposed model and hypotheses, this study provides several new insights on the new character of trust in B2B e-commerce. First, an important finding is the important role of the new target of trust, which is the underlying technology, underlying infrastructure, and associated control mechanisms. Even if trust has been proven a source of favorable outcomes in traditional exchange relationships, this study shows that in the B2B e-commerce environment, technology trust is another source of business value. Second, a key finding of this research is the relative strength of the technology and trading partner trust on value potential and realization. Finally, this paper contributes to the trust literature by proposing a new scale with excellent measurement properties to capture the construct of technology trust, which is an important value-creator in B2B e-commerce.

This paper has implications for the development of design principles for information systems that support the control of inter-organizational co-operation in

dynamic network organizations. The analysis of technology trust and its facilitating role for trading partner trust can help to build information systems (i.e. e-commerce technologies) that create a trustworthy environment for electronic commerce. Traditionally, inter-organizational controls between companies were based on paper documents such as contracts and trade documents (e.g. the Letter of Credit procedure). The challenge in electronic business is to replace these paper documents by new controls based on secure electronic messages. For example, some groups are developing formal modeling languages for electronic control documents that enable intelligent agent-based software applications for electronic commerce to reason about and process these documents automatically. This secure electronic document exchange is also relevant for inter-organizational exchange of production and planning information such as Enterprise Resource Planning (ERP) or Application Service Providing (ASP), where core company data are shared between different parties in a network organization.

5.1 Limitations and Suggestions for Future Research

This research conceptually views trust as a collectively held belief by a group of organizational members. However, our empirical study was limited to a single respondent that was asked to evaluate the trust perceptions of the entire group. Future research should attempt to collect responses from several respondents within the organization to assess communal trust. Second, this research examines only a subset of the many possible relationships between technology trust and its antecedents and consequences. Since technology trust has been shown to be associated with favorable outcomes, future research could propose and examine new antecedents and consequences. Finally, the results and implications of this research are constrained by the research method employed, and the proposed causal relationships are limited by the cross-sectional nature of the methodological design. Therefore, longitudinal research and other statistical methods could complement these empirical findings.

6. Conclusion

This research attempts to make a theoretical contribution to the area of trust in B2B e-commerce by integrating the trust literature with theories from security, privacy, and control to propose a new theoretical construct that describes the importance of trust in the underlying technology infrastructure. The proposed new construct is hypothesized and shown to be a significant value creator in e-business. This study also makes an empirical contribution by proposing how trust can be strategically used beyond the traditional dyadic level to contribute to perceived benefits, organizational performance, and B2B e-commerce success. Therefore, the role of

establishing trust in the underlying technology becomes a critical factor for understanding the value realization potential of today's B2B e-commerce.

References

Ba, S., Pavlou, P.A (2001) 'Evidence of the Effect of Trust Building Technology in Electronic Markets, Price Premiums, and Buyer Behavior', *MIS Quarterly* – forthcoming.

Bagozzi, R. P. and Philips L. W. (1982) 'Representing and Testing Organizational Theories: A Holistic Construal', *Administrative Science Quarterly* 27, 3: pp. 459-489.

Barney, J.B., and Hansen, M.H (1994) 'Trustworthiness as a source of competitive advantage, *Strategic Management Journal* 15: pp. 175-216

Bhimani, A. (1996) 'Securing the Commercial Internet', *Communications of the ACM* 39: pp. 29-35.

Cassell, J. and T. Bickmore (2000), "External Manifestations of Trustworthiness of the Interface," *Communications of the ACM*, 43, 12, 50-59.

Das, T.K., and Bing-Sheng Teng (1996) 'Risk Types and Inter-firm Alliance Structures', *Journal of Management Studies* 33: pp 827-843

Doney, P.M., and Cannon, J.P. (1997) 'An Examination of the Nature of Trust in Buyer-Seller Relationships', *Journal of Marketing* April: pp 35-51.

Dwyer, R.F., Schurr, P, H., and Oh, S. (1987) 'Developing Buyer-Seller Relationships', *Journal of Marketing*51: pp 11-27.

Fearson, C., and Phillip, G. (1998) 'Self-assessment as a means of measuring strategic and operational benefits from EDI: the development of a conceptual framework', *European Journal of Information Systems* 7: pp 5-16.

Gambetta, D. (1988) *Trust: Making and Breaking Cooperative Relations*, Basil Blackwell, New York.

Ganesan, S. (1994) 'Determinants of Long-Term Orientation in Buyer-Seller Relationships', *Journal of Marketing* 58: pp 1-19.

Geyskens, I., Steenkamp, J.B., and Kumar, N. (1998) 'Generalizations about trust in marketing channel relationships using meta-analysis', *International Journal in Marketing* 15: pp. 223-248

Hart, P., Saunders, C (1998) 'Emerging Electronic Partnerships: Antecedents and Dimensions of EDI Use from Suppliers Perspective', *Journal of Management Information Systems* 14: pp. 87-111.

Heil, G., Bennis, W., and Stephens, D (2000) *Douglas McGregor, Revisited: Managing the Human Side of the Enterprise*, John Wiley and Sons.

Iacovou, C.L., Benbasat, I., and Dexter, A.S (1995) Electronic data interchange and small organizations: adoption and impact of technology, *MIS Quarterly*, 19, 4, 465-485.

Jamieson, R. (1996) 'Auditing and Electronic Commerce', *EDI Forum*, Perth, Western Australia.

Keen, P.G.W (2000) 'Ensuring E-trust', *Computerworld*, March 13.

Kumar, N (1996) 'The Power of Trust in Manufacturer-Retailer Relationships', *Harvard Business Review*, Nov-Dec, pp 92-106.

Lee, M.K.O., and Turban, E (2001) 'A Trust Model for Consumer Internet Shopping', *International Journal of Electronic Commerce* 6, 1: pp. 75-92

Lewicki, R.J. and Bunker, B.B. (1996) 'Developing and Maintaining Trust in Work Relationships,' in Kramer, R.M. and Tyler, T.R. (eds) *Trust in Organizations: Frontiers of Theory and Research*, Sage Publications, Thousand Oaks, CA, 114-139.

Marcella, A.J., Stone, L., and Sampias, W.J (1998) 'Electronic Commerce: Control Issues For Securing Virtual Enterprises', *The Institute of Internal Auditors*.

Mayer, R.C., Davis, J.H., and Schoorman, F.D. (1995) 'An Integrative Model of Organizational Trust,' *Academy of Management Review* 20: pp. 709-734.

Mcknight, H,D., Cummings, L.L., and Chervany, N.L. (1998) 'Managers as initiators of trust: An exchange relationship framework for understanding managerial trustworthy behavior', *Academy of Management Review* 23: pp. 513-530.

Morgan, R.M., and Hunt, S.D. (1994) 'The Commitment-Trust Theory of Relationship Marketing', *Journal of Marketing* 58: pp. 20-38.

Mukhopadyay, T., Kekre, S., and Kalathur, S (1995) 'Business value of information technology: A study of electronic data interchange', *MIS Quarterly* 19: pp 137-156.

Nath, R., Akmanligil, M., Hjelm, K., Sakaguch, T., and Schultz, M. (1998) 'Electronic Commerce and the Internet: Issues, Problems and Perspectives', *International Journal of Information Management* 18, 2: pp. 91-101.

Palmer, J.W., Bailey, J.P., and Faraj, S (2000) 'The roe of Intermediaries in the development of Trust on the WWW: The use and Prominence of Trusted Third Parties and Privacy statements', *Journal of Computer Mediated Communication*, 5, 3, Online.

Parker, D.B., (1995) 'A New Framework for Information Security to Avoid Information Anarchy', *IFIP*, pp. 155-164.

Parkhe, A. (1998) 'Understanding Trust in International Alliances', *Journal of World Business* 33: pp 219-240.

Ratnasingam, P. and Klein, S. (2001) 'Perceived Benefits of Interorganizational Trust in E-Commerce Participation: A Case Study in the Telecommunications Industry', *Americas Conference in Information Systems*, Boston, MA.

Ratnasingam, P (2002) 'Model of Inter-Organizational Trust for Business to Business E-Commerce', *Information and Management Journal*, Volume 15, No 1-2, 19-22, Spring 2002, Idea Group Publishing.

Riggins, F.J., and Rhee, H.S. (1998) 'Toward a Unified View of Electronic Commerce', *Communications of the ACM* 41, 10: pp. 88-95.

Ring, P.S and Van de Ven, A.H. (1994) 'Developing Processes of Cooperative Inter-organizational Relationships', *Academy of Management Review*19: pp 90-118.

Senn, J.A (2000) 'Business to Business E-Commerce', *Information Systems Management*, Spring: pp. 23-32.

Smith, J. B., and Barclay, D.W (1997) 'The Effects of Organizational Differences and Trust on the Effectiveness of Selling Partner Relationships', *Journal of Marketing* 51: pp. 3-21.

Straub, D. W. (1989) 'Validating Instruments in MIS Research', *MIS Quarterly* 13: pp. 146-169.

Tallon, P.P., Kraemer, K.L and Gurbaxani, V (2000) 'Executives Perceptions of the Business Value of Information Technology: A Process-Oriented Approach', *Journal of Management Information Systems* 16: pp.145-173

Tan, Yao-Hua., and Thoen, W. (1998) 'Towards a Generic Model of Trust for Electronic Commerce', *International Journal of Electronic Commerce* 3: pp. 65-81.

Williamson, O.E (1975) *Markets and Hierarchies*, New York: Free Press.

Zaheer, A., Mc Evily, B., Perrone, V. (1998) 'Does Trust Matter? Exploring the effects of Interorganizational and Interpersonal Trust on Performance', *Organization Science* 9: p. 141-159

Zucker, L.G. (1986) 'Production of trust: Institutional sources of economic structure: 1840-1920', in B.Staw and L.Cummings, (eds) *Research in organizational behavior*, Greenwich, CT.