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TRADING PARTNER TRUST IN ELECTRONIC COMMERCE PARTICIPATION

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Abstract

The growth of business-to-business e-commerce has highlighted the role of computer and communications technologies as well as inter-organizational trust in developing and maintaining business-to-business relationships. Despite the acknowledged importance of trust, only a limited amount of research exists and that examines the role of trust in these relationships. By investigating inter-organizational relationships and trust in e-commerce, this study will enable us to identify factors leading to successful e-commerce participation (adoption and integration). Drawing on theories such as trust in business relationships, inter-organizational relationship theories, transaction cost economics, and resource dependency theory, this paper develops a conceptual model to examine the impact of trading partner trust in e-commerce participation. The model is currently being tested through multiple in-depth case studies. The findings of the case studies are expected to increase the awareness of e-commerce adopters and implementers about the importance of trading partner trust in e-commerce participation.

1. INTRODUCTION

The objective of this research is to examine the importance of trading partner trust in business-to-business e-commerce. The evolution of the Internet provides the ability to conveniently and flexibly share information across organizations. This results in radical transformations of organizational procedures for dealing with one another to procure supplies, deliver goods and services, and carry out financial transactions. Consequently, Internet-based business-to-business e-commerce applications potentially result in profound changes in the patterns of uses of technology, and inter-organizational relationships between trading partners. Moreover, by reaching trading partners through the Internet, organizations can implement more effective targeted marketing and relationship building strategies with low overhead. Thus, the Internet and e-commerce are changing both the technological as well as the relationship landscape of business-to-business relations.

It is only recently that the IS literature has recognized the complementary, and at the same time competing, roles of technology and trust in inter-organizational business relationships. For example, while some scholars (Clemons et al. 1993; Malone et al. 1987), have focused primarily on information technology as a means for reducing inter-organizational transaction costs, the findings by Kumar et al. (1998) suggest the substitutability of trust and technology in reducing transaction costs in inter-organizational systems (IOSs). Many major manufacturers and retailers are very much concerned with the development of *electronic partnerships* with their suppliers. Furthermore, Fukuyama (1995) suggests that trust is based on shared norms and values within organizations and communities. Thus, it is important that we understand the relative roles of technology and trust in participation in e-commerce

There seems to be a perception by businesses that e-commerce transactions may be both insecure and unreliable. Despite the assurances of technological security mechanisms, trading partners in business-to-business e-commerce do not seem to trust the *people side* of the transactions (Marcella et al. 1998). Preliminary research suggests that a perceived lack of trust in e-commerce transactions sent by trading parties using the Internet could be a possible reason for this slow adoption rate (Keen 1999).

Lack of trust and consequently barriers to participation in e-commerce activities arise due to uncertainties inherent in the current e-commerce environment. These, uncertainties, in turn, create a perception of increased risk, thereby inhibiting the tendency to participate in e-commerce. Uncertainties reduce confidence both in the reliability of business-to-business transactions transmitted electronically and, more importantly, in the trading parties themselves. Parkhe (1998) identifies two types of uncertainties: uncertainty regarding unknown future events and uncertainty regarding trading partners' responses to future events. It is in this environment of dual uncertainty that trust becomes important for business-to-business e-commerce participation.

Furthermore, a lack of universally accepted business standards and policies to guide global business-to-business e-commerce has left trading partners, especially smaller suppliers, with a lack of awareness, knowledge, and expertise in using e-commerce technologies to their fullest potential. This leads to uncertainties in their tasks, environment and trading partners (Bensao and Venkatraman 1996; Iaconov et al. 1995; Parkhe 1998; Raman 1996).

Finally, interdependencies between organizations arise from sharing e-commerce technologies. Previous research in EDI adoption suggests that these interdependencies can lead to an imbalance of power between smaller suppliers and their more powerful buyers (Hart and Saunders 1997; Webster 1995). How this power is exercised may influence the creation or degradation of trust between trading parties. Trust, therefore, plays an important role in e-commerce participation.

2. THEORETICAL FOUNDATIONS OF THE STUDY

The conceptual model developed for this study was derived from theories in multi-disciplinary literature, including marketing, management, sociology, information systems and e-commerce. Five theoretical perspectives were found to be relevant. Theories about trust in business relationships, inter-organizational relationships theory (IOR), transaction cost economics theory (TCE), resource dependency theory, and trust and security based mechanisms in e-commerce. These theoretical perspectives contributed to an understanding of the potential strengths and weaknesses of trading partner relationships in e-commerce participation. Moreover, they provide a unique emphasis by not only taking an organizational, economic, and socio-political perspective of trading partner relationships in e-commerce, but also their behavioral dimensions (as in their interactions in a dyadic relationship). The following section discusses how these theories lead to the conceptual model.

2.1 Theories of Trust in Business Relationships

Previous scholars who examined trust in business relationships identified trust to be a key factor for successful long term trading partner relationships. For example, trust has been found to increase cooperation, thus leading to communication openness and information sharing (Cummings and Bromiley 1996; Doney and Cannon 1997; Morgan and Hunt 1994; Ring and Van de Ven 1994; Smith and Barclay 1997). Furthermore, Granovetter (1985) suggests that the density and cohesiveness of social networks within relationships' influence the evolution of trust. Table 1 demonstrates antecedent trust behaviors from previous research that paved the way for three types of trading partner trust.

Competence trust emphasizes the trust in trading partners' skills, technical knowledge, and ability to operate business-to-business e-commerce applications correctly. Trading partners who demonstrate skills in producing high quality goods and services such as timely delivery of accurate information to other trading partners, that help maintain their supply chains and make strategic decisions achieve high levels of competence trust. McAllister (1995) suggests that we choose who to trust and under what circumstances. This choice is cognition based (interpersonal trust), thus investigating past measures of trust such as reliability and dependability. When reliability and dependability expectations are met, trust moves to affective foundations that include emotional bonds such as care and concern. Thus, competence trust develops in an economic foundation and perceived benefits such as savings in cost and time from accurate transfer of e-commerce messages are achieved. Alternatively, a lack of competence trust may lead to additional costs, as trading partners need to spend time training and educating themselves, in addition to re-sending the same transaction correctly again.

Predictability trust emphasizes the trust in trading partners' consistent behaviors that provide sufficient knowledge for other trading partners to make predictions and judgements due to past experiences. Perceived benefits such as trading partners' satisfaction and information sharing develop from competence trust. Thus, a chain of consistent positive behaviors creates a foundation of familiarity, which makes the perception of trading partners reliable, predictable, and, therefore, trustworthy. Alternatively, opportunistic behaviors, such as imbalance of power, increase the price of goods or create a demand for high quality services.

Table 1. Different Types of Trading Partner Trust

Source	Competence Trust Economic Foundation	Predictability Trust Familiarity Foundation	Goodwill Trust Empathy Foundation
Gabarro (1987)	Character Role competence	Judgement	Motives/ Intentions
Mayer, Davis, and Schoorman (1995)	Ability	Integrity	Benevolence
McAllister (1995)	Cognitive	Cognitive → affective	Affective
Lewicki and Bunker (1996)	Deterrence/ Calculus	Knowledge	Identification
Mishra (1996)	Competence	Reliability	Openness Care Concern

Goodwill trust emphasizes the trust in trading partners' care, concern, honesty, and benevolence that allow other trading partners to further invest in their trading partner relationships, thus leading to a foundation of empathy. Goodwill trust is characterized by an increased level of cooperation, open communication, information sharing, and commitment, thus leading to increased e-commerce participation. Perceived benefits, such as long term investments, and building the reputation of trading partners are achieved from goodwill trust. Alternatively, an absence of goodwill trust may lead to termination of trading partner contracts and in some cases a bad reputation among trading partners.

2.2 Inter-Organizational Relationships Theory

Inter-organizational relationships (IOR) arise from inter-organizational systems (IOS) and occur when two or more organizations exchange resources (e.g., money, physical facilities and materials, information, customer or client referrals, technical staff services) (Bensao and Venkatraman 1996; Clemons et al. 1993; Malone et al. 1987; Vijayarathy and Robey 1997). Inter-organizational relationships are concerned with reasons and conditions for forming relationships (situational), thereby providing insights into interactions, environmental and contingent factors that explain the formation and structure of cooperative IORs (Ring and Van de Ven 1994). Furthermore, the structural factors form of institutional arrangements and governance mechanisms prescribe an overall pattern of interactions in inter-organizational relationships. They include procedures, policies, standards, and trading partner agreements found to be useful for trading partners involved in routine business-to-business operations. This creates a framework of awareness for protecting trading partners against risks and opportunistic behaviors in e-commerce. It also introduces best business practices in their exchange behaviors, thus resulting in the benefit of having high trading partner trust.

By properly managing situational and structural factors in e-commerce, outcomes from inter-organizational relationships can be monitored to achieve high standards and quality. Structured and standardized routines lead to complete and correct e-commerce operations that yield benefits from savings in time and cost, as trading partners are not required to resend e-commerce transactions, thereby achieving transaction integrity. Outcomes also represent perceived benefits in the extent of e-commerce performance and development of trading partner relationships. For instance, Vijayarathy and Robey, who examined the effect of EDI, found that EDI clearly has a potential to transform relationships between organizations, and that economic advantages of EDI are likely to depend on EDI's effect on trading partner relationships. Thus, learning how trading partner relationships can be transformed into long-term relationships will provide additional insights to increase e-commerce participation.

2.3 Transaction Cost Economics Theory

Transaction cost economics (TCE) theory focuses on economic efficiencies of transactions and provides insights into economic exchanges. It contributes to the understanding of perceived benefits and perceived risks of e-commerce. Transaction cost

economics deals with optimum governance mechanisms (markets or hierarchies), thus minimizing production and transaction costs. For example, how an organization chooses to transact with another organization depends on the cost of transacting and, based on these costs, determining an optimal governance structure that minimizes total costs (Williamson 1975). For example, trading partners, before engaging in e-commerce, normally negotiate and monitor trading partner agreements through legal contracts to protect themselves against opportunistic behavior. Furthermore, transaction costs can include factors such as asset specificity, uniqueness, uncertainty, and complexity of exchange and behavioral factors such as opportunism and bounded rationality. Williamson (p 109), suggests that while business managers sometimes do act on the basis of trust, it is difficult to identify trustworthy trading partners. Therefore the concern is how to develop efficient safeguard strategies against the hazards of opportunism. Malone et al. and Clemons et al. interpret transaction cost economics theory by suggesting that information communication technologies reduce coordination costs and transaction risks, thereby reducing transaction costs and promoting a move toward markets. Kumar et al. (1998), on the other hand, point out that trust and relationships, by lowering the cost of search and monitoring compliance, can also reduce opportunism, transaction risk, and coordination costs, thereby reducing transaction costs. Kumar et al. go on to suggest that it is the interplay between trust and technology that would affect transaction costs and thus the internalizing or externalizing of business functions. Thus, transaction cost economics clearly points to the role of trust in facilitating business-to-business transactions.

2.4 Resource Dependency Theory

Resource dependency theory provides a holistic approach with explicit recognition of economic and socio-political dimensions of trading partner relationships (Pfeffer and Salanick 1978; Reekers and Smithson 1996). Specifically, resource dependency theory is concerned with

- external forces such as e-commerce environment within which the dyad operates,
- internal organizational dimensions that structure and shape written policies and procedures thus, determining the formalization of standards, and
- trading partner interactions (as in behavioral dimensions) in their day to day e-commerce exchanges (Bensao and Venkatraman 1996).

Granovetter suggests that these structural arrangements may be embedded within socio-political characteristics of the dyad, thus using power and control as well as corresponding sentiments and behavior (conflict and cooperation). Indeed, resource dependency theory contributes to perceived risks of e-commerce, derived from trading partners' imbalance of power in their relationship.

2.5 Trust and Security Based Mechanisms

Trust and security based mechanisms are safeguard protective measures. They provide technological, organizational, and relationship benefits by ensuring timely, accurate and complete transmission and receipt of transactions, thereby achieving transaction integrity, authentication, confidentiality, non-repudiation, and availability (Jamieson 1996). These mechanisms include digital signatures, encryption mechanisms (via public key infrastructure), authorization mechanisms (via User IDs and passwords), and best business practices (via regular audit, top management commitment, standards, and contingency procedures) (Bhimani 1996; Jamieson 1996; Marcella et al. 1998; Parker 1995). Perceived benefits such as efficiency, security, and quality can be achieved by properly managing these mechanisms. Alternatively, with poor business practices, such as incomplete, incompatible, or insecure systems, together with inadequate backup and a lack of training given to staff operating e-commerce applications, perceived risks of e-commerce might escalate.

This section discussed the relevance of five theoretical perspectives that contributed to constructs in the conceptual model. They include trust in business relationships, inter-organizational relationships that help identify situational, structural, formalization and procedural factors contributing to perceived benefits, uncertainties/risks, and governance mechanisms in e-commerce. Similarly, transaction cost economics theory focuses on perceived benefits in the form of economic advantages and perceived risks in the form of opportunistic behaviors, task complexities, and uncertainties. Resource dependency theory contributes to perceived risks of e-commerce. Finally, trust and security based mechanisms focus on providing best business practices. Hence, perceived benefits and perceived risks derived from the above theories help determine the extent of e-commerce participation in the form of e-commerce performance and trading partner trust relationship development.

3. CONCEPTUAL MODEL OF TRADING PARTNER TRUST IN E-COMMERCE PARTICIPATION

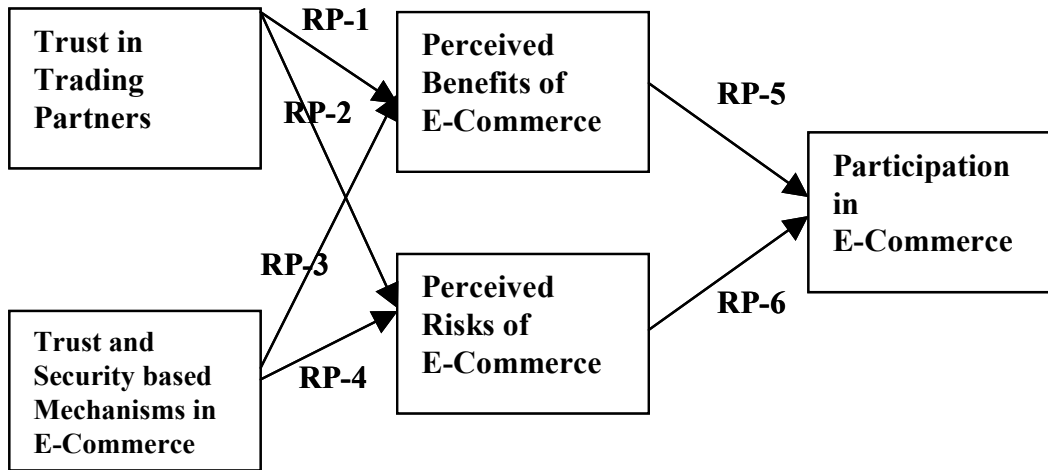


Figure 1. Conceptual Model of Trading Partner Trust in E-Commerce Participation

3.1 Research Propositions

Research propositions are derived from the conceptual model and are shown as arrows connecting the constructs.

Research Proposition 1: Trading partner trust is positively associated with perceived benefits of e-commerce.

Research Proposition 2: Trading partner trust is negatively associated with perceived risks of e-commerce.

Research Proposition 3: Trust and security based mechanisms in e-commerce are positively associated with perceived benefits of e-commerce.

Research Proposition 4: Trust and security based mechanisms in e-commerce are negatively associated with perceived risks of e-commerce.

Research Proposition 5: Perceived benefits of e-commerce are positively associated with e-commerce participation.

Research Proposition 6: Perceived risks of e-commerce are negatively associated with e-commerce participation.

4. RESEARCH METHOD

Given the exploratory nature of this study, a qualitative in-depth case study research strategy was found to be appropriate. How and why types of research questions suggest that a case study research method is appropriate (Yin 1994). Case studies allow us to examine various aspects of trading partner trust in an e-commerce environment (that is within a natural setting of organizations) and enables extensive data collection from different sources. Reports, security policies, trading partner agreements, and written procedures on business-to-business e-commerce interactions between trading partners and trust will be analyzed to cross-reference the data gathered from interviews, thus leading to generalizations and abstractions. Furthermore, a case study method allows us to examine contemporary events of how and why trading partners behave and in what situations.

The data required for this study is being collected from e-commerce adopters, implementers, IS managers, buyers, suppliers, manufacturers, and channel distributors responsible for business-to-business e-commerce. Our fieldwork proceeded as follows. First a set of interviews were conducted with e-commerce adopters and implementers responsible for day to day interactions. The purpose of the initial interviews was to clarify the following issues:

1. to pretest the semi-structured questionnaire,
2. to refine the jargon (commercial language) to suit case sites, and
3. to ensure that we have an adequate basis to sample trading partner trust relationships in e-commerce participation.

Table 2 defines the constructs, sub-concepts/dimensions and evaluation pointers that indicate how they are being tested. Questions are structured to have a qualitative focus using how and why types of questions. In addition, participants are asked to provide examples and evidences of their responses that later led to quantitative measures via a Likert scale (as in Low (0–3), Medium (4–6), High (7–10)).

Table 2. Constructs, Sub-concepts, Definitions, and Evaluation Pointers

Constructs	Sub-concepts Dimensions	Definitions	Evaluation Pointers
Trust in Trading Partners		antecedent trust behaviors that determine competence, predictability, and goodwill types of trust in trading partners	
	<i>Competence trust</i>	ability, skills, knowledge, and competence of trading partners to perform business-to-business e-commerce correctly and completely	examines the ability and skills of the trading partner dependence
	<i>Predictability trust</i>	consistent behaviors of trading partners that allow another trading partner to make predictions and judgements due to past experience	examines consistent behavior, trading partner's reliability in keeping business promises, trading partner's adherence to policies and terms of contract predictability
	<i>Goodwill trust</i>	care, concern, honesty, and benevolence shown by trading partners that allow the other trading partners to further invest in their trading partner relationship	examines trading partner's willingness to share information, demonstrate care, cooperation commitment, and being honest
Trust and Security Based Mechanisms in E-Commerce		trust and security based mechanisms in e-commerce are trust assurances, security safeguards, and protection services provided by e-commerce technology, organizations, human, and third party services.	
	<i>Confidentiality</i>	protection of e-commerce transactions and message content against unauthorized reading, copying, or disclosure	examines firewall and encryption mechanisms
	<i>Integrity</i>	accuracy and assurance that e-commerce transactions have not been altered or deleted	examine system integrity, sequence numbers in e-commerce transactions, application controls, accounting controls, and web seal assurances
	<i>Authentication</i>	quality of being authoritative, valid, true, genuine, worthy of acceptance or belief by reason of conformity to the fact that reality is present	examines formal log-on user IDs and password procedures
	<i>Non-repudiation</i>	originator of e-commerce transactions cannot deny receiving or sending that transaction	examines e-commerce transaction confirmation, acknowledgments, and digital signatures
	<i>Access controls</i>	protection of e-commerce transactions against weaknesses in the transmission media and protection of the sender against internal fraud or manipulation	examines network access control, and authorization mechanisms
	<i>Availability</i>	assurance that passes or conveys e-commerce transactions without interruption by providing authorized users with e-commerce systems	examines segregation of duties
	<i>Best business practices</i>	policies, procedures, and standards that ensure smooth functioning of e-commerce	examines top management commitment, standards, policies, trading partner agreements, training and education of staff, risk analysis, audit involvement, and contingency measures
Perceived Benefits of E-Commerce		perceived benefits in e-commerce are gains received by organizations that have adopted e-commerce	
	<i>Direct (operational) perceived benefits of e-commerce</i>	benefits derived from direct savings in costs and time	examines reduction in transaction and administrative costs

	<i>Indirect perceived benefits of e-commerce</i>	benefits derived from accuracy and quality of the messages thus leading to competitive advantage	examines improved customer service, product quality, improved productivity, profitability, increased sales, sharing of risks, and competitive advantage
	<i>Relationship related perceived benefits of e-commerce</i>	benefits derived from closer trading partner relationship such as open communications, information sharing, cooperation, and commitment	examines improved communication, cooperation, sharing of information, and commitment between trading partners
	<i>Strategic perceived benefits of e-commerce</i>	benefits derived from long term business investments and improved reputation of the trading partners	examines organization's image, increased long term investments, and continued trading partner relationship
Perceived Risks of E-Commerce		perceived risks in e-commerce are the potential weakness, barriers, and losses faced by organizations that have adopted e-commerce	
	<i>Technology-related perceived risks of e-commerce</i>	risks derived from misuse of e-commerce technology, unauthorized access, integrity, viruses, confidentiality, availability	examines compatibility of hardware and software, confidentiality, concerns over viruses, complexity of business operations, uncertainties, and internal security error
	<i>People-related perceived risks of e-commerce</i>	risks derived from trading partner's lack of knowledge and training in e-commerce	examines trading partner reluctance to change, lack of training, knowledge, awareness, poor reputation of trading partner, opportunistic behavior, lack of trading partner trust, and partnership uncertainty
	<i>General perceived risks of e-commerce</i>	risks derived from poor business practices, environmental risks, standards and audit policies	examines lack of security in trading partner's system, difficulty in identifying and quantifying cost, benefits, lack of standards, government policies, and poor business practices
Participation in E-Commerce		participation in e-commerce is the degree e-commerce organizations engage themselves in business to business e-commerce	
	<i>E-commerce performance</i>	is the volume, dollar value, and types of business transactions exchanged between trading partners	examines the importance of e-commerce for trading partner, percentage of e-commerce business, volume of e-commerce transactions, and dollar value of e-commerce transactions
	<i>Trading partner relationship development</i>	the extent of trading partner satisfaction	examines trading partner relationship in a long term business investments, increases level of open communications, increases level of cooperation, and increases level of commitment

5. PRELIMINARY RESULTS

Pattern matching was applied to the qualitative data collected from in-depth case studies. In addition to the interview data, documentary evidence provided secondary data that was used to cross-reference the data from interviews. The findings discussed below are only preliminary, as we are in the early stages of data analysis.

In line with previous theories of trust in business relationships and e-commerce implementation, trading partner trust was seen to be important for e-commerce participation. There are clear indications that trading partner trust, although implicit, if extended to frequent open communications, (e.g., timely, relevant, accurate information) provided to trading partners will ensure better management control, thereby enabling trading partners to forecast accurate strategic decisions. Preliminary findings also suggest that trust is seen from two perspectives: trading partner trust as between human actor or actors in e-commerce and technology assurances (as in trust and security based mechanisms in e-commerce). While ample research exists in the case of the latter perspective, only limited research currently exists in the role of trust between human actors. This study is unique as it combines both perspectives of trust, thereby providing insights for trading partners to increase e-commerce participation.

The findings provide evidence that e-commerce technology alone is insufficient for successful e-commerce participation. It is important to build and maintain positive trading partner trust relationships in order to increase e-commerce participation and maintain long term trading partner relationships. As an e-commerce coordinator stated, *“We need to concentrate on writing out a partnering/relationship agreement, instead of a trading partner agreement. The contract only states that two trading partners have agreed to trade with each other, but does not guarantee any purchase orders.”* Hence, in order to boost the flow of

business-to-business e-commerce transactions, trading partners will need to communicate openly, share information, and provide value-added services, thus moving from transactional trust to relational trust.

Research propositions relating to perceived benefits and perceived risks were supported as high trading partner trust seemed to lead to low monitoring and transaction costs. Furthermore, high levels of trading partner trust and secured e-commerce systems with complete configuration seemed to help mitigate perceived risks of e-commerce. Perceived benefits and perceived risks influenced the extent of e-commerce participation (e.g., volume and dollar value of e-commerce transactions) and the extent of development of trading partner relationships.

6. EXPECTED CONTRIBUTIONS AND CONCLUSION

The main implications of this study are the insights it provides about the relationship between trust and levels of participation in e-commerce. Kraut and Steinfield (1994) propose that the existence of *value added partnerships* implies exchange of a more enduring nature, the payoffs of electronic integration have a better chance of exceeding the costs firms incur in implementing systems. Such integration, however, increases the vulnerability of organizations, as sensitive information is made available to external trading partners. This implies that an important precondition to the successful deployment and use of e-commerce systems is the establishment of trust. We believe that the findings of this study will enable current and potential e-commerce adopters to design more effective strategies, trading partner agreements, and partnering/relationship charters in order to increase their level of trading partner interactions and coordination, thus eventually increasing trust and e-commerce participation. This study also contributes to the inter-organizational systems and inter-organizational relationships research streams by providing evidence of the importance of inter-organizational trust. Sydow (1998) defines inter-organizational trust as “*the confidence of an organization in the reliability of other organizations regarding a given set of outcomes or events*” (p. 35). We adopt this definition and define inter-organizational trust as *the confidence in the reliability of two organizations in a possibly risky situation that all trading partners involved in the action will act competently and dutifully*.

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