



# Information quality, trust, and risk perceptions in electronic data exchanges

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## ARTICLE INFO

### Article history:

Received 11 July 2011

Received in revised form 14 May 2012

Accepted 7 October 2012

Available online 23 October 2012

### Keywords:

Information quality

Exchange-risk

Performance-risk

Competence-trust

Goodwill-trust

Electronic transaction performance

Intent to use

## ABSTRACT

This study investigates the influence of information quality, trust and risk perceptions on the expected transaction performance of inter-organizational data exchanges and on the user intent to continue using the exchange. This study provides empirical evidence on the distinctive influences of information quality on competence-trust, goodwill-trust, exchange-risk and relationship-risk and how these different dimensions influence the intent to use inter-organizational data exchanges. As the performance of a data exchange may vary according to degree of successful completion of a specific transaction on the spot, this study also examines the extent to which expected transaction performance affects the model relationships. A survey is conducted to collect data from 221 business professionals. The study's hypothesized relationships are in general supported by the data and the resulting structural model proved to adequately represent the construct relationships. While these findings contribute to information system design theory, they also benefit professionals by providing insights as to how organizations can deal with the different types of uncertainties related to participating in electronic data exchanges. In addition, these findings help demonstrate the importance of interventions in the design of electronic data exchanges and the benefits expected by enhancing information quality in those settings.

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## 1. Introduction

Modern inter-organizational (I-O) partnerships employ electronic data exchange systems to facilitate collaboration and supply-chain performance. The various types of business relationships require different types of electronic data exchanges ranging from standard web-based ordering systems to proprietary systems. The benefits of these systems can range from efficient automated processes in ordering systems and cost-effective transactions, to strategic benefits of collaborative planning [44,52].

Electronic data exchanges present risks because they require sharing information with the partner [30] and the exchange of information may be subject to a fear of opportunism by the other [5,73]. Data exchanges also require one to cooperate and to trust that the partner will do likewise [8,34]. For the customer firm to use the vendor's exchange system assumes they can rely on both the system and its vendor. The exchange system should thus possess desirable features that ensure transaction performance and reinforce use continuance behavior.

Lack of control over an exchange partner increases uncertainty and the need to devise strategies to manage risk. Past research has argued

that the evolution from traditional electronic data interchanges (EDI) to open electronic commerce I-O exchanges demonstrates the need for real time controls [35, p. 47–49]. Research in risk management (e.g., [37,68,69]) also proposes a risk model in electronic I-O exchanges which addresses issues of risk at the technical/system, business process, and application/user levels. The present study examines the design of electronic inter-organizational (I-O) systems in an exchange context and the information sharing that occurs in the use of these exchanges. Past studies examined the extent to which integrated information sharing in an I-O exchange enables data standardization, and provides the link necessary to integrate the technical system, business process, and application/user architectural layers over an organization's electronic supply chain [26,28,31]. While the extent of integration in information sharing is an important determinant of supply chain performance (e.g., [57]), concerns over the quality of information exchanged can potentially influence the perceived trustworthiness attributed to the exchange partner, the assessed effectiveness of the data exchange to effectively carry out transactions, and a user's overall intent to continue using an electronic data exchange.

A number of significant research studies have been conducted on what makes data exchanges successful (e.g., [30,34,52,72]). Several studies have been done from the economics viewpoint, finding that electronic data exchanges provide lower coordination costs, higher exchange quality, reduced inventory costs, and enhanced strategic and operational benefits [5,45,52]. Other studies have examined the broader phenomenon of inter-organizational relationships – IORs

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(e.g., [29,34]). Data exchange relationships form a subset of IORs and their benefits seem to be mainly due to enhanced information sharing in the relationship [2,40,57]. Gulati and Gargiulo [29] suggest that positive cues are needed initially both to overcome “information hurdles” and to help strengthen the exchange relationship. Positive cues like special site features help exchange users feel right about the exchange even when uncertainty about it is high.

Information quality (IQ) is one such cue. IQ means beliefs about the favorability of the characteristics of the exchange information and reflects the user evaluation of information sharing in data exchanges [53,67]. Previous research has examined how information quality of an exchange influences trust and risk perceptions and how such perceptions influence the intent to adopt a specific exchange. Trust and risk have been emphasized to play decisive roles in economic exchanges [16] and to affect the success of inter-organizational exchanges [30]. The complexity of social and economic exchanges has led to the distinction between various types of trust and risk [15,60]. This paper aims at exploring whether information quality has distinctive influences on two types of trust (competence-trust and goodwill-trust) and two types of risk (exchange-risk and relationship-risk) and how these different types of trust and risk influence the intent for continued use of IOS exchanges. As the performance of a data exchange relies on the successful completion of a specific transaction on the spot, the paper also examines the extent to which transaction performance affects the model relationships.

We believe answering these questions has the potential to benefit data exchange research and practice in significant ways. First, exchanges are very prevalent in professional practice, and what makes them successful is important. Second, studying how information quality exerts its effects on outcome variables by analyzing its distinctive influences on competence-trust and goodwill-trust can influence successful information system design. Previous research has showed that interorganizational relationships can be characterized with specific types of trust [32]. This study contributes to enhancing our knowledge about the precise influences of information quality on the specific types of trust helps to (1) determine the characteristics of information systems that are needed for successful performance in different contexts of interorganizational relationships, (2) establish how information quality can be employed to deal with performance-risk and exchange-risk, and (3) ascertain whether information quality can be utilized to attain the required balance between trust and risk for enhanced transaction performance.

## 2. Theoretical background, rationale, and research hypotheses

### 2.1. Theoretical background

Organizations value information quality as they are confronted with increasing uncertainty, market volatility and dynamic customer demands. Decision makers value timely information on market developments, reliable information on customer preferences and accurate information on the latest trends. High information quality gives the system user confidence in the exchange vendor because having quality information suggests that exchange information is reliable, correct, adequate, complete, responsive, and timely [27]. Within an expectation-disconfirmation framework, McKinney et al. [48] use IQ as a construct to predict Internet consumer satisfaction, while DeLone and McLean [19] use information quality to predict user satisfaction and system use. The quality of information sharing, nevertheless, varies widely across different data exchanges. Professional exchanges, including [www.covisint.com](http://www.covisint.com) and [www.recycle.net](http://www.recycle.net), vary in the degree to which they make available to the user important exchange information or offer transaction information.

The effects of information quality have been previously examined within the theoretical contexts of system adoption and system success [10]. Applying these insights, this paper highlights the role of IQ and

relationships among exchange partners in the adoption and use of electronic data exchanges. Past research (e.g., [29]) suggests that initial partners rely on cues (e.g., business credentials) to develop confidence in each other. It is likely that the availability of information cues in the exchange serves as a key determinant of the relationship between IQ and exchange outcomes.

Past evidence on initial use of data exchanges establishes the importance of factors that impact the climate of the relationship (i.e., sentiments of bonding and trust), which Bensaou [6] found to be the most robust predictor of buyer–supplier cooperation. Also, Bensaou and Venkatraman [7] integrate across three theoretical lenses – transaction cost economics, organization theory, and political economy – to model interorganizational relationship (IOR) formation. They show how all three theory bases address exchange uncertainty via joint action, information sharing, and coordination. Economic theories like transaction cost economics and agency theory suggest that online data exchange use may be fraught with concerns [64] because the vendor–supplier party has the ability to hide information from the customer–user. In the online environment, the ability to appear to be what you are not increases the chances for opportunistic behavior [18]. Further, as Singh and Sirdeshmukh [64] explain, the vendor may not deliver goods in a satisfactory manner, resulting in a moral hazard situation the consumer cannot detect. Because each party is dependent on the other, they need and want to cooperate, but suspicion often lurks in their minds due to the possibility of moral hazard or opportunism. Thus, economic exchange theory suggests that the exchange must either be supported by control structures such as formal rules, procedures, and policies to monitor and reward desirable performance [16] or informal controls that enforce obligations, promises, and expectations through trust relations [21,25]. While trust has been studied widely in B2C e-commerce [9,23,56], few (e.g., [30]) have studied trust in settings like electronic data exchanges. In related work, Bensaou and Venkatraman [7] develop a conceptual model for interorganizational partners that include trust as a factor of partnership uncertainty.

In our study, we examine empirical relationships in a spot exchange (business-to-business) context, and thus consider informal forms of control and cooperation in such business interactions. In their role as boundary spanners, managers need to supervise various horizontal relations with other organizations, including suppliers, competitors, and other entities in their supply chain that can influence their own organizations. These managers are in fact active in complex networks of social interactions [11] where effective interactions are keys for achieving the increased performance and realizing value. An inter-organizational exchange involves partners engaged in high uncertainty and risk [42,70], and such uncertainty and risk are typically high because the behavior of the partner can neither be guaranteed nor monitored [23,58]. Hart and Saunders [30] find trust and risk are both crucial to electronic data exchanges. As a result, an economic exchange perspective on informal exchange processes can theoretically explain the relationships that form during the interaction of a user with a data exchange system.

Given the level of uncertainty and volatility that is inherent in business exchanges, trust and risk are pervasive phenomena in such interactions. Trust enables people and organizations to interact without fear of getting exploited or taken advantage of [20]. Such trust in the business partner can be founded on competence and demonstrated accomplishments or the consideration of interests and goodwill [54]. Although different types of trust are distinguished, the matter of how these types influence the use of data exchange systems has received limited theoretical attention. Perceived risk, on the other hand, appears to be an integral part of people's cognitive processes when dealing with risky situations. As organizations are compelled to creating alliances with numerous parties, including competitors, managers are expected to supervise these alliances even though they are confronted with various risks including opportunistic behavior, hidden agendas and market volatility. The academic literature

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