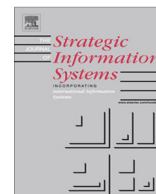




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## Journal of Strategic Information Systems

journal homepage: [www.elsevier.com/locate/jsis](http://www.elsevier.com/locate/jsis)

## Distinguishing the effects of B2B information quality, system quality, and service outcome quality on trust and distrust

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## ARTICLE INFO

## Article history:

Received 15 November 2014

Received in revised form 3 January 2017

Accepted 4 January 2017

Available online xxxx

## Keywords:

Trust  
Distrust  
Data exchange  
B2B relationship  
Information quality  
System quality  
Service outcome quality  
Relationship commitment  
Perceived risk

## ABSTRACT

Successful business-to-business (B2B) data exchanges can help firms improve inter-organizational cooperation and operational practices, thereby increasing competitive advantage. However, data exchange quality and trust are not assured. Further, although researchers have examined how trust in the exchange partner relates to data exchange system success, both trust and distrust may be important to consider. Using two-factor theory and trust theory, we examine the differential impacts of information quality, system quality, and service outcome quality on trusting and distrusting beliefs. We also study whether trusting and distrusting beliefs have differential influences on relationship commitment and perceived risk. Results from a laboratory experiment show that information quality, a process (i.e., motivating) factor, more strongly influences trusting beliefs than distrusting beliefs, whereas service outcome quality, an outcome (i.e., hygiene) factor, more strongly influences distrusting beliefs. Also, while trusting beliefs has a significantly stronger influence on relationship commitment, trusting and distrusting beliefs have equivalent effects on perceived risk. Implications and ways to expand this research are discussed.

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### Introduction

Internet and electronic commerce applications are allowing businesses to use information technology (IT) to manage B2B activities and create competitive advantage (Ho et al., 2011). These technologies range from standard web-based ordering systems to elaborate proprietary systems (Hart and Saunders, 1998; Lippert, 2007; Nicolaou and McKnight, 2006; Nicolaou et al., 2013; Ratnasingam, 2001). Forrester Research recently reported that the B2B e-commerce market alone is more than twice the size of online retail, and is expected to top \$1.1 trillion by 2020.<sup>1</sup> Online B2B data exchanges are beneficial to organizations because they can enhance buyer and seller cooperation, and potentially improve their operational performance (Madlberger, 2006). According to a real-life B2B data exchange participant, these systems can help exchange partners: (1) establish visibility; (2) change manufacturing schedules; (3) improve inventory control; (4) reduce carrying costs; and (5) increase customer order fulfillment satisfaction (Lippert, 2007). These make B2B data exchanges critical strategic information systems.

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<sup>1</sup> <https://www.internetretailer.com/2015/20/23/groundbreaking-survey-b2b-e-commerce>.

However, some researchers find that B2B data exchange systems do not achieve these benefits, and can even damage inter-organizational coordination efficiency (Clemons and Row, 1993) and customer service performance (Closs and Savitskie, 2003; Wong et al., 2011–12). Two factors emerge in the literature as being among the most important for ensuring the benefits of online B2B data exchange relationships. The first is quality. Purchasing is often the main point of contact in inter-organizational relationships, and to remain competitive businesses must focus their strategy on improving quality, responsiveness, and delivery performance (Kannan and Tan, 2003; Prakash, 2011). Enhancing process and delivery quality can improve partner relationships and operational efficiency, and can positively impact the competitiveness of the entire supply chain (Prakash, 2011). However, quality is sometimes inadequate in B2B data exchange system relationships (Lippert, 2007; Nicolaou and McKnight, 2006). Low quality can have drastic consequences like lost orders, increased claims, lower prices, delayed payments, and generally lower supplier ratings (Guonaris, 2005; Mehta and Durvasula, 1998). Thus it is crucial to investigate how quality influences data exchange partner perceptions and intentions.

The second vital factor for ensuring the benefits of B2B data exchange systems is trust.<sup>2</sup> Trust is necessary in data exchange relationships because such relationships involve uncertainty and risk. Uncertainty and risk exist because business partners experience less personal contact, increased technical changes and competitive pressures, and unknown future events (Ratnasingam, 2005). Research shows trust in the exchange partner can help alleviate uncertainty and increase favorable perceptions about the data exchange system and the relationship as a whole (Ibrahim and Ribbers, 2009; Morgan and Hunt, 1994; Lippert, 2007; Nicolaou and McKnight, 2006; Nicolaou et al., 2013; Ratnasingam, 2001).

However, distrust may also be important to data exchanges. Trusting beliefs are perceptions of the exchange partner's positive trust-related attributes, whereas distrusting beliefs are perceptions of the exchange partner's negative trust-related attributes. Trusting beliefs and distrusting beliefs are distinct constructs that can exist simultaneously (Dimoka, 2010; Lewicki et al., 1998), and both may be important to understand in this context. For example, researchers find through interviews that while trust is important in well-functioning buyer-seller relationships, distrust is also vital for questioning things and not taking them for granted (Seppänen and Blomqvist, 2006). Others suggest that sustained high trust and high distrust is not uncommon in complex organizational relationships, and may require partners to use controlling actions because of distrust's effects (Lewicki et al., 1998). This makes it critical to know what factors influence both trusting and distrusting beliefs in B2B data exchange relationships.

Based on this, our main research objective is to understand the complex relationships among quality, trust, and distrust. We extend the Nicolaou and McKnight (2006) theoretical model that depicts the roles of information quality and trusting beliefs in inter-organizational data exchange relationships (Fig. 1). While their model includes only trusting beliefs, we add distrusting beliefs to account for buyers' beliefs about both the vendor's positive and negative attributes (Fig. 2). Also, while Nicolaou and McKnight (2006) focus solely on information quality, we extend their work to also include system quality and service outcome quality. While previous studies investigate the impacts of system, information, and service quality on trusting beliefs (Kim et al., 2004; Nicolaou and McKnight, 2006; Zhou, 2011b, 2012), no work to our knowledge has examined the impact of all three quality factors on trusting and distrusting beliefs in a B2B data exchange context. But all three types of quality are important because of intensive pressures to remain competitive (Kannan and Tan, 2003; Prakash, 2011), and because they may differentially impact trusting and distrusting beliefs. Based on Herzberg et al.'s (1959) two-factor theory that distinguishes between service process and service outcome quality (Chen and Kao, 2010; Collier and Bienstock, 2006; Mentzer et al., 2001), we predict differential effects of these three quality-related factors on trusting and distrusting beliefs. We also propose and test differential influences of trusting and distrusting beliefs on two exchange outcomes: relationship commitment and perceived risk.

We investigate our research model using a laboratory experiment that is intended to help create variance in quality. The experimental design places subjects in the role of a purchasing manager for a large manufacturing company who is using a system modeled after real-life B2B data exchange systems. The experimental materials include a number of B2B contextual attributes not only to help the subjects role-play, but also to ensure the context is distinguishable from a B2C context (Table 1). This is important because B2B and B2C contexts differ widely in terms of purchase objectives, decision complexity, payment, products, and supplier relationships. B2B purchasing for example, is often for raw materials to be used in manufacturing rather than for finished goods to be used personally as in B2C purchasing (Kaplan and Sawhney, 2000).<sup>3</sup> Also, B2B purchasing decisions are often more complex because they can involve more people (functional areas) than B2C purchasing decisions (Oliveira and Roth, 2012). Further, researchers suggest that trust can be perceived differently based on these differences (Sirdeshmukh et al., 2002). Hence, it is important to ensure our experimental design simulates a B2B context. Table 1 shows that our procedures usually do so, either partly or fully.

This study potentially contributes to strategic information systems theory and practice by examining the differential effects of quality, trust and distrust on data exchange system user perceptions and intention to use. Little work has investigated the influence of all three quality factors on trust and distrust in any context, yet all are important for understanding

<sup>2</sup> The general term "trust" includes both trusting beliefs and trusting intention (Rousseau et al., 1998). The term "trust" is used often in the information systems literature (e.g., Gefen et al., 2003a) to refer to the more specific construct "trusting beliefs" (perceptions about the positive attributes of the trustee), usually comprised of benevolence, integrity, and competence. Hence when talking from or about the literature, we use the terms "trust" and "distrust." We also use "trust" and "distrust" in conveying our practical implications. But we use "trusting beliefs" when hypothesizing, measuring, or reporting on the specific operationalization of trust in this paper.

<sup>3</sup> <http://smallbusiness.chron.com/differences-between-b2c-b2b-business-systems-39922.html>.

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