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TRUSTWORTHINESS IN COMPUTER-MEDIATED TRANSACTIONS: A CONTENT ANALYSIS OF TRUSTOR FEEDBACK

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Abstract

Internet-based information technology enables impromptu, virtually anonymous interactions between geographically dispersed, diverse others that is an order of magnitude larger than any preceding information technology. With this increased networking capability comes increased risk and uncertainty. We conducted a content analysis to identify what trustors in peer-to-peer computer-mediated transactions communicate to other trustors regarding the trustworthiness of a trustee with whom they have interacted. In our study, 61% of all feedback comments made reference to the trustworthiness of the trustee. Nearly half of all comments referred to the ability of the trustee while nearly a quarter referred to the trustee's integrity. Very few references to benevolence were observed. The relevance of this study is that it informs the process of designing and developing systems that reduce the risk and uncertainty engendered by this new form of connectivity and interaction.

Keywords: trust, computer-mediated transactions, peer-to-peer computing, reputation system

Introduction

As information technology increasingly mediates our interaction with each other, teams, and organizations, it is critical to understand the nature of that interaction as it pertains to the new risks and uncertainties brought about by this interaction. This is especially true for peer-to-peer computer-mediated transactions. Internet-based information technologies are enabling interactions with diverse others on a scale and scope greater than any other technology in history.

Peer-to-peer computer-mediated transactions are different from traditional business transactions in terms of how reputation systems are established. A reputation system "collects, distributes, and aggregates feedback about participants' past behavior" (Resnick et al. 2000). Reputations are normally built through face-to-face interaction, references, or institutional channels. Participants in peer-to-peer computer-mediated transactions usually neither have nor are likely to ever have face-to-face interaction with each other. These transactions occur as impromptu, virtually anonymous dyadic interactions between geographically disperse, diverse others.

From this new form of interaction, a networked society (Wellman 2002) is emerging. Computer-mediated social networks pose significant challenges to system designers and developers. One challenge is to establish and maintain reputation systems in a world where boundaries shift and individuals move effortlessly in and out of networks of overlapping alliances and acquaintances. This is a significant challenge because reputation provides an indication of

trustworthiness. Trust is a crucial ingredient in any meaningful interaction, but even more so in computer-mediated transactions where the risk of online fraud and the level of uncertainty regarding the characteristics of the trustee are very high.

A first step in understanding how to design systems that enable users to assess and communicate trustworthiness in computer-mediated interactions is to identify important trust-related attributes of trustees that are perceived and communicated by trustors. The collection of trustworthiness perceptions communicated online constitutes a trustee's reputation (Resnick et al. 2000). So, the objective of this study is to address the following research question:

What do trustors communicate to other trustors regarding their perceptions of the trustworthiness of a trustee with whom they have completed a peer-to-peer computer-mediated transaction?

Dimensions of Trustworthiness

Prerequisite to answering the research question is the development of a definition of trust and the dimensions of the trustor's perception of the trustee's trustworthiness. Trust in a peer-to-peer computer-mediated interaction is a dyadic situation. Accordingly, we adopt the definitions put forth by Mayer et al. (1995), who define trust as "the willingness of a party to be vulnerable to the actions of another party based on the expectations that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party." They further propose three dimensions of trustworthiness: ability, integrity, and benevolence. See Figure 1.

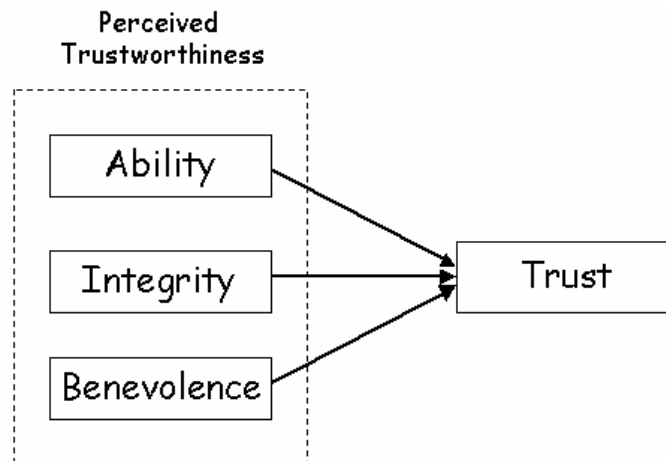


Figure 1. Dimensions of perceived trustworthiness

The dimensions of perceived trustworthiness are defined in Table 1. These definitions provide the theoretical basis for identifying trustee characteristics that are important to trustors.

Table 1. Dimensions of Perceived Trustworthiness

Construct	Definition
Ability	The trustee's competence in the area related to the task of the transaction
Integrity	The trustor's perception that the trustee adheres to a set of principles that the trustor finds acceptable
Benevolence	The extent to which a trustee is believed to want to do good to the trustor. This is above and beyond the egocentric profit motive

Content Analysis

To test the research question, we conducted a content analysis of an online reputation system. We submit that the collection of comments left by trustors about a trustee's past behavior constitutes the trustee's reputation in the

virtual marketplace. Content analysis provides an objective, replicable method for drawing inferences about the meaning of a communication. This is done by enlisting independent coders to identify the comparative frequency of a symbol's appearance in a set of communications. Through content analysis, it is possible to identify what trustors are telling other trustors about their perceptions of the trustworthiness of a trustee.

The source of empirical data for our study of trustworthiness in the virtual marketplace is a popular online auction site. We sampled comments left by buyers about sellers with whom they had completed a transaction on eBay. Currently, eBay (www.ebay.com) is the most successful and widely used example of Internet-based peer-to-peer transactions system. Ebay.com hosts thousands of simultaneous peer-to-peer auctions for items ranging from antiques to jewelry to televisions. Ebay.com creates a worldwide virtual marketplace for individuals to place items up for auction for sale to other individuals.

In the virtual marketplace, potential buyers can be viewed as trustors and sellers as trustees. Potential buyers must be willing to be vulnerable to the actions of the seller irrespective of the buyer's ability to monitor and control the actions of the seller. EBay has institutionalized this perspective by creating a facility that provides potential buyers with information posted by past buyers about particular sellers. EBay calls this facility the Feedback Forum. After posting a winning bid and completing the transaction, a buyer can post short comments about the seller into the Feedback Forum interface.

The sample of feedback forum comments used in this study was drawn from the "Textbooks, Education" category. We selected this category of auctions because a book is like a commodity. Each copy of a particular book is interchangeable with other copies and has standard, known attributes. As such, the coders analyzing the comments require a relatively low level of expertise or knowledge to understand the perceptions of the buyers regarding characteristics of the item or the manner in which the item was packaged and shipped. By choosing a category for which knowledgeable coders appear frequently in the general population, we increase the replicability of the study (Krippendorff, 1980).

We generated the sample by compiling a list of all sellers with an active auction in the textbook category. From this list, we collected the most recent 500 comments left by buyers about each seller. As with most decisions regarding the sampling frame, we weighed the cost of data collection against the potential bias introduced by taking a convenience sample. Given that the feedback forum interface has remained relatively stable over the time period from which the sample was taken, we see no reason to think the most recent 500 comments are not relatively representative of the population of comments.

After creating a sample, we developed and refined the coding instructions through several iterations with pilot coders. The coding instructions included a 15-comment training module. The comments in the training module were not included in the final study. Neither the pilot coders nor pilot recording units were used in the final content analysis. None of these coders were included in the final study. We operationalized the theoretical dimensions or categories of trustworthiness into detailed coding instructions, as follows:

Ability is the buyer's perception that the seller has the skills, competencies, and characteristics to perform the tasks necessary to post and describe an item on the eBay system, interact with potential buyers, and complete the exchange of payment and delivery of the item, where:

post and describe an item is the extent of the seller's knowledge about the use of the eBay system and the item being sold.

interact with potential buyers is the seller's communication skills including the ability to use email effectively and to answer questions about the item in a clear and understandable way.

complete the exchange of payment and delivery is the seller's ability to package the item with care and manage the process of shipping the item in a timely fashion.

Integrity is the buyer's perception that the seller adheres to a set of principles that the buyer finds acceptable. This set of principles includes the consistency of the seller's past actions, the seller's sense of justice and fairness, and the extent to which the seller's actions are consistent with his or her words, where:

sense of justice and fairness is the extent to which the seller does not intend to deceive the buyer and adheres to established standards of proper business conduct.

actions are consistent is the extent to which the seller keeps his or her promises.

Benevolence is the buyer's perception that the seller wants to do good to the buyer aside from the seller's egocentric profit motive, where:

do good to the buyer is the extent to which the seller wants to help the buyer even though he or she is not required to do so and does not expect an extrinsic reward.

The entire set of coding instructions can be made available at the reviewer's request.

We enlisted four coders to classify comments. Each coder received the coding instructions and sample via email. All coders worked independently and without any intervention from the researchers. None of the coders were familiar with the study. The coders were a homemaker (female), an information technology professional (female) and an undergraduate majoring in information technology (male). Two of the coders have never used eBay, but were aware of its existence. The other coder is a moderate eBay user.

The entire feedback comment constituted the recording unit. This resulted in 1,604 analyzable units. From this 1,604 we randomly selected 15% of the total or 240 units. Agreement and reliability were assessed by cross-coding 30 comments or 12.5% of the sample. We rejected the data from one of the four coders due to a technical problem that introduced irregularities into the coding procedure leaving only three coders in the final study.

Results

To assess the extent to which trustworthiness is communicated in an online reputation system, we calculated the comparative frequency of coded references to buyer perceptions of seller trustworthiness. From the sample of 240 feedback comments, our coders classified 61% or 148 comments as containing a reference to a buyer's perception of the trustworthiness of the seller. As can be seen in Table 2, the dimensions of ability and integrity appeared most frequently. Only two comments contained a reference to benevolence.

Table 2. Comparative Frequencies

Construct	Comparative Frequency	Reliability (Scott's Pi)
Trustworthiness	61% (148/240)	0.65
Ability	48% (114/240)	0.67
Integrity	23% (54/240)	0.60
Benevolence	1% (2/240)	na

Each comment in the sample could contain a reference to one, two, or all three of the dimensions. Multiple references to a dimension within a single comment were counted only once. A comment was counted if at least one coder classified the comment as containing a reference to trustworthiness.

The reliabilities listed in Table 2 are based on 30 cross-coded comments. On this subset, our coders agreed 84% of the time on the classification of comments for the ability and integrity dimensions. Our coders found no references to benevolence, and reliability could not be calculated.

Discussion

Our findings suggest that trustors communicate their perceptions of the trustworthiness of a trustee to other trustors in online reputation systems. Further, these communications tend to make reference to the trustor's perception of the trustee's ability and integrity. We found very few references to the trustee's benevolence.

If the comparative frequency of communication is a measure of importance, our findings suggest that trustors are most concerned about the ability of the trustee. Nearly half of all comments included a reference to the trustee's ability to communicate, use the technology competently, properly package the book and manage the shipment process.

Although trustors made fewer references to the trustee's integrity, they still care about the trustee's honesty and sense of justice and fairness. Our coders indicated that 25% of all comments contained a reference to the trustor's perception of the trustee's integrity.

Our coders found very few references to benevolence. One possible explanation for the lack of importance placed on benevolence is that although eBay attempts to foster a sense of community, ultimately buyers and sellers meet in eBay's marketplace to conduct transactions. There are many possible reasons for buyers and sellers to interact via online auction sites, such as the entertainment value of winning an auction or the personal satisfaction of belonging to a community of like-minded individuals. But at the foundation of most transactions is the egocentric profit motive. Benevolence goes beyond the egocentric profit motive and refers more to process of building personal relationships and the trustor's perception that the trustee is concerned for his or her personal well being.

Conclusion

Our findings suggest that trust is a significant issue for trustors in peer-to-peer computer-mediated transactions. Presumably trustors communicate their perceptions to other trustors regarding the trustworthiness of the trustee because they feel there is a need to do so. Trustors recognize the element of uncertainty and risk engendered by these types of interactions. By submitting feedback to other trustors, they attempt to reduce this uncertainty and risk for other trustors.

Systems that support peer-to-peer computer-mediated transactions are different from systems that support traditional business-to-business and business-to-consumer transactions. In the peer-to-peer environment of loosely coupled social networks, the system itself is likely the only means by which an individual can assess the trustworthiness of virtually anonymous, geographically disperse, diverse others. These systems become the conduit for creating, maintaining, and conveying the reputations of trustees. As such, it is important that these systems do more than just mediate interaction. In the most recent report published by the IC3 Internet Crime Report, online fraud on auction sites accounted for 62.7 percent of all complaints (IC3 2005). Our findings suggest that system designers should work to develop interfaces that enable trustors to consistently assess and communicate their perception of the trustworthiness of a particular trustor.

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