

Design of the Merchant Reputation System: A Web-based Purchase Decision Support System

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ABSTRACT

The focus of the paper is to investigate the design of current merchant reputation systems on shopping agent websites. The study explores their roles and impacts in customer decision-making process, identifies their rating methodology and rating reliability. The findings will help industrial practitioners for their design of merchant reputation systems, and will benefit online shoppers and e-merchants for their utilization of merchant reputation systems.

1. Introduction

A merchant reputation system works as a recommendation system on a shopping agent website. The system provides customers with the opportunity to compare electronic service quality (E-SQ) and to choose a merchant they feel comfortable shopping with. A recent Internet search shows that more and more merchant reputation systems have become available on shopping agent websites. BestWebBuys.com, BizRate.com, NexTag.com, PriceGrabber.com and Shopping.com are five very popular merchant reputation systems involved with a large number of online customers and merchants.

Despite its undeniable importance and widespread adoption, very little research has been published on the standardization of merchant reputation systems so far. With the increasing number of merchant reputation systems coming upon shopping agent websites, different designs of different reputation systems may generate rating discrepancy for the same merchants which might mislead the online shoppers. Customers may find ratings on the same merchant not consistent across different

merchant reputation systems. Based on their research, Wang and Christopher [15] indicated that customer ratings on the same set of merchants are neither consistent within the same reputation system nor across different reputation systems. Rating discrepancy between different reputation systems may attribute to different evaluation approaches and different categorized rating criteria utilized in different reputation systems. To meet the challenge, the study of design standards of merchant reputation systems needs to be conducted.

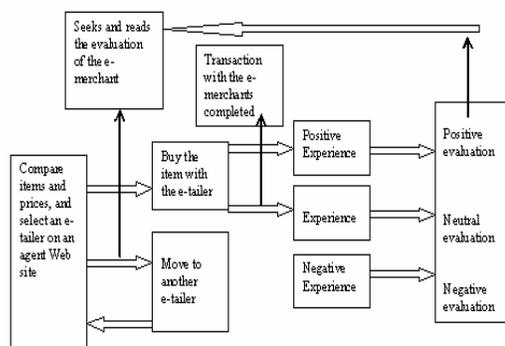
This paper aims to investigate the current merchant reputation systems and to identify the rating methodology and design standard. The intent is to improve the design of reputation systems on agent websites and rating reliability, thereby helping customers to find their most appropriate merchants and reducing the risks inherent in interactions with strangers on the Internet. The paper explores the roles and impacts of the merchant reputation system, provides an overview of five most popular merchant reputation systems, identifies their evaluation methodology and rating reliability, and proposes suggestions for the design of merchant reputation systems in the future development.

2. Background

Prior to the reputation system, the ratings of merchant service quality were answered through e-mail and survey forms popped out on the merchant website. The recent development of agent technology makes it possible for the merchant reputation system to collect customer feedback on multiple merchants from the Internet. Since one shopping agent website has access to hundreds and thousands of merchants'

stores, the reputation system is able to collect the customers' feedback on multiple merchants. Customers who have finished shopping with merchants listed on the agent websites are invited to write text comments, and evaluate their merchants on the reputation system. In response, the online reputation system will display these evaluations including both text comments and ratings to the public. The prospective customers can possibly use these evaluations in their purchase decision-making process. Figure 1 illustrates how a merchant reputation system works on a shopping agent website.

Figure 1 Role of a Reputation System



The role of the merchant reputation system is to provide information about the past behavior of merchants to online shoppers. The purpose of establishing the reputation system is to build trust by using comments from previous customers as a valuable asset to other customers. Trust is an essential concept that an e-business should attend to since trust has been considered a building block that strengthens relationships between customers and merchants [13]. In the B2C e-commerce environment, trust is more difficult to establish and even more critical for success than in traditional business. The retailers down the block will likely be there the next day, but the merchant that exists in cyberspace is often not real in the customer's eyes [6]. The customers' lack of inherent trust in "strangers" in the e-stores is logical and to be expected. If an e-tail store wants to do business, it has to prove its trustworthiness by satisfying customers for many years as it grows [12].

The rating of the merchant reputation system is important because of its great impact on online shopper behavior and public opinion

formation of merchants. As Resnick, et. al [9] defined, a reputation system collects, distributes, and aggregates feedback about participants' past behavior. Though few customers of ratings know one another, these systems help people decide who to trust, and encourage trust behavior.

The merchant reputation has significant impact on customers' trust and on their intentions towards adopting e-services [10]. Taylor [14] found that consumers tend to regard information obtained by "word of mouth" as more objective and possibly more accurate. A satisfied customer will tell three people about his or her experience, but a dissatisfied customer will complain to thirty people. Therefore, consumer comments can be a powerful influence on the purchasing decisions of others [8]. While word of mouth always disseminates reputations informally, Internet can now vastly accelerate and add structure to the process, gathering information about past behavior swiftly and systematically, and distributing it to a broad audience. The reputation system is best known so far as a technology for building trust and encouraging trust behavior Dellarocas [3], and encourages trust worthiness in e-commerce transactions by using past behavior as a public available predictor of likely future behavior.

Recent research shows that price and promotion are no longer the main draws for customers to make a decision on a purchase. More and more sophisticated online customers would rather pay higher prices to merchants who provide high quality e-service [12]. Thus, the customer e-satisfaction rating is an important measure of e-service quality. Conventional marketing research has also illustrated the relationship of customer service variables with customer outcomes such as customer satisfaction [1, 4, 18]. The most experienced and successful merchants are beginning to realize that key determinants of success or failure are not merely web presence or low price, but instead center on e-service quality [17]. Study of reputation systems is crucial for both customers and merchants. Customers need to have reliable merchant ratings from merchant reputation systems before they make a purchase decision, and merchants need to have a reliable resource to get the customers' feedback so that they can adjust their marketing strategies and improve their service quality.

scale of 1 to N where N is the best rating. Figure 5 illustrates the categorized rating form of a reputation system with two most common criteria: customer support and on-time delivery.

Figure 5 Categorized Ratings

	1	2	3	4	5
Customer Support:	☺	☺	☺	☺	☺
On-Time Delivery:	☺	☺	☺	☺	☺

The result of the study shows that the categorized rating criteria utilized on the four different systems are very different from one system to another in terms of the number of rating criteria and the content of rating criteria. For example, the Shopping.com invites customer to rate merchants for only three criteria. Whereas, BizRate invites customers to rate merchants for eleven criteria for: six for the pre-order mode and five for post-order mode.

There is similarity shown in the categorized rating criteria on all the 3 merchant reputation systems that have the categorized ratings – they all include on-time delivery and customer support as rating criteria. On-time delivery and customer support. Table 1 illustrates that two common rating criteria occurs on the following three reputation systems.

Table 1 Common Categorized Rating Criteria on Reputation Systems

	BestWeb Buys	BizRate	Shopping
Customer support	*****	☺☺☺☺☺	+++++
On-time Delivery	*****	☺☺☺☺☺	+++++

3.4 Summary

Table 2 shows that combination of text comment and overall rating is used in each of the five reputation systems, but the categorized rating only occurs in three out of five reputation systems. As indicated in Table 2, a text comment approach is used on all the five reputation systems. A categorized rating approach is used in three out of five reputation systems. An overall rating approach is used on five reputation systems, which will be the focus of the next phase of research. In summary, the following

three types of rating methodologies have been identified based on the investigation of five reputation systems though they could be in different kind of combination for each reputation system.

Table 2 Three Rating Approaches

	Text Comment	Categorized Rating	Overall Rating
BestWebBuys	Yes	*****	*****
BizRate	Yes	☺☺☺☺☺	☺☺☺☺☺
NexTag	Yes	N/A	*****
PriceGrabber	Yes	N/A	*****
Shopping	Yes	+++++	+++++

The result also shows that four out of five reputation systems using a rating scale of 1 to 5 where 5 is the best rating. The BizRate.com only has outstanding, good, satisfactory and poor with neutral omitted. It is suggested that BizRate.com may consider neutral ratings not significant enough in the reviews for readers.

Three out of five reputation systems have periodic overall ratings. The periodic ratings will certainly help readers view the progress of merchants' performance in e-service quality. The length of period is different ranging from a past week, a past month, to the past three months and all-time reviews on PriceGrabber.com, BizRate.com and Shopping.com systems.

4. Rating Reliability

The research on the rating reliability of reputation systems can be traced back as early as 1998. Friedman and Resnick [5] pointed out risks related to the reputation system, indicated the ease with which online community participants can change their identity, and concluded that the assignment of lowest possible reputation value to new comers was an effective mechanism for discouraging participants to misbehave and, subsequently, to change their identity. Kollock [7] stated that online rating systems had emerged as an important risk management mechanism in the e-commerce community based on his study of eBay case. Dellarcas [2] identified several scenarios ("ballot stuffing", "bad-mouthing", positive seller discrimination, negative seller discrimination and unfair ratings "flooding") in which buyers and sellers can attempt to "rig" an

online rating to their advantage resulting in biased ratings, which don't accurately reflect the expected service quality of a given merchant. Some important management mechanisms have been developed.

So far, most merchant reputation systems have developed measures to counteract the above potential threats in various ways. The study shows that most systems have created registration systems to restrict online reputation writers only to its member customers. Being member customers, they have to log on to their accounts before they evaluate their merchants. Four out of five reputation systems require to log on a registered account before rating is performed with the exception of NexTag.com.

All the five systems claim that they keep the right to be able to detect and eliminate fraudulent ratings by using a combination of sophisticated mathematical algorithms and large numbers of reviews from a variety of sources that were checked for consistency. This is a technical issue that remains within each company for its confidentiality.

A newly developed mechanism occurs on the GraberPrice.com system is to display the overall rating on a merchant with the purchase transaction number and item description. By clicking the displayed transaction number, readers can see the transaction details including the merchandise name, and its description, price, and date of purchase. This makes the merchant evaluation more meaningful and convincing to readers. The problem is that the rater must have a transaction with the merchant who has registered with the Storefront Company before he/she contributes a rating. Thus, the mechanism has not been popularly used even on the PriceGrabber.com system.

5. Concluding Remarks

The significance of this paper is to provide industrial practitioners, customers, and merchants with a valuable evaluation of current design standards of merchant reputation systems on shopping agent websites. This study makes contributions to the design of merchant reputation systems in three areas: 1)

identification of rating methodology, 2) examination of categorized rating criteria, and 3) study of countermeasures for rating reliability.

Three rating approaches: text comment, overall rating and categorized ratings are identified through investigation of the five merchant reputation systems. Each reputation system utilizes the combination of at least two, possibly three approaches because each of the three types of approaches has its pros and cons. Text comment accurately describes real personal purchasing experience, but might not incorporate similar perceptions among individual customers. Overall ratings describe customers' general impression of the store using ordinal numbers, but it misses specific details. Categorized ratings describe feedback on some specific issues of e-satisfaction with ordinal numbers, but these issues may not cover all of the customers' concerns and do not provide reasons to support these categorized ratings. To overcome the above limitations of each of the approaches, the combination of two or three reputation approaches is utilized for different reputation systems.

On-time delivery and customer support are the two major factors identified by Wang & Huarng [16] in their content analysis of text comment of reputation systems. The result of the study further confirms their research result by identifying these two issues as common criteria utilized in categorized ratings on reputation systems. Although the categorized rating criteria on reputation systems are different from one system to another in terms of the number of rating criteria and the content of rating criteria, on-time delivery and customer support criteria are always shared by all the reputation systems.

Logging on to the account before rating has become a very popular mechanism. To create an account to rate a merchant, the rater needs to register with a valid e-mail account at least. Most reputation systems require raters to log onto their account before they write their evaluations.

The study shows that the categorized rating criteria utilized on the different systems are different from one to another in terms of the number of rating criteria and the content of rating criteria. Categorized ratings will affect

overall ratings. Different categorized ratings on different systems may generate different overall ratings for the same merchant across different reputation systems. Rating discrepancies may occur on different rating systems. One shopper may be exposed to multiple online merchant reputation systems and be confused by different ratings on the same merchants across different reputation systems.

Rating consistency is crucial for both customers and merchants. A solution to the problem of rating discrepancy across different reputation systems is to develop a new agent website that displays the merchant ratings posted on different merchant systems. It is possible to classify e-tailer stores into three categories: the best stores that received high ranks from all the shopping agents and the worst stores that received low ranks from all the shopping agents. The remaining stores with controversial ratings will also be displayed as a comparison at a glance reference resource for customers. With this, customers can have confidence to shop at highly ranked stores and avoid low ranked stores.

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