Chapter XV
Designing Reputation and Trust Management Systems

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ABSTRACT

This article analyzes the handling of customer complaints after shipping ordered goods by applying automated reputation and trust accounts as decision support. Customer complaints are cost intensive and difficult to standardize. A game theory based analysis of the process yields insights into unfavorable interactions between both business partners. Trust and reputation mechanisms have been found useful in addressing these types of interactions. A reputation and trust management system (RTMS) is proposed based on design theory guidelines as an IS artifact to prevent customers from issuing false complaints. A generic simulation setting for analysis of the mechanism is presented to evaluate the applicability of the RTMS. The findings suggest that the RTMS performs best in market environments where transaction frequency is high, individual complaint-handling costs are high compared to product revenues, and the market has a high fraction of potentially cheating customers.

INTRODUCTION

The continued demand for automated interorganizational business processes to reduce transaction costs in supply chains has provided a strong demand for extensive information systems (IS) support. While areas for the application of IS in supply chain management are growing rapidly, the management and automation of personal relationships in impersonal electronic business relations is still an area that has not been adequately served by existing IS research and development. In this article, we describe how a reputation and trust management system (RTMS) for an automated evaluation of business relationships in supply chains can be designed and implemented. As

RTMS research domain, we have chosen the management of customer complaints since it is also a largely unexplored, yet promising application area. While empirical research and data are limited in this area, two cases provide an indication of how much money can be saved by an improved complaint-handling process: Eastman Chemicals saved $2 million after improving its business processes associated with investigating and responding to complaints by cutting expenses for waste removal and rework caused by off-quality products or incorrect paperwork (Hallen & Latino, 2003). The second example provides a more accurate view on the de facto costs of handling customer complaints manually: According to Schilling and Sobotta (1999), a medium-sized enterprise with approximately €5 million annual revenue calculated the average processing costs as €837.47 for each complaint handling process in 1997.

The need for human interaction and decision (e.g., to check complaints or to prevent opportunistic customer behavior) historically has been a major impediment to increasing the degree of automation. Since handling of complaints is costly for both suppliers and customers, only 5% to 10% of all dissatisfied customers decide to complain at all (Tax & Brown 1998). Dissatisfied customers are likely to switch providers, which usually leads to future revenue losses higher than the costs caused by complaints in the first place (Fornell & Wernerfelt, 1987). Therefore, suppliers face two dilemmas: First, they cannot automate or standardize the complaint-handling process, since opportunistic customers may benefit from this lack of human diligence. Second, dissatisfied customers, having switched to another supplier, may never notify the errant supplier, since the manual complaint-handling process is too expensive in comparison to the value of the defective or missing delivery.

This article proposes an RTMS-based complaint-handling solution, not only to provide benefits from the efficiency of computer-based customer complaint management but also to prevent opportunistic behavior and customer losses in relevant market environments. We provide a mechanism that allows increasing the role of automated business processes while concurrently mitigating incentives for opportunistic behavior in business-to- business as well as business-to-consumer relationships. We believe that this approach is a contribution to IS literature, since reputation and trust management research from behavioral science has not yet been expatiated adequately in existing IS research.

After describing the problem relevance, the theoretical background of the article presents foundations of reputation and trust as well as transaction cost theory. Since we strive to contribute to knowledge by following a design science approach, the guidelines provided by Hevner, March, and Park (2004) and further IS design science contributions are related to this research in the theoretical section. Next, we detail the (predominantly) existing defective product handling or customer complaint process after receiving defective articles or failing to receive articles. A game-theoretical model of supplier and customer motivations is introduced providing the formal representation and logic for process redesign. Afterward, we modify the customer complaint-handling process by introducing RTMS to minimize the number of manual interactions. To evaluate our solution, results of a simulation model are provided for demonstrating the utility and efficacy of the proposed design artifact. The validity of the sociotechnical approach is discussed and scenarios are identified where this IT artifact may yield higher benefits for suppliers. The article closes with a short summary of our findings and a discussion of the design problems.

THEORETICAL BACKGROUND

The need for efficient relationship management arises whenever independent business partners

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