Chapter III
A Decision Support System for Trust Formalization

Farid Meziane
University of Salford, UK

Samia Nefti
University of Salford, UK

ABSTRACT

Trust is widely recognized as an essential factor for the continual development of business-to-customer (B2C) electronic commerce (EC). Many trust models have been developed, however, most are subjective and do not take into account the vagueness and ambiguity of EC trust and the customers’ intuitions and experience when conducting online transactions. In this chapter, we describe the development and implementation of a model using fuzzy reasoning to evaluate EC trust. This trust model is based on the information customers expect to find on an EC Web site and that is shown from many studies to increase customers trust towards online merchants. We argue that fuzzy logic is suitable for trust evaluation as it takes into account the uncertainties within EC data and like human relationships; it is often expressed by linguistic terms rather than numerical values. The evaluation of the proposed model is illustrated using four case studies and a comparison with two other models is conducted to emphasise the benefits of using fuzzy decision system.

INTRODUCTION

Business to consumer (B2C) electronic commerce (EC) has seen a phenomenal growth since the development of the Internet, and there is a growing interest from many organizations to use it as a way to improve their competitiveness and reach a wider customer base. According to eMarketer, the total business of B2C EC has increased from $30 billions in 2002 to $90.1 billions in 2003 and continued increasing...
to around $133 billions in 2005 (Grau, 2006). Similar figures were also predicted by Jupiter Research, which estimated an increase from $85.7 billion in 2003 to $132.2 billion in 2005 (Naraine, 2003). This growth is usually attributed to the increasing number of online users over the 2000-2005 period and this is expected to continue (Naraine, 2003). Although for the 2005-2009 period the growth is expected at a lower rate of 18.6 %, the expansion of EC can still be considered as strong (Grau, 2006).

Though the expansion and development in EC is encouraging, this growth may not be achieved if the prevailing obstacles for a greater acceptance of EC as a transaction medium are not addressed carefully. Among the obstacles that hinder the development of EC, consumers lack of trust has often been identified as one of the main reasons (Luo, 2002; Merrilees & Fry, 2003; Corbitt, Thanasankit, & Yi, 2003; Cazier, Shao & Louis, 2006) and other factors include: consumer dissatisfaction of the unstable EC systems, a low level of personal data security, disappointments with purchases such as non-delivery of goods, hidden charges, difficulties in getting a refund, unwillingness to provide personal details and fraud (Han & Noh, 1999; Lewicki & Bunker, 1996; Matthew & Turban, 2001; Mayer, Davis, & Schoorman, 1995; Patton and Jøsang, 2004; Shapiro, Sheppard, & Cheraskin, 1992). In B2C EC, the concept of trust is crucial because it affects a number of factors essential to online transactions.

Kasiran and Meziane (2002) developed a trust model for B2C EC that is based on the kind of information customers are looking for on a vendor’s Website to help them decide whether to engage in a transaction or not. The model identified four major factors that need to be present on a merchant’s Website to increase customers’ trust when shopping online. These factors are: existence, affiliation, policy, and fulfilment. The information customers need to know to satisfy the existence factor include physical existence, such as the merchant’s telephone number, fax number, postal address, mandatory registration, and peoples’ existence. These are known as variables. The affiliation factor looks at third-party endorsement, membership and portal and the policy factor looks at information with regards to customer satisfaction policy, privacy statement, and warranty policy. Finally, the fulfilment factor looks at delivery methods, methods of payment and the community comments. Hence, a total of 12 variables have been identified for the trust model as summarized in Figure 1.

Given the large amount of information the model requires, an information extraction system has been developed to automate the data collection process (Meziane & Kasiran, 2003, Meziane & Kasiran, 2002).