

Chapter XXVII

Design and Implementation of Trust Enabling Functions

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ABSTRACT

Through a case study based on a knowledge-sharing community of Danish plant growers, this chapter examines how an IT system can be designed to support strategic knowledge-sharing between firms participating in an industry-based virtual community. A suitable environment for trust is seen as an important part of making the community function effectively. Therefore, the system aims to support community members in making trust decisions related to knowledge-sharing. In the presented system decisions are based on digital evidence in the form of system-managed credentials. The chapter presents a model for trust, reputation, and performance management which supports the needs of the specific type of knowledge-sharing community. Further, the model is linked to an underlying public key infrastructure framework which supports the secure exchange of information and credentials between community members.

INTRODUCTION

Trust is a key requirement in a virtual knowledge-sharing community. Not only does trust play a key role in modeling interactional social concepts, trust also plays a key role in a macro-social context. This chapter presents a trust and security model which can support Web-based trust building from a socio-psychological and a technical perspective. The model demonstrates how community reputation can be linked to community-performance measures in a virtual community of practice (CoP). The presented model focuses on the basis of inter-personal and system-trust and looks at how trust can be related to the use of a form of digital context. More specifically, the model examines trust based on digital evidence in the form of credentials.

Trust in an IT-system perspective is often linked to reputation where a user builds a reputation and hence forms a basis for trust. Using reputation as a basis for trust-building raises the question of what reputation should be based on, particularly when entities do not have detailed knowledge of each other. In e-commerce systems, reputation is generally linked to ratings generated as feedback to transactions in the type of financial interactions. However, in the presented target community, the specific knowledge-sharing goals are not linked to financial transactions. Instead performance measurement for knowledge exchange is related to improving financial and process strategies. The value of the knowledge exchange depends on the quality, reliability, and level of detail of information provided. Consequently, the reputation system is linked to ratings of non-financial metrics which reflect how well a member participates in and contributes to the virtual community.

In this chapter, an appropriate performance-measurement framework using community-agreed metrics to support reputation building and management is examined. Both the socio-psychological and the technical aspects of trust

in relation to the proposed model are discussed. The socio-psychological aspect of trust focuses on the operation of a community in relation to deciding on the value of information and metrics, sharing resources, and creating rules and policies. This includes community-based policy management (Feeney et al., 2004). And it is the basic assumption that a common set of rules can be applied to community members. The technical aspect of trust addresses the issues of designing an operational trust and security architecture. The trust and security model for information-sharing proposed here focuses on sub-groups within a specific CoP. The model is built on the assumption that knowledge acquisition evolves as members move from limited to full participation in the community, and is based on level of interaction. The model looks at group formation within the community and at the conditions through which community members can join groups. This supports a simple group hierarchy by which members can be compared.

WEB-BASED COLLABORATION

Companies increasingly look at how strategic alliances achieved through Web-based collaboration can benefit and add value to their businesses. Web-based collaborations are usually supported by networks (Brown & Carpenter, 2004) which extend beyond firm boundaries. The use of network technology to link participants and to support the formation of social networks, for example, underlies the concept of virtual communities (Malhotra, 2002). Recently, virtual communities have attracted interest from businesses as part of finding new ways to enable business-oriented knowledge exchange. This was done by leveraging the same form of virtual community model which has been successful in areas like e-market places, file-sharing networks, and online development communities.

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