

Chapter 7

Trust Management Models for Digital Identities

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ABSTRACT

Trust is an essential requirement to transact in the digital environment. Digital identity proves a user's presence, whereas the trust proves the standing and worthiness. Trust management can establish and verify the trust to give rise to new outcomes for online transactions such as increased perception towards buying and selling the goods and services, increased retention and loyalty, increased reputation and so on. This paper presents the need and significance of trust management in the digital environment, along with the various models and techniques available to manage the trust. A comparative analysis has been presented for the available models. The work has a lot of importance, considering the large scale proliferation of the digital environment as well as the electronic businesses.

1. INTRODUCTION

With the increasing number of frauds and security breaches around the Globe, trust and identity management has become very much important in both the real and virtual world. People resort to trust, while interacting to each other: instinctively in closed and static environments, consciously in open and dynamic ones (Corcoglioni et al., 2007). Trust and identity are the concepts that lie at the basis of our existence and have been exercised through physical recognition and face to face communication (Rooy and Bus, 2010; Pradhan and Kumar, 2015; Bhardwaj and Kumar, 2014). Trust management refers to the approaches by which judgments are reached, including how trust information is maintained, propagated and used (Ioannidis and Keromytis, 2005; Wang and Singh, 2010). In transformation from physical to digital world, it is essential to understand how mechanisms of trust and identification can be maintained:

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1.1 Digital Identity

Digital Identity refers to the traits, attributes and preferences on which one may receive personalized services. Identity traits might include government issued IDs, corporate user accounts or biometric information. Two user attributes, which may be associated with the identity, are presence and location. Presence is most often associated with real time communications systems (such as Instant Messenger) and describes the state of a user's interaction with a system, such as which the computer they are accessing, whether they are idle or working, and which task they are currently performing (reading a document, composing email, etc.). Location refers to the user's physical location and typically includes latitude, longitude, and sometimes altitude. Authentication and authorization mechanisms generally focus on determining the 'who' of identity, location defines 'where' and presence defines the 'what', these all critical components of the identity-based emerging technologies including cloud computing (Rittinghouse and Ransome, 2010).

1.2 Trust

Trust is often described as the subjective belief of someone in the character, ability, strength, reliability, honesty or truth of someone or something (Pradhan and Kumar, 2015). According to Gambetta (1988), "Trust (or a trust relation) is a unidirectional relation between truster and a trustee, expressing the strong belief of the truster that the trustee will behave as expected with respect to a particular capability with a particular context". Trustworthiness (or a trust value) is a quantitative measure of the strength of a trust relation representing the subjective estimation of the likelihood that the trustee will behave as expected with respect to a particular capability within a particular context.

In case of the real world, physical identities trust each other on the basis of relationship, social norms and mutual understanding. However, the digital world is very much virtual in nature, where identities interact with each other with no physical contact. Hence, management of trust becomes very much critical in this environment.

2. NEED FOR TRUST MANAGEMENT

No transaction is feasible without an acceptable level of mutual trust between parties. Trust is required to balance risks and create an effective collaboration. Many organizations use dynamic computing environment for their business transactions through internet (Pradhan and Kumar, 2016). Parties involved in such transactions need to trust each other, based on the trust that certain decisions were made, which are beneficial for both the parties to continue their transactions and meeting their goals.

2.1. Trust and Trust Management

Trust means an act of faith, confidence, and reliance in something that's expected to behave or deliver as promised. It's a belief in the competence and expertise of others, such that you feel you can reasonably rely on them to care for your valuable assets (Khan and Malluhi, 2010). Trust revolves around 'assurance'

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