

A Trust Model with Personality Factors for Information Dissemination in Social Networking Service

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Abstract

The rapid development of Social Networking Services (SNS) has generated numerous possibilities for human communication. The countless posts and messages uploaded daily can generate rumors that often evolve into fake news. This fake news can be deliberately spread, but most of it is accidental. Moreover, this false information can spread in many areas, including critical disaster-related information. To analyze and address these issues, understanding the trustworthiness of both users and the SNS in general can help in mitigating the spread of fake news. In this paper, we propose a trust model consisting of identity-based, behavior-based, relation-based, feedback-based, and information-based trust factors, incorporating the Big Five personality traits. We conducted an agent-based modeling simulation for the proposed trust model, investigating user behavior according to the Big Five personality traits and several user aspects: knowledge level and psychopathy. The experiment is based on online surveys and related studies representing social network users' behavior. We compare the overall trust and trustworthiness in the numerical results to validate our proposed trust model. Furthermore, we systematically compare the occurrence of fake news under conditions where the initial news is either truthful or fabricated. Numerical results show that overall trust is sensitive to information-based trust, while it is not significantly affected by behavior-based trust. Additionally, openness, conscientiousness, and extroversion were correlated with overall trust, while the effects of agreeableness and neuroticism on overall trust were insignificant.