Mnikr: Reputation Construction Through Human Trading of Distributed Social Identities

Brendan Francis O'Connor
Department of Computer Science
The Johns Hopkins University
Baltimore, Maryland, United States
bfo@ussjoin.com

John Linwood Griffin
Department of Computer Science
The Johns Hopkins University
Baltimore, Maryland, United States
jlg@cs.jhu.edu

ABSTRACT

Reputation forms an important part of how we come to trust people in face-to-face interactions, and thus situations involving trust online have come to realize that reputation is an important characteristic in the digital age. We propose a new holistic and context-free approach to quantifying reputation on the Internet, based upon a stock exchange where users can trade reputation shares of other users and obtain goodwill dividends, including new algorithms for identifying and creating digital identities not inherently tied to a user's personally identifiable information. We developed such a system, named Mnikr, and deployed our system on the Internet for a month to demonstrate and evaluate this approach. Our results suggest that existing public data sources can indeed be used to create an overarching social network whose utility is greater than its number of users would indicate, and in which reputation measurements are generated that are actually indicative of each user's standing in society.

Categories and Subject Descriptors

K.6.5 [**Management of Computing and Information Systems**]: Security and Protection; J.4 [**Social and Behavioral Sciences**]: Economics

General Terms

Security, Design, Algorithms

Keywords

Reputation, Identity, Social Networking, Stock Market, Digital Persona

1. INTRODUCTION

Reputation is a nebulous construct of our society. On the one hand, it is often easy to say that a person has a "good reputation" or a "bad reputation," based upon our understanding of the person and that person's role within a community. On the other hand, a person's reputation may be quite different between communities; people prized for their programming prowess may be vilified as "griefers" in computer gaming circles, or people known in one town for their kindness and generosity may in fact be escaped convicts known to the law enforcement of another. Such examples point to the subjectivity of reputation, and would seem to suggest that it would be a measure worth avoiding as we move more interactions to a digital world.

At the same time, however, reputation forms an important part of how we come to trust people in face-to-face interactions, and thus situations involving trust online have come to realize that reputation, or some analogue thereof, is an important characteristic in the digital age. Online marketplaces like eBay have created elaborate systems of reputation to allow people to feel that their experiences, good or bad, with merchants can serve as a message to others; whole websites, such as ResellerRatings, exist to serve the same goal across the Internet. In less critical—but no less interesting—circumstances, online destinations like HotOrNot provide a reputation score for a person's physical appearance.

All of these reputation systems, however, have severe shortcomings. Many of them are susceptible to the Sybil attack [6], which involves the creation of trivial user accounts to undermine any multi-user system, rendering such systems subject to the whims of massive and mobile online groups. Other reputation systems—for instance, the eBay auction site—require some sort of monetary transaction to earn the right of commentary. Such systems are subject to extortion because of this property, something rendering their ratings nearly meaningless except as a most rough-hewn marker. All of these systems are subject to the vagaries of the contexts in which they were formed, and are indeed inextricable from those contexts. This might seem like a feature to be desired—one might not care, for the purposes of an eBay transaction, how well one does at a particular game, or about the details of one's physical appearance—but in the quest for a holistic reputation, it is important to realize that these very context-sensitive reputation values are not necessarily related to a person as a whole, only to that person's performance in a particular task. Clearly, some other system needs to exist that can achieve the fairly difficult goals inherent in a reputation system.

Toward this need, we pose the question: Can the idea of buying and selling shares on a theoretical market be used to gain a machine-readable understanding of traditionally unquantifiable data, without resorting to the techniques of machine learning or artificial neural networks? If so, there

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