

129. Using Reputation System to Motivate Knowledge Contribution Behavior in Online Community

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Abstract

In this study, we present a theoretical model of motivations explaining the relationship between reputation system and knowledge contribution in online communities. Knowledge contribution is modeled as a response to varied motivations (base on Maslow's hierarchy of needs). These motivations are proposed to be influenced by the availability of reputation systems. We test this model in an experiment. Given the importance of global knowledge sharing in today's world, we expect our findings will be useful to inform the design of online knowledge-sharing communities.

Keywords: Reputation system, Knowledge contribution, Hierarchy of needs and Motivations

Introduction

Reputation system is a type of collaborative filtering algorithm which attempts to collect, distribute, and aggregate ratings about all users' past behavior within an online community in an effort to strike a balance between the democratic principles of open publishing and maintaining standards of quality (Resnick et al. 2000). Such algorithm, allowing readers to collaboratively impose editorial influence on the sites' content, can contribute to users' sense of trust, and encourage and reward good behavior. For example, eBay (online marketplace), Amazon (online book and product review site), Epinions (online product review site), Slashdot (online discussion forum), and Yahoo! Knowledge+ (online knowledge sharing community) etc., all rely on reputation mechanisms to promote trust and elicit cooperative behavior.

Prior research on online reputation system has mostly focused on trust building in business communities such as the eBay community and, the results show that reputation system promotes trust as expected (Dellarocas et al. 2004). However, few (if any) studies have examined the relationships between the presence of a reputation system and levels of participations and contributions. We try to fill this gap and specifically attempt to find an answer to the following research question:

“How and to what extent does a reputation system contribute to perceptions of varied motivations and influences knowledge contribution in an online community?”

Theoretical Background and Hypotheses Development

Maslow's Motivation Theory

Over the years, many psychologists have attempted to define and categorize what motivates people. One of the very influential theories explaining the actions of people is that of Maslow's theory of motivation. It pictures human behavior as subjected to a set of fundamental drives, as illustrated in Figure 1.

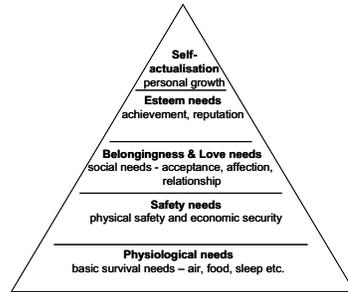


Figure 1 Maslow's hierarchy of Needs (Abraham Maslow 1954)

Maslow hypothesized that the actions of people are motivated by a hierarchy of needs. The most basic drives are physiological. After that comes the need for safety, then the desire for love, and the quest for esteem. As long as we are motivated to satisfy these cravings, we are moving towards growth, that is self-actualization. Hundreds of empirical studies have supported the motivational force of physiological, safety, love, and esteem needs. But the same studies have failed to discover a hierarchical arrangement (Huizinga 1970).

Today, many people have no need to worry about their physical needs or economic insecurity. Basic wants of humans are usually well satisfied and they no longer motivate people's action as much as in the past, although the needs are always present (Herrington 2004). Our study, therefore, adopts Maslow's theory (1954) with a focus on the higher level needs, from social (belongingness & love), esteem, to self-actualizing needs. Further, when basic needs and safety are no longer the major concerns, people would begin to focus not only on what they can get from others (selfishly), but also on what they can contribute to others. This opens the door to altruistic help of others, even strangers (Neher 1991). Thus, altruistic motive is also considered.

Effects of Reputation System

Reputation systems existed long before the popularity of the Internet. The main purpose of a reputation system is to reflect public opinion. Word-of-mouth, one of the most ancient reputation mechanisms in the history of human society, is being given new significance by the unique property of the Internet. Through the Internet, large-scale word-of-mouth networks in which individuals share opinions, experiences and knowledge on a wide range of topics, are made accessible via reputation systems (Dellarocas, 2003). In recent years, reputation systems have been widely adopted as an important characteristic of many online communities, helping to elicit good behavior and encourage knowledge sharing among loosely connected and geographically dispersed individuals. Contributions (or the history) of any individual within the collective is made publicly known with a reputation system, and people would pay more attention to what they contribute to the communities in order to achieve a higher reputation score. Prior research supported that gaining reputation is one potential way an individual can benefit from active participation in an online community, leading to higher participations and knowledge contributions (Wasko and Faraj, 2005). Hence, we hypothesize that

H1: Overall, individuals will contribute more responses to an online community with a

reputation mechanism.

However, how and to what extent do reputation systems help to motivate people to contribute their time and knowledge in online communities is not well understood. To understand this question, we apply Maslow's theory to examine the relationships between perceptions of motivations and knowledge contribution in an online community. Different categories of needs were assessed in this study.

Social needs. As Maslow expressed it, individuals are social beings. They have a need to belong and to be accepted by others, i.e. they strive for meaningful relations with other people. Many researchers suggest that trust is a key aspect of social (relational) need and a facilitator of collective action (Coleman 1990; Ma 2004). In general, trust develops when a history of favorable past interactions leads to expectations about positive future interactions (Wasko and Faraj, 2005). McKnight et al. (1998) define trust as "a belief that the intended action of others will be appropriate and be good for the collective". Earlier studies on online communities, for instance, indicate that a general trust drives individuals to participate in virtual communities (Ridings et al. 2002). This leads to the following hypothesis:

H2: *High perceived trust will lead to high knowledge contribution intent in an online community.*

In addition to trust, another aspect of social need that has been investigated relates to expectations that an individual's efforts will be reciprocated. Reciprocity represents a sense of fairness where individuals usually reciprocate the benefits they receive from others in order to receive more useful knowledge in return in the future. Prior work in online communities has found evidence that people who regularly helped others seemed to receive help more quickly when they asked for help (Rheingold 2000). Hence, we expect that

H3: *High expectation of reciprocity will lead to high knowledge contribution intent in an online community.*

Esteem needs. According to Maslow (1954), all humans have a need to be respected, and to have self-respect. The esteem needs are of two types. There is the attention and recognition that come from others. There is also self-esteem. Contributing to an online community can provide a way to support one's ego. Prior research has reported that individuals contributing to an online knowledge-sharing community may gain some reputation as an expert in a particular domain (Wasko and Faraj 2005). Contributing to a knowledge-sharing community, therefore, may lead to approval, respect and self-value (Jones et al. 1997). Thus, we expect that

H4: *High perceived reputation will lead to high knowledge contribution intent in online community.*

A sense of contribution arises when individuals feel that they are able to share with others the skills, knowledge and experiences they possess. By writing contents in a community, individuals benefit the community as a whole by contributing useful knowledge that others receive. Researchers have found that individuals with higher levels of expertise are more likely to provide useful knowledge on computer networks (Constant et al. 1996). Individuals are less likely to contribute when they feel their expertise to be of no use in the communities (Wasko and Faraj, 2000). The sense (perceived value) of contribution, according to

Ardichvili et al. (2003), is closely related with knowledge sharing behavior. Hence we hypothesize that

H5: *High perceived sense of contribution will lead to high knowledge contribution intent in an online community.*

Researchers have also found that when people share knowledge useful to the community, they gain confidence in their abilities and this brings the benefits of increased self-value (Constant et al. 1996). This belief, in turn, serves as a self-motivational force for contributors to contribute knowledge in virtual knowledge-sharing communities (Bock and Kim, 2002; Kankanhalli et al. 2005). It has been shown that development of self-esteem is associated with contribution activity. Hence we propose that

H6: *High perceived self-esteem will lead to high knowledge contribution intent in an online community.*

Cognitive needs. In addition to social and esteem needs (deficiency needs), Maslow's theory (1954) also proposes the importance of growth needs. The conceptualization of growth needs in this study is limited to cognitive need – the knowledge motive. According to Maslow, cognitive needs are defined as the need to know, to understand, and to explore. By writing contents for a knowledge-sharing community, individuals might have a new learning experience, and be able to exercise their knowledge, skills and other abilities (Peddibhotla and Subramani, 2005). Hence we hypothesize that

H7: *High perceived knowledge motive will lead to high knowledge contribution intent in an online community.*

Altruism needs. Altruism exists when individuals derive intrinsic enjoyment from helping others without expecting anything in return (Smith 1981; Kankanhalli et al. 2005). By contributing knowledge to online community, individuals might have the opportunity to help others (Wasko and Faraj, 2000). Prior studies on electronic knowledge repositories (e.g., Kankanhalli et al. 2005) indicate that individuals enjoy and derive pleasure from the acts of helping others. Hence, we propose that

H8: *High perceived altruism will lead to high knowledge contribution intent in an online community.*

Methodology

Research site and respondents. To empirically test the above hypotheses, we conducted our experiment on CityTalk.org (see Figure 2 and 3), an online knowledge-sharing community for this experiment. A total of 438 graduate students at a major university in Hong Kong were invited to participate in the experiment. Reputation mechanism, as an independent variable, was manipulated in this study. Two experimental groups were used to test if any differences arise in individual motivations and knowledge contributions if reputation mechanism is applied. Upon accepting the invitation, subjects were assigned to one of the experimental groups randomly, where the experimental condition is similar except that the control group does not have any reputation mechanisms on the website (see Figures 3 and 5).

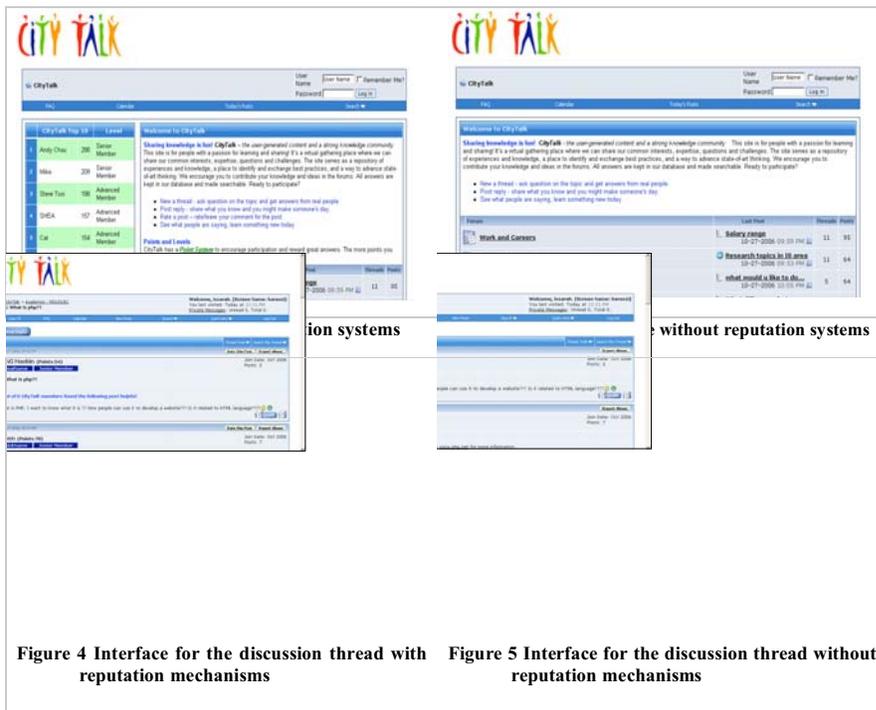


Figure 4 Interface for the discussion thread with reputation mechanisms **Figure 5 Interface for the discussion thread without reputation mechanisms**

Reputation mechanisms were operationalized by having a website version with a point system, in which participants have running totals of reputation points (and membership level achieved) attached visibly to their online identity (see Figure 4). The points each participant get depends on their contributions within the experimental session. A points table that summarizes all point-value for different participations is attached in the website. Subjects could rate each other (1 or -1) and leave comments or private messages to the writers. Furthermore, a table listing the top 10 contributors was shown at the home page of website (see Figure 2). The experimental procedure consisted of a pre-experimental training, the experiment proper, and a debriefing. To avoid any confounding between different groups, we isolated the groups in different laboratories to avoid them watching the other group's interface. After performing the task, subjects had to complete a questionnaire containing measures of the research variables adapted from past research. For the analysis, we will present results compiled from two sources: logged behavioral data and self-report survey data.

Contribution

This study has both theoretical and practical contributions. On the theoretical side, it presents an integration of reputation system and motivation research from multi-disciplines. On the practical side, findings of the study provide more complete and explicit justification for the general belief of using reputation systems to promote online contributions. This could provide a deeper understanding and valuable guidelines for promoting contribution behavior in online communities.

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