Electronic Commerce Research and Applications 14 (2015) 204–212

Contents lists available at ScienceDirect

Electronic Commerce Research and Applications

journal homepage: www.elsevier.com/locate/ecra

Drivers of interdependence and network convergence in social networks in virtual communities

Ching-I Teng *

Graduate Institute of Business and Management, Chang Gung University, Taiwan

ARTICLE INFO

Article history:
Received 2 July 2014
Received in revised form 13 January 2015
Accepted 16 January 2015
Available online 17 February 2015

Keywords:
Social network
Virtual communities
Need for affiliation
Altruism
Social intelligence
Interdependence
Network convergence

ABSTRACT

Social networks proliferate in virtual communities, where interdependence and network convergence among users are key to their development. However, as little is known about the drivers of interdependence and network convergence, this study examines whether individual differences could be one such driver. An online questionnaire was used to collect data and responses from 3086 online gamers, and hierarchical regressions were used for the testing of hypotheses. This study found that the need for affiliation, altruism, and social intelligence are positively related to interdependence and network convergence. Moreover, the need for affiliation interacts with altruism to predict interdependence, and interacts with social intelligence to predict network convergence. This study is the first using the weak/strong tie theory to identify drivers of interdependence and network convergence among users of virtual communities.

1. Introduction

Social networks—sets of people or their digital representations bonded by friendship (Musial and Kazienko, 2013)—in virtual communities are widely discussed and influential in various areas, including campaigning (Vergeer and Hermans, 2013), marketing (Wang et al., 2013), revisit intention (Teng and Chen, 2014), knowledge seeking and sharing (Wang et al., 2013), and the spread of information and communication technology products (Lee et al., 2014). Drivers of participation in social networks include trust (Lin and Liu, 2012) and interdependence (Teng et al., 2012). Interdependence (the extent to which individuals depend on each other to make decisions) and network convergence (the extent to which individuals share common friends) are important for developing online social networks (Parks and Floyd, 1996). However, insufficient research has been done into the drivers of interdependence and network convergence in virtual communities. Thus research into this issue should contribute novel knowledge to communication literature and provide insights for electronic commerce managers to form and utilize online customer networks.

The purpose of this study is to examine drivers of interdependence and network convergence in social networks in virtual communities. To choose what potential drivers to include, this study reviewed the pertinent literature and one classic theory, i.e., the weak/strong tie theory (Granovetter, 1973). This is among the most well-known network theories (Borgatti and Halgin, 2011) and explains how individuals form strong ties, and how weak and strong ties affect the development of social networks. Thus, this theory was found to be suitable for adoption in the present study.

The weak/strong tie theory (Granovetter, 1973) posits that strong ties foster local (i.e., within a group) cohesion while weak ties provide opportunities for integrating individuals into communities. Moreover, interpersonal tie strength grows as associated individuals devote time, emotion, intimacy, and reciprocal services to the tie (Granovetter, 1973). Such commitment may be motivated by an individual's efforts to satisfy their own needs or those of others in social networks. In social networks, maintaining relationships with others is associated with the need for affiliation (Schultheiss, 2008), while helping others is related to the personality trait, altruism (Rushton et al., 1981). Hence this study considered the need for affiliation and altruism. Whether a commitment of time and emotion can effectively lead to interpersonal tie strength may depend on an individual's ability to understand others, which is the essence of social intelligence (Yeh, 2013). Therefore, this study also considered social intelligence. In short, this study consulted the weak/strong tie theory (Granovetter, 1973) to identify three potential drivers (i.e., the need for affiliation, altruism, and social intelligence) for the building of social networks.

Strong ties foster cohesion within a group (Granovetter, 1973) and such cohesion can be described by the extent to which

* Address: 259, Wenhua 1st Rd, Gueishan, Taoyuan 333, Taiwan. Tel.: +886 32118800x5418; fax: +886 32118500.
E-mail addresses: chingit@mail.cgu.edu.tw, cguchingit@yahoo.com.tw

http://dx.doi.org/10.1016/j.elerap.2015.01.004
1567-4223/

individuals depend on each other to make decisions, i.e., interdependence (as defined by Parks and Floyd, 1996). Moreover, weak ties provide opportunities for integrating individuals into communities (Granovetter, 1973). When individuals are integrated into close friends' communities, they share more common friends with these close friends, i.e., increased network convergence (Parks and Floyd, 1996). Therefore, this study aims to examine whether and how the need for affiliation, altruism, social intelligence, and their interactions, are related to interdependence and network convergence.

2. Theoretical background and hypotheses development

2.1. Weak/strong tie theory

Social networks contain numerous interpersonal ties that link individuals. The strength of such ties develops when individuals devote time, emotion, intimacy, and reciprocal services to the tie (Granovetter, 1973). Although strong ties intuitively contribute to the development of social networks, weak ties transmit crucial information from one network to another (Granovetter, 1973). Therefore, as strong ties foster local (i.e., within a group) cohesion while weak ties provide opportunities for integrating individuals into communities, each contributes to the development of social networks in different ways.

The weak/strong tie theory has been widely applied and proposes that intergroup ties consist disproportionately of weak ties (Granovetter, 1973). This proposition and others have been verified by subsequent literature (e.g., Friedkin, 1980). This theory explains the tendency for an individual to have more access to job-opening information via weak ties than via strong ties (Granovetter, 1983). Weak ties also facilitate the provision of useful information among organizational contexts (Constant et al., 1996). Strong ties lead to the receipt of useful knowledge while weak ties provide access to nonredundant information (Levin and Cross, 2004). Although weak ties provide access to useful and non-complex knowledge, strong ties provide access to complex knowledge (Hansen, 1999). Strong ties also motivate people to use more media to communicate than weak ties (Haythornthwaite, 2005), indicating that both weak and strong ties are important and should be included in studies on information and communication systems.

The weak/strong tie theory is useful for developing a research model describing social networks in virtual communities, where individuals devote time and emotion, and provide information or services reciprocally to other individuals, i.e., increasing strength of specific ties. Strong ties then contribute to local cohesion, which helps individuals develop social networks (Granovetter, 1973). Individuals in virtual communities typically do not meet in person, but exchange information and make decisions. Therefore, the local cohesion or development of social networks in virtual communities should be measured by how individuals depend on each other to make decisions, i.e., their interdependence (as defined by Parks and Floyd, 1996).

Moreover, weak ties contribute to the development of social networks in linking groups, i.e., integrating individuals into multiple communities (Granovetter, 1973). In virtual communities, individuals integrated into a close friend's community have mutual friends with the close friend, i.e., increased network convergence (as defined by Parks and Floyd, 1996). Therefore, the present study chose to use interdependence and network convergence that should be key to the development of social networks.

2.2. Need for affiliation

The need for affiliation is an individual's desire to belong to a social group (Schultheiss, 2008). Individuals with a strong need for affiliation enjoy establishing and maintaining close relationships with another person or group (Schultheiss, 2008). The need for affiliation motivates an individual to frequently interact with others. In virtual communities, individuals are motivated to engage in social activities (Lee et al., 2012) and social motivation drives individuals to cooperate with others, engage in teamwork, and build interpersonal relationships (Yee, 2006). Such cooperation, engagement, and relationship-building activities require individuals to devote the time and energy that is essential for creating strong interpersonal ties (Granovetter, 1973), or close relationships. Close relationships exist in virtual communities (Huynh et al., 2013) and in such strong (or close) relationships, partners can incur emotional rewards (e.g., care or happiness) and costs (e.g., anger or anxiety) (Guerrero et al., 2012), which impact on the formation of partnerships and cooperation (the interdependence theory, Rusbult, 1980). Hence, those individuals consult each other when making decisions, i.e., they have strong interdependence (Parks and Floyd, 1996), motivating this study to hypothesize a positive relationship between the need for affiliation and interdependence.

H1. The need for affiliation is positively related to interdependence.

The need for affiliation characterizes an individual with the desire to belong to a social group (Schultheiss, 2008), and this need thus motivates the individual to seek out social groups to which they can belong. In online communities, friends' social groups (e.g., guilds in online games and clubs on social networking sites) are just a click away, enabling frequent interactions with members of friends' social networks. Frequent interactions typically involve exchanges of ideas and information, and effort, and thus such interaction likely leads to an increased number of acquaintances or weak ties, which help integrate individuals into communities (or social networks) (Granovetter, 1973), i.e., making friends in friends' social networks. Hence, an individual with a strong need for affiliation likely makes friends through friends' social networks, resulting in a substantial overlap between the individual's own social network and friends' social networks. Such an overlap is called network convergence (Parks and Floyd, 1996). This study thus hypothesizes a positive relationship between the need for affiliation and network convergence.

H2. The need for affiliation is positively related to network convergence.

2.3. Altruism

Altruism is an individual's tendency to help others (Rushton et al., 1981) when they can choose to help or not (Fritzsche et al., 2000). Altruism is related to helping others via information systems (Lee and Lee, 2010), and community engagement behavior (Lee et al., 2011). Helping others and engaging in community activities require the devotion of time, emotion, and reciprocal services that are essential for forming strong ties (Granovetter, 1973). Strong ties represent strong interpersonal relationships in which partners enhance each other's wellbeing (Brown and Brown, 2006), indicating that they likely consult each other when making decisions i.e. interdependence (Parks and Floyd, 1996). Therefore, this study hypothesizes a positive relationship between altruism and interdependence.

H3. Altruism is positively related to interdependence.

Altruism is a facet of the broad trait agreeableness (Zeidner and Shani-Zinovich, 2011). Highly agreeable individuals are cooperative, warm, and kind (Saucier, 1994), and thus are typically