Kybernetes

A multidimensional model of knowledge sharing behavior in mobile social networks

Mohamad Hoseini, Fatemeh Saghafi, Emad Aghayi,

A multidimensional model of knowledge sharing behavior in mobile social networks

Mohamad Hoseini
Max Planck Institute for Informatics, Germany

Fatemeh Saghafi
Faculty of Management, University of Tehran, Iran, and

Emad Aghayi
Computer Science Department, George Mason University, Fairfax, VA, USA

Abstract

Purpose – A great number of people use mobile social networks (MSNs) to communicate, entertain, learn, search and get advice. Growth and survival of any community depends on the activities of its members in sharing information and knowledge. The purpose of this study is to assess the influential factors on knowledge sharing behavior in MSNs in different perspectives in a comprehensive manner.

Design/methodology/approach – A model of factors affecting knowledge sharing behavior in MSNs is proposed by applying the structural equation modeling and path analysis to data collected from a sample of users of a well-known MSN through a questionnaire.

Findings – This study supports the contributive aspects of trust and enjoying participation in sharing knowledge, while there is no significant correlation between perceived ease of use and knowledge sharing behavior in MSNs. Furthermore, intention to share knowledge can lead to actual behavior in MSNs environments.

Practical implications – The results obtained here provide a grasp of factors that influence knowledge sharing in mobile communities which would promote enhanced contribution towards their online communities by MSNs administrators.

Originality/value – A four-dimensional comprehensive model consisting of social, psychological, cultural and technological perspectives in one package is proposed here for knowledge sharing behavior in MSNs. Such a comprehensive perspective is overlooked in the existing literature.

Keywords Social capital, Perceived ease of use, Knowledge sharing behaviour, Enjoying participation, Knowledge sharing intention, Mobile social networks

Paper type Research paper

1. Introduction

With the emergence of internet and cyber space communication technologies, people found social networking websites for contacting others worldwide. A social network is an environment where people can interact and have an inter-relationship with one another (Kimura and Saito, 2006). Online social networks create and maintain members' profiles consisting of unique user identifiers, with or without avatars, some personal information, a list of friends, a list of social groups, an environment and capabilities for sending and receiving information among members (Pietiläinen *et al.*, 2009). Mobile social networking has an average share of over 15 per cent of total mobile data traffic with the objective of

Kybernetes
© Emerald Publishing Limited
0368-492X
DOI 10.1108/K-07-2017-0249

staying in touch with friends and sharing views and ideas on various types of topic (Moreno-Munoz *et al.*, 2016).

Fast-growing social networking websites and applications are applied in many areas with a significant increasing rate. In global scale many people, some of which are even known as being addicted to the internet and social networks seeking online friendships maintenance spend a lot of time in these virtual communities (Tang *et al.*, 2016).

Mobile phones constitute the essential and complementary aspect of contemporary human life. Smart phone technology has improved communication and innovated methods for exchanging information and knowledge (LaRue *et al.*, 2010). Applying electronic devices by young population is on a rapid growth. Research studies in this area revealed that other age groups are joining this trend, particularly adults and the middle aged (Lee and Kim, 2014). Mobile device interface is of particular features. The small touch screen, relatively low storage capacity and easy and quick information access lead to different behavioral manners in people who use these devices. For example, people may prefer to exchange short articles and files with limited volume (Shim *et al.*, 2015).

The social networks which are based on applications working on mobile phones like Telegram, WhatsApp, Line and Viber are explored in this article.

Mobile social networks (MSNs) have become the core of the whole virtual space (Ha *et al.*, 2015). This incomparable prevalence of MSNs has produced a unique opportunity for many businesses, organizations, individuals and even nations in achieving success.

Individuals can search and gain information about their interests while being able to share their own knowledge which may be needed or useful for other people (Li *et al.*, 2012). Knowledge sharing contributes to learning, creativity, meeting needs and making the cyber space environment useful. It might be the most important feature of social networks. Several factors could influence MSN members' decision whether to disperse their obtained knowledge and information to other members or not. It is worthwhile to diagnose factors which would facilitate knowledge sharing in a sense that community owners would be able to enhance their quantity and quality of their community. Low knowledge sharing rate in MSNs can cause serious problems as to their survival. People like to join MSNs which have active members who would release their knowledge and information requirements.

The following research questions are addressed in this study:

RQ1. Which are the factors that can facilitate sharing knowledge and information in MSNs?

RQ2. How do the mobile community administrators promote the knowledge sharing behavior in their communities?

RQ3. How can knowledge sharing in MSNs be assessed in a comprehensive manner in different perspectives?

Although there exist some studies on exchanging knowledge in social networks (Wei *et al.*, 2014; Razmerita *et al.*, 2016; Sedighi *et al.*, 2016; Hung and Cheng, 2013; Papadopoulos *et al.*, 2013), few studies seek to apply an integrated approach for exploring influential factors on knowledge sharing behavior in MSNs.

The contributions of this article are briefed as:

- A four-dimensional comprehensive model is proposed here for knowledge sharing behavior in MSNs, consisting of social, psychological, cultural and technological perspectives in one package. Such a comprehensive perspective is overlooked in the existing literature.

- Both the intention and behavior for content sharing are considered separately. Although some studies have assessed virtual communities from these two points of view, the focus here is on intention and behavior in practical perspective in MSNs to measure the differences between intention and actual behavior in MSNs environments.
- A practical approach is proposed here on which mobile community owners and managers of online groups can develop their community according to the findings here.
- Because the related literature in mobile communities is scarce, the output of this study and few other studies may shed light on this issue of concern.

A comprehensive framework is proposed to better realize the relationships between social, psychological, cultural, technological factors and knowledge sharing behavior in MSNs. The hypotheses regarding this relationship are evaluated by an empirical study run on MSNs members of domestic, Iranian social network groups through the structural equation modeling (SEM) approach, path analysis method and the SPSS 22 and Amos 18 software.

The rest of this article is organized as follows: the theoretical background of the research model and the declared corresponding hypotheses are discussed in Section 2; the research methodology and data collection are presented in Section 3; the empirical test of research model through an online survey and data collected from an Iranian MSN is expressed in Section 4; the subject of the study is discussed in Section 5; and conclusion, implications, limitations and suggestions on future studies are presented in Section 6.

2. Literature review and research model

2.1 Knowledge sharing in mobile social networks

The term knowledge sharing is defined as "the sharing of community-related information, ideas, suggestions and expertise among individuals" (Yu *et al.*, 2010) which consists of a set of actions that lead to information exchange or assisting others (Roblek *et al.*, 2013). The information and knowledge flow in a community is of two facets: information sharing and information seeking. Knowledge sharing is an important feature in meeting the users' need.

The degree to which users seek or share information and knowledge in social networks varies because of the features and factors. Researchers have introduced many factors influencing knowledge sharing among users in virtual communities (Table I).

These factors are categorized in five factors, namely, social, individual, psychological, cultural and technological context. As the individual and psychological issues are close to each other, they are categorized as one; thus, only four categorized influencing factors are involved here. In this context, it is assumed that knowledge sharing behavior of MSN members can be affected by these categories. The relationship between intention to share knowledge and knowledge sharing behavior is required because there may exist a gap between intention and real action in MSNs which should be addressed and assessed. The objective here is to assess the contributive effect of trust, norm of reciprocity and shared cognition in social perspective, altruism and reputation in psychological perspective, knowledge sharing culture in cultural perspective, perceived ease of use and enjoying participation in technological perspective and intention to share knowledge on knowledge sharing behavior of members in MSNs.

Here, nine effective items in knowledge sharing behavior together with their definitions in an MSN are assessed (Table II).

Category	Constructs in related literatures
Social context	Trust, social norms, community identification, perceived sense of belongings, expected relationship, shared cognition, affective commitment, perceived compatibility, perceived similarity, familiarity, social identity, shared goal, community loyalty, shared language, shared vision, social interaction ties, needs for affiliation, social tie
Individual motivation	Sense of self-worth, perceived benefits perceived costs, personal outcome expectation, entertainment, personal growth, organizational rewards, perceived individual benefits, user satisfaction
Psychological context	Altruism, reputation, self-efficacy, enjoy helping, psychological safety
Technological context	Perceived usefulness, perceived ease of use, perceived enjoyment, enjoying participation, insecurity, community structure, perceived mobility, mobile convenience, accessibility
Cultural context	Fairness, identification, openness, power distance, individualism, uncertainty, Confucian dynamism, subjective norms, group norms

Table I. Classification of influencing factors into five groups

2.2 Social capital and social context

In general, social factors are important when communities of people and their relationships are of concern, something unique in Iranian cultural fiber, where people are interested in and care about what others think about them. Individuals are more likely to spend time in social networks provided that people who are important for them and influence their behavior expect them to be active in these networks (Nikou and Bouwman, 2014). Knowledge sharing in MSNs is accomplished through socializing as a need and desire to be in contact with other people and friends (Tang *et al.*, 2016). The three components of social capital consisting of trust, reciprocity and shared cognition are assessed and tested here.

2.2.1 Trust. If trust is established in its appropriate sense among virtual community members, their contribution increases, that is, they share and seek more knowledge in the community (Chen and Hung, 2010). One of the most important determinants of community members' behavior is assessing the other members' behavior. Individuals would be reluctant to spend their knowledge and time on others if they notice selfishness and free-ridership. Trust in community members leads to more mutual willingness in assisting (Fang and Chiu, 2010). Individuals usually rely more on their reputation among people who they trust, while the opposite holds true as well. When mutual trust in a group is high, members will have more intention to share knowledge therein (Alamir and Navimipour, 2016). It is found that trust between members in a digital community has a positive influence on information sharing and seeking for more, thus contributing to the promotion of the community (Chen and Hung, 2010). Customers tend to apply other consumers' purchasing experience instead of the marketing information provided by the organization owners in their purchase decision-making process (Lee and Koo, 2012). Trust through voluntary members without expecting benefits has significant effect on knowledge sharing in a virtual community (Kim and Ahmad, 2013). Tamjidyamcholo *et al.* (2013) found that trust affects intention and attitude in knowledge sharing because members in virtual communities are of high enthusiasm in contributing when they trust one another and the community as a whole.

The hypotheses of concern here consist of the following:

H1a. Trust has a positive effect on the level of reputation (willingness in reputation) among members in MSNs.

Construct	Definition	References
Trust	An expectancy held by an individual or a group that the word, promise, verbal or written statement of another individual or group can be relied upon	Hsu and Lin (2008), Zhao *et al.* (2012), Zhang *et al.* (2010), Lin *et al.* (2009), Fang and Chiu (2010), Lu and Yang (2011), Tamjidyamcholo *et al.* (2013), Hsu *et al.* (2007), Tsai *et al.* (2012), Chang and Chuang (2011), Hsiao and Chiou (2012), Chen and Hung (2010), Chai and Kim (2010), Hau and Kim (2011)
Reciprocity	The belief that current contribution could lead to future request for knowledge being met	Zhang *et al.* (2014), Lin *et al.* (2009), Lu and Yang (2011), Tamjidyamcholo *et al.* (2013), Chang and Chuang (2011), Chen and Hung (2010), Wasko and Faraj (2005), Hau *et al.* (2013);
Shared cognition	An individual member's perception of the degree in which his/her team members share similar cognitive structure	Yu *et al.* (2013), Lu and Yang (2011), Tamjidyamcholo *et al.* (2013), Tsai *et al.* (2012), Chang and Chuang (2011), Hau and Kim (2011)
Perceived ease of use	The degree to which a person believes that using a particular system would be free of effort	Hsu and Lin (2008), Hung and Cheng (2013), Papadopoulos *et al.* (2013), Huang *et al.* (2012), Davis (1989), Mun *et al.* (2006)
Sharing culture	Deep structure in a community which is based on values, beliefs and assumptions to contribute and share information and knowledge in community environment held by its members	Pi *et al.* (2013), Yu *et al.* (2010), Van Dick *et al.* (2006), Chen *et al.* (2012)
Enjoying participation	The extent to which the participation in a social network is perceived to be enjoyable in its own right	Ku *et al.* (2013), Venkatesh (2000), Gil de Zúñiga *et al.* (2012), Shim *et al.* (2015),
Altruism	The degree to which a person is willing to increase other people's welfare without expecting returns	Hsu and Lin (2008), Papadopoulos *et al.* (2013), Fang and Chiu (2010), Chang and Chuang (2011)
Reputation	Perception of increase in reputation because of sharing knowledge	Pi *et al.* (2013), Park *et al.* (2014), Papadopoulos *et al.* (2013), Wasko and Faraj (2005)
Intention to share	The intention and motivation members in social network have to participate with sharing knowledge and information in community environment	Park *et al.* (2014), Venkatesh *et al.* (2003), Shin (2010), Ajzen (1991), Tan *et al.* (2014), Choi *et al.* (2013), Chen *et al.* (2012)

Table II.
Constructs of research model, their definition and related work

H1b. Trust has a positive effect on the altruism degree among members in MSNs.

H1c. Trust has a positive effect on intention to share knowledge in MSNs.

2.2.2 Reciprocity. Reciprocity refers to the expectation of participants as if their contributed information would lead to their future requests on information being met (Kankanhalli *et al.*, 2005). Members who share their knowledge have the expectation of being assisted in future hopping that their efforts would be compensated (Tang *et al.*, 2016). Moreover, when members perceive that they are treated fairly and are provided by useful knowledge within

the community, they are more likely to interact with other members in an active manner (Yu *et al.*, 2010). Reciprocity can regulate interactions among individuals to avoid unfair manners like sharing knowledge by some people and free-riding by others (Rheingold, 1993). According to social exchange theory proposed by Thibaut and Kelley (1959), beliefs about the norm of reciprocity can make community members feel responsible in sharing their useful knowledge and information with other members (Wasko and Faraj, 2005). Reciprocity is an advantage for the community members with respect to sharing knowledge and information with other people on mutual basis. When members are assisted by other members in a community, they tend to compensate with favor and help through information sharing (Lin *et al.*, 2009). People who provide valuable knowledge for other members in a mutual manner would be more ready to assist others by their knowledge without any expectation too. When members participate more in responding to other members' contributions, they care more on being known by them. Reciprocal knowledge exchange relationships can promote the members' willingness to obtain more reputation.

The hypotheses of concern here consist of the following:

H2a. Reciprocity has a positive effect on the level of reputation (willingness in reputation) among members in MSNs.

H2b. Reciprocity has a positive effect on the altruism degree among members in MSNs.

H2c. Reciprocity has a positive effect on intention to share knowledge in MSNs.

2.2.3 Shared cognition. Shared cognition refers to a member's gained perception of the level at which other team members share similar knowledge, values, philosophies and problem-solving approaches (Yu *et al.*, 2013). According to self-categorization theory, when there is a high similarity among group members, they are more likely to join and interact with one another (Zagenczyk *et al.*, 2010). When talking to other people, one expects to receive positive feedback and this becomes unlikely if there is misunderstanding. The existing disputes and conflicts in social networks and online forums might be derived from differences in thoughts and visions of their members. Shared cognition is a major antecedent in encouraging MSNs' members to assist other members with their knowledge and experience. MSNs' members with common interests or similar properties are more likely to congregate in the same group or channel (Xu *et al.*, 2016), and it is expected that people are more willing to assist those who share common attitudes with them. Altruistic behavior is exposed as sharing useful knowledge and ideas with other members. Shared cognition as an influential factor in willing to earn reputation implies that members tend to earn reputation among community members when they perceive they have less cognitive conflict and are in consent with other members.

One of the aspects of cognitive social capital is the shared language referred to as "the acronyms, subtleties and underlying assumptions that are the staples of day-to-day interactions" (Lesser and Storck, 2001). Shared language can implicitly strengthen the sense of "group" among community members (Tsai *et al.*, 2012). With the assistance of a shared language, community members can share their thoughts and opinions more easily and interaction among people can be facilitated (Tamjidyamcholo *et al.*, 2013). People tend to share their knowledge, beliefs and opinions with those who have similar tendencies in community topics (Darr and Kurtzberg, 2000).

The hypotheses of concern here consist of the following:

H3a. Shared cognition has a positive effect on the level of reputation (willingness in reputation) among members in MSNs.

H3b. Shared cognition has a positive effect on the altruism degree among members in MSNs.

H3c. Shared cognition has a positive effect on intention to share knowledge in MSNs.

2.3 Psychological context

The psychological aspects cannot be disregarded while talking about a group of people, their interrelations and behaviors. Many actions in a community depend on personal feelings, emotions, opinions, beliefs, motivations and tendencies. Individual and psychological factors are considered as a unified category. Altruism and willing to earn reputation have been and are being applied as psychological constructs in the proposed model mainly because MSN users try to interact and contribute according to their psychological characteristics based on their craving for being well-known and helpful to others.

2.3.1 Altruism. Due to non-beneficial nature of most communications in MSNs, altruism can be highly contributive in interactions and involvement of members. The need and desire among the MSN's members towards being helpful and enhance sense of self-worth can trigger their knowledge sharing (Tang *et al.*, 2016). In psychological context, when members of a community tend to assist other people, they will have more contribution by distributing more useful information to other members in the community environment (Ba *et al.*, 2001; Davenport and Prusak, 1998; Kankanhalli *et al.*, 2005; Wasko and Faraj, 2000; Yu *et al.*, 2010). If individuals are not rewarded for sharing their knowledge and useful information, they will stop doing so (Chang and Chuang, 2011). On the contrary, altruism in members will increase enthusiasm to share knowledge within online and traditional communities (Fang and Chiu, 2010). The more one is interested in assisting others without any expectation, the more his/her altruism (Hsu and Lin, 2008); therefore, in a society where this psychological feature is strong among people, more enthusiasm in making comment and giving advices is observed.

The hypothesis of concern here consists of the following:

H4. Altruism has a positive effect on intention to share knowledge in MSNs.

2.3.2 Reputation. One of the strongest motives in people is to become known by others. Many activities in social networks take place on voluntarily basis, without any monetary rewards. If people feel that sharing knowledge and information in an electronic social community can improve their social status and reputation, they will become motivated more in participating in such activities (Arenas-Gaitan *et al.*, 2013; Pi *et al.*, 2013). Individuals perceive that when they respond more frequently and expose their profession in a social network, they earn more reputation (Wasko and Faraj, 2005).

The hypothesis of concern here consists of the following:

H5. Reputation has a positive effect on intention to share knowledge.

2.4 Technological context

All activities in MSNs are carried out on a technological platform (Figure 1). Technology is not neutral and producers of the applications try to improve the usability of MSNs by applying key features to provide different social practices (Bar *et al.*, 2016). The factors because of applying technology are of high significance and cannot be disregarded. The degree to which members feel using technology is easy and enjoyable is determinant by

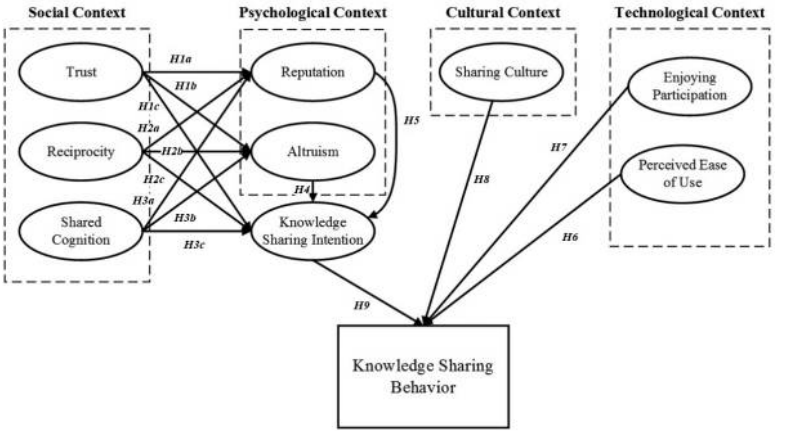

Figure 1.
Research model

participating in MSNs; consequently, the technological factors, perceived ease of use and enjoying participation are applied in this proposed model.

2.4.1 Perceived ease of use. Not all participants are fit enough at working with online websites and applications; therefore, popularity and prevalence of an MSN might be affected by its environment design. People usually like to use simple and easy applications. According to Davis (1989), perceived ease of use is "the degree to which a person believes that using a particular system would be free of effort". In the study run by Hung and Cheng (2013), both personal and technological factors are considered, and it is revealed that perceived ease of use of technology not only affects perceived usefulness but also has significant influence on intention to share knowledge. Hsu and Lin (2008) stated that perceived usefulness and perceived ease of use have significant effect on behavioral intention of members in social networks. They found that an easy-to-use interface can reduce the resistance of members against applying the website technology. Most of the users in social networks are information technology experts with limited competency in using electronic technologies. Many useful and efficient applications and websites may be relinquished because of the difficulty that members confront while resort to them. In this context, it is expected that social network applications which are easy to work with can facilitate knowledge sharing behavior among users.

The hypothesis of concern here consists of the following:

H6. Perceived ease of use has a positive effect on knowledge sharing behavior in MSNs.

2.4.2 Enjoying participation. Perceived enjoyment is defined as "the extent to which the activity of using a particular system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use" (Venkatesh, 2000). It is revealed in available studies that perceived enjoyment is one of the main stimulants in applying a system or technology (Park *et al.*, 2014).

Individuals are interested more in visiting a website if it amuses them (Hausman and Siekpe, 2009). Mobile users seek information mostly on entertainment through mobile devices (Gil de Zúñiga *et al.*, 2012; Horan, 2013; Shim *et al.*, 2015). The users' contribution is made by the feeling of enjoyment while using mobile apps in both conscious and unconscious (as a habit) states (Hsiao *et al.*, 2016). Many MSNs' channels and groups serving entertainment purposes, which have gained a great tendency of people to join them, imply

that individuals have a great motivation for experiencing pleasure, accordingly participate in MSNs' activities.

The hypothesis of concern here consists of the following:

H7. Enjoying participation will have a positive effect on knowledge sharing behavior in MSNs.

2.5 Cultural context

The virtual community culture and climate is related to thoughts, feelings, norms, values, perceptions and behaviors of the members of a community. The culture formed among members in sharing knowledge in MSN environment is of high importance mainly because that norms, expectations and beliefs which members already have are always strong stimulants for contributing their knowledge.

2.5.1 Sharing culture. The behavior of members' knowledge sharing is influenced by cultural features of community space. In an MSN with an unwilling culture featured as to share knowledge, members perceive that the communication environment is not appropriate for sharing knowledge, thus, not much contribution is expected. In contrast, in an MSN with a strong positive knowledge sharing culture, members feel that they should try to share knowledge to conform to the community culture and to be adopted. When an MSN is of a better sharing climate, its members share more information and knowledge with others (Pi *et al.*, 2013). The cultural features have both direct and indirect impact on knowledge sharing behavior. In its direct sense, more sociable members would like to share more knowledge and content with other members in the community (Zhang *et al.*, 2014). An open and ethical culture can trigger sharing knowledge in a community space (Curry and Stancich, 2000). Li (2010) confirmed the impact of cultural differences on knowledge sharing behavior by assessing the Chinese and American members' behaviors with different sharing cultures based on different cultural features like different thinking logical pattern and different levels of perceived credibility of voluntarily shared knowledge. When there exists an agreeing phase regarding sharing useful information in a group, the members will have a positive attitude towards sharing their knowledge (Bock *et al.*, 2005).

The hypothesis of concern here consists of the following:

H8. Positive knowledge sharing culture has a positive effect on knowledge sharing behavior in MSNs.

2.6 Intention to share knowledge

This factor is a motivational factor. People should have enough motivation and desire to do things. Both intention and behavior and the correlation thereof are assessed here. Administrators should respond to the following questions if they want to survive and compete in the fast-growing virtual space of MSNs:

Q1. How can motivations when participating in an MSN increase the sense of contribution in the community?

Q2. How can administrators promote the members' willingness in contributing?

Q3. How can sharing knowledge depend on the level of willingness to participate?

High intention to share knowledge, information, ideas and opinions can lead to high actual behavior (Chen *et al.*, 2012; Park *et al.*, 2014; Shin, 2010).

The hypothesis of concern here consists of the following:

H9. Intention to share knowledge has a positive effect on knowledge sharing behavior.

3. Research methodology

After collecting information on virtual communities and MSNs through a field study and assessing the related works, the focus is directed on the domestic issues about MSNs in Iran with respect to its cultural features. Research questions are assessed by conducting a survey study on members of online social networks. Here, interviews are run with experts and some group managers in Telegram, a widely used instant messaging application. A researcher designed questionnaire is applied in data gathering. The reliability and validity of the suggested model is evaluated by fitting model indexes. The SEM method is adopted in determining and evaluating the correlations among the variables. Applying SEM is a proper choice, as analyzing all of the paths in general in one analysis is sought. The SPSS 22 and Amos 18 software are applied in this study (Figure 2).

3.1 Sample and procedure

Because some of the main features of Web-based virtual communities and mobile virtual communities are different, the questionnaire is distributed only among MSNs members. The questionnaire is designed through Google Forms and the link of the page is distributed among various Iranian groups and channels in Telegram application in a viral manner. Before distributing the copies of the questionnaire, it is assessed through some MSN users and their feedback is gathered to improve the clarity and remove the ambiguity and misunderstanding about the items if any. A cover letter explaining the purpose of the research, vague concepts about the questions and the confidentiality is attached. From 180 distributed questionnaires, 161 responded completely. The sample size of at least 150

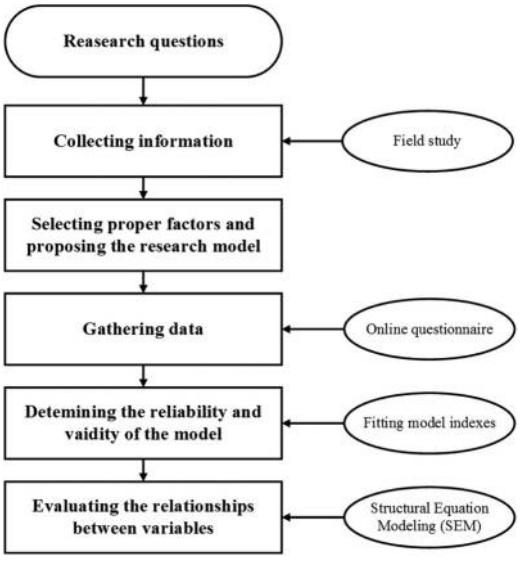

Figure 2.
Research framework

responses can lead to reliable statistical results (Anderson and Gerbing, 1988); thus, this sample size of 161 is acceptable for this methodology. The demographic information of the respondents is tabulated in Table III.

3.2 Measurement development

A questionnaire consisting of measuring items is designed based on previous related works and interviews with experts, researchers and administrators of online communities. The items are developed from the literature related to online social networks area. The selected items are modified in a manner to fit MSNs field but not just virtual communities or social networks in general. Trust, knowledge sharing intention and altruism are measured through items introduced by (Fang and Chiu, 2010; Pi *et al.*, 2013). The items to measure shared cognition, reputation and enjoying participation are modified based on the findings by (Hsu and Lin, 2008; Zhao *et al.*, 2012). Furthermore, applying materials from (Davis, 1989; Wasko and Faraj, 2005; Yan *et al.*, 2013) a scale are developed for measuring knowledge sharing behavior, perceived ease of use and reciprocity.

A five-point Likert scale is applied where 5 indicates "I completely agree" and 1 "I completely disagree".

4. Research findings

The collected data are measured in two steps: confirmatory factor analysis is run on appraising the measure model fit, and the correlations among items of the conceptual model are assessed.

4.1 Validity and reliability

Analyzing and assessing the convergent validity is run through the content analysis method. The Cronbach's alpha is applied to measure the validity of the questionnaire that is 0.88, an acceptable rate indicating validity of the questionnaire. The extracted variance averages and factor loading related to convergent validity are tabulated in Table IV. The values of the factor loading should be greater than 0.6 for each variable; otherwise, that variable is removed and convergent validity of the instrument is confirmed if the AVE index is greater than 0.5. As observed in Table IV, as the AVE value for each construct is more

Measure	Category	Frequency	(%)
Gender	Male	75	47
	Female	86	53
Age	<18	16	10
	18-25	51	32
	26-34	58	36
	>35	36	22
Education level	High school	23	10
	BSc	81	50
	MSc	44	27
	PhD	13	8
Active time	<3 h	22	14
	3-9 h	56	35
	10-20 h	52	32
	>20 h	31	19

Table III. Demographic information

Construct	Factor loading	Composite reliability	Variance extracted	α	AVE
Trust	0.812	0.913	0.533	0.85	0.733
	0.801				
	0.762				
Shared cognition	0.686	0.727	0.644	0.83	0.620
	0.661				
Reciprocity	0.775	0.775	0.573	0.97	0.743
	0.898				
Enjoying participation	0.825	0.794	0.612	0.79	0.689
	0.773				
Perceived ease of use	0.826	0.856	0.554	0.86	0.818
	0.895				
Altruism	0.924	0.816	0.579	0.92	0.804
	0.862				
	0.830				
Reputation	0.845	0.864	0.635	0.90	0.675
	0.697				
	0.756				
Sharing culture	0.787	0.713	0.518	0.91	0.728
	0.741				
Knowledge sharing intention	0.934	0.832	0.714	0.92	0.864
	0.905				
	0.978				
Knowledge sharing behavior	0.854	0.896	0.641	0.85	0.721
	0.817				

Table IV.
Convergent validity and reliability

than 0.5, convergent validity of the variables is confirmed. Moreover, the factor loading values greater than 0.5 indicate an acceptable level of convergent validity (Hair *et al.*, 2010).

The reliability of the questionnaire is evaluated through the partial least square method and two measurement items of Cronbach's alpha reliability and composite reliability (CR). Through Cronbach's alpha coefficient, it is revealed how the questions can determine the appropriate combination of their own. In the combined reliability's coefficient, one differentiates between correlation coefficient of questions in one dimension and the other defines the adequate measurement models fitness, respectively (Fornell and Larcker, 1981). The Cronbach's alpha values and CR values for all constructs greater than 0.7 which suggest the acceptable reliability are tabulated in Tables IV and V.

		1	2	3	4	5	6	7	8	9	10
1	Trust	*0.893*									
2	Reciprocity	0.211	*0.805*								
3	Shared cognition	0.234	0.257	*0.874*							
4	Perceived ease of use	0.129	0.153	0.194	*0.773*						
5	Sharing culture	0.108	0.131	0.124	0.462	*0.682*					
6	Enjoying participation	0.133	0.079	0.237	0.529	0.546	*0.840*				
7	Altruism	0.445	0.361	0.452	0.216	0.291	0.268	*0.756*			
8	Reputation	0.408	0.478	0.542	0.228	0.361	0.217	0.527	*0.897*		
9	Intention to share	0.711	0.522	0.633	0.482	0.437	0.340	0.639	0.659	*0.912*	
10	Knowledge sharing behavior	0.736	0.580	0.679	0.495	0.675	0.655	0.698	0.703	0.893	*0.944*

Table V.
Comparison of inter-construct correlation with AVE for discriminant validity

4.2 Structural model

Confirmatory factor analysis is run to test the consistency between the measurements of the constructs and their perceived nature by the researchers. The indices of fitness measures for the measurement model are tabulated in Table VI. The goodness-of-fit of this proposed model is tested through these indices.

It is recommended that the value of χ^2/df be less than 3 and CFI and NFI be greater than 0.9 (Bentler and Bonett, 1980) while the value of more than 0.8 is suggested for GFI and AGFI (Seyal *et al.*, 2002). All indices of factor analysis yield acceptable values for model fit. Normed fit index (NFI = 0.93), chi square/degrees of freedom ratio (χ^2/df = 1.69), goodness-of-fit-index (GFI = 0.86), adjusted goodness-of-fit index (AGFI = 0.83), root mean square error of approximation (RMSEA = 0.037), Tucker–Lewis index (TLI = 0.96) and comparative fit index (CFI = 0.91) all meet their acceptance levels, indicating that the measurement model is well defined. (Table VII)

The correlation between the constructs of the conceptual model is assessed through the structural model. The path coefficients and how hypothesizes are supported, are presented in Figure 3. Knowledge sharing behavior is affected by knowledge sharing intention (*H9*: $\beta = 0.72$, $p < 0.001$), enjoying participation (*H7*: $\beta = 0.42$, $p < 0.001$) and sharing culture (*H8*: $\beta = 0.32$, $p < 0.001$) constructs. As observed in Figure 3, perceived ease of use (*H6*: $\beta = -0.12$, $p > 0.05$) does not have a significant correlation with knowledge sharing behavior. Trust has a positive direct effect on reputation and intention to share knowledge (*H1a*: $\beta = 0.24$, $p < 0.01$ and *H1c*: $\beta = 0.53$, $p < 0.001$) but not on altruism. Reciprocity has just one significant correlation with other construct, altruism (*H2b*: $\beta = 0.61$, $p < 0.001$). Shared cognition like trust, has a significant effect only on reputation and intention to share knowledge (*H3a*: $\beta = 0.19$, $p < 0.05$ and H3c: $\beta = 0.27$, $p < 0.001$). Both the psychological factors, reputation and altruism, can affect knowledge sharing intention (*H5*: $\beta = 0.13$, $p < 0.05$ and *H4*: $\beta = 0.25$, $p < 0.01$). As observed in Table VIII, ten out of 15 hypotheses are supported by the results of statistical analysis.

Table VI. Model fit indices – measurement model

Fit index	Research model	Recommended criteria
Root mean square error of approximation (RMSEA)	0.037	<0.08
χ^2/df	1.69	<3
Goodness-of-fit index (GFI)	0.86	>0.8
Adjusted goodness-of-fit index (AGFI)	0.83	>0.8
Tucker–Lewis index (TLI)	0.96	>0.9
Normed fit index (NFI)	0.93	>0.9
Comparative fit index (CFI)	0.91	>0.9

Table VII. Model fit indices – structural model

Fit index	Research model	Recommended criteria
Root mean square error of approximation (RMSEA)	0.05	<0.08
χ^2/df	1.314	<3
Goodness-of-fit index (GFI)	0.88	>0.8
Adjusted goodness-of-fit index (AGFI)	0.91	>0.8
Tucker–Lewis index (TLI)	0.94	>0.9
Normed fit index (NFI)	0.97	>0.9
Comparative fit index (CFI)	0.95	>0.9

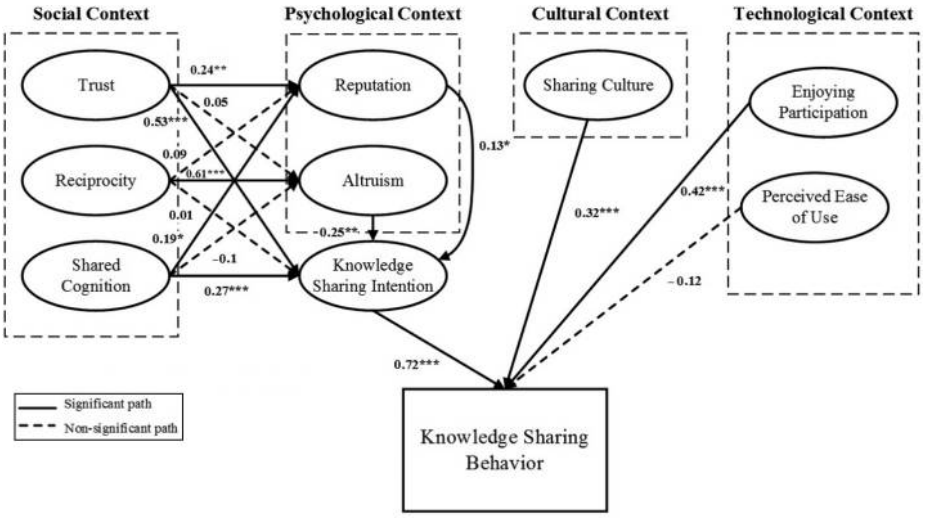

Figure 3.
Path coefficients for the research model

Notes: Path significance *** = $p < 0.0001$, ** = $p < 0.01$, * = $p < 0.05$

Table VIII.
Standardized path estimates

Path (hypothesis)	Standardized β	Standard error	p-value	Result
Trust → Reputation	0.24	0.03	<0.01	Supported
Trust → Altruism	0.05	0.07	>0.05	Not supported
Trust → K-sharing intention	0.53	0.05	<0.001	Supported
Shared cognition → Reputation	0.19	0.09	<0.05	Not supported
Shared cognition → Altruism	−0.10	0.12	>0.05	Supported
Shared cognition → K-sharing intention	0.27	0.08	<0.001	Not supported
Reciprocity → Reputation	0.09	0.10	>0.05	Supported
Reciprocity → Altruism	0.61	0.04	<0.001	Not supported
Reciprocity → K-sharing intention	0.01	0.01	>0.05	Supported
Altruism → K-sharing intention	0.25	0.07	<0.01	Supported
Reputation → K-sharing intention	0.13	0.10	<0.05	Supported
Ease of use → K-sharing behavior	−0.12	0.05	>0.05	Not supported
Enjoyment → K-sharing behavior	0.42	0.02	<0.001	Supported
Sharing culture → K-sharing behavior	0.32	0.03	<0.001	Supported
K-Sharing Intention → K-sharing behavior	0.72	0.05	<0.001	Supported

5. Discussion and implications

Social network services are being developed, distributed and applied in almost all over the world in a rapid manner in an expanding sense (Park *et al.*, 2014). People try to create and maintain supportive ties with their friends and other members in social networks through their electronic devices like smart phones and tablets (Petrovčič *et al.*, 2015). Because knowledge sharing is the most important feature of MSNs, the focus of this study is on assessing the influencing factors on knowledge sharing behavior in MSNs based on a conceptual model including the relationships between the mentioned constructs and knowledge sharing behavior. These factors cover the four effective aspects of: social,

psychological, cultural and technological. The objective here is to provide a comprehensive scheme of how members can be motivated to contribute in MSNs. While reviewing the related works on contribution in virtual communities, the MSNs in specific, it becomes evident that some factors are overlooked, especially in assessing the Iranian online communities. Consequently, a comprehensive approach is introduced to cover all significant aspects of influencing factors on knowledge sharing and contribution in MSNs. Although there exist many related works on knowledge sharing in virtual communities, this is one of the few studies run on knowledge sharing in MSNs in the realm of mobile applications in these communities. For example, Razmerita *et al.* (2016) proposed an integrated model of influential factors classified among individual, organizational and technological dimensions on knowledge sharing motivation in enterprise social media. The importance of MSNs is in their progressive emergence and lack of existing research in this field.

The purpose of assessing the intention to share knowledge and knowledge sharing behaviors in a separate manner in the conceptual model is to determine the gap between intention and behavior in Iranian mobile communities. There exist some studies where this gap is assessed in online communities but not in MSNs. Some researchers have assessed the intention to contribute in virtual communities but not in MSNs (Choi *et al.*, 2013; Tan *et al.*, 2014) and if any with a combined view in assessing the gap between intention and behavior. The direct effect of technological and cultural factors on behavior caused by these items is related to acting rather than vision, attitude or view. The effect of perceived ease of use on knowledge sharing behavior is insignificant here, similar to the results obtained by Papadopoulos *et al.* (2013), moreover it contradicts the findings of some available studies (Hung and Cheng, 2013; Huang *et al.*, 2012; Mun *et al.*, 2006). This might be because of the high prevalence of mobile applications and high IT skill level in working with smart phones among average Iranian social networks' users. If lower contribution of people is because of their low IT skills, easier environment and application interface may lead to a higher contribution because the difficulties in using the application as a barrier are eliminated. This indicates that, in this context, contribution in MSNs cannot be increased only by making the application and the use of corresponding technologies easier which makes administrators think of other reasons.

Enjoying participation and sharing culture are the other two items that can affect members' participation in a community in a direct manner, indicating that it is important that people enjoy participation, in sharing their opinions, ideas, etc. if expected. A considerable proportion of MSN users, especially Iranian users, see MSNs as a place for entertaining and have pleasure when online. In this context, Papadopoulos *et al.* (2013) and Shim *et al.* (2015) have confirmed the effect of joy and gratification as an indirect factor influencing contribution which trigger active interactions in online social networks, while in this study, the same is considered as a direct influential factor on knowledge sharing behavior because of the special nature of MSNs' context and pleasure expectations of mobile users. Some researchers consider the effect of sharing culture on knowledge sharing behavior as being direct (Yu *et al.*, 2010; Li, 2010), while some indirect, through intention to share knowledge or subjective norms (Pi *et al.*, 2013). All of the aforementioned studies have run their empirical studies on Web-based social networks, not on MSNs. The findings in this article support the association between knowledge sharing culture and knowledge sharing behavior which corresponds to the results obtained in the available literature, in this field. When members are not accustomed to writing and sharing their thoughts, it's likely to form a highly populated group of members (as free-riders) which do not share anything and just want to receive other people's posts as many online social networks. The group norms and members' expectations constitute the primary contributive elements in communities. If individuals' perceptions of their community are based on contribution and active interaction

with other members, more contribution and sharing activities would take place in that community.

The factors reputation and altruism have been and are the major concern in some of the available studies run on online social networks. In some, these two are assessed in a separate manner (Fang and Chiu, 2010; Pi *et al.*, 2013) and in a few they are considered as one category. According to Chang and Chuang (2011), reputation and altruism are considered as individual motivations; to Wasko and Faraj (2005), reputation is a subsidiary of individual motivations. In contrast, in Papadopoulos *et al.* (2013), both factors are labeled as social cognitive factors. As to the relationship between psychological constructs and intention to share knowledge, the hypotheses *H4* and *H5* are supported based on the statistical results. The need to earning reputation can be a strong stimulant among individuals to share their knowledge. As in traditional communities, people make efforts to gain others' attention and find contribution as the only manner to be noticed in an MSN. Individuals can respond to their needs by assisting people through sharing useful information and knowledge in MSNs' environment. Consequently, it can be assumed that members' behavior for knowledge sharing is subject to the extent at which they are willing to assist others and as Sedighi *et al.* (2016) state, altruism positively affects the quality and quantity of the knowledge shared.

This finding suggests that knowledge sharing is more common among people who are interested in assisting others (Wang, 2013). Social constructs are applied in this proposed model as predictors of psychological factors and intention to share knowledge, mainly because social ties are contributive in MSNs with respect to intention and psychological state of mobile users. Strong bonds between social and psychological factors are revealed in this study. The effect of social factors on psychological factors in a community is one of the most important issues which should be addressed by community managers. According to Tangaraja *et al.* (2015), influence of altruism as an intrinsic, reciprocity as an extrinsic and trust as an organization motivational factor on knowledge sharing behavior among Malaysian public sector managers are of major concern. Their findings are consistent with this study where the association of trust and reciprocity with knowledge sharing behavior is revealed. According to the obtained results, trust positively affects reputation and intention as to share knowledge but not altruism. This implies that individuals may need trust for having willingness to earn reputation and intention to share knowledge and in contrast, they assist other people, regardless of the lack of trust. This result is similar with the recent findings by Goh and Sandhu who confirmed the influence of trust on intention to share knowledge in academic communities based on the theory of planed behavior. As to social capital perspective, it is revealed that when there is mutual common interest, ideas and trust among groups of people, they become more motivated to gain reputation in such groups. The results indicate that willingness to earn reputation and intention to share knowledge among MSNs' members who share cognition are stronger. The insignificant influence of shared cognition on altruism reveals that individuals try to assist others even there is no consent on thoughts and ideas. Here, it is found that, if members in an MSN believe in reciprocal behavior, they tend to provide more assistance to others with their problems. The association between the norm of reciprocity and reputation and intention to share knowledge is not supported. This finding is inconsistent with that of Sedighi *et al.*'s (2016), where reciprocity influences on both the quality and quantity of knowledge sharing are debated.

This study is of two theoretical and practical dimensions with an impact on MSNs literature both. It can shed light on assessing knowledge sharing activities in mobile online communities with a comprehensive approach by considering the social, psychological, cultural and technological influencing factors. As indicated by the results here, the effect of influencing factors on knowledge sharing behavior in MSNs is different from those on Web-

based social networks. In practical context, most managers of MSNs' groups seek manners and methods to increase their communities' popularity among the whole society. Attempt is made to shed more light on this ambiguous issue in practice and diagnose the factors actually involved in improving contribution level in a mobile community.

6. Conclusions

MSNs have become popular and somewhat epidemic throughout Iran in a rapid manner. This sudden growth attributed to MSNs is because of the great enthusiasm in online social communication and deep prevalence of smart phones usage in Iran. The unprecedented prevalence of MSNs has promoted high willingness for attracting audience among administrators of these communities in a significant manner. Because the most common feature in a virtual community is knowledge sharing, growth and survival of MSNs is subject to managing and promoting knowledge sharing among members. Here, it is sought to reveal a comprehensive understanding of factors influencing knowledge sharing in MSNs.

There exist four main aspects in this newly proposed model: social, psychological, cultural and technological. The traces of these four aspects are available in related literature while not all of them are dealt with in one model.

This study is one of the few on MSNs. Although MSNs have become an issue of focus at global scale and have achieved unique importance especially in financial phase, most of the existing literature in social networks is related to Web-based social networks which indicates lack of studies in this area evident.

This empirical study is run on Iranian mobile social groups in Telegram. The statistical results obtained from 161 respondents of the subject questionnaire support most of the relations of the conceptual research model.

The findings here imply that intention to share knowledge, enjoying participation and sharing culture are the significant antecedents of knowledge sharing behavior, while reputation, altruism, trust and shared cognition influence knowledge sharing behavior in an indirect manner through intention to share knowledge. Both the psychological and social factors have significant impact on intention to share knowledge and consequently on knowledge sharing behavior.

6.1 Implications

The findings here may be applied by administrators and managers of these mobile groups especially in Iran because it embodies the study grounds. This study extends the understanding of how knowledge sharing behavior is facilitated and promoted in MSNs. Evaluating the relations among four construct categories of the social, the psychological, the cultural and the technological contexts and knowledge sharing behavior are applied here through an integrated approach.

Several significant practical implications are proposed here for MSNs' administrators to promote knowledge sharing behavior. MSNs' administrators should provide an environment within which participation is accompanied with enjoy and entertainment. The activities which cause enjoyment should be facilitated and promoted. Entertaining and facetious content, multimedia messages and easy to understand topics can be examples of facetious facilitators. As observed in Iranian social networks entertaining and facetious pages and channels are highly popular. The cultural fiber of a given community of people is always matter of concern; consequently, knowledge sharing culture in an MSN can be enhanced by several predetermined measures taken by administrators. Information and knowledge flow should be in a manner which would imply that contribution is of value and free-riding does not correspond with the norms of the community.

Now that the results support the impact of shared cognition, increasing the degree of cognition homogeneity among members must be a task undertaken by the administrators (e.g. creating interest groups). Concentrating on this important factor can prevent formation of groups and communities where individuals think and feel that others cannot understand them. Administrators should always establish and promote trust in their communities. Clarity and honesty in community environment are the two major critical features applicable in establishing trust. Forming trust among community members not only promotes intention to share knowledge but also increases the willingness to earn reputation which consequently leads to an increase in knowledge sharing. Designing community environment in a manner where people's participation would be observed more is another way of promoting hope and willingness for earning reputation.

The findings here provide new insight for Iranian MSNs' administrators who are concerned about increasing the degree of knowledge sharing behavior among their members.

6.2 Limitations and future research

6.2.1 Limitations

- There exist geographical limitations in this research due to applying the exploratory research on Iranian MSNs.
- Although there exist some overlaps between the findings here and the available findings, the results cannot be generalized as to other areas and countries with respect to differences in social set ups of people.
- Due to electronic distribution of the questionnaires, it is not possible to clarify every question in details for every respondent which provides the potential personal perceptions and misunderstanding.
- The Telegram MSN application is applied to run a survey which would affect the results, on the contrary, if the study was run on other applications, the findings would have differed.

6.2.2 Future research. A comprehensive approach to knowledge sharing behavior in MSNs is presented here, an issue still in its infancy, thus, more new and thriving studies should follow for its enrichment.

- Fast circulation and amazing prevalence of MSNs has led to a deep effect and change in many aspects of people's lives, especially in cultural sense. It is proposed to assess the differences among personal and social norms and culture in general even though in every country the studies can yield practical results fit to it.
- Relationships among family members and cultural behavior can be influenced by MSNs activities for valuable achievements which can be a new area of research.
- Knowledge sharing behavior in special types of groups like any kind of scientific groups can be assessed in future research studies.

References

Alamir, P. and Navimipour, N.J. (2016), "Trust evaluation between users of social networks using the quality of service requirements and call log histories", *Kybernetes*, Vol. 45 No. 10, pp. 1505-1523.

Ajzen, I. (1991), "The theory of planned behavior", *Organizational Behavior and Human Decision Processes*, Vol. 50 No. 2, pp. 179-211.

Anderson, J.C. and Gerbing, D.W. (1988), "Structural equation modeling in practice: a review and recommended two-step approach", *Psychological Bulletin*, Vol. 103 No. 3, p. 411.

Arenas-Gaitan, J., Javier Rondan-Cataluña, F. and Esteban Ramírez-Correa, P. (2013), "Social identity, electronic word-of-mouth and referrals in social network services", *Kybernetes*, Vol. 42 No. 8, pp. 1149-1165.

Ba, S., Stallaert, J. and Whinston, A.B. (2001), "Research commentary: introducing a third dimension in information systems design – the case for incentive alignment", *Information Systems Research*, Vol. 12 No. 3, pp. 225-239.

Bar, F., Weber, M.S. and Pisani, F. (2016), "Mobile technology appropriation in a distant mirror: Baroquization, creolization, and cannibalism", *New Media and Society*, Vol. 18 No. 4, pp. 617-636.

Bentler, P.M. and Bonett, D.G. (1980), "Significance tests and goodness-of-fit in the analysis of covariance structures", *Psychological Bulletin*, Vol. 88 No. 3, p. 588.

Bock, G.W., Zmud, R.W., Kim, Y.G. and Lee, J.N. (2005), "Behavioral intention formation in knowledge sharing: examining the roles of extrinsic motivators, social-psychological forces, and organizational climate", *MIS quarterly*, Vol. 29 No. 1, pp. 87-111.

Chai, S. and Kim, M. (2010), "What makes bloggers share knowledge? An investigation on the role of trust", *International Journal of Information Management*, Vol. 30 No. 5, pp. 408-415.

Chang, H.H. and Chuang, S.S. (2011), "Social capital and individual motivations on knowledge sharing: participant involvement as a moderator", *Information and Management*, Vol. 48 No. 1, pp. 9-18.

Chen, C.J. and Hung, S.W. (2010), "To give or to receive? Factors influencing members' knowledge sharing and community promotion in professional virtual communities", *Information and Management*, Vol. 47 No. 4, pp. 226-236.

Chen, S.S., Chuang, Y.W. and Chen, P.Y. (2012), "Behavioral intention formation in knowledge sharing: examining the roles of KMS quality, KMS self-efficacy, and organizational climate", *Knowledge-Based Systems*, Vol. 31, pp. 106-118.

Choi, J., Jung, J. and Lee, S.W. (2013), "What causes users to switch from a local to a global social network site? The cultural, social, economic, and motivational factors of Facebook's globalization", *Computers in Human Behavior*, Vol. 29 No. 6, pp. 2665-2673.

Curry, A. and Stancich, L. (2000), "The intranet – an intrinsic component of strategic information issue management?", *International Journal of Information Management*, Vol. 20 No. 4, pp. 249-268.

Darr, E.D. and Kurtzberg, T.R. (2000), "An investigation of partner similarity dimensions on knowledge transfer", *Organizational Behavior and Human Decision Processes*, Vol. 82 No. 1, pp. 28-44.

Davenport, T.H. and Prusak, L. (1998), *Working Knowledge: How Organizations Manage What They Know*, Harvard Business Press.

Davis, F.D. (1989), "Perceived usefulness, perceived ease of use, and user acceptance of information technology", *MIS Quarterly*, Vol. 13 No. 3, pp. 319-340.

Fang, Y.H. and Chiu, C.M. (2010), "In justice we trust: exploring knowledge-sharing continuance intentions in virtual communities of practice", *Computers in Human Behavior*, Vol. 26 No. 2, pp. 235-246.

Fornell, C. and Larcker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, Vol. 18 No. 1, pp. 39-50.

Gil de Zúñiga, H., Jung, N. and Valenzuela, S. (2012), "Social media use for news and individuals' social capital, civic engagement and political participation", *Journal of Computer-Mediated Communication*, Vol. 17 No. 3, pp. 319-336.

Ha, Y.W., Kim, J., Libaque-Saenz, C.F., Chang, Y. and Park, M.C. (2015), "Use and gratifications of mobile SNSs: Facebook and KakaoTalk in Korea", *Telematics and Informatics*, Vol. 32 No. 3, pp. 425-438.

Hair, J.F., Jr, Black, W.C., Babin, B.J., Anderson, R.F. and Tatham, R.L. (2010), *Multivariate Data Analysis; A Global Perspective*, Pearson Prentice Hall.

Hau, Y.S. and Kim, Y.G. (2011), "Why would online gamers share their innovation-conducive knowledge in the online game user community? Integrating individual motivations and social capital perspectives", *Computers in Human Behavior*, Vol. 27 No. 2, pp. 956-970.

Hau, Y.S., Kim, B., Lee, H. and Kim, Y.G. (2013), "The effects of individual motivations and social capital on employees' tacit and explicit knowledge sharing intentions", *International Journal of Information Management*, Vol. 33 No. 2, pp. 356-366.

Hausman, A.V. and Siekpe, J.S. (2009), "The effect of web interface features on consumer online purchase intentions", *Journal of Business Research*, Vol. 62 No. 1, pp. 5-13.

Horan, T.J. (2013), "'Soft'versus 'hard'news on microblogging networks: semantic analysis of twitter produsage", *Information, Communication and Society*, Vol. 16 No. 1, pp. 43-60.

Hsiao, C.C. and Chiou, J.S. (2012), "The effect of social capital on community loyalty in a virtual community: test of a tripartite-process model", *Decision Support Systems*, Vol. 54 No. 1, pp. 750-757.

Hsiao, C.H., Chang, J.J. and Tang, K.Y. (2016), "Exploring the influential factors in continuance usage of mobile social apps: satisfaction, habit, and customer value perspectives", *Telematics and Informatics*, Vol. 33 No. 2, pp. 342-355.

Hsu, C.L. and Lin, J.C.C. (2008), "Acceptance of blog usage: the roles of technology acceptance, social influence and knowledge sharing motivation", *Information and Management*, Vol. 45 No. 1, pp. 65-74.

Hsu, M.H., Ju, T.L., Yen, C.H. and Chang, C.M. (2007), "Knowledge sharing behavior in virtual communities: the relationship between trust, self-efficacy, and outcome expectations", *International Journal of Human-Computer Studies*, Vol. 65 No. 2, pp. 153-169.

Huang, S.L., Lin, S.C. and Chan, Y.C. (2012), "Investigating effectiveness and user acceptance of semantic social tagging for knowledge sharing", *Information Processing and Management*, Vol. 48 No. 4, pp. 599-617.

Hung, S.W. and Cheng, M.J. (2013), "Are you ready for knowledge sharing? An empirical study of virtual communities", *Computers and Education*, Vol. 62, pp. 8-17.

Kankanhalli, A., Tan, B.C. and Wei, K.K. (2005), "Contributing knowledge to electronic knowledge repositories: an empirical investigation", *MIS Quarterly*, Vol. 29 No. 1, pp. 113-143.

Kim, Y.A. and Ahmad, M.A. (2013), "Trust, distrust and lack of confidence of users in online social media-sharing communities", *Knowledge-Based Systems*, Vol. 37 No. 1, pp. 438-450.

Kimura, M. and Saito, K. (2006), "Tractable models for information diffusion in social networks", *Knowledge Discovery in Databases: PKDD 2006*, Vol. 4213, pp. 259-271.

Ku, Y.C., Chu, T.H. and Tseng, C.H. (2013), "Gratifications for using CMC technologies: a comparison among SNS, IM, and e-mail", *Computers in Human Behavior*, Vol. 29 No. 1, pp. 226-234.

LaRue, E.M., Mitchell, A.M., Terhorst, L. and Karimi, H.A. (2010), "Assessing mobile phone communication utility preferences in a social support network", *Telematics and Informatics*, Vol. 27 No. 4, pp. 363-369.

Lee, J.H. and Kim, J. (2014), "Socio-demographic gaps in mobile use, causes, and consequences: a multi-group analysis of the mobile divide model", *Information, Communication and Society*, Vol. 17 No. 8, pp. 917-936.

Lee, K.T. and Koo, D.M. (2012), "Effects of attribute and valence of e-WOM on message adoption: moderating roles of subjective knowledge and regulatory focus", *Computers in Human Behavior*, Vol. 28 No. 5, pp. 1974-1984.

Lesser, E.L. and Storck, J. (2001), "Communities of practice and organizational performance", *IBM Systems Journal*, Vol. 40 No. 4, pp. 831-841.

Li, W. (2010), "Virtual knowledge sharing in a cross-cultural context", *Journal of Knowledge Management*, Vol. 14 No. 1, pp. 38-50.

Li, Y.M., Liao, T.F. and Lai, C.Y. (2012), "A social recommender mechanism for improving knowledge sharing in online forums", *Information Processing and Management*, Vol. 48 No. 5, pp. 978-994.

Lin, M.J.J., Hung, S.W. and Chen, C.J. (2009), "Fostering the determinants of knowledge sharing in professional virtual communities", *Computers in Human Behavior*, Vol. 25 No. 4, pp. 929-939.

Lu, Y. and Yang, D. (2011), "Information exchange in virtual communities under extreme disaster conditions", *Decision Support Systems*, Vol. 50 No. 2, pp. 529-538.

Moreno-Munoz, A., Bellido-Outeirino, F.J., Siano, P. and Gomez-Nieto, M.A. (2016), "Mobile social media for smart grids customer engagement: emerging trends and challenges", *Renewable and Sustainable Energy Reviews*, Vol. 53 No. C, pp. 1611-1616.

Mun, Y.Y., Jackson, J.D., Park, J.S. and Probst, J.C. (2006), "Understanding information technology acceptance by individual professionals: toward an integrative view", *Information and Management*, Vol. 43 No. 3, pp. 350-363.

Nikou, S. and Bouwman, H. (2014), "Ubiquitous use of mobile social network services", *Telematics and Informatics*, Vol. 31 No. 3, pp. 422-433.

Papadopoulos, T., Stamati, T. and Nopparuch, P. (2013), "Exploring the determinants of knowledge sharing via employee weblogs", *International Journal of Information Management*, Vol. 33 No. 1, pp. 133-146.

Park, E., Baek, S., Ohm, J. and Chang, H.J. (2014), "Determinants of player acceptance of mobile social network games: an application of extended technology acceptance model", *Telematics and Informatics*, Vol. 31 No. 1, pp. 3-15.

Park, J.H., Gu, B., Leung, A.C.M. and Konana, P. (2014), "An investigation of information sharing and seeking behaviors in online investment communities", *Computers in Human Behavior*, Vol. 31 No. 1, pp. 1-12.

Petrovčič, A., Fortunati, L., Vehovar, V., Kavčič, M. and Dolničar, V. (2015), "Mobile phone communication in social support networks of older adults in Slovenia", *Telematics and Informatics*, Vol. 32 No. 4, pp. 642-655.

Pi, S.M., Chou, C.H. and Liao, H.L. (2013), "A study of Facebook groups members' knowledge sharing", *Computers in Human Behavior*, Vol. 29 No. 5, pp. 1971-1979.

Pietiläinen, A.K., Oliver, E., LeBrun, J., Varghese, G. and Diot, C. (2009), "MobiClique: middleware for mobile social networking", in *Proceedings of the 2nd ACM workshop on Online social networks*, *ACM*, pp. 49-54.

Razmerita, L., Razmerita, L., Kirchner, K., Kirchner, K., Nielsen, P. and Nielsen, P. (2016), "What factors influence knowledge sharing in organizations? A social dilemma perspective of social media communication", *Journal of Knowledge Management*, Vol. 20 No. 6, pp. 1225-1246.

Rheingold, H. (1993), *The Virtual Community: Homesteading on the Electronic Frontier*, MIT press.

Roblek, V., Pejić Bach, M., Meško, M. and Bertoncelj, A. (2013), "The impact of social media to value added in knowledge-based industries", *Kybernetes*, Vol. 42 No. 4, pp. 554-568.

Sedighi, M., Splunter, S., Brazier, F., Beers, C. and Lukosch, S. (2016), "Exploration of multi-layered knowledge sharing participation: the roles of perceived benefits and costs", *Journal of Knowledge Management*, Vol. 20 No. 6, pp. 1247-1267.

Seyal, A.H., Rahman, M.N.A. and Rahim, M.M. (2002), "Determinants of academic use of the internet: a structural equation model", *Behaviour and Information Technology*, Vol. 21 No. 1, pp. 71-86.

Shim, H., You, K.H., Lee, J.K. and Go, E. (2015), "Why do people access news with mobile devices? Exploring the role of suitability perception and motives on mobile news use", *Telematics and Informatics*, Vol. 32 No. 1, pp. 108-117.

Shin, D.H. (2010), "MVNO services: policy implications for promoting MVNO diffusion", *Telecommunications Policy*, Vol. 34 No. 10, pp. 616-632.

Tamjidyamcholo, A., Baba, M.S.B., Tamjid, H. and Gholipour, R. (2013), "Information security–professional perceptions of knowledge-sharing intention under self-efficacy, trust, reciprocity, and shared-language", *Computers and Education*, Vol. 68, pp. 223-232.

Tan, G.W.H., Ooi, K.B., Leong, L.Y. and Lin, B. (2014), "Predicting the drivers of behavioral intention to use mobile learning: a hybrid SEM-Neural Networks approach", *Computers in Human Behavior*, Vol. 36, pp. 198-213.

Tang, Q., Zhao, X. and Liu, S. (2016), "The effect of intrinsic and extrinsic motivations on mobile coupon sharing in social network sites: the role of coupon proneness", *Internet Research*, Vol. 26 No. 1, pp. 101-119.

Tang, J.H., Chen, M.C., Yang, C.Y., Chung, T.Y. and Lee, Y.A. (2016), "Personality traits, interpersonal relationships, online social support, and Facebook addiction", *Telematics and Informatics*, Vol. 33 No. 1, pp. 102-108.

Tangaraja, G., Mohd Rasdi, R., Ismail, M. and Abu Samah, B. (2015), "Fostering knowledge sharing behaviour among public sector managers: a proposed model for the Malaysian public service", *Journal of Knowledge Management*, Vol. 19 No. 1, pp. 121-140.

Thibaut, J.W. and Kelley, H.H. (1959), *The Social Psychology of Groups*, Wiley, New York, NY.

Tsai, Y.H., Joe, S.W., Lin, C.P., Wang, R.T. and Chang, Y.H. (2012), "Modeling the relationship between IT-mediated social capital and social support: key mediating mechanisms of sense of group", *Technological Forecasting and Social Change*, Vol. 79 No. 9, pp. 1592-1604.

Van Dick, R., Grojean, M.W., Christ, O. and Wieseke, J. (2006), "Identity and the extra mile: relationships between organizational identification and organizational citizenship behaviour", *British Journal of Management*, Vol. 17 No. 4, pp. 283-301.

Venkatesh, V. (2000), "Determinants of perceived ease of use: integrating control, intrinsic motivation, and emotion into the technology acceptance model", *Information Systems Research*, Vol. 11 No. 4, pp. 342-365.

Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D. (2003), "User acceptance of information technology: toward a unified view", *MIS Quarterly*, Vol. 27 No. 3, pp. 425-478.

Wang, X. (2013), "Forming mechanisms and structures of a knowledge transfer network: theoretical and simulation research", *Journal of Knowledge Management*, Vol. 17 No. 2, pp. 278-289.

Wasko, M.M. and Faraj, S. (2000), "It is what one does: why people participate and help others in electronic communities of practice", *The Journal of Strategic Information Systems*, Vol. 9 Nos 2/3, pp. 155-173.

Wasko, M.M. and Faraj, S. (2005), "Why should I share? Examining social capital and knowledge contribution in electronic networks of practice", *MIS Quarterly*, Vol. 29 No. 1, pp. 35-57.

Wei, J., Bu, B., Guo, X. and Gollagher, M. (2014), "The process of crisis information dissemination: impacts of the strength of ties in social networks", *Kybernetes*, Vol. 43 No. 2, pp. 178-191.

Xu, K., Zou, K., Huang, Y., Yu, X. and Zhang, X. (2016), "Mining community and inferring friendship in mobile social networks", *Neurocomputing*, Vol. 174 Part B, pp. 605-616.

Yan, Y., Davison, R.M. and Mo, C. (2013), "Employee creativity formation: the roles of knowledge seeking, knowledge contributing and flow experience in web 2.0 virtual communities", *Computers in Human Behavior*, Vol. 29 No. 5, pp. 1923-1932.

Yu, T.K., Lu, L.C. and Liu, T.F. (2010), "Exploring factors that influence knowledge sharing behavior via weblogs", *Computers in Human Behavior*, Vol. 26 No. 1, pp. 32-41.

Yu, Y., Hao, J.X., Dong, X.Y. and Khalifa, M. (2013), "A multilevel model for effects of social capital and knowledge sharing in knowledge-intensive work teams", *International Journal of Information Management*, Vol. 33 No. 5, pp. 780-790.

Zagenczyk, T.J., Scott, K.D., Gibney, R., Murrell, A.J. and Thatcher, J.B. (2010), "Social influence and perceived organizational support: a social networks analysis", *Organizational Behavior and Human Decision Processes*, Vol. 111 No. 2, pp. 127-138.

Zhang, X., De Pablos, P.O. and Xu, Q. (2014), "Culture effects on the knowledge sharing in multi-national virtual classes: a mixed method", *Computers in Human Behavior*, Vol. 31, pp. 491-498.

Zhang, Y., Fang, Y., Wei, K.K. and Chen, H. (2010), "Exploring the role of psychological safety in promoting the intention to continue sharing knowledge in virtual communities", *International Journal of Information Management*, Vol. 30 No. 5, pp. 425-436.

Zhao, L., Lu, Y., Wang, B., Chau, P.Y. and Zhang, L. (2012), "Cultivating the sense of belonging and motivating user participation in virtual communities: a social capital perspective", *International Journal of Information Management*, Vol. 32 No. 6, pp. 574-588.

Further reading

Aselage, J. and Eisenberger, R. (2003), "Perceived organizational support and psychological contracts: a theoretical integration", *Journal of Organizational Behavior*, Vol. 24 No. 5, pp. 491-509.

Dixon, N.M. (2000), *Common Knowledge: How Companies Thrive by Sharing What They Know*, Harvard Business Press.

Hulland, J. (1999), "Use of partial least squares (PLS) in strategic management research: a review of four recent studies", *Strategic Management Journal*, Vol. 20 No. 2, pp. 195-204.

Jarvenpaa, S.L. and Staples, D.S. (2000), "The use of collaborative electronic media for information sharing: an exploratory study of determinants", *The Journal of Strategic Information Systems*, Vol. 9 Nos 2/3, pp. 129-154.

Appendix. Questionnaire items

Trust

- I trust MSN's information to be true.
- Administrators do not take advantage of members when the opportunity arises.
- Members do not take advantage of others members when the opportunity arises.
- The other members have adequate knowledge about the subject we discuss.

Norm of reciprocity

- I find that writing and commenting in community environment can be mutually helpful.
- I find my participation in Telegram groups can be advantageous to me and other members.
- I think that participating in Telegram groups can improve reciprocal benefit.

Shared cognition

- I feel members in Telegram application have common goals and values.
- I feel members in Telegram application have interests similar to mine.
- I feel members in Telegram application understand each other.

Reputation

- I feel that I earn respect from members by sharing my knowledge in community environment.
- I feel that sharing my knowledge improves my status in the groups.
- Participating in community activities would enhance my personal reputation in the groups.

Altruism

- I enjoy helping other members through sharing my knowledge.
- I help others via sharing knowledge without expecting benefits.
- When I have the opportunity, I help members through responding to their questions.

Intention to share knowledge

- I am always making an effort to share knowledge with other members.
- I am always willing to share knowledge with other members when they ask.
- It is worth participating in an MSN.
- If I can, I would like to continue sharing knowledge with others.

Sharing culture

- It is expected of members in Telegram application that they share their knowledge.
- Sharing knowledge among Telegram application members is valued.
- Sharing knowledge and responding to questions are common in community environment.

Enjoying participation

- While participating in Telegram application, I experience pleasure.
- I have fun using Telegram application.
- I feel that using Telegram application is interesting.
- Using Telegram application, I enjoy sharing knowledge.

Perceived ease of use

- Overall, I believe Telegram application is easy to use.
- Learning to work with Telegram application is easy.

Knowledge sharing behavior

- I often use the MSN application to contribute my knowledge.
- I spend a lot of time using the MSN application to share my knowledge with other members.

Corresponding author
Mohamad Hoseini can be contacted at: mhoseini@mpi-inf.mpg.de