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Knowledge-sharing determinants, behaviors, and innovative work behaviors: An integrated theoretical view and empirical examination

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Abstract

Purpose – The purpose of this paper is to examine the influence of socio-psychological factors from different theoretical perspectives, as well as the roles of technological and cultural facilitators on knowledge sharing (KS) behaviors and whether it leads to superior employees' innovative work behaviors.
Design/methodology/approach – Partial least squares analysis was used to investigate the research model based on a survey of 257 employees from 22 high-tech companies (including companies in pharmaceutical, nano technological, biotechnological, aviation, and aerospace industries) in Iran.
Findings – The results supported the effects of three motivational factors, i.e. perceived loss of knowledge power, perceived reputation enhancement, and perceived enjoyment in helping others, and two social capital factors, i.e. social interaction ties and trust, on employees' attitude toward KS. Findings also indicated that employees' KS behaviors enhance their innovative work behaviors.
Research limitations/implications – Since the survey used cross-sectional data and samples here were limited to some Iranian companies, the results of this study may prove not to be generalizable and should be confirmed using larger samples and/or longitudinal studies.
Practical implications – The findings provide useful insights into how managers should encourage employees' KS attitudes, intentions, and behaviors to foster innovative work behaviors of employees.
Originality/value – This study is one of the first attempts to fill the void in integrative research for examining relationships among KS determinants, behaviors, and outcomes.

Keywords Iran, Theory of planned behaviour, Knowledge sharing, Social exchange theory, Innovative work behaviours, Social capital theory

Paper type Research paper

1. Introduction

Knowledge, in the era labeled as knowledge economy, is recognized as a critical asset for organizations to gain competitive advantage and to maintain long-term success. This recognition has encouraged many organizations to adopt knowledge management (KM) initiatives (King and Marks, 2008; He and Wei, 2009). KM is the process of identifying, sharing, and utilizing knowledge and good practice to enable organizations to compete (O'Dell and Grayson, 1998). Researchers tend to describe the knowledge sharing (KS) by the employees as the heart of KM (Riege, 2005). Basically, knowledge is created and applied by individuals (Nonaka, 1994). KS is the pivotal process to transform individual knowledge into organizational knowledge (Nonaka, 1994; Foss *et al.*, 2010). If individuals are found to be reluctant to share what they know, then implementation of KM would be beyond question. KS is crucial to individual level outcomes in organizations. Fostering employees' innovative work behaviors

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constitutes one of the most important benefits of the KS through providing opportunities for mutual learning and facilitating the knowledge creation and reuse at both individual and organizational levels (Yu *et al.*, 2013; Radaelli *et al.*, 2014). Consequently, the organizations that wish to elevate their employees' innovative work behaviors are likely to motivate their employees to enhance their willingness to share their knowledge (Marshall and Sapsed, 2000; Carmeli *et al.*, 2013).

There is an extensive literature on the factors that influence KS behaviors as well as impacts of KS behaviors on the outcomes of firms at different levels. Nevertheless, these studies solely focussed on the relationship between KS determinants and behaviors (e.g. Bock *et al.*, 2005; Chen and Hung, 2010; Amayah, 2013; Sanjaghi *et al.*, 2013), or on the relationship between KS and firm outcomes (e.g. Calantone *et al.*, 2002; Liao *et al.*, 2007; Akhavan *et al.*, 2012). For instance, Amayah (2013) merely investigated KS enablers, motivators, and barriers in a public academic institution, while Liao *et al.* (2007) just examined the effects of KS behaviors on the organization absorptive capacity and innovation capability. Although some KM scholars have recently endeavored to develop an integrative model to study KS (e.g. Kim and Lee, 2012; Hu and Randel, 2014), these works also have focussed only on some aspects of KS determinants and outcomes. For example, three social capital dimensions and extrinsic incentives as KS determinants, on one side, and team innovation as KS outcome, on the other, was incorporated in Hu and Randel's (2014) research model. Nonetheless, they have not considered some other KS determinants like organizational contextual factors. Therefore, there is still limited empirical research for developing an integrative model that explores the determinants of KS from a holistic perspective through considering motivational, sociological, and facilitating conditions. In addition, most of prior research examined the effect of KS on performance of companies at organizational level, rather than individual level (e.g. Lin, 2007; Kim *et al.*, 2013). Furthermore, most of KM studies have been conducted in Western and East Asian countries. Little empirical research has been conducted about KS in Iranian context. Iran has a relatively low Hofstede ranking in individuality and the society is collectivist rather than individualist (Hofstede, 1997). Therefore, in such a context, it would be interesting to identify the factors that facilitate KS behaviors and effects of these behaviors on individual outcomes (innovative work behaviors) in an integrative view. Aimed at bridging above-mentioned gap, this study attempts to develop a research model that relates KS determinants, behaviors, and employees' innovative work behaviors at individual level within Iranian high-tech companies. Findings of this study may offer significant contributions to KM officers and practitioners to develop appropriate KS initiatives and enhance employees' innovative work behaviors. They would also be able to evaluate the effectiveness of investments on different KS strategies.

For its ability to forecast any kind of behavior, the theory of planned behavior (TPB) is adopted in this paper. Indeed, many other researchers have taken up TPB to investigate KS behaviors (e.g. Bock and Kim, 2002; Chen *et al.*, 2009; Chennamaneni *et al.*, 2012; Wu and Zhu, 2012; Akhavan *et al.*, 2013). In consideration of personal factors for KS determinants, it has been proposed that both costs and benefits aspects are of importance in KS, though the latter has been given more attention than the former (Kankanhalli *et al.*, 2005). In addition, the rational are more likely to consider the outcomes of an action (such as KS) before making a decision. Thus, we also apply social exchange theory (SET) for measurement of the effects of cost and benefit on attitudes toward KS. Besides, social capital, as argued by scholars, offers significant social contexts for social exchange (Nahapiet and Ghoshal, 1998) in general, and for KS

(Kankanhalli *et al.*, 2005) in particular. Previous studies have found that social capital factors, such as trust and social networks (Chow and Chan, 2008), can affect KS behaviors. Thus, this study also employs social capital theory (SCT) to form a theoretical basis for recognizing KS determinants. In addition, information and communication technology (ICT) and organizational climate were considered as complementary factors in our model.

This paper is organized into five sections, of which the following provides a review of underlying theories and the factors that are of influence on individuals' KS behaviors in organizational context. Research hypotheses and conceptual model are also developed in this section. A discussion of the development of survey instrument to measure the constructs in the research model is made in Section 3, which is followed by a report on data analysis and presentation of the results including significant and insignificant hypotheses in Section 4. Finally, Section 5 intends to discuss the findings, analyzing the study's theoretical and practical implications together with the limitations and directions for future research.

2. Theoretical background and research hypotheses

In this section, TPB, SET, and SCT as three important theories concerning formation of the KS behaviors are expressed. The roles of organizational climate and ICT on KS behavior as well as the effect of KS behaviors on innovative work behaviors are also discussed in this section. Lastly, according to the hypotheses developed about significant determinants and one of outcomes of KS, our research model is illustrated.

2.1 TPB

Researchers have recently begun to make use social psychology theories to get insight into psychological motivations associated with individual KS behaviors. Ajzen's and Fishbein's (1980) theory of reasoned action (TRA) has been used by many researchers to investigate KS behaviors (e.g. Bock *et al.*, 2005; Dong *et al.*, 2010; Hassandoust *et al.*, 2011). TRA suggests that an individual's behavior is determined by his/her intention to conduct a behavior, which in turn is motivated by his/her attitude toward the behavior and subjective norm there on. One underlying assumption of TRA is that most social actions are volitionally controlled (Ajzen and Fishbein, 1980), which implies an individual with relevant intention is able to freely choose whether or not to act in a certain way (Hansen and Avital, 2005). Thus, TRA comes with limitations regarding dealing with behaviors over which people do not have complete volitional control. When there are certain external constraints on a behavior (e.g. lack of necessary opportunities and resources), the mere formation of intention is insufficient to foresee the behavior (Armitage and Conner, 2001).

Afterwards, Ajzen (1991) extends the TRA model by incorporating perceived behavioral control (PBC) as an additional predictor of intention and behavior, establishing the model of TPB. TPB proposes that individuals' intention to perform a behavior is composed of three constructs: attitude toward the behavior, subjective norm regarding the behavior, and PBC over the behavior. The performance of the behavior is, thus, simultaneously determined by behavioral intention and PBC. PBC serves as a predictor of both intention to perform a behavior and actual performance of the behavior, enabling TPB to address behaviors over which people have incomplete volitional control. Previous research provides empirical evidence that superiority of TPB over TRA lays in explaining individual intention to share

knowledge and shows better overall model fit (Ryu *et al.*, 2003). Accordingly, TPB is adopted as the theoretical framework of this study to examine individual KS behaviors. TPB proposes three independent determinants of intention: attitude, subjective norm, and PBC. Following is a description of the effects of these determinants on KS intention, which in turn impacts on KS behaviors.

Attitude toward KS. Attitude toward a behavior is defined as the degree to which a person has a favorable or unfavorable evaluation of the behavior (Ajzen, 1991). Attitude has proved to be a significant antecedent of organizational behavioral intentions. Chang (1998) investigated that attitude held by people toward moral behavior significantly affects their moral behavioral intention. Attitude toward KS was found to have a strong impact on employees' KS intention in large public organizations (Bock *et al.*, 2005). Thus, it is hypothesized that:

H1. Employees' attitude toward KS is positively associated with their intention to share knowledge.

Subjective norm. Ajzen (1991) defined subjective norm as a perceived social pressure to perform or not to perform a given behavior. Evaluating expectations of relevant important referents shape the perceived social pressure. Sveiby (2007) argued that perceived behaviors, attitudes, and atmosphere that characterize the life in workplace exert influence on employees' behavior. Possibly, people behave in accord with the dominant norms in the workplace. Prior empirical research is illustrative of the issue of subjective norm as an important predictor of behavioral intention regarding KS (e.g. Ryu *et al.*, 2003; Bock *et al.*, 2005; Dong *et al.*, 2010; Hassandoust *et al.*, 2011). Thus:

H2. Employees' subjective norm regarding KS is positively associated with their intention to share knowledge.

PBC. TPB holds that PBC affects individuals' performance of a behavior as well as his/her intention to perform it. Even if a person has a favorable attitude toward KS and a positive subjective norm thereon, he/she may still have little intention to share knowledge due to lack of necessary opportunities or resources. For instance, Fong and Chu (2006) demonstrated that time constraints as a consequence of a heavy workload and the busy nature of work diminish employees' willingness to share knowledge. Therefore, it is suggested that:

H3. PBC toward KS is positively associated with the employees' intention to share knowledge.

In accord with TPB, in circumstances in which individuals have partial volitional control over a behavior, the actual behavior is also contingent on some non-motivational factors like availability of requisite opportunities, resources, and tools (Ajzen, 1991). An evaluation of those factors generates PBC, which refers to individuals' perception of the simplicity or difficulty of performing the behavior of interest (Ajzen, 1991). If an individual firmly believes that he/she possesses sufficient resources and opportunities, he/she will expect fewer impediments and as such has greater perceived control over the behavior. Furthermore, previous research has been supported significant effect of PBC on KS behaviors (e.g. Chen *et al.*, 2009; Chennamaneni *et al.*, 2012; Wu and Zhu, 2012). Thus, it is supposed that:

H4. PBC toward KS is positively associated with the employees' KS behaviors.

KS intention. Individuals' intention to perform a behavior is a chief construct in TPB. Intention, as stated by Ajzen (1991), is "indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior" (p. 181). According to the TPB, intention to perform a behavior is an essential determinant of the actual performance of a behavior. Prior research in KS literature has empirically supported a strong and significant causal link between KS intention and KS behaviors (e.g. Choi *et al.*, 2008; Tohidinia and Mosakhani, 2010; Jeon *et al.*, 2011). The following hypothesis is, accordingly, proposed:

H5. Employees' intention to share knowledge is positively associated with the KS behaviors.

2.2 SET

SET holds that actors accomplish a behavior expecting rewards that bring benefits, and they possibly choose alternative behaviors that maximize benefits and minimize costs (Blau, 1964; Cook and Rice, 2006). In other words, people would trade off the potential benefits and costs before performing a behavior. SET involves obligations, the nature of which is not specified beforehand and the time when the rewards are delivered is unclear (Blau, 1964). If one is not given any reward after providing a favor, with other people, he/she may give up the favor. In case, however, other people reciprocate with a return, additional cycles of exchange may be initiated. Therefore, SET is characterized by reciprocal interdependence, i.e., one party's action is contingent on the other party's behavior (Blau, 1964; Cropanzano and Mitchell, 2005).

KS could be considered as a sort of social exchange (Bock *et al.*, 2005) with people who share their knowledge and skills with their co-workers and expecting, reciprocally, to receive others' knowledge. Much research has been carried out on SET as a way of examining personal behavior in KS (e.g. Bock *et al.*, 2005; Kankanhalli *et al.*, 2005). Since social exchange is a complex activity, much research has concentrated on different aspects thereof. Kankanhalli *et al.* (2005) adopted cost/benefit analysis using SET framework in order to analyze incentives and hindering factors in KS. Furthermore, whereas Chua (2003) emphasized reciprocity in KS, Constant *et al.* (1994) focussed on self interest and context. There are also scholars who have taken advantage of SET aimed at analyzing how KS behaviors can be rewarded more effectively (Bartol and Srivastava, 2002). In this paper, we considered perceived loss of knowledge power as cost and perceived reputation enhancement and perceived enjoyment in helping others as benefits that may be regarded in KS exchange between individuals. These factors have been frequently emphasized in prior literature on KS (e.g. Jeon *et al.*, 2011; Huang *et al.*, 2008; Kankanhalli *et al.*, 2005) and are addressed in the following.

Perceived loss of knowledge power. Earlier studies have suggested that individuals, by sharing precious knowledge, dispossess that knowledge, which minimize the positive aspects arising from KS (Gray, 2001). The value of such individuals is, accordingly, lessened for the organization. Since knowledge is regarded as a resource of power, individuals might be concerned about losing the power when their knowledge is shared with others (Wu and Zhu, 2012). It generates a negative relationship between loss of knowledge power and attitude toward KS, which leads to the following hypothesis:

H6. Perceived loss of knowledge power is negatively associated with the employees' attitude toward KS.

Perceived reputation enhancement. People have been found to be in need of establishing their positions as experts in an organization. One of the ways to do so is to share their professional knowledge with their co-workers (Ardichvili *et al.*, 2006). Sharing useful knowledge by individuals cause them to win their co-workers' respect and enhance their personal image in the organization (Constant *et al.*, 1994). It is believed that possession of a good reputation and personal image helps people have a better career life. The following hypothesis is, accordingly, proposed:

H7. Perceived reputation enhancement is positively associated with the employees' attitude toward KS.

Perceived enjoyment in helping others. By providing assistances to others, an individual may achieve a sense of satisfaction (Kollock, 1999). Individuals, more often than not, help others never minding they get something in return (Davenport and Prusak, 1998). Constant *et al.* (1994) proposed that people who share tangible information may do so for the sake of their pro-social attitudes. Wasko and Faraj (2005) maintained that contribution of knowledge to others is an intrinsic motivation in such individuals, out of which they take enjoyment. Recent empirical studies have also confirmed the positive relationship between enjoyment in helping others and knowledge contribution. For instance, Kankanhalli *et al.* (2005) found that enjoyment in helping others significantly affects electronic repository usage by knowledge contributors and it also significantly increases the helpfulness of the contribution. Thus, we hypothesize that:

H8. Perceived enjoyment in helping others is positively associated with the employees' attitude toward KS.

2.3 SCT

Social capital is defined as "the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit" (Nahapiet and Ghoshal, 1998, p. 243). In organization and community research, the concept of social capital is used to describe the role of relational resources embedded in dyadicor network relationships involving resource exchange and KM activities. Recent KM studies have dealt with social capital as the key facilitator of knowledge creation and sharing (Akhavan and Hosseini, 2015; Chang and Chuang, 2011; Yang and Farn, 2009; Inkpenand Tsang, 2005; Wasko and Faraj, 2005). Chow and Chan (2008) investigated the effects of social capital factors on employees' KS intentions in order to understand the role of social capital in an organizational sharing environment. Yang and Farn (2009) employed perspectives of social capital to explore employees' tacit KS behaviors within a workgroup. The impact of the multi-level nature of social capital on knowledge transfer was investigated by Wei *et al.* (2011), who suggested that employees' network positions, such as distance and structural equivalence, have significant effects on their knowledge transfer.

Social capital includes structural, cognitive, and relational dimensions (Nahapiet and Ghoshal, 1998). Structural social capital can be conceptualized as the overall pattern of relationships among social actors (Nahapiet and Ghoshal, 1998). The structural dimension of social capital focusses on characteristics of the configuration of connections among members within a network. Relational social capital is composed of the assets created and leveraged through ongoing relationships that affect social actors' behavior (Nahapiet and Ghoshal, 1998). In other words, the relational dimension involves assets that accompany the connections between or among individuals.

Moreover, they regard cognitive social capital as common understanding among social actors through shared language and narratives. This dimension of social capital focusses on the creation of shared cognition among individuals. Previous KM studies (e.g. Chow and Chan, 2008; Nahapiet and Ghoshal, 1998) have asserted social interaction ties, trust, and shared goals as the major constructs representing the structural, relational, and cognitive dimensions of social capital, respectively, which were adopted in the present study.

Social interaction ties. Social interaction ties are considered as channels for information and resource flows (Tsai and Ghoshal, 1998). In virtual communities, Chiu *et al.* (2006) defined social interaction ties as "the strength of the relationships, the amount of time spent, and communication frequency among members of virtual communities" (pp. 1876-1877). Granovetter (1973) also explained tie strength as a combination of the amount of time, emotional intensity, intimacy, and the reciprocal services that characterize the tie. The more social interactions undertaken by exchange partners, the greater the intensity, frequency, and breadth of information exchanged (Larson, 1992; Ring and van de Ven, 1994). Nahapiet and Ghoshal (1998) argued that "network ties influence both access to parties for combining and exchanging knowledge and anticipation of value through such exchange" (p. 252). Thus, the next hypothesis is as follows:

H9. Social interaction ties are positively associated with the employees' attitude toward KS.

Trust. Trust is the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will make a particular action, irrespective of the ability to monitor or control the other party (Mayer *et al.*, 1995). Trust, in prior literature, was described as one of the most frequently mentioned factors and facilitators of KS (e.g. Andrews and Delahay, 2000; Mayer *et al.*, 1995; Tsai and Ghoshal, 1998). When there are trusted relationships, people, as asserted by Bakker *et al.* (2006), are more willing to present their useful knowledge. Also, in existence of trust, people are more inclined to listen to and absorb each other's knowledge (e.g. Andrews and Delahay, 2000; Mayer *et al.*, 1995; Tsai and Ghoshal, 1998). Nahapiet and Ghoshal (1998) proposed that if trust exists among the parties, they are more eager to engage in cooperative interactions. To create an atmosphere for KS, interpersonal trust is important in teams and organizations (Nonaka, 1994). Trust allows for a freer exchange of information and for confidence in individuals' attitude (Inkpenand Tsang, 2005). Therefore, it is proposed that:

H10. Trust is positively associated with the employees' attitude toward KS.

Shared goals. Shared goals promote mutual understanding and facilitate exchange of ideas (Chow and Chan, 2008). Shared goals can thus be characterized as the force that binds people together and permits them to share what they know. Having shared goals or a shared understanding is a resource from which benefits such as having transmitted information understood easily among organization members, can be accumulated (Hu and Randel, 2014).Through cooperation and KS, shared goals are possibly attained within an organization (Chow and Chan, 2008). Hence, the next hypothesis is introduced as follows:

H11. Shared goals among individuals are positively associated with the employees' attitude toward KS.

2.4 Organizational contextual factors and KS behaviors

ICT and organizational climate are two major organizational contextual factors that have been underscored in organization studies (e.g. Lin and Lee, 2006; Chennamaneni *et al.*, 2012; Wu and Zhu, 2012). The effects of these two factors on KS behaviors are elucidated as follows.

ICT. ICT is a major enabler of KS activities in organizations. Such ICT applications as internet, intranet, e-mails, knowledge portal, data mining, social network services, and Wikis are able to perform more than just storing and retrieving data (Tsui, 2005; Jennex, 2007). ICT facilitate cooperative work (Ruggles, 1998; Song, 2002; Choi *et al.*, 2010; Buckley and Giannakopoulos, 2011) and enhance KS through improving access to knowledge and eliminating temporal and spatial obstacles among individuals (Hendriks, 1999). It is, therefore, suggested that tools and technology that are perceived to be highly available and easy to use positively influence individuals' PBC toward KS:

H12. A higher level of facilitating ICT is positively associated with the PBC toward KS.

Organizational climate. According to Chennamaneni *et al.* (2012), organizational climate is "the shared values, norms, meanings, beliefs, myths, and underlying assumptions within an organization" (p. 1101). One of the most important determinants of intention to share knowledge is organizational climate (Bock *et al.*, 2005; Chen *et al.*, 2012). This is also held that external factors such as organizational climate can affect the individuals' subjective norm by guiding them to desirable behavior expected from them (Ajzen and Fishbein, 1980). Thus, the following hypothesis is proposed:

H13. A higher level of perceived organizational climate toward KS will lead to greater subjective norm to share knowledge.

2.5 KS behaviors and innovative work behaviors

From a process and behavioral point of view, Unsworth and Parker (2003) defined innovation as "the process of engaging in behaviors designed to generate and implement new ideas, processes, products and services, regardless of the ultimate success of the phenomena" (p. 180). The behaviors referred to the definition of innovation tend to describe innovative work behaviors. Innovative work behavior is defined as "an individual's behavior that aims to achieve the initiation and intentional introduction (within a work role, group or organization) of new and useful ideas, processes, products or procedures" (Farr and Ford, 1990, p. 24). Innovative work behaviors include three separate tasks: idea generation, i.e. developing novel ideas; idea promotion, i.e. obtaining external support; and idea application, i.e. producing a model or prototype of the idea (Scott and Bruce, 1994; Janssen, 2000; de Jong and den Hartog, 2007). Accordingly, prior studies suggested that individuals with willingness and ability to innovate, extend their contribution beyond the scope of their job requirements and at the same time, realize a continuous flow of innovations (Parker *et al.*, 2006).

KS is an element that encourages individuals to create knowledge and convert it into greater strength (Liebowitz, 2001). When employees are more engaged in KS, they internalize a greater amount of knowledge. This condition fosters innovative behaviors of employees. According to Woodman *et al.* (1993), personal innovation is affected by cognitive ability, character, knowledge, inner motives, and social networks. Holub (2003) underlined that faster knowledge transfer through sharing helps cultivate the ability to think and create. Socialization, externalization, combination, and internalization have been identified as conducive to knowledge creation and exchange (Nonaka and Takeuchi, 1995; Huang and Wang, 2008). Mom *et al.* (2007) found that top-down, bottom-up, and horizontal

knowledge flows all affect the innovative behaviors of midlevel managers. Hence, we supposed that KS behaviors would significantly influence individuals' innovative behaviors:

H14. KS behaviors are positively associated with employees' innovative work behaviors.

2.6 Research model

Based on research hypotheses developed above, a research model was generated which is depicted in Figure 1. This research model uses TPB as theoretical framework, which is supplemented by the determinants from SET, SCT, and cultural and technological determinants to analyze the factors influencing KS behaviors. In addition, innovative work behavior has been considered as an outcome of KS behaviors in this model.

3. Research methods

3.1 Sample and data collection

We adopted the survey method for data collection to test the proposed research model since it could enhance the generalizability of results (Kankanhalli *et al.*, 2005). Since high-tech companies need to work in fast-moving and knowledge-intensive environments, we gathered data from R&D departments of 22 Iranian high-tech companies, including companies in pharmaceutical, nano technological, biotechnological, aviation, and aerospace contexts. The survey was conducted from May to July 2014, and a total of 500 questionnaires were distributed among the companies studied in this research. Following the data collection, a total of 289 questionnaires were obtained, which gives a response rate of 57.8 percent. Invalid questionnaires were excluded, resulting in a total of 257 usable questionnaires for further analysis. Table I shows demographic information about the respondents.

3.2 Measurement

All measures of the survey instrument were developed from the literature and adjusted to the context of Iranian companies. Before running the survey, the instruments were translated into Persian and checked by some KM researchers for their wording, format, content, possible ambiguities, etc., and the survey items were modified based on their feedback. Items of perceived loss of knowledge power and perceived reputation enhancement were adapted from Kankanhalli *et al.* (2005). Attitude, subjective norm, and intention measurements were based on the items provided by Bock *et al.* (2005). Items for perceived enjoyment in helping others were adapted from Kankanhalli *et al.* (2005) and Wasko and Faraj (2005).Trust items were taken from Chiu *et al.* (2006) and Mooradian *et al.* (2006). Finally, items of KS behaviors, PBC, perceived organizational climate, social interaction ties, shared goals, facilitating ICT, and innovative work behavior measurements were respectively adapted from Akhavan *et al.* (2013), Taylor and Todd (1995), Tohidinia and Mosakhani (2010), Chiu *et al.* (2006), Chow and Chan (2008), Chennamaneni *et al.* (2012) and Janssen (2000).The survey items and sources are listed in Appendix 1. A five-point Likert scale was used for all survey items, ranging from strongly disagree = 1 to strongly agree = 5.

4. Research results

4.1 Analysis method

The partial least squares (PLS) method was used to test the relationships among the constructs. PLS was selected for its suitability for examining the relationships among latent variables when the sample size is small (Chin, 1998). Additionally, PLS does not

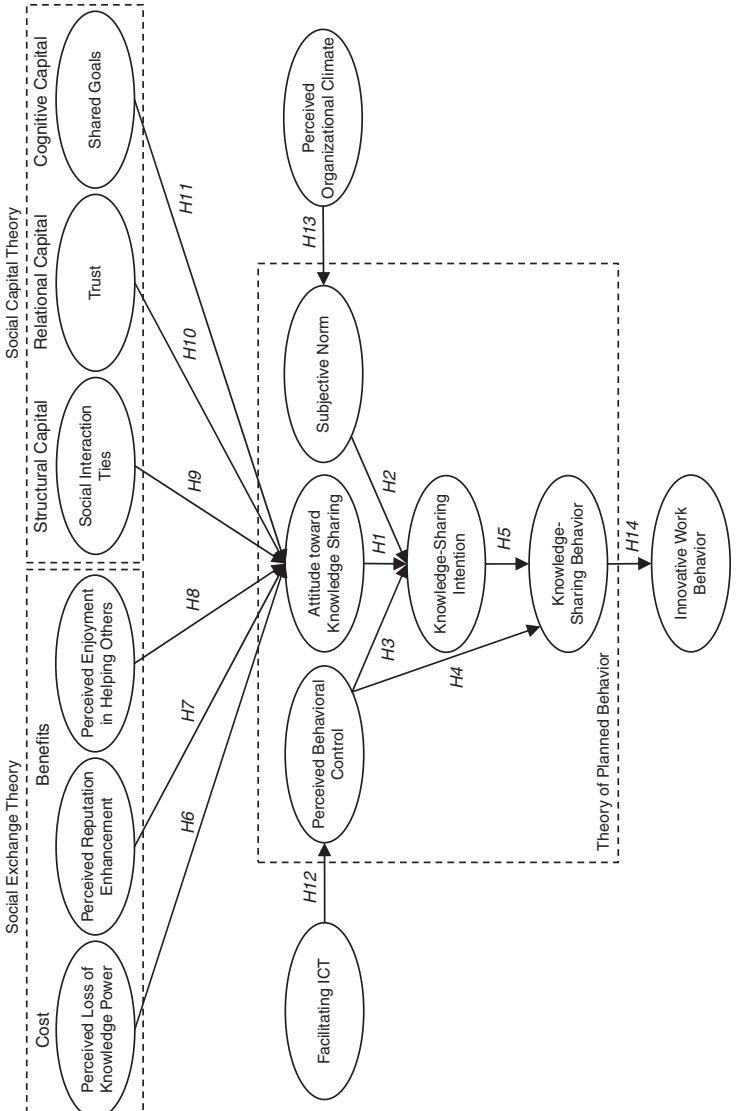


Figure 1.
Research model

Measure	Items	Frequency	%
Gender	Male	170	66
	Female	87	34
Age	20-30	56	22
	30-40	123	48
	40-50	41	16
	Greater than 50	2	1
Education	Bachelor	84	33
	Master	156	61
	PhD	9	4
Position	Employee	101	39
	Supervisor	75	29
	Director of department	53	20
	Senior Manager	18	7
Work experience	1-3 years	47	18
	3-6 years	50	19
	6-10 yeas	38	15
	Greater than 10 years	104	40

Table I.
Demographic information of respondents

necessitate normal distribution of variables and it is suitable for highly complex predictive models (Lohmöller, 1984). Aimed at analyzing the measurement and structural model, the PLS Graph, ver. 3.00, was used along with the bootstrap resampling method to determine the significance of the paths within the model.

4.2 Measurement model

The measurement model and structural relationships were examined with regard to the two-stage analytical procedures (Hair *et al.*, 1998). We checked the internal reliability of our measurement items by using Cronbach's α. Table II below shows Cronbach's α values, ranging from 0.711 to 0.900, indicating satisfactory levels of reliability. To validate the measurement model, convergent validity, and discriminant validity were evaluated. For evaluating convergent validity, composite reliability, and average variance extracted were calculated. In the studies which used the PLS analysis, 0.7 is the minimum recommended level of reliability (Hair *et al.*, 1998) and 0.5 is the minimum acceptable level of average variance extracted (Fornell and Larcker, 1981). In our study, composite reliabilities ranging from 0.774 to 0.938, and average variance extracted from 0.620 to 0.833, exceeded the threshold values for satisfactory convergent validity. In addition, to evaluate the discriminant validity, each variable's square root value of average variance extracted was compared with the correlations between variables. As seen in Table III, for every variable, the square root value of average variance extracted was larger than any correlation values with other variables, proving the discriminant validity of the study.

Lastly, to overcome the concern of the common method bias in self-reported survey research, this study evaluates the variances of the indicator of all constructs (Liang *et al.*, 2007). The results in Appendix 2 show that the average substantively explained variance of the constructs' indicators is 0.703, while the average method bias variance is 0.008. The ratio of substantive variance to method variance is 83.23:1. Given the small magnitude and insignificance of method variance, that common method bias does not seem to pose a serious threat for this study.

Construct	Cronbach's α	CR	AVE	Items	Factor loading
Perceived loss of knowledge power (PLK)	0.796	0.871	0.693	PLK1	0.83
				PLK2	0.87
				PLK3	0.80
Perceived reputation enhancement (PRE)	0.726	0.840	0.637	PRE1	0.85
				PRE2	0.81
				PRE3	0.73
Perceived enjoyment in helping others (PEH)	0.852	0.913	0.777	PEH1	0.85
				PEH2	0.92
				PEH3	0.87
Social interaction ties (SIT)	0.706	0.774	0.640	SIT1	0.74
				SIT2	0.87
				SIT3	0.74
Trust (TR)	0.711	0.796	0.670	TR1	0.89
				TR2	0.70
				TR3	0.65
Shared goals (SG)	0.721	0.829	0.620	SG1	0.87
				SG2	0.69
				SG3	0.79
Attitude toward knowledge sharing (ATK)	0.846	0.909	0.769	ATK1	0.90
				ATK2	0.82
				ATK3	0.91
Knowledge-sharing intention (KSI)	0.888	0.929	0.815	KSI1	0.93
				KSI2	0.93
				KSI3	0.84
Knowledge-sharing behaviors (KSB)	0.888	0.935	0.827	KSB1	0.91
				KSB2	0.93
				KSB3	0.88
Subjective norm (SN)	0.763	0.849	0.684	SN1	0.77
				SN2	0.81
				SN3	0.75
				SN4	0.73
Perceived behavioral control (PBC)	0.711	0.790	0.656	PBC1	0.78
				PBC2	0.76
				PBC3	0.70
Facilitating ICT (FIT)	0.900	0.938	0.833	FIT1	0.91
				FIT2	0.92
				FIT3	0.91
Perceived organizational climate (POC)	0.837	0.890	0.670	POC1	0.84
				POC2	0.85
				POC3	0.80
				POC4	0.78
Innovative work behavior (IWB)	0.836	0.814	0.812	IWB1	0.83
				IWB2	0.86
				IWB3	0.93
				IWB4	0.81

Table II.
Scale reliabilities and convergent validity

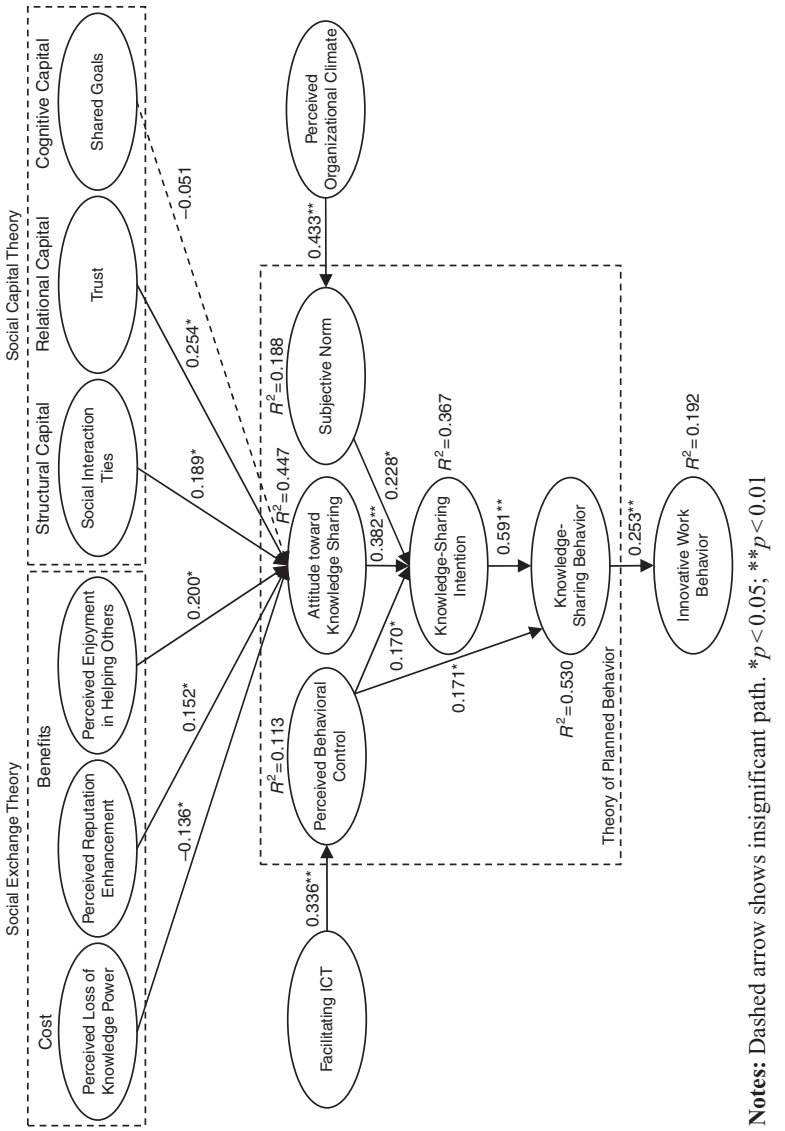
4.3 Structural model

The bootstrap resampling method (with 500 resamples) was used to determine the significance of the path coefficients and to test the hypotheses. The structural equation model results are shown in Figure 2. Result of path analysis indicated that attitude toward KS, PBC, and subjective norm are significantly associated with KS intention (*H1-H3*). PBC and KS intention, in turn, were positively related to KS behaviors (*H4-H5*).

Table III.
Correlation matrix and discriminant assessment

	PLK	PRE	PEH	SIT	TR	SG	ATK	KSI	KSB	SN	PBC	FIT	POC	OIC
PLK	*0.832*													
PRE	−0.375	*0.798*												
PEH	−0.310	0.495	*0.881*											
SIT	−0.298	0.469	0.350	*0.735*										
TR	−0.237	0.477	0.304	0.464	*0.755*									
SG	−0.346	0.581	0.408	0.502	0.410	*0.787*								
ATK	−0.354	0.482	0.508	0.449	0.349	0.456	*0.877*							
KSI	−0.233	0.283	0.526	0.368	0.295	0.243	0.508	*0.903*						
KSB	−0.310	0.435	0.457	0.503	0.386	0.342	0.325	0.491	*0.909*					
SN	−0.228	0.480	0.425	0.395	0.463	0.345	0.378	0.467	0.526	*0.764*				
PBC	−0.156	0.298	0.390	0.416	0.433	0.434	0.240	0.389	0.448	0.361	*0.746*			
FIT	−0.118	0.189	0.135	0.060	0.134	0.238	0.031	0.062	0.061	0.192	0.336	*0.913*		
POC	−0.139	0.425	0.439	0.542	0.576	0.550	0.311	0.259	0.346	0.433	0.359	0.248	*0.819*	
OIC	−0.155	0.365	0.258	0.285	0.240	0.434	0.215	0.332	0.274	0.315	0.323	0.359	0.459	*0.868*

Note: Diagonal italic letters are the square roots of AVE



Notes: Dashed arrow shows insignificant path. $*p<0.05$; $**p<0.01$

Figure 2.
Results of PLS analysis

Regarding the determinants of KS attitude the analysis suggested, as expected, that all proposed determinants-perceived loss of knowledge power, perceived reputation enhancement, perceived enjoyment in helping others, social interaction ties, and trust – showed significant association with KS attitude (*H6-H10*), except for shared goals (*H11*). Facilitating ICT has also significant positive impact on PBC (*H12*). Furthermore, perceived organizational climate was significantly associated with subjective norm (*H13*). Finally, KS behaviors are significantly associated with employees' innovative work behaviors (*H14*). Thus, all of the research hypotheses, except *H11*, were supported. Summary of hypotheses testing results listed in Table IV.

Figure 2 also shows the explanatory power of the research model, which explains 44.7 percent of the variance in KS attitude, 36.7 percent of the variance in KS intention, 53.0 percent of the variance in KS behaviors, 19.2 percent of the variance in employees' innovative work behaviors, 11.3 percent of the variance in PBC, and 18.8 percent of the variance in subjective norm. All R^2 values exceed 10 percent, indicating an acceptable explanatory power (Bock *et al.*, 2006).

5. Discussion and implications

5.1 Discussion of results

Among motivational factors of KS attitude, perceived enjoyment in helping others had the strongest effect ($\beta = 0.200$), which is consistent with prior research, as in Chennamaneni *et al.* (2012) and Wu and Zhu (2012). KS behaviors are similar to organizational citizenship behaviors or pro-social behaviors (Connelly and Kelloway, 2003), which constitute a body of action such as assisting, sharing, donating, cooperating, and volunteering, that are aimed at enhancing welfare of others (Brief and Motowidlo, 1986). In their study on electronic knowledge repository usage, Kankanhalli *et al.* (2005) found that people contribute to the repository because they enjoy helping others. We found that perceived reputation enhancement had a significant positive effect on the employees' attitude toward KS at 0.152. This finding suggests that employees are likely to engage in KS with an intention to create their professional reputation. Consistent with this finding, Wasko and Faraj (2005) expressed that both quantity and quality of shared knowledge is increased when individuals consider reputation enhancement as

Table IV. Results of hypothesis testing

Hypotheses	Path	Path coefficient	*t*-value	Result
H1	KS attitude→KS intention	0.382	5.01	Supported
H2	Subjective norm→KS intention	0.228	2.17	Supported
H3	Perceived behavioral control→KS intention	0.170	2.04	Supported
H4	Perceived behavioral control→KS behavior	0.171	2.20	Supported
H5	KS intention→KS behavior	0.591	9.32	Supported
H6	Perceived loss of knowledge power→KS attitude	−0.136	2.01	Supported
H7	Perceived reputation enhancement→KS attitude	0.152	2.10	Supported
H8	Perceived enjoyment in helping others→KS attitude	0.200	2.20	Supported
H9	Social interaction ties→KS attitude	0.189	1.97	Supported
H10	Trust→KS attitude	0.254	2.28	Supported
H11	Shared goals→KS attitude	−0.051	0.44	Not supported
H12	Facilitation ICT→Perceived behavioral control	0.336	2.74	Supported
H13	Perceived organizational climate→Subjective norm	0.433	5.93	Supported
H14	KS behavior→Innovative work behavior	0.253	3.57	Supported

triggering KS. Our results also showed a significant negative effect of perceived loss of knowledge power on KS attitude at −0.136. This implies that many employees are reluctant to share their experience and core knowledge with others since they believe that knowledge power is crucial. This finding is in accord with Li and Scullion (2006), who stated that belief in "knowledge is power" makes people hoard knowledge than share it.

The results revealed that trust among individuals is significantly and positively related to KS attitude at 0.254, which is the strongest among all determinants. This finding supports Davenport's and Prusak's (1998) suggestion that managers should facilitate relationships and trust among employees intended to encourage their knowledge transfer. Both tangible and intangible obstacles among individuals are decreased by trust. Thus, higher levels of trust permit people to talk about the problems they encounter, by which they either acquire new knowledge or enhance their existing knowledge. Further, social interaction ties were found to influence significantly the attitude toward KS at 0.189, which agrees with previous literature (e.g. Chang and Chuang, 2011; Chiu *et al.*, 2006; Nahapiet and Ghoshal, 1998). This is due to the fact that social interactions enable individuals to increase the depth, breadth, and efficiency of the knowledge they share with the others (Amayah, 2013). A surprising result is that shared goals had negative and insignificant effect on KS attitude, a finding that is against previous studies (e.g. Fathi *et al.*, 2011; Chow and Chan, 2008; Hau *et al.*, 2013). One possible interpretation for this result may be due to ignoring other important factors of cognitive capital like shared language and shared narratives (Nahapiet and Ghoshal, 1998) in the social capital framework of Chow and Chan (2008) which likely affect attitudes toward KS rather than shared goals. In addition, as mentioned earlier, Iranian culture is inclined into collectivist rather than individualist (Hofstede, 1997) which may have significant impact on individuals' attitudes toward KS.

The results indicated that KS attitude, subjective norm, and PBC were significant in explaining KS intention, the results which were consistent with previous research (e.g. Jeon *et al.*, 2011; Chennamaneni *et al.*, 2012; Wu and Zhu, 2012). Among the three determinants linked to KS intention, KS attitude had the strongest influence (0.382), followed by subjective norm (0.228) and then PBC (0.170). This suggest increased behavioral disposition to KS, might greatly elevate the employees' intention toward KS. The significance of subjective norm implies that employees consider expectations of management and co-workers about KS to be important. When individuals perceive that their management and co-workers value KS and are likely to praise the behavior, they are likely to engage in KS. The impact of PBC on the intention toward KS indicates that employees are encouraged to engage in KS to the extent that they believe they have time, resources, and opportunities.

As theorized, KS intention and PBC also emerged as significant determinants of KS behaviors at 0.591 and 0.171, respectively. Many researchers (e.g. Chow and Chan, 2008; Huang *et al.*, 2008; Bock *et al.*, 2005) have reported a positive attitude toward KS leading to strong intention to share knowledge. Additionally, PBC's effect on KS behaviors indicates that KS is not largely under volitional control, being much dependent on necessary opportunities and resources.

Our study also indicated that KS behaviors play an important role in development of employees' innovative work behaviors through getting access to others' knowledge and experiences. This is why knowledge is driving motor of any innovative behavior. In other words, an innovative behavior is a process wherein knowledge is acquired,

shared, and assimilated with the aim to create new knowledge, which embodies products and services (du Plessis, 2007).

Our results showed that facilitating ICT was significantly associated with PBC at 0.336. Organizations are heavily investing in developing and obtaining ICT, such as internet, intranet, knowledge bases, e-mails, communities of practice, expertise locator, groupware, which may decrease the perceived cost of KS and facilitate the KS processes (Song, 2002; Ruggles, 1998).

Perceived organizational climate was found to have substantial impact on subjective norm with a path coefficient of 0.433. Ajzen and Fishbein (1980) contend that external factors such as organizational climate can influence the subjective norm of individuals by guiding them into the favorable behavior expected of them. This finding corroborates the prior research results (Bock *et al.*, 2005).

5.2 Theoretical implications

Theoretically, this study had the following implications and insights. First, this study proposed and empirically investigated the integrative model that explores the structural relationships among determinants (motivational factors: perceived loss of knowledge power, perceived reputation enhancement, and perceived enjoyment in helping others; social capital factors: social interaction ties, trust, and shared goals), process of shaping and outcomes (innovative work behaviors) of KS behaviors as well as the facilitating role of ICT and cultural factors, in a variety of Iranian high-tech companies. The results from a PLS analysis underline a strong support for the proposed relations, except for the effect of shared goals on KS attitude, elucidating the process of shaping KS behaviors by employees and their effect on individual outcomes. Moreover, the findings of this study will provide a theoretical basis for further generalizations not only within the high-tech companies but also in other knowledge-intensive contexts. More importantly, our research model proposed in this study facilitated the analysis of KS behaviors and its outcome at individual level in a single framework which has been rare in prior research.

Second, the importance of a more integrated and comprehensive approach to the study of the effects of different factors on employees' KS attitude was highlighted in our findings. This approach may be more profitable than previous examinations of the bivariate relationships between each of the constructs which can help decision makers to select and develop the most appropriate KS initiatives to achieve competitive advantage.

Third, this approach provides a more complete picture to better understand the various determinants of KS behaviors exhibited by employees from multiple theoretical perspectives. Although prior research has included some of the factors that shape KS behaviors, most of these studies focussed on a limited number of determinants drawn from some theoretical perspectives like SET, social cognitive theory, SCT, and so on (Ryu *et al.*, 2003; Bock *et al.*, 2005; Cabrera and Cabrera, 2005; Chow and Chan, 2008). While a comprehensive framework had hardly been explored by prior research, our study represented an important step toward filling this void and deepening our understanding of KS behaviors by developing a comprehensive body of essential motivational and social capital factors that nurtures KS behaviors. Our investigation of underlying KS determinants in the model was very thorough, enabling it to account for a large portion of the variance of KS attitude, intention, and behaviors.

Fourth, most of KS studies have been conducted in Western and South-East Asian countries. Obviously, only few studies have been conducted in Iranian companies. This may be the first study within high-tech companies to establish such an integrative view of KM, especially in Iranian context, and would be generalized to other South-West Asian countries.

Finally, our results supported the facilitating role of ICT and organizational climate in planned KS behaviors. This could add to the comprehensiveness of our proposed research model.

5.3 Practical implications

This study made the following suggestions to help managers establish a successful KS strategy in knowledge-intensive companies.

First, the relationships among KS determinants, KS behaviors, and innovative work behaviors from an integrative view may instruct managers how to achieve competitive advantage by improving employees' KS behaviors to develop innovation capability.

Second, organizations should manage factors that have a strong effect on employees' attitude toward KS. Our findings suggest that KM leaders should recognize the KS activities by individuals to promote their reputation. Achieving recognition and reputation is likely to stimulate employees to engage in KS. It may be accomplished via the selection and public rewarding of regular, high-quality contributor(s) in public at regular intervals, which will affect the attitudes of employees toward KS. Further, organizations should eliminate the individuals' fears about losing power as a result of KS by securing their position, power, and status in the organization. Also, organizations should elevate individuals' perceptions of the enjoyment in helping others by proclaiming the advantages of KS. As a consequence, organizations are recommended to foster KS by promoting pro-social and organizational citizenship behavior. In addition, firms can elevate the perceived enjoyment of their employees' KS through linking KS initiatives with various corporate social responsibility missions and community activities where giving knowledge to each other can lead to the same or greater level of self-esteem and satisfaction. They can also identify and recognize the individuals or teams for their KS contribution through enterprise-wide KM festivals (Hau *et al.*, 2013).

The results indicated that social interaction ties were significant determinants of individuals' KS attitude. Managers interested in developing and sustaining knowledge exchange throughout the organization should develop strategies or initiatives that persuade the interaction and strengthen the relationships among individuals. For instance, organizations can arrange face-to-face meetings or seminars and invite top-level knowledge contributors and professional educators to share their knowledge and experience with co-workers as a way to enhance the social interaction ties among the employees. The finding suggests that managers are required to ensure that relationships among employees are so carefully structured to foster mutual interaction and trust. In order to expedite interactions and relationships, an organization may utilize spatial designs in an atmosphere of intimacy, such as knowledge café, or virtual community of practices. Management, through such initiatives, can assist employees to establish informal and formal communication media or form their own communities and social activities, which promote social relationships, trust, and trustworthiness among employees. In addition, HRM unit scan reinforce and grow the social capital of their firms by diagnosing the diverse social relationships within their organization through social network analysis and fostering the collegial relationships among their employees through initiatives such as mentor-mentee programs or community of practice activities.

Third, our results indicated that employees make use of KM systems for KS to the degree that they believe the technology is easy to use and flexible. Therefore, organizations should develop and exploit KM systems that direct beliefs of individuals, allow the open sharing of knowledge. It should, however, be noted that technology facilitates KS only when the behavioral and normative beliefs already support individuals' intention to involve KS. It means, although KM systems play a vital role in facilitating the flow of knowledge in organizations, in many instances the introduction of new technology has failed because inadequate attention was paid to the or human factors which are critical determinants of the effectiveness of the new systems (Cabrera and Cabrera, 2005).

Fourth, the effect of organizational climate on subjective norm was supported by our research's findings. Undeniable is the role of management in developing a favorable climate; thus, managers should determine to support an encouraging atmosphere within their organization which can in turn promote organizational values and norms toward KS behaviors (Saleh and Wang, 1993). Managers need to promote several cultural factors, including communication structure, cohesiveness, and professional autonomy, in order to establish such a positive atmosphere (Ryu *et al.*, 2003). Moreover, social pressure from peers to participate in knowledge exchange will also create positive environment for sharing

Finally, the list of KS determinants presents a checklist for high-tech companies to appraise themselves based on the extent to which they launch the practices necessary to promote KS behaviors of employees.

5.4 Limitations and future research

Although the research results are applicable particularly for managers and researchers in high-tech companies, limitations of this study should be realized and suggestions for future research must be made. First, the research design uses cross-sectional rather than longitudinal data. Cross-sectional data confine the degree to which causality can be deducted from the research results. Fortunately, though, the proposed causal relationships in the current study have their roots in well-established theories and practices and as such have the theoretical support for the direction of the relationship. Future research, however, will certainly take advantage of collecting longitudinal data to lend support to the causal relationships.

Second, the sample was selected from employees in a number of Tehran-based high-tech companies including companies in pharmaceutical, nano technological, biotechnological, aviation, and aerospace contexts. Hence, the research model should be tested and compared using samples from more companies in such other industries as manufacturing and telecommunication, since business modes and cultural factors related to KS among companies influence employees' perceptions of KS. Additional testing thus would offer a more robust test of the hypotheses and structural model.

Third, as Connelly and Kelloway (2003) indicated, there is a significant relationship between individual differences and employees' perceptions of KS culture. Therefore, future research can investigate how demographic data such as sex, age, education, and work experiences as well as organizational characteristics like company size and industry type may moderate the relationships between motivational factors and KS behaviors of employees.

Fourth, the study focussed on some motivating factors which affect employees' KS behaviors. As suggested by prior studies, factors such as sense of self-worth, personality traits, extrinsic rewards, affect, leadership styles, reciprocal benefits, etc.,

that may also have significant influence on KS can be incorporated into future studies to further enhance the research model.

Fifth, as mentioned earlier, the effect of shared goals was not supported by the result of this research. For this reason, it is suggested to consider a more comprehensive framework, including other important cognitive capital factors (e.g. shared language and shared narratives) in order to more accurately investigate the effect of cognitive dimension of social capital on KS behaviors.

Finally, this study included employees' innovative work behaviors as only one of the outcomes of KS behaviors. Considering more objective outcomes for KS behaviors, like number of patents or new product/services, is suggested for future research to work on.

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(The Appendix follows overleaf.)

Appendix 1

Construct	Items (Indicators)	Source(s)
Perceived loss of knowledge power	Sharing my knowledge makes me lose my power base in the company	Kankanhalli *et al.* (2005)
	Sharing my knowledge makes me lose my knowledge that makes me stand out with respect to others	
	Sharing my knowledge makes me lose my knowledge that no one else has	
Perceived reputation enhancement	Sharing my knowledge improves my image within the company	Kankanhalli *et al.* (2005)
	Sharing my knowledge improves others recognition of me	
	When I share my knowledge, the people I work with respect me	
Perceived enjoyment in helping others	I enjoy sharing knowledge with my co-workers	Kankanhalli *et al.* (2005) and Wasko and Faraj (2005)
	It feels good to help my co-workers solve their work related problems	
	I enjoy helping others	
Social interaction ties	I maintain close social relationships with my co-workers	Chiu *et al.* (2006)
	I spend a lot of time interacting with my co-workers	
	I have frequent communication with my co-workers	
Trust	My co-workers will always keep the promises they make to one another	Chiu *et al.* (2006) and Mooradian *et al.* (2006)
	My co-workers are truthful in dealing with one another	
	If I got into difficulties at work I know my co-workers would try and help me out	
Shared goals	My co-workers and I always agree on what is important at work	Chow and Chan (2008)
	My co-workers and I always share the same ambitions and vision at work	
	My co-workers and I are always enthusiastic about pursing the collective goals and missions of the whole company	
Attitude toward knowledge sharing	My knowledge sharing with other co-workers is a wise move	Bock *et al.* 2005
	My knowledge sharing with my co-workers is good	
	My knowledge sharing with my co-workers is valuable to me	
Intention to share knowledge	I will share my work reports and official documents with my co-workers more frequently in the future	Bock *et al.* 2005
	I intend to share my experience or know-how from work with my co-workers more frequently in the future	
	I will try to share my expertise from my education or training with my co-workers in a more effective way	

Table AI.
Measurement items

(*continued*)

Construct	Items (Indicators)	Source(s)
Knowledge sharing behaviors	I share my working knowledge and expertise with my co-workers I share results of my activities with my co-workers I share new ideas pertaining to my job with my co-workers	Akhavan *et al.* (2013)
Subjective norm	My boss thinks that I should share my knowledge with my co-workers My colleagues think I should share my knowledge with my co-workers Generally speaking, I accept and carry out my boss's decision even though it is different from mine Generally speaking, I respect and put in practice my colleague's decision	Bock *et al.* (2005)
Perceived behavioral control	I have enough time available to share knowledge with my co-workers I have the necessary tools to share knowledge with my co-workers I have the ability to share knowledge with my co-workers	Taylor and Todd (1995)
Facilitating ICT	Whenever I want to share knowledge, I can easily access tools and technology (e.g. internet, e-mail, etc) in ourcompany In our company, it is easy to use tools and technology (e.g. internet, e-mail, etc) to share knowledge I am satisfied with the overall quality of tools and technology (e.g. internet, e-mail, etc) for sharing knowledge in our company	Chennamaneni *et al.* (2012)
Perceived organizational climate	Members in my department cooperate well with each other Members in my department have a strong feeling of "one team" My department encourages suggesting ideas for new opportunities Members in my department consider other members' standpoint	Tohidinia and Mosakhani (2010)
Innovative work behaviors	I usually introduce small innovations into my practice I often develop new procedures to improve my everyday practice I often succeed in transforming my innovative ideas into practical solutions I often develop new solutions to solve problems	Janssen (2000)

Table AI.

Appendix 2

Table AII.
Common method bias analysis

Construct	Items	Substantive factor loading ($R1$)	$R1^2$	Method factor loading ($R2$)	$R2^2$
Perceived loss of knowledge power	PLK1	0.693***	0.480	−0.041	0.002
	PLK2	0.913***	0.834	−0.016	0.000
	PLK3	0.912***	0.832	0.051	0.003
Perceived reputation enhancement	PRE1	0.696***	0.484	0.112	0.013
	PRE2	0.954***	0.910	−0.126*	0.016
	PRE3	0.753***	0.567	0.024	0.001
Perceived enjoyment in helping others	PEH1	0.652***	0.425	0.240**	0.058
	PEH2	1.002***	1.004	−0.108*	0.012
	PEH3	0.978***	0.956	−0.115	0.013
Social interaction ties	SIT1	0.816***	0.666	0.016	0.000
	SIT2	0.564***	0.318	0.181	0.033
	SIT3	0.897***	0.805	−0.190*	0.036
Trust	TR1	0.580***	0.336	0.162	0.026
	TR2	0.843***	0.711	−0.005	0.000
	TR3	0.923***	0.852	−0.146*	0.021
Shared goals	SG1	0.641***	0.411	0.117	0.014
	SG2	0.903***	0.815	−0.109	0.012
	SG3	0.863***	0.745	0.003	0.000
Attitude toward knowledge sharing	ATK1	0.893***	0.797	0.005	0.000
	ATK2	0.838***	0.702	0.012	0.000
	ATK3	0.899***	0.808	0.011	0.000
Knowledge-sharing intention	KSI1	0.926***	0.857	0.007	0.000
	KSI2	0.956***	0.914	−0.040	0.002
	KSI3	0.820***	0.672	0.043	0.002
Knowledge-sharing behaviors	KSB1	0.938***	0.880	−0.025	0.001
	KSB2	0.954***	0.910	−0.029	0.001
	KSB3	0.799***	0.638	0.092	0.008
Subjective norm	SN1	0.733***	0.537	0.017	0.000
	SN2	0.717***	0.514	0.080	0.006
	SN3	0.793***	0.629	−0.014	0.000

(*continued*)

Construct	Items	Substantive factor loading ($R1$)	$R1^2$	Method factor loading ($R2$)	$R2^2$
	SN4	0.823***	0.677	−0.084	0.007
Perceived behavioral control	PBC1	0.713***	0.508	0.117	0.014
	PBC2	0.844***	0.712	−0.164*	0.027
	PBC3	0.692***	0.479	0.028	0.001
Facilitating ICT	FIT1	0.895***	0.801	0.055	0.003
	FIT2	0.930***	0.865	−0.023	0.001
	FIT3	0.914***	0.835	0.032	0.001
Perceived organizational climate	POC1	0.951***	0.904	−0.132*	0.017
	POC2	0.883***	0.780	0.026	0.001
	POC3	0.731***	0.534	0.092	0.008
	POC4	0.694***	0.482	0.091	0.008
Innovative work behaviors	IWB1	0.774***	0.599	0.099	0.010
	IWB2	0.909***	0.826	−0.037	0.001
	IWB3	0.938***	0.880	−0.013	0.000
	IWB4	0.851***	0.724	−0.042	0.002
Average		0.831	0.703	0.006	0.008

Notes: *$p<0.05$; **$p<0.01$; ***$p<0.001$

Table AII.

This article has been cited by:

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