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SOMAYEH
LABAFI

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KNOWLEDGE HIDING AS AN OBSTACLE OF INNOVATION IN ORGANIZATIONS A QUALITATIVE STUDY OF SOFTWARE INDUSTRY

OCULTAMIENTO DEL CONOCIMIENTO COMO OBSTÁCULO PARA LA INNOVACIÓN EN LAS ORGANIZACIONES: UN ESTUDIO CUALITATIVO DE LA INDUSTRIA DEL SOFTWARE

SOMAYEH LABAFI[1]

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ABSTRACT

Transmission and popularization of knowledge among personnel leads to a functional synergy in the innovation processes of organizations. It has been found that most research on organizations are related to knowledge sharing, while the knowledge hiding has seldom been investigated. Firms that operate in a software industry are among the knowledge-based organizations in which employees are required to possess specialized knowledge and skills to perform their tasks. The dissemination of knowledge and information can help organizations to be innovative and to improve their competitive advantage. Current study shows that information does not flow through the employees of sample organizations, and employees prefer to hide their organizational knowledge from their colleagues in order to maintain their own portfolios. Using thematic analysis, and interviews as data collection method, some thematic issues were extracted. These themes include, behavioral characteristics, complexity of knowledge, Power of requesting person, organizational incentives for knowledge sharing, Lack of clear responsibility for knowledge sharing, Sense of internal competition, level of trust to colleagues, effect of ubiquitous media, learning ability of the knowledge demandant, Level of personal contacts with colleagues, Deceiving colleagues, Violence, Negative feedback from organizational environment.

KEYWORDS

Knowledge Hiding; Knowledge Sharing; Knowledge Management; Software industry.

RESUMEN

La transmisión y la popularización del conocimiento entre el personal lleva a una sinergia funcional en el proceso de innovación de las organizaciones. Se ha encontrado que la mayoría de la investigación sobre organizaciones está relacionada con el intercambio de conocimiento, mientras que el ocultamiento de conocimiento ha sido raramente investigado. Aquellas empresas que operan en la industria del *software* están entre las organizaciones basadas en el conocimiento en que los empleados requieren poseer conocimiento especializado y habilidades para desempeñar sus funciones. La diseminación del conocimiento y de la información puede ayudar a las organizaciones a ser innovadoras y a mejorar su ventaja competitiva. El presente estudio indica que la información no fluye a través de los empleados de las organizaciones que sirvieron de muestra y que los empleados prefieren esconder su conocimiento organizacional de sus colegas con el fin de mantener sus propios portafolios. Utilizando un sistema temático y entrevistas como método de recolección de información, se extrajeron algunas cuestiones temáticas. Estos temas incluyeron: características comportamentales, complejidad del conocimiento,

1 PhD in media management, she is a lecturer in University of Tehran. Her research interests are media management, social media, media strategy, knowledge management and qualitative methods. She has written over 25 scientific articles in Iranian and international journals. Institutional Email address: s_labafi@ut.ac.ir

el poder de la persona que hace la solicitud, los incentivos que brinda la organización para el intercambio de conocimiento, el nivel de confianza entre los compañeros de trabajo, el efecto de la ubicuidad de los medios de comunicación, la capacidad de aprendizaje del demandante de conocimiento, el nivel de contactos personales con los compañeros de trabajo, los compañeros que resultan engañosos, la violencia y las reacciones negativas por parte el ambiente organizacional.

PALABRAS CLAVE
Ocultamiento de conocimiento; Intercambio de conocimiento; Gestión del conocimiento; industria del *software*.

INTRODUCTION
Organizational knowledge is identified as a nontangible but very valuable resource in gaining competitive advantage (Huang, 2008; Jarvenpaa and Majchrzak, 2008), Although Khajeheian and Tadayoni (2016) implied on limit of organizational capacity for innovation, organizational knowledge is still the main source of innovation (Xie et al,2016, Cu and Wu,2016). Despite the many efforts to simplify the transfer of knowledge in organizations, remarkable successes have not been achieved (Kelloway, 2000; Huang et al., 2008). In many cases, the personnel are not keen to share their knowledge - even when the organizational design has simplified the knowledge transferring process. And this reluctancy is an obstacle for innovation. This unwillingness occurs even when personnel are encouraged and rewarded to transfer knowledge (Swap and Leonard, 2005; Bock et al., 2001).

Firms that operate in software industry are knowledge-based organizations that are strongly innovation-intensive. The nature of their operations requires that their employees are talented and possess high level knowledge. The sharing of knowledge in such organizations are vital towards keeping the firm in competition in such a highly competitive industry (Bari, et al. 2016; Chen et al., 2016).

With regards to the importance of this obstacle to innovation, this research investigates how personnel in software firms understand, define, interpret and represent their experience of knowledge hiding. What is the subjective meaning of "knowledge hiding" in employees, and what are the main reasons for the current situation. In this research, the author investigates a) whether knowledge hiding happens in software developing companies? b) The knowledge hiding aspects and thereby differentiating this behavior with similar concepts and c) concentrating on distrust as the key reason of knowledge hiding in organizations. Some factors of knowledge transition may be universal, but the degree to which individuals are affected by these barriers may vary across cultures. This study increases the understanding of knowledge transmission in those knowledge based organizations and it further presents a discovery on the barriers presented by knowledge hiding.

LITERATURE REVIEW
Knowledge sharing and knowledge transfer are one of the most widely researched topics by professionals and academics in different fields such as management, information sciences, sociology and economics (Demirkasimoglu, 2015; Serenko

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and Bontis, 2016; Kang, 2016). Conrad and Newberry (2012) and Gonzalez-Perez et al (2014) implied on necessity of practical use of skills and knowledge instead of theoretical understanding or abstract knowledge. For knowledge to be applicable, the foundation and context is needed, to provide a place for implementing knowledge (Khajeheian,2014, p. 177) and knowledge sharing provides such context for practical knowledge (Dong et al., 2016).

A review of research literature indicates that the knowledge hiding process can be classified in three ways: These are evasive hiding, rationalized hiding and playing dumb (Connelly et al., 2012; Zhao et al., 2016). Each of these knowledge hiding behaviors can be explained by an important predictor known as distrust. Distrust, interpersonal relationships, social exchanges and organizational background may influence employees' knowledge hiding behaviors (Blau, 1964). For example in one study, Hernaus et al., (2015) confirmed the importance of interpersonal trust in work relationships and supports the differential role of knowledge complexity in the evasive hiding behavior. Also, Peng (2013) showed that knowledge-based psychological ownership positively affects knowledge hiding. Nevertheless, each of these three behaviors leads to different categories of individual and organizational consequences.

The concept of knowledge hiding in organizations can be used to define this phenomenon. Information hiding is defined as an individual's deliberate effort to avoid or hide the knowledge requested by another person. Therefore, in situations where there is an explicit request for knowledge and the opposite person hides it, a knowledge hiding behavior occurs (Connelly and Zweig, 2012; Wittenbaum et al., 2004).

Besides this, knowledge hiding may have a positive intent or outcome from that person's perspective or can be called a "white lie" in the organization (Saxe, 1991; Greenberg et al., 2007). This behavior may exist in order to protect the feelings of the person requesting the information, maintain confidentiality on some issues, and/or safeguard the interests of a third party; therefore, it is not always considered negative.

In the abovementioned examples, knowledge is requested by individuals and not groups or organizations that has to be attended to. Therefore, in this research we study knowledge hiding between binary groups in organizations, since mutual interactions are the main knowledge transferring route (Duffy, 2006; Duffy and Ganster, 2006). Knowledge transfer is also defined as a mutual transfer of organizational knowledge between one source and a receiving party (Bock and Zmud, 2005; Webster et al, 2008).

Since knowledge hiding occurs among colleagues, the quality of their relationship is very important. It is also important to know how an individual responds to a knowledge request made by other colleagues. Mutual relationships generally exist due to an unspoken social exchange among people in organizations (Blau, 1964). In an organizationally mutual relationship, there are expectations of interpersonal trust where individuals can share their knowledge the more (Buller and Burgoon, 2005). As time passes, the nature of organizational relationships expands and there are more commitments to each other. Finally, trust is built between the parties.

Investigations indicate that trust powerful predicts the fulfilment of duty and an organizational citizenship behavior (Colquitt et al., 2007; Laski and Moosavi, 2016; Zeinabadi and Salehi, 2011). This is why distrust in the sharing of knowledge should be studied in organizations (Majchrzak and Jarvenpaa, 2008). In addition to distrust, the other knowledge hiding factors were investigated. These were: knowledge complexity, relevant types of knowledge and the groundwork for sharing known are among the predictors (Connelly, 2012).

An organizations area of justice (Colquitt, 2002) have similar effects. In particular, it is possible that an unfair individual behavior increases the level of knowledge hiding. An individual's power is also an important factor in knowledge hiding in an organization (Yukl and Falbe, 1996). In other words, an important factor influencing this type of behavior is the power relationships between the knowledge-requesting agent and knowledge requesting individuals (Yukl et al., 1996). Some groups may experience individual injustice and an imbalance on power, such as workers, ethnic minorities, workers with disabilities and women in unimportant jobs.

Since knowledge hiding is a new concept, the first research goal was to investigate the presence of knowledge hiding in organizations from different studies. Another research goal was to establish an initial relationship between distrust and knowledge hiding. The second main research goal is to discover the possible strategies which employees may use to hide their knowledge. It can be stated that researchers have been willing to reveal knowledge hiding in organizations. The aim of this study is to present the factors that result in the phenomenon of knowledge hiding in organizations.

Organizational Innovation has been a subject of serious academic and policy interest for several decades. The 'creative organizations' have been studied for a shorter period of time, but perhaps more intensely (Miles and Green, 2010). Organizational units can produce more innovations and enjoy better performance if they occupy central network positions that provide access to new knowledge developed by the other units. This effect, however, depends on units' absorptive capacity, or the ability to successfully replicate new knowledge (Tsai, 2015). We begin with a critical review of the literature on knowledge management, arguing that its focus on creating a network structure may limit its potential for encouraging knowledge sharing across social communities. Two cases of interactive innovation are contrasted. One focused almost entirely on using IT (intranet) for knowledge sharing (Swan, 2014). In the other, while IT was used to provide a network to encourage sharing, there was also recognition of the importance of face- to- face interaction for sharing tacit knowledge (Amabil, 2013). The emphasis was on encouraging active networking among dispersed communities, rather than relying on IT networks (Cooper, 2014).

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RESEARCH METHODOLOGY

Research design

The methodology of this research follows the qualitative approach and uses thematic analysis as the research method for the interpretation of the collected data. The thematic analysis method determines, analyzes and expresses patterns (themes) within the data. Although this method organizes and describes the data in details, it goes beyond data organization and it interprets different aspects of the subject matter (Thomas, 2008). The formation and selection of themes largely depends on the research structures (Wang, Noe, 2010). The trustworthiness of qualitative content analysis is often presented by using terms such as credibility, dependability, conformability, transferability, and authenticity (Elo et al., 2014). As Elo et al (2014) pointed out, we scrutinize the trustworthiness of every phase of the analysis process, including the preparation, organization, and reporting of results.

Also, as Mohammadpour (2010) noted, Different criteria have been regarded as the indicators of reliability in qualitative research. Therefore, the current study used three methods:

1. Descriptors with low deductions: these descriptors were repeatedly used as quotations to present the findings.
2. Researcher angulation: researchers were involved with data for a long time. Information and experience were regularly and continuously exchanged between the interviewers. Therefore, it was possible to maintain a continuous preoccupation with the data. It was also possible to increase the range and depth of information. The conducted interviews were coded by two coders (authors) again, then the codes were compared and synchronized in a process of exchanging views.
3. External detection: two other researchers were asked to study the research reports, especially the findings, and express their opinions

Data collection and analysis

The context of the phenomenon was observed, the data collected were properly interpreted and the qualitative data were analyzed using the thematic analysis method (Mohammadpour, 2010). Thematic analysis is a method for identifying, analyzing and reporting patterns (themes) within data (Braun & Clarke, 2006). It has also been introduced as a qualitative descriptive method that provides core skills to researchers for conducting many other forms of qualitative analysis (Vaismoradi, Turunen, & Bondas, 2013). The snowball sampling technique was used. In this study 20 interviews (Table 1) were conducted. The experts who took part in this study

reflected a variety of specialized fields, from a computer firm in Isfahan, Iran. Out of the 20 engineers participating in the interviews, 17 were male and three were females - aged between 24 and 35. Face-to-face semi-structured interviews were undertaken. Data collection and analysis were conducted simultaneously. Data collection continued until no new issues emerged. Interviews lasted between 45 and 60 minutes and were audio recorded and also transcribed verbatim. In terms of education, majority of the respondents earned either a bachelor's degree (12 people) or a master degree (eight people). The participants signed a consent form prior to a face-to-face interview which was audio recorded.

Table 1. Participant characteristic.

ID	Gender	Education	Age	Role	Time interview (appx)
1	F	Bs	24	Computer programmer	40
2	M	Bs	26	Computer programmer	45
3	M	Ms	30	Computer programmer	45
4	M	Ms	31	Computer programmer	60
5	M	Ms	32	Computer programmer	55
6	M	Ms	29	Computer programmer	50
7	F	Bs	27	Computer programmer	40
8	F	Bs	28	Computer programmer	45
9	M	Bs	26	Computer programmer	50
10	M	Ms	35	Software designer	55
11	M	Ms	34	Software designer	60
12	M	Ms	32	Software designer	60
13	M	Bs	31	Computer programmer	65
14	M	Bs	30	Computer programmer	40
15	M	Bs	29	Computer programmer	55
16	M	Ms	28	Computer programmer	55
17	M	Ms	33	Manager	50
18	M	Ms	32	Manager	45
19	M	Ms	30	Computer programmer	45
20	M	Bs	31	Computer programmer	55

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RESEARCH FINDINGS

At this stage, all key points obtained from the interviews are given titles. About 530 primary codes were extracted. Then, all the codes were placed tables. A sample of primary codes mined from one of the interviews is presented in the table below.

Table 2. Primary codification.

Primary codification (first interview)
1. Only skillful and knowledgeable people can stay in this organization
2. Employees hide their knowledge in order to have competitive advantage
3. Employees are not encouraged by the organization to share their knowledge
4. Individualism is the standard culture in this company
5. They try to serve themselves rather than considering organizational goals
6. Personal characteristics is the main reason for hiding their knowledge
7. The complexity of knowledge cause employees less tendency to transfer their knowledge
8. The power of knowledge applicant is important in information presentation
9. The factor of power is important for updating information
10. Organizational processes do not encourage employees to transfer their knowledge
11. Information sharing is not a main task in organization
12. Most of the time engineer seek for information not related to their job
13. Some engineers hide their information for job competitions and non -job competitions
14. As new media share information with everyone, it is not possible to hide information
15. knowledge hiding is against relationships in organization
16. colleagues usually have requests causes to take my time

In the next stage, primary codes are transformed into conceptual codes and grouped into categories. Similar conceptual codes are turned into a theme. In the following table, for instance, the results are presented based on conceptual codes and themes.

Table 3. conceptual codes and themes.

Themes	Conceptual codes	Abundance
Internal competition	Competitiveness in organization	15
	Weak organizational communication	
	Personal characteristic	
	Organization processes	
Obiquete media	Access to information via online media	11
	Ubiquity of access	
Complexity of knowledge	Professional knowledge	14
	Ability to learn	
	Required time for transit	

In answer to our research questions, the following themes were identified as predictors of knowledge hiding in these organizations.

Behavioral characteristics

The most important reason that software engineers expressed on why they hide information, were related to behavioral characteristics. Some of these characteristics are prevalent in those who hide knowledge from their colleagues (such as jealousy towards colleagues' progress), while some others are related to special individuals. Most engineers had behaviors and characteristics that were institutionalized, which led to hiding information from their colleagues. The phrase "jealousy towards others' progress" was frequently used by the engineers.

"*Since those who stay in this firm are those that have a higher level of knowledge and talent, therefore, if our colleagues acquire knowledge, they will hide it in order to gain a competitive advantage; and if one day the firm decides to lay off personnel, they will be the ones to stay, because their knowledge and talent is greater than the others.*"

However, some engineers consider deeper roots for knowledge hiding. Most believe the organizational culture can be individualist; hence, people tend to serve themselves instead of working towards organizational goals. Therefore, a set of behaviors based on personal traits were stated as the main reason of knowledge hiding.

Some of these engineers considered religious teachings while defending knowledge transfer.

"*There is a charity for everything and the charity of science it its distribution.*"

Therefore, those who do not transfer knowledge to their colleagues are not paying their dues.

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Complexity of knowledge

The complexity and expertise of knowledge in the software design, leads to people becoming less enthusiastic over the transfer of the knowledge. Most claim that if they did explain to their colleagues, they wouldn't learn by themselves.

"*Sometimes my colleagues request information from me, and I feel that it wouldn't be useful to transfer it, because it's so complex that they wouldn't learn with my brief descriptions; therefore, I try to get out of it.*"

"*In our field, knowledge is specialized, and you can't be hopeful to transfer it with a simple explanation.*"

Hence, they believe that knowledge complexity is an important ground for knowledge hiding.

Power of the requesting person

Presenting information to colleagues was easier for the engineers when they felt the requester had a higher and more important position than they. Indeed, the power relations factor influenced their knowledge offers. This implies that if a colleague with power and influence requested information from them, they would easily divulge information with the hope that they would someday use his position.

"If a colleague who has more influence on the managers, requests information from me, I would provide it, since if my relation with him/her deteriorates he/she may use that influence to hurt my position."

"I provide information and knowledge to higher managers, even if they are not my supervisor. Because these people will someday come to my use, and I will need their influence."

Profit-seeking in these people caused them to be indifferent to the knowledge request of their peers or subordinates.

Organizational incentives for knowledge sharing

Almost all the interviewees observed that processes in their company were not designed to encourage information sharing in order to reduce the time and energy spent on cases that colleagues have previously tested.

"*In our company, your level of skill and knowledge is important. Not much value is given to helping your colleagues or providing information to them.*"

"*When the basis of success and bonus is your skills and knowledge and not on how much information you have transferred, will there be a motive to do so?*"

"*When I first entered this company, I tried to extend relations with my colleagues, therefore, providing them with any new information I acquired. After a while, I noticed that instead of increasing my own skills I was using my time for others, and this was not in my favor.*"

Since the process design in most of these companies did not include information sharing as a main responsibility, therefore, these engineers lacked the motive to present their information to others.

Lack of clear responsibility for knowledge sharing

One reason that individuals hide information from their colleagues was this belief that it is related to their responsibilities and there is no need for others to know about it. The lack of clear responsibilities leads to individuals interfering in each other's work; this behavior increasingly caused information hiding.

"When I feel my colleague is requesting information, which is not relevant, I do not consider myself responsible to provide it."

"*Most people request information, which is not related to their job, and if they know so it may even harm their performance.*"

These people considered that the request of information in their specialized field from colleagues an interference. And they felt that, if everyone continues in their specialized field, everything would be better.

Sense of internal competition

For some engineers, work and non-work competition was the ground of information hiding. In these companies those with higher skill and knowledge could soon achieve organizational benefits and success; the basis of receiving a bonus is not the reputation of individuals but the level of skill and knowledge.

"*Since software design is a highly up-to-date talent, individuals should always be upgrading their knowledge and information, or they will fall behind. Those who can't update their knowledge will lose their performance in the company and therefore, position in the eyes of the managers. Hence, people try to hide what they have acquired with much difficulty, in order to maintain their competitive advantage and keep the company needful of their skills.*"

Of course, some believe that knowledge hiding leads to underdevelopment of individuals; since they believe; to be ahead of others and not feel the need to acquire further information and skills, they finally lose competitive advantages.

"*I try to present information to my colleagues to help the company's progress, but in order to stay ahead of others I'm always trying to access the latest information.*"

Level of trust to colleagues

Most personnel don't trust their colleagues to present knowledge.

"Even if I give access to my information, others still won't do so. After they have acquired their necessary information if I ask a question most will avoid answering."

"*I present my information to colleagues, but even if they do so, their answers are incomplete and unusefull.*"

Interviewees had reached these answers after years of working in these firms and these answers are not based on private comments or short-term emotions. Interviewers found that distrust is an important barrier that exists in the minds of most people towards their colleagues.

Distrust was another result identified in these organizations. Colleagues did not trust each other in presenting information, consulting and even cooperating.

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Unless they were forced and requested to do so by their managers, they wouldn't voluntarily cooperate on a work project. They were mostly afraid that a colleague would provide them with false information; therefore, they attempted to acquire information from those they trust and those who work in a higher level (managers) or other departments and rarely among direct colleagues.

"*Why should I base my job on false or incomplete information given to me by my colleague; they don't know more than me. I prefer to obtain this information from higher managers whom I trust.*"

"*I have been harmed by false or incomplete information therefore; I prefer to access information from the main source.*"

Effect of obiquete media

New media acts as a cofounder element and regulate knowledge hiding behaviors. Some interviewees stated that nowadays it is impossible to hide knowledge and information, since new media, especially the Internet, have created an atmosphere where information is accessible to everyone. One of the interviewees stated,

"If I hide information from a colleague, he/she will acquire it from other sources such as the Internet. Therefore, it would be better to present that information and indebt him/her."

Learning ability of the knowledge demandant

One of the issues which held back engineers in presenting their information and talent was this argument that:

"If a colleague of mine has the ability and talent to learn such knowledge, he/she would not need my explanations and could acquire this information from any other place and wouldn't wait on me. If he/she doesn't have the ability, even if I do explain, he/she will not learn, and I have only wasted time."

The learning ability of individuals is a significant problem when assessing the level of knowledge hiding in these organizations.

Level of personal contacts with colleagues

Since knowledge hiding in organizations is inversely related to friendly relations, therefore, those who have developed this behavior normally try to separate themselves from their colleagues; meaning that they do not try to develop close and friendly relations with their colleagues.

"*If I become friends with my colleagues, they may have requests that I cannot provide. Coworkers usually have requests which waste my time; therefore, I try to have the least communication with them.*".

Another code explains that:

"*At the beginning of my employment, I found out that if I mind my own business and not communicate with others I would be more accepted, and that is exactly what I did.*"

Avoiding information presentation

An important result of knowledge hiding behavior is to avoid the presentation of information.

> "*When I ask for information about an issue, most colleagues avoid giving an answer. They do not want to damage the work relation but still hide their information for any reason.*"

This strategy was mainly employed by those who intended to hide knowledge from colleagues, since it is a milder approach.

Deceiving colleagues

The worst and most irresponsible strategy towards hiding information was the deception of colleagues. In order to hide the true and correct information, some presented incorrect information to their colleagues.

> "*In some cases when I' had a request, colleagues have distracted me with false information. They had deceived me in order to block my access to that information*."

This strategy, among the others, leads to more overt and covert violence in interpersonal relations.

Violence

Knowledge hiding has resulted in violence among employees. Some staff stated that violence was the worst result of this phenomenon. Some personnel had experienced violence in different forms. This ranged from strained interpersonal relationships to abusing one colleague in front of others or managers. This violence leads to a cycle of adversarial relations between colleagues who in turn had to hide current and specialized information in the organization.

> "*Last month, I noticed that a colleague had gossiped about me to the manager and distorted his image of me, my talents and actions in the organization. I didn't confront him but I guess he did so because some time ago he had asked me to teach a specific programming language and being busy I didn't fulfill his request.*"
>
> "*Some colleagues hide even the most common information in the organization. For example, when I ask a direct coworker where they were? Why did you come in late? They either avoid my question or answer why do you want to know? Did you need me? They answer me with another question.*"

Negative feedback from organizational environment

Knowledge hiding leads to lack of knowledge sharing in organizations and therefore leads to a decrease in the organization's competitive advantage in complex industrial environments. Since the software-development environment is highly dynamic and steadily changing, it is impossible to grow and surpass the competition while hiding information. This concept is specially emphasized by managers of these firms.

> "*Considering the current situation, in a few years we will not be able to compete against other firms in terms of specialized human resources because information and knowledge do not spread across our firm.*"

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DISCUSSION AND CONCLUSIONS

Managers who try to increase knowledge and information in their organizations, need to be aware of the way their employee's think and the incentives needed to motivate them. In order to improve knowledge sharing in the software development firms, we need to understand the factors that do have an effect on hiding knowledge.

To identify the central themes, open codes were extracted from the interviews.

It is understood that in order to hide information from their colleagues, engineers adopt strategies such as reducing individual and organizational communications with their colleagues. It is noteworthy that this occurs only for those who intentionally hide their knowledge. Knowledge hiding is the main theme that was extracted based on codes, such as:

"*My colleague has been avoiding me since when I requested some information about his expertise. He does not even have lunch with me anymore," or "My colleague prefers to change his room so that he does not provide me with his work information.*"

It can be stated that the behavioral characteristics of people are the main reasons for knowledge hiding. This reason can be seen as the impetus for the emergence of knowledge hiding. Buck (2005) pointed out a group of underlying factors for knowledge hiding such as knowledge complexity. Yulk and Falbe dealt with the power of a knowledge-requesting individual in 1996. This study identified two themes namely: the encouragers of information sharing and the clarity of tasks. These themes were extracted from the following codes:

"*In our company, managers do not reward those who provide their colleagues with their new work information," or "Even in the company, where I work, managers do not want employees to establish extensive relationships with each other.*"

Other intervening factors includes trust between colleagues, pointed out by Luichi (2004); modern means of communication, dealt with Gotiguer and Huang (2008) in separate studies; the learning levels of individuals and the sense of competition. These factors have resulted in knowledge hiding among the engineers in software development companies extracted from the theoretical sample of this study. Based on how much they trust a colleague; the engineer can provide him/her with their knowledge (information). The power behind the knowledge-requesting individual has a great impact on information exposure by a colleague. This theme was backed up by the following code:

"*If the high-ranking managers ask an engineer for specialized information, he/she provides them with the information immediately because he/she thinks that his/her position and promotion depends on close and friendly relationships with them.*"

The abovementioned conditions resulted in the phenomenon of knowledge hiding in software development companies in Isfahan. Engineers put some strategies on the agenda in order to prevent the exposure of hidden knowledge to their colleagues. They reduced the level of individual and organization interpersonal relationships with their colleagues. In some cases, they would avoid sharing information if they had to do so, a fact which was pointed out by Gordon and Miller (2002). However, it is

worth mentioning that such conditions occurred only to people who tried to conceal their knowledge deliberately. Otherwise, such factors and conditions were not true about other employees, and these strategies could not be observed among them.

The important point is that, although knowledge hiding is common in organizations all over the world, few relevant studies were seen in the review of theoretical literature. This indicates the need for an empirical study in which data based on an inductive method, a specific contextual theoretical and situational model can be analyzed. And a groundwork for the perception of the hidden behavior of knowledge hiding in companies.

This study was meant to ascertain the factors resulting in knowledge hiding in organizations. It was also meant to explain that there have been no coherent studies on this subject. According to the research results, the sixteen factors were the most comprehensive indicators of knowledge hiding in knowledge-based organizations in Iran (see, Salamzadeh et al., 2014). Although KhalehKhah and Ebrahimpoor (2015), Rafoa and Abbasi (2015) and Akhavan et al. (2014) conducted separate studies to determine the factors of acceleration or deceleration in sharing knowledge in organizations, none of them dealt with the factors causing knowledge hiding by employees.

Overall, Connelly and Zweig (2015) suggest that not all knowledge hiding is equally harmful. Some types of knowledge hiding may enhance the relationships between colleagues and might break the cycle of knowledge hiding in organizations.

It would be worthwhile to explore which types of knowledge hiding are harmful? And also which types of them are useful for organizations?

Finally, the limitations of the research should be mentioned. The most important limitation was access to engineers for interviewing purposes. Since most firms were privately owned and having access to them was not easy as one needs a prior appointment. As the research subject implies, some engineers tried to hide the fact that there was knowledge hiding in their organizations, although this was resolved through numerous in-depth interviews.

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