

An implementation of TPB method for learning important factors influencing knowledge sharing

Shahrzad Karampour^{a*} and Mojtaba Bojarpour^b

^aDepartment of Management, Islamic Azad University, Firoozkooh Branch, Firoozkooh, Iran

^bDepartment of Accounting & Management of Allameh Tabataba'i University, Tehran, Iran

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ABSTRACT

Knowledge management incorporates the systematic management of vital knowledge resources and the associated processes of creating, organizing, gathering, utilizing, diffusion and exploiting data. A key challenge emerging is learn to encourage knowledge sharing (KS) within firms because knowledge is an organization's intellectual capital and plays an important role in gaining a competitive advantage. Isolated initiatives for promoting KS and team collaboration without taking into consideration the limitations and constraints of KS can halt any further development in the KM culture of an operation. In this paper, in addition to individual and social factors, an effect of individual perception, which is an important factor for any behavior, is studied. We first identify effective factors in KS behavior through the theory of planned behavior, six factors of trust, knowledge power, organizational motivation, organizational culture, IT and Communities of Practice (COP) as effective factors in three categories of behavioral beliefs, subjective norms and perceived behaviors are analyzed for an Iranian research center. The results of this research helps develop KS behavior and enhance performance and creativity of research in this center.

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1. Introduction

Knowledge sharing (KS) plays an important role on increasing organizations' efficiencies and there have been tremendous efforts on detecting necessary factors developing KS in organizations. Liu et al. (2011) investigated the challenges of KS in dynamic virtual enterprises using a socio-technological method by proposing a human-centered KS solution and architecture. They proposed a knowledge resource space framework to represent heterogeneous knowledge resources. They also developed a KS community framework and adopted an agent based solution to perform the functions of KS among members of a dynamic virtual enterprise. KS in dynamic virtual enterprises is normally executed with three kinds of ties including knowledge agent to knowledge agent, knowledge agent to knowledge item, and knowledge item to knowledge item and they measured each one using a special

* Corresponding author. Tel: +989125021127
E-mail addresses: sh.karampour@gmail.com (Sh. Karampour)

model. Chen et al. (2012) studied the direct and indirect impacts of knowledge management systems (KMS) quality, KMS self-efficacy, organizational climate and behavior on the intention to share knowledge in the new product development process. The hypotheses were tested in some major electronic manufacturing firms in Taiwan, using regression analysis. They reported that attitude was the key factor impacting intention to engage in KS. Wang and Noe (2010) reviewed qualitative and quantitative literature of individual-level KS and developed a framework for understanding KS research. They identified five areas of emphasis of KS research including organizational context, interpersonal and team characteristics, cultural characteristics, individual characteristics, and motivational factors. For each emphasis item, they discussed the theoretical frameworks used and summarized the empirical research results. Hong et al. (2011) studied KS bottlenecks and proposed the use of conversational KS as an efficient instrument for KS. To develop strategies, they determined the causes and effects of knowledge barriers and provided solutions. They also introduced a financial company as a case study of conversational KS and analyzed it to provide evidence for the feasibility and effectiveness of the proposed method.

Tseng and Huang (2011) explained that the development of Web 2.0 means that internet users are no longer passive recipients of information and they are able to share their knowledge and interact with others. For instance, Wikipedia makes it possible for users to create, edit, and link pages together. Tseng and Huang (2011) investigated the content, technical and social values of Wikipedia to explore its impact on KS and job performance. They reported that Wikipedia had a significant impact on KS and job performance, which means that enterprises could employ Wikipedia to increase willingness among the workers to share knowledge.

Seba et al. (2012) investigated on the limited research based on KS in public sector organizations, specifically police forces in the Middle East through a case study investigation into the factors that influence KS in the Dubai Police Force. They reported that there was a strong relationship between attitude to KS, and intention to share knowledge. Hypotheses regarding the influence of leadership, trust, organizational structure, time, and information technology on attitude to KS were upheld. Li and Jhang-Li (2010) used game theory to study the incentives of KS activities in different kinds of communities of practice characterized by individual profiles and decision structures. Boer et al. (2011) investigated the relational dimension of KS behavior by proposing a comprehensive theoretical model to study KS in different firms. They described how the relational context guides KS behavior and demonstrated that the willingness to share knowledge is associated with various relational models and that people only share knowledge when they share similar relational models. Yu et al. (2010) offered a new perspective on the mechanisms associated with the sharing culture construct, which in turn facilitated weblog knowledge sharing behaviors and resulted important implications for understanding KS behavior in online communities.

Chow and Chan (2008) developed an understanding of social capital in organizational-KS. They first developed a measurement tool and then a theoretical framework in which three social capital factors including social network, social trust, and shared goals were integrated with the theory of reasoned action. They also analyzed their relationships using confirmatory factoring analysis and by analyzing 190 managers from Hong Kong firms, they confirmed that a social network and shared goals substantially contributed to a person's volition to share knowledge, and directly impacted to the perceived social pressure of the organization. However, according to their research, the social trust had no direct impact on the attitude and subjective norm of sharing knowledge. Huang and Lin (2010) proposed a solution for sharing knowledge with the semantic web and reported that entities in a supply chain could represent, seek, and share knowledge effectively.

Abili et al. (2011) explained that many believe that organizations should pursue important methods for disseminating and sharing of organizational knowledge among various levels of organization's human resources. There is no doubt that the necessity of identifying and applying effective methods for sharing and transferring internal knowledge of organization and knowledge management has been

increased during the past decade. They examined effective factors on KS in the Institute for International Energy Studies. They reported that KS had a positive relation with human factors (commitment and trust) and negative relation with structural factors. There was also a positive relation among KS, creative and supportive culture and negative relation between knowledge sharing and bureaucratic culture.

2. The proposed research

Targeted sharing of useful knowledge will accelerate individual and organizational learning and innovation and will result in the development of better products and services. If employees' knowledge are not documented, it can be discarded as soon as they leave the organization. The importance of exploring behavioral factors, which impact MS among researchers and industry experts is affected by common reasons like decreasing costs, improving performance, improving customer service, reducing new products development time, reducing delays in delivering goods to customers and reducing costs of access to valuable knowledge.

In this research, we explore not only individual and social factors but also the people's perception that according to the theory of planned behavior (TPB) is an important factor in the occurrence of any behavior. Given that science and technology institute is considered as a knowledge based organization, this study focuses on organization to investigate factors, which influence KS behavior and assess the impact of these factors among institute's professors, researchers and experts. In short, we want to answer the following two questions:

- With regard to TPB model what are the factors affecting knowledge sharing behavior in researchers of Institute of Science and Technology?
- What is the importance of each factor and its relationship with knowledge sharing?

2.1 Research Hypotheses

Hypotheses of this study are as follows:

- There is a meaningful relationship between individual beliefs and KS.
- There is a meaningful relationship between subjective norms and KS.
- There is a meaningful relationship between perceptual beliefs and KS.

The hypotheses include some important components, which are discussed as follows,

2.1.1 Knowledge Management

Knowledge Management (KM) includes identification and analysis of existing and needed knowledge capital; designing processes related to knowledge capital; and planning and control of operations for these capital and processes development for achieving desired goals. KM' processes are production, development, dissemination, protection and application of knowledge.

2.1.2 Knowledge Sharing

Knowledge dissemination means to transfer knowledge from one source of knowledge to another source. These sources could be people, teams or even organizations. Besides these resources, explicit knowledge resources such as documents, databases, and even different software can also be employed as a source of knowledge. In each of these cases, knowledge should transmit from one source to another. According to KM definition, knowledge sharing is one of the key areas in KM process. Our culture, presents different definitions from the concept of "sharing". In childhood, many parents encourage their children that share their toys with their playmates. While in school, students learn that

should hide their test sheets from other prying eyes. But companies award employees who hold the information for themselves. “Adam Bianchi” one of KM analysts say: “Your value for your organization is in what you know and others don’t know”. Hence one of the main challenges in KM is forcing people to share what they know. Why should people share the knowledge that has earned difficulty while this knowledge is considered as one of their personal competitive advantages in organization?

2.1.3 Behavior

Behavior is a chain of activities and people are always doing something like walking, talking, working, eating, sleeping, etc. and in most cases do multiple activities simultaneously. Such as walking and talking with other at the same time or driving and listening to radio. This introduces important questions. Why a person does a special activity and no other activities? Why changes his activities?

The behavior basically is target-oriented. In other words, our behavior is often motivated by the desire to achieve a specific goal. However, people are not always consciously aware of this specific goal. The drivers that motivate person’s distinctive behavioral patterns (“personality”) are to some extent unconscious and it is not easy to assess and evaluate them.

2.2 Behavioral Patterns

2.2.1 Theory of Planned Behavior (TPB)

Theory of Planned Behavior (TPB) is based on the Theory of Reasonable Behavior (TRB) (Fishbein & Ajzen, 1975). TPB is based on this assumption that person’s behavior is affected by his attitude. According to TPB, the main factors that determine human’s behavioral attitude are: Attitude toward the behavior, Subjective norms and Perceived behavioral control. Table 1 presents a description of these determinants.

Table 1

TPB determinants

Determinants	Description
Attitude toward the behavior (Individual Factors)	The degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question
Subjective norms	The perceived social pressure to perform or not to perform the behavior
Perceived behavioral control	The perceived ease or difficulty of performing the behavior and it is assumed to reflect past experience as well as anticipated impediments and obstacles

2.3 Innovation Diffusion Theory (IDT)

Innovation Diffusion Theory (IDT) proposes information about the proper method for moving an innovative design from the stage of invention to the application. This theory explains innovative decision making process, which specifies the rate of practical application of inventions. IDT assumes that people can be classified according to their speed in innovation adoption. Different categories of people are: innovators (venturesome); early adopters (respectable); early majority (deliberate); late majority (skeptical); laggards (traditional).

2.4. Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) is one of the models widely used for explaining technology acceptance in past 2 decades. TAM is derived from the Theory of Reasoned Action (TRA) and offers a powerful explanation for user acceptance and usage behavior of a technology. TAM posits that

perceived ease of use (PEOU) and perceived usefulness (PU) predict attitude toward use of a technology. The definition of this model components are presented in Table 2.

Table 2
Main components of TAM

Components	Description
Perceived usefulness (PU)	the degree to which an individual believes that using a particular system would enhance his or her productivity
Perceived ease of use (PEOU)	the degree an individual believes that using a particular system would be free of effort
Attitude	Negative or positive sense of person (according to self-evaluation) about the specific behavioral

2.5. Knowledge Sharing influencing factors

Factors affecting knowledge sharing behavior can be classified into individual factors, subjective norm or organizational factors and perceptual factors.

This paper uses TPB model and identifies six indices of trust, knowledge power, personal motivation, organizational culture, information technology and communities of practice for investigating KS affecting factors.

3. Methodology

Our research is an “applied research” and explores the relationship between knowledge sharing affecting factors and individual knowledge sharing based on the theory of planned behavior. This research is a “survey research”. We used library and non-library studies in this research. In library studies, we studied different books, papers and some internet sites, gathered information about knowledge management, knowledge sharing, knowledge sharing affecting factors and identified proper behavioral models and then developed our research model. In non-library studies, we acquired experts’ opinions with a questionnaire. Our research variables chose with respect to TPB model and included 3 factors that investigated with 6 indices.

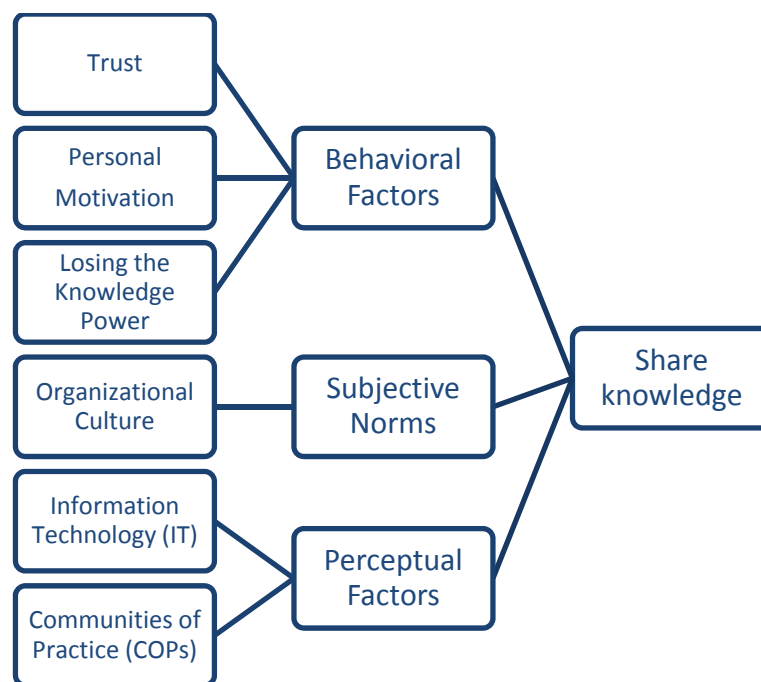


Fig. 1. Research model

3.4. Statistical Population and sample

The survey's population included 184 experts and researchers who worked for an Iranian organization and used the following sampling technique to determine the sample size,

$$n = \frac{N \times z_{\alpha/2}^2 \times p \times q}{\varepsilon^2 \times (N - 1) + z_{\alpha/2}^2 \times p \times q}, \quad (1)$$

where N is the population size, $p=1-q$ represents the yes/no categories, $z_{\alpha/2}$ is CDF of normal distribution and finally ε is the error term. Since we have $p=0.5$, $z_{\alpha/2}=1.96$ and $N=184$, the number of sample size is calculated as $n=123$.

3.5. Data gathering method and tool

Our tool for data gathering was a 5 scales Likert (from "very low" to "very high") questionnaire with 50 questions. Each of the questions measured the importance and effect of the specified index in generating favorable attitude for knowledge sharing experts who worked for this organization.

Table 3

The number of questions according to indices and factors

Factor	Index	Questions Number
Individual factors	Knowledge Power	4
	Trust	5
	Personal Motivation	5
Subjective norms	Organizational Culture	13
Perceptual factors	Communities of Practice	8
	Information Technology	9
Knowledge Sharing	=	6

3.6. Validity and reliability of questionnaire

We calculated Cronbach alpha coefficient for reliability. The Cronbach alpha was calculated for our questionnaire (that included 50 questions) as 0.935, which means the questionnaire is reliable.

For ensuring validity, we presented the questionnaire to some faculty professors and statistics and management experts. Then with regard to their opinions, we deleted some questions; added some new ones; and also changed some questions and prepare the final questionnaire.

4. The results

4.1 Correlation between indices/factors and knowledge sharing behavior

We have used SPSS software for data analysis and Table 2 shows the results of Spearman test and the correlation coefficient between indices/ factors with knowledge sharing behavior.

Table 2

Correlation between Investigated Indices

Row	Index	Correlation with Knowledge Sharing	Correlation Coefficient
1	Losing the knowledge power	No Meaningful correlation	0.65
2	personal Motivation	Meaningful correlation	0.227
3	Trust	Meaningful correlation	0.129
4	Organizational Culture	Meaningful correlation	0.523
5	Communities of Practice (COP)	Meaningful correlation	0.247
6	Information Technology (IT)	Meaningful correlation	0.116

Table 3
Correlation between investigated factors

Row	Factor	Correlation with Knowledge Sharing	Correlation Coefficient
1	Behavioral beliefs	Meaningful correlation	0.212
2	Subjective norms	Meaningful correlation	0.523
3	Perceived behavioral control	Meaningful correlation	0.285

4.2 Ranking of the indices and factors influencing knowledge sharing

We used Friedman test for ranking the indices and factors that affect knowledge sharing behavior. The results of this test showed in Table and Table .

Table 4
Ranking of indices

Row	Index	Rank
1	Losing the knowledge power	1.41
2	Personal Motivation	5.10
3	Trust	4.49
4	Organizational Culture	3.66
5	Communities of Practice (COP)	2.29
6	Information Technology (IT)	4.05
Most Important Index	Personal Motivation	5.10

Table 5
Ranking of factors

Row	Factor	Rank
1	Behavioral beliefs	2.22
2	Subjective norms	2.20
3	Perceived behavioral control	1.58
Most Important Factor	Behavioral beliefs	2.22

Table shows descriptive statistics for indices.

Table 6
Descriptive statistics for investigated indices

Row	Investigated Factors	Sample (n)	Mean	Std. Dev.	Min	Max	t-value	Sig.
1	Losing the knowledge power	86	2.1163	0.45478	1.00	3.00	1.41	0.05
2	Personal Motivation	86	3.7674	0.41258	3.00	4.80	5.10	0.05
3	Trust	86	3.5233	0.45106	2.40	4.40	4.49	0.05
4	Organizational Culture	86	3.1974	0.39797	2.31	4.23	3.66	0.05
5	Communities of Practice (COP)	86	2.6014	0.59547	1.50	3.75	2.29	0.05
6	Information Technology (IT)	86	3.3336	0.48649	2.22	4.33	4.05	0.05

As we can observe from the results of Table 6, there is no meaningful relationship between losing the knowledge power and knowledge sharing behavior. In other words, knowledge power presents KS in our case study. The other observation is that motivation is the most important index that affects KS and in this index components such as job security, job promotion, job enrichment and increased salaries are considered as elements that influence the motivation of people. Trust is the second important index after motivation. According to the results, there is a meaningful relationship between subjective norms and KS. This relationship was investigated with the identification of organizational culture index and exploring the correlation between this index and its components such as teamwork, creativity, existence of formal and informal relationships and belief to hoard knowledge in organization. Our investigation results show the existence of meaningful relationship between perceptual factors and knowledge sharing. This relationship was investigated with the identification of COP and IT indices and exploring the correlation between these indices and their components.

5. Conclusion

In this paper, we have presented an empirical study to investigate important factors influencing knowledge sharing. We have used TPB model and identified six indices of trust, knowledge power, personal motivation, organizational culture, information technology and communities of practice for investigating KS affecting factors. Our study indicated that there was no meaningful relationship between losing the knowledge power and KS behavior, the most important index that affects KS such as job security, job promotion, job enrichment and increased salaries were considered as elements, which influenced the motivation of people. Trust was also the second important index after motivation. Our investigation results showed the existence of meaningful relationship between perceptual factors and KS. This relationship was investigated with the identification of COP and IT indices and exploring the correlation between these indices and their components.

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