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ABSTRACT

Knowledge management is one of the most important research streams in IS research since knowledge is being seen as a vital and significant strategic organizational resource that can influence the competitive advantages of the organization. Organizations have been trying to understand how knowledge is created, shared, and used within the organization as they need to capitalize on the knowledge they possess. Knowledge exists and is shared at different levels (individual, group, and organization level) in organizations. This paper reviews existing literature in this area and presents a framework that identifies factors that most significantly influence knowledge sharing between individuals in organizations.

KEYWORDS

Knowledge Management, Intension-based Models, Behavioral Models, User Acceptance, Knowledge Sharing

INTRODUCTION

In recent years, the concept of knowledge in organizations has become increasingly popular in the literature (Alvesson & Karreman, 2001), with knowledge being recognized as the most important resource of organizations (Nahapiet & Ghoshal, 1998; Spender & Grant, 1996). Interest in KM has been grown in last decade because of the belief that the creation and transfer of knowledge is essential to long-term organizational effectiveness.

The importance of knowledge as the key resource of today's organizations (Ipe, 2003) is indicated by the increasing body of research on knowledge management (KM) and the growing organizational spending on KM initiatives and technologies. User acceptance of IT in an organization is the important factor in determining the success or failure of any IS implementation including KMS. With the increasing importance of the people perspective of knowledge in organizations (Ipe, 2003), there exist many opportunities for researchers in the area of IS continuance to advance the understanding of knowledge and knowledge sharing. Yet, there is much to be learned and understood about how knowledge is created, shared, and used in the organizations (Grover & Davenport, 2001). The advance in IT and the need for the growing scale of information activities in the organizations make it becomes even more important to understand this phenomenon.

The purpose of this study is to contribute to a better understanding of the phenomenon of knowledge sharing between individuals in organizations. Specifically, this paper is designed to:

(1) examine existing paradigms for studying knowledge management systems (KMS) and user acceptance;

(2) identify the major categories of research variables significant to individual's knowledge sharing behavior in organizations

(3) derive a rich framework that contributes to help guide practitioners in designing more effective knowledge management initiatives.

Drawing on literature from the relevant fields of study, a model of knowledge sharing between individuals in organizations is developed. Although knowledge exists at many levels in organizations, the focus of this study is the knowledge that exists with and within individuals and the factors that influence knowledge sharing behavior between individuals.

The Need for a Comprehensive Framework of Knowledge Sharing

The field of knowledge management has traditionally been dominated by information technology and technology-driven perspectives (Davenport et al., 1998). However, there is increasing recognition of the role of individuals in knowledge management processes and a growing interest in the "people perspective" of knowledge in organizations (Earl, 2001; Stenmark, 2001). The key to successfully managing knowledge is now being seen as dependent on the connections between individuals within the organization (Brown & Duguid, 1991; McDermott, 1999).

Many researchers have proposed a variety of KM frameworks, models, and perspectives to help researchers and practitioners to understand the concepts and processes as well as to implement KM initiatives. Each of the frameworks is usually introduced with a specific focus. Holsapple and Joshi (1999) have made a comparative analysis of key KM frameworks available in the literature and argued that none of these researchers appeared to subsume all of the others as each of them addressed certain KM elements.

Some KM frameworks proposed are generic ones that intend to capture more than one part if not all of KM initiatives, including knowledge creation and knowledge sharing, performance of knowledge transfer in organization, employee knowledge sharing capabilities, and interdepartmental knowledge sharing (Nahapiet & Ghoshal, 1998; Syed-Ilchsan & Rowland, 2004; Kim & Lee, 2006; Willem & Buelens, 2007).

Alavi and Leidner (2001) developed a framework of organizational knowledge management process which classified that knowledge management systems (KMS) consist of four knowledge process: creation, storage/retrieval, transfer, and application. In particular, knowledge sharing is perceived to be the most essential process for KM if not for efficient business practice in general (Bock and Kim, 2002; Goh, 2002). In this area, researchers studied KM frameworks from several perspectives. Table 1 summarizes these studies.

Study	Research focus
Conceptual framework perspective	
Nahapiet and Ghoshal (1998)	Presenting social capital as an integrated framework for understanding the creation and sharing of knowledge in organizations
Holeapple and Joshi (1999)	Introducing a descriptive framework for understanding factors that influence the success of knowledge management (KM) initiatives in an organization by identifying three main classes of influencing factors (managerial, resource, and environmental) and characterizing the individual factors in each class
Alavi and Leidner (2001)	Reviewing and interpreting knowledge management literature to identify important research areas and potential role of IT in support of KM
Goh (2002)	An integrative conceptual framework with a number of explored key factors (e.g. reward system and relationship among individuals) which influence on organizational ability to transfer knowledge, is discussed
Ipe, Minu (2003)	Presenting a conceptual framework that identifies factors that most significantly influence knowledge sharing (e.g. nature of knowledge, organizational culture, etc.) between individuals in organizations

Table 1 - Previous Studies on KM Framework

According to Rye et al. (2005), knowledge sharing is the behavior when an individual disseminates his acquired knowledge to other members within an organization. In order to identify this, several prior studies have adopted conceptual (Markus 2001; Goh. S.C., 2002; Ipe, Minu, 2003) or qualitative approach (Goodman & Darr 1998; Orlikowski, 1993; Wasko & Faraj, 2000) in attempts to understand the individual's knowledge sharing behaviors. Other studies have conducted quantitative methods, for instance experiments (Constant et al., 1994) or surveys (Bock et al., 2005; Constant et al., 1996; Wasko and Faraj, 2005) to model and explain contribution behavior with varying success.

Source	Theories/Models applied	Research focus	Key findings
Bock & Kim (2002)	Theory of Reason Action, Social Exchange Theory, Social Capital Theory	Understanding the factors affecting the individual's behavior in the organizational context.	expected rewards is found to discourage the formation of a positive attitude toward knowledge sharing
Bock, Zmud, Kim (2005)	Theory of Reason Action	Developing an integrative understanding of the factors supporting or inhibiting individuals' knowledge-sharing intentions	Subjective norms as well as organizational climate exert positive effect and anticipated extrinsic rewards exert negative effect on individual's knowledge sharing attitudes
Wasko & Faraj (2005)	Social Capital Theory, Theory of Collective Action	Investigating how individual motivations and social capital influence knowledge contribution in electronic networks	Professional reputation is found to be a significant predictor of individual knowledge contribution and reciprocity is less significant
Kankanhalli, Tan, Wei (2005)	Social Capital Theory, Social Exchange Theory	Formulating and testing theoretical model to identify cost and benefit factors affecting EKR usage	Knowledge self-efficacy and enjoyment in helping others significantly impact EKR knowledge usage
Chiu, Hsu & Wang (2006)	Social Capital Theory, Social Cognitive Theory	Integrating two social theories to construct a model for investigating the motivations behind people's knowledge sharing in VCs	Social capital (trust, ties, norms, etc.) have positive effect while personal outcome expectations have a negative effect on individual's quantity of knowledge sharing

Table 2 - Prior Model Comparison Studies

Previous research have highlighted the various factors that affect individual's willingness to share knowledge, such as costs and benefits, incentive systems, extrinsic and intrinsic motivation, social relationship, organization climate and management championship. (e.g., Bock & Kim, 2002; Bock et al., 2005; Kankanhalli et al., 2005; Wasko & Faraj, 2005; Chiu et al. 2006). (See Table 2)

However, there exists a lack an understanding of why and under what conditions people are willing to share their knowledge within a more comprehensive framework. Furthermore, the research on knowledge sharing explains little variance in actual knowledge sharing behavior. It is suggested that there is a need for a unified framework describing the nature of KM and factors influencing the individual's knowledge sharing behavior in organizations.

LITERATURE REVIEW

Given the fact that knowledge management systems are a subset of IS and specific to the organizational context, we include our study with a review of user acceptance models such as Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), and social theories such as Social Cognitive Theory, Social Capital Theory, and Social Exchange Theory, which can be applied to a broad range of individual behaviors including knowledge sharing. For each theory or model, its contribution and rational will be discussed and relevant empirical studies will be presented. Through a thorough literature review on both conceptual and empirical studies in this area, we aim to find some common themes across various theoretical paradigms and identify important predictors of individual knowledge sharing behavior in organizations.

The Concept of Knowledge, Knowledge Management and KMS

The current literature contains numerous definitions of the term *knowledge*. Davenport & Prusak (1998) define it as "a fluid mix of framed experiences, values, contextual information, and expert insights that provide a framework for evaluating and incorporating new experiences and information". Nonaka & Takeuchi (1995) stated knowledge as "a dynamic human process of justifying personal belief toward the truth" (p.58).

Knowledge can be categorized into explicit and implicit (tacit) categories (Polanyi, 1966). *Explicit knowledge* is what is written or recorded in patents, instruction manuals, best practices, lessons learned, research findings and can be readily codified, articulated, and captured. This suggests that explicit knowledge can be transferred through more technology-driven, structured processes such as information systems, Lotus Notes, and similar mechanisms such as a shared best practice database.

Clearly, *tacit knowledge* is personal; it is hard to formalize and communicate to others. It is also generally more complex, existing in the mental models and expertise gained over time and through personal insights. This suggests that tacit knowledge may be best transferred through more interpersonal means and using processes that are less structured. Some examples are mentoring, teamwork, chat rooms, personal intranets, and opportunities for face-to-face conversations such as group dialogue or personal reflections on experiences and lessons learned (Hansen et al., 1999). The challenge in knowledge management is to determine how each knowledge type can be codified and transferred in an organization.

Knowledge Management (KM) has been defined as "the process by which an organization creates, captures, acquires, and uses knowledge to support and improve the performance of the organization" (Kinney, 1998). KM has been discussed in several key articles (Alavi & Leidner, 2001; Nonaka, Toyama, & Konno, 2001; and Grant, 2001).

There are primarily two different types of KM strategies: the personalization strategy and the codification strategy (Hensen et al., 1999).

- *A Codification Strategy* – Where knowledge is carefully codified and stored in databases so that it can be accessed and easily used by anyone in the organization. (e.g. electronic network repository)

- *A Personalization Strategy* – Where knowledge is closely tied to the person who developed it and is shared mainly through direct person-to-person contact.

Earl (2001) also recognizes the importance of codification (describing it as a contribution of knowledge to databases) and expands the "personalization strategy" component to include the formal and informal sharing of knowledge between individuals and among workgroups as well as the sharing of information within a "Community of Practice."

Knowledge Management Systems (KMS) are IT-based systems applied to managing organizational knowledge (Alavi & Leidner, 2001). IS researchers have conducted a number of studies attempting to understand how KMS enables and facilitates knowledge creation, storage, sharing and application for improving organizational performance. While KM has been recognized as essential for an effective and successful business, knowledge sharing is one of the critical issues in KM processes (e.g. Lee, 2000). Yet, KM research is still in its infancy and much research is needed for a better understanding of individual knowledge sharing behavior in KMS.

Major Theories and Models

Several research models in the literature suggest how knowledge is created and transferred in organizations. In a review of **KM Critical Success Factors** identified in recent research, Alazmi & Zairi (2003) found that many factors have been suggested as important to implementing a successful KM program. These factors include culture, training, technology infrastructure, knowledge type, etc. Additional studies suggest the importance of culture, technology, systems and procedures, structure, tasks, and incentives (Davenport & Prusak, 1998; Gold, et. al., 2001; Karlsen & Gottschalk, 2004).

In their recent empirical study, Kim & Lee (2006) observed that social networks, centralization, performance-based reward systems, employee usage of IT applications, and user-friendly IT systems are significant variables that affect employee's knowledge sharing capabilities in public and private organizations. Syet-Ikhsan & Rowland (2004) also investigated the relationship between organizational elements (culture, structure, people and technology) and the performance of knowledge transfer.

Organizational Culture   Knowledge sharing culture is one of the most important elements that need to be understood before implementing any new strategies in organizations. Knowledge sharing can only work if the culture of the organization promotes it. Any changes need to be developed in line with the existing organizational culture (Stoddart, 2001).

Trust can be regarded as a fundamental aspect of a knowledge friendly culture (Stonehouse & Pemberton, 1999; Lee & Choi, 2003). Building a relationship of trust between individuals and groups will help to facilitate a more proactive and open knowledge sharing culture (Von Krogh, 1998). Roberts (2000) and Zand (1972) also found empirical support for the relationship between employee trust and knowledge sharing.

It is also culture that determines the *norms* regarding the distribution of knowledge between an organization and the individuals in it (Staples & Jarvenpaa, 2001).

Organizational Structure   Organizational structure refers to the way people and jobs in an organization are arranged so that the work of the organization can be performed (Encyclopedia of Management, 2000). Despite limited empirical research on the impact of organizational structure on employee knowledge-sharing activities, several scholars have addressed its

importance. Sharratt & Usoro (2003) suggest that "organizations with a centralized, bureaucratic management style can stifle the creation of new knowledge, whereas a flexible, decentralized organizational structure encourages knowledge-sharing, particularly of knowledge that is more tacit in nature". In fact, hierarchical organizations are not likely to fully engage the skills and knowledge of all employees (Vallas, 1998). O'Dell & Grayson (1998) also suggest that organizational structure should be designed to promote flexibility as a means of encouraging collaboration and sharing within and across organizational boundaries and stakeholders.

Reward systems   According to Leonard (1995), organizational reward systems determine knowledge flow and access. Several researchers have noted the utility of incentive systems for motivating employees to generate new knowledge, share existing knowledge, and help employees in other divisions or departments (e.g., Argote & Epple 1990; O'Dell & Grayson 1998).

The relationship between knowledge sharing and incentives was further supported by studies (e.g., Gupta & Govindarajan, 2000; Quinn et al., 1996) finding that significant changes had to be made in the incentive system to encourage individuals to share their knowledge, particularly through technology-based networks in organizations.

Although there are those who perceive rewards and incentives to be indispensable to knowledge sharing (e.g., Gupta & Govindarajan, 2000; Quinn et al., 1996), others have argued that *tangible rewards* alone are not sufficient to motivate knowledge sharing among individuals. Professionals participate in knowledge-sharing activities because of the *intrinsic reward* that comes from the work itself (Tissen et al., 1998), formal rewards may be perceived as demeaning by professionals who are motivated by a sense of involvement and contribution (McDermott & O'Dell, 2001). Yet others argued against the use of incentives to share knowledge claiming that in the long run, unless knowledge-sharing activities help employees meet their own goals, tangible rewards alone will not help to sustain the system (O'Dell & Grayson, 1998).

Technology   Technology is considered as the most effective means of capturing, storing, transforming and disseminating information. Davenport & Prusak (1998) state that *Information Technology (IT)* can be viewed both as a key contributor to and as an enabler of KM. IT can be widely employed to connect people to reusable codified knowledge, and IT should facilitate conversations to create new knowledge (Alavi & Leidner 2001).

Training   An adequate training in ICT given to all employees has a positive relationship with the creation and transfer of knowledge. The more training given, the more knowledgeable the person will be in using all the ICT facilities and the better is the creation and transfer of knowledge. Employees should be given constant training to improve their knowledge and capabilities. According to Smith (2001) employees with a lack of adequate training, or explicit knowledge, struggle to keep up. Therefore, it is important for the organization to have a proper training program to enable employees to gain knowledge and contribute to the creation and transfer of knowledge in the organization.

User Acceptance Models

In the last two decades, information systems (IS) researchers have suggested intention-based models from social psychology as a potential theoretical foundation for research on the determinants of user behavior. In this research stream, Theory of reasoned action (TRA) and technology acceptance model (TAM) are well researched intention-based models in predicting and explaining behavior across a wide variety of domains (Fishbein & Ajzen, 1975).

Theory of Reasoned Action (TRA)

Embedded in the field of social psychology, Theory of Reasoned Action (TRA) was widely used in predicting behavior by an individual's attitude towards behavior. According to TRA, a person's behavior is determined by one's intention to perform the behavior (BI), and this intention is determined by the individual's attitude (A) towards the behavior and subjective norms (SN) surrounding the performance of the behavior.
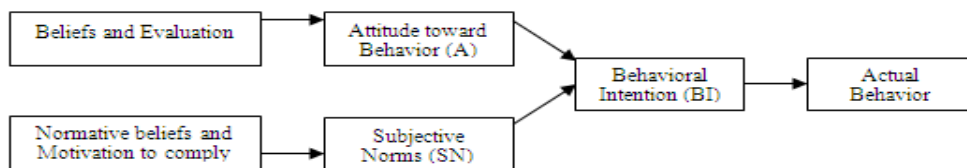
**Figure 1 - Theory of Reasoned Action (TRA)**

A particularly helpful aspect of TRA is that it assumes all other factors influence behavior only indirectly by influencing attitude, subjective norms, or their relative weights (Davis et al., 1989). Based on this explanatory power, TRA can be a useful model for explaining the knowledge sharing behavior in organizations, as Davis et al. presented the technology acceptance model (TAM) by adapting TRA to explain the individual's computer usage behavior.

In the line of research with this model, Bock & Kim (2002) studied the factors affecting the individual's knowledge sharing behavior in the organizational context, Bock et al (2005) examined the roles of extrinsic motivators, social-psychological forces, and organizational climate, for understanding behavioral intention formation in knowledge sharing.

Technology Acceptance Model (TAM)

TAM was proposed by Davis et al. (1989) to explain IT users' intention and behavior regarding IT usage. It was grounded in the theory of reasoned action (Fishbein and Ajzen, 1975). TAM identified two salient beliefs - perceived usefulness and ease of use, as the primary predictors of user's attitude or overall affect toward IT usage.

Davis et al. (1989) also hypothesized perceived usefulness to have a direct effect on intention, in addition to its indirect effect via attitude, to account for circumstances where utilitarian considerations may dominate users' decision to use IT, over and above any negative attitude toward such usage. Davis et al. (1989) also observed a positive association between perceived usefulness and ease of use. External variables (such as individual abilities, the type of IT, the task, and situational constraints) influence user intentions only indirectly by influencing perceived usefulness and perceived ease of use.
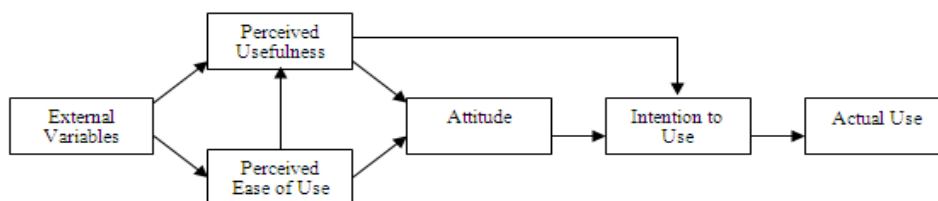
Figure 2 - The Technology Acceptance Model

Numerous empirical investigations have established strong empirical support for TAM (Venkatesh et al., 2003; Karahanna et al., 1999; Venkatesh & Davis, 2000). While *Perceived usefulness* has consistently been the predominant predictor of user attitude toward IT usage, though *ease of use* has had a somewhat inconsistent effect particularly during later stages of usage, *attitude* has tended to have a mixed effect, especially when perceived usefulness is included as a predictor of intention (Venkatesh et al., 2003).

TAM is found to be a powerful and parsimonious model in predicting and explaining IT acceptance, especially so because it is formulated specifically to explain IS adoption including KMS. It is also easier to apply. Another salient strength and contribution of TAM is its role in IS research. It has strengthened the IS research field because of its research rigor and it is one of the few theories that belongs to the IS research field (Lee et al., 2003).

In their recent study of KMS continuance in organizations, He & Wei (2006) propose a conceptual model that explains individual intention and continuance usage of KMS in organizations drawing theoretical foundation from TAM.

Social Theories

Social Cognitive Theory (SCT)

Social cognitive theory is a widely accepted model of individual behavior as it examines the reasons why individuals adopt certain behaviors. In the SCT model, personal factors, environmental influence, and behavior act as interacting determinants that will influence each other bidirectionally (Wood & Bandura, 1989).

Social cognitive theory has been utilized in a number of disciplines due to its dynamic nature as it considers human behavior to constantly change (Kock, 2004). It has been applied in business through the analysis of organizational management (Wood and Bandura, 1989), task complexity (Bolt et al., 2001) and technological innovation adoption (Compeau et al., 1999). The rapid changing technological environment has meant that social cognitive theory is a useful theoretical framework to understand human behavior.
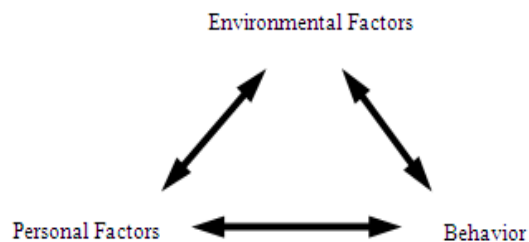
Figure 3 – Social Cognitive Theory (Bandura, 1986)

SCT (Bandura, 1986, 1997) has been widely applied in the information systems literature with demonstrated validity. This theory argues that a person's behavior is partially shaped and controlled by the influences of social environment (i.e. social network) and the person's cognition (i.e. expectations, beliefs). Bandura advances two types of beliefs as the major cognitive forces guiding behavior: *self-efficacy* and *outcome expectation*.

Self efficacy and knowledge sharing

Self-efficacy is a form of self-evaluation that influences decisions about what behaviors to undertake, the amount of effort and persistence to put forth when faced with obstacles, and finally, the mastery of the behavior (Bandura, 1997). In general, the perceived self-efficacy plays an important role in influencing individuals' motivation and behavior (Bandura, 1982, 1986). People who have high self-efficacy will be more likely to perform related behavior than those with low self-efficacy.

One of the main contributions of SCT in IS research is the conceptualization of self-efficacy in a variety of research streams. One of this research streams is focused on examining the effect of *computer self-efficacy (CSE)* on computer training performance (e.g., Compeau and Higgins, 1995, 1999; Johnson and Marakas, 2000) and on IT usage (e.g., Easley et al., 2003; Venkatesh et al., 2003). Another research stream is concentrated on the construct of *Internet self-efficacy (ISE)*. Studies in this line also address the significant relationship between ISE and Internet use (e.g., Hsu and Chiu, 2004; Lam and Lee, 2005).

More recently, the concept of self-efficacy has been applied to knowledge management to validate the effect of personal efficacy belief in knowledge sharing, that is *knowledge sharing self-efficacy (KSSE)*. Several researchers have employed knowledge sharing self-efficacy to examine its effect on knowledge sharing intention (e.g. Bock and Kim, 2002; Kankanhalli et al., 2005). Their results show that self-efficacy is positively related to knowledge contribution and sharing in specific contexts such as public organizations and EKR.

Based on studies cited above, we recognize that self-efficacy is a critical determinant for users' behavior in various IT use contexts.

Outcome expectation and knowledge sharing

According to the SCT, *outcome expectations* refer to the expected consequence of one's own behavior (Bandura, 1997; Compeau and Higgins, 1995). Outcome expectations consist of three major forms: physical effects (e.g., pleasure, pain, discomfort), social effects (e.g., social recognition, monetary rewards, power, applause) and self-evaluation effects (e.g., self-satisfaction, self-devaluation) (Bandura, 1997). Within each form, the positive expectations can be seen as incentives and thus human behavior can be regulated by these different forms of effects (Bandura, 1997). An individual's behavior may lead to positive outcome, because individuals will behave with rational self-interest as asserted in the social economic exchange theory (Bock and Kim, 2002). This is also why knowledge sharing will take place when rewards are greater than cost (Constant et al., 1994).

On the one hand, outcome expectations imply that, if members of a community believe that they would receive *extrinsic benefits* such as monetary rewards, promotion, or educational opportunity from their knowledge sharing, then they would develop a more positive attitude toward knowledge sharing (Bock and Kim, 2002; Kankanhalli et al., 2005). On the other hand, if members believe that they would receive *intrinsic benefits* such as self-satisfaction, social recognition, or power, then they would also have pleasure in knowledge sharing (Kankanhalli et al., 2005).

However, the Social Cognitive Theory is limited in addressing what components are within a social network and how they influence an individual's behavior, necessitating the additional theory as the foundation for exploring the impact of social network on knowledge sharing in organizations (Chiu et al., 2006).

Social Capital Theory

Social capital refers to the resources embedded within networks of human relationship. Social capital theory posits that social capital provides the conditions necessary for knowledge exchange to occur (Nahapiet & Ghoshal, 1998). Bandura (1989) also argues that individuals' behavior is a product of their social network. Through close social interactions, individuals are able to increase the depth, breadth, and efficiency of mutual knowledge exchange. Nahapiet & Ghoshal (1998) define social capital with three distinct dimensions: *structural* (the overall pattern of connections between actors, such as network ties), *relational* (the kind of personal relationships people have developed with each other through a history of interactions, such as trust, norms, identification), and *cognitive* (those resources providing shared representation, and systems of meaning among parties, such as shared vision and goals).

A fundamental proposition of social capital theory is that *network ties* provide access to resources, which means that ties can influence both access to people for knowledge exchange and anticipation of value through such exchange (Nahapiet & Ghoshal, 1998). Tie strength characterizes the closeness and interaction frequency of a relationship between two parties. Strong ties reportedly mean that people are more accessible and willing to be helpful in sharing behaviors. Recent studies have provided empirical support for the influence of social interaction ties on inter-unit resource exchange and combination (Tsai & Ghoshal, 1998), and knowledge transfer between scientists and engineers within an organization (Levin & Cross, 2004).

Trust - the extent to which users believe in the good intent, competence, and reliability of others - can reduce transactional cost and enable social relations (Nooteboom, 2001). McEvily et al. (2003) further argue that the level of trust influences the extent of knowledge disclosure, screening, and sharing between two parties. Kankanhalli et al. (2005) in their study on electronic knowledge repositories, have developed and validated the trust construct and verified trust as a significant contextual factor in knowledge contribution behavior.

A *norm* represents a degree of consensus in the social system (Coleman, 1990). Norms are deeply entrenched in organizational culture. More specifically, shared norms within a community govern how its members behave, think, make judgments, and even how they perceive the world. Therefore, shared norms will generate propositional attitudes that tend to affect the members' behaviors in a certain way.

According to Nahapiet & Ghoshal (1998), *identification* is the process whereby individuals see themselves as one with another person or group of people and it acts as a resource influencing the motivation to combine and exchange knowledge. In the context of knowledge sharing, identification refers to an individual's sense of belonging and positive feeling toward a community which will enhance one's willingness to share knowledge.

A shared vision embodies the collective goals and aspirations of the members of the organization (Tsai & Ghoshal, 1998). Clear organizational vision and goals engender a sense of involvement and contribution among employees. Organization members who share a vision will be more likely to become partners sharing or exchanging resources.

Social Exchange Theory

Social exchange theory explains human behavior in social exchanges in which people do others a favor with a general expectation of some future return (Blau, 1964). Social exchange theory posits that people behave in ways that maximize their benefits and minimize their costs (Molm, 1997). In agreement with this theory, researchers have suggested that increasing the benefits and reducing the costs for contributing knowledge can help to encourage knowledge sharing using KM systems (Markus, 2001; Wasko & Faraj, 2000).

During social exchange, benefits acting as motivators of human behavior can be extrinsic or intrinsic in nature (Deci & Ryan 1980; Vallerand 1997). *Extrinsic benefits* are sought after as means to ends desired by people. For example, knowledge contributors may receive *organizational rewards* for their contributions (Beer & Nohria 2000) through which they can obtain a better lifestyle. Ewing and Keenan (2001) studied that explicit rewards were effective in motivating employees to share their knowledge in Siemens' ShareNet project.

As a result of contribution, individuals may also enhance their image or *reputation* in the organization (Ba et al. 2001; Constant et al. 1994; 1996), which can serve to increase their self concept.

Knowledge sharing via knowledge repositories can be seen as a form of generalized social exchange (Fulk et al., 1996) or generalized reciprocity (Wasko & Faraj, 2000). *Reciprocity* can facilitate knowledge sharing and individuals who share their knowledge with others are expected to benefit from their sharing behaviors (Ipe, 2003). Prior research shows that knowledge sharing in electronic networks of practice is facilitated by a strong sense of reciprocity (Wasko & Faraj, 2005).

Intrinsic benefits are sought after as ends by themselves. For example, through contribution, knowledge contributors can be satisfied by enhancing their knowledge self-efficacy or confidence in their ability to provide valuable knowledge that is useful to the organization (Constant et al. 1994; 1996). Also, by contributing knowledge to knowledge repository, knowledge contributors have the opportunity to help others (Ba et al. 2001; Wasko & Faraj 2000). Previous study on *altruism* has shown that people enjoy and derive pleasure from such acts of helping others (Baumeister, 1982, Krebs, 1975).

Research has established extrinsic and intrinsic benefits as motivators of human behavior in several domains (Vallerand 1997), including knowledge sharing (Osterloh & Frey 2000).

Summary of Literature Review

Identification of one theory or model as dominant in KMS user acceptance may not be explicit because each has contribution and limitation. As a good combination of different paradigms is helpful to understand individual knowledge sharing phenomenon, this study attempts to make this effort.

It is clear that *two themes* recur across different paradigms. Firstly, according to the intention based models (TRA & TAM), *beliefs* and *attitude* are proximal antecedents of user acceptance behavior where beliefs may also influence attitude. In this study, we propose beliefs as *motivational variables* in terms of *system specific motivations* and *personal cognitions* in order to perform knowledge sharing behavior.

Secondly, *three aspects* have been suggested to influence knowledge sharing behavior – *environmental variables*, *situational variables*, and *organizational facilitating conditions* – drawing from the social theories.

Through the examination of theoretical and empirical studies in line with each paradigm, key variables pertinent to these categories have been identified, as shown in Table 3.

Categories	Key variables
Situational variables (Individual characteristics/ Task characteristics)	Position, experience, education, awareness, tenure Type of knowledge, KM strategy
Environmental variables (Organizational culture/Social relationships)	Trust, norms, network ties, identification, shared vision and goals
Motivational variables (System-specific Motivations/ Personal cognitions)	Perceived ease of use, perceived usefulness Outcome expectation, perceived self-efficacy perceived benefits (organizational rewards, reciprocity, reputation, altruism)
Organizational facilitating conditions	Organizational structure, training, reward system, availability of IT

Table 3 - Key Variables Identified

PROPOSED RESEARCH FRAMEWORK AND PROPOSITIONS

Based on the literature review, we propose the framework for individual knowledge sharing behavior as shown in Figure 4. Dashed frame in the right is the outcome variables of our study in consistent with the various paradigms for IS user acceptance research, which describes the fundamental relationship between beliefs (*motivational variables*), *attitude* and *behavior* (i.e. *intention to share* and *actual sharing* of knowledge). The three frames, link to the outcome variables represent the effects of other aspects on the outcome variables: *situational variables*, *environmental variables*, and *organizational facilitating conditions*.

The lists of key variables are presented in each category below the label. The relationships among categories are indicated by the arrows. We hope this framework would provide the basic rational of KMS acceptance as well as a comprehensive view of various factors influencing the individual knowledge sharing behavior. The explanation of each category of variables and propositions would be presented in the following part.
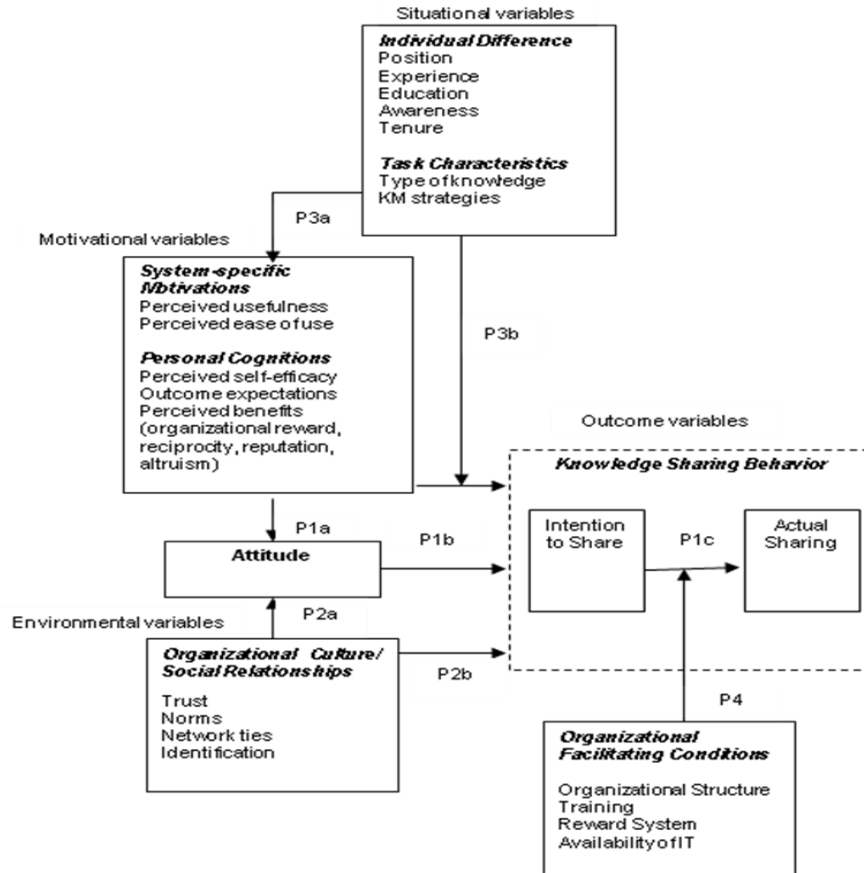
Figure 4 – Proposed Research Framework for Individual Knowledge Sharing Behavior in Organizations

Behavior, Attitude, and Motivational Variables

Behavior would be the individual's intention to share or actual sharing of knowledge to the organization's KMS. Each of them is served as dependent variable in most KM studies. Here, we propose knowledge sharing behavior as the outcome variables which include both intention to share and actual sharing of knowledge.

Attitude reflects an individual's positive or negative feelings (evaluative affect) about the use of an information technology artifact (Fishbein & Ajzen, 1975). There is some discord about the role of attitudes in the overall relationship between beliefs and intentions. In the TRA, attitude is conceived as fully mediating the effect of beliefs on intentions. In contrast, TAM recognizes direct effect of beliefs on intentions in addition to the indirect effects through attitude, and some of TAM studies exclude attitude from the model in the specific case of IT usage (Venkatesh, 2000). For our framework, we consider the effect of beliefs on intention as either direct or indirect through the mediating of attitude, for the purpose of explaining the various KMS contexts.

Motivational Variables

IS researchers have been studied the psychological motivations or beliefs to explain both acceptance and continuance behavior. Motivational variables identified in existing studies can be divided into two types: system specific motivation (perceived usefulness, perceived ease of use), and personal cognitions (perceived self-efficacy, outcome expectations) and perceived benefits in terms of organizational reward, reciprocity, reputation, and altruism.

According to TAM, *perceived usefulness* has consistently been the predominant predictor of user attitude towards IT usage while *ease of use* has had a somewhat inconsistent effect, especially during later stages of usage (Venkatesh et al., 2003). In the context of KMS, if individuals perceive that the KMS can improve their job performance or can accomplish their work easily, they are likely to be motivated to use the system.

According to social cognitive theory, *self-efficacy* - the belief in one's capabilities to organize and execute courses of actions required to manage prospective situations - is a potentially important factor influencing the decision to share knowledge (e.g., Bock and Kim, 2002; Kankanhalli et al., 2005; Hsu et al., 2007). *Outcome expectation* that is related to reward system (Bartol and Srivastava, 2002) is also an important predecessor to usage behavior. Individuals are more likely to engage in behavior they expect will result in favorable outcomes.

According to social exchange theory, *organizational rewards* such as increased pay, bonuses, job security, or career advancement are regarded as extrinsic motivators of human behavior. Prior research reports that organizational rewards seem to be effective for encouraging EKR usage by knowledge contributors (Kankanhalli et al., 2005).

Reciprocity is a sense of mutual indebtedness; individuals usually reciprocate the benefits they receive from others, thus ensuring ongoing supportive exchanges (Shumaker and Brownell, 1984). Davenport and Prusak's (1998) reported reciprocity is one of the factors that drive knowledge sharing.

Reputation is an important asset that an individual can leverage to achieve and maintain status within a social network. Prior research on electronic networks of practice indicates that reputation is an important motivator for active participation (Wasko and Faraj, 2005; Roberts et al., 2006).

Altruism can be regarded as an intrinsic benefit that exists when people derive pleasure and enjoyment from helping others without expecting anything in return (Krebs, 1975). Prior research in electronic networks of practice finds that knowledge contributors obtain satisfaction from demonstrating their altruistic behavior (Wasko and Faraj, 2000; 2005).

It is suggested that major theoretical paradigm of knowledge sharing lies in the relationship between beliefs (motivational variables), attitudes and behaviors: positive beliefs about using the KMS are likely to coexist with positive affect (attitude) and intention, and subsequent manifestation of corresponding behavior of using the KMS. In consistency with this, we have the first propositions:

Proposition 1a: It is likely that individuals, who hold beliefs in terms of system specific motivations and personal cognitions, may develop more positive attitude toward knowledge sharing.

Proposition 1b: Individual's beliefs or motivations and attitude toward using the system jointly determine his/her intention to share knowledge to KMS.

Proposition 1c: The intention to share knowledge then determines the actual sharing (usage) of KMS.

Environmental Variables

Environmental variables refer to social relationships which attributed to the organizational culture. According to social capital theory, social capital such as trust, norms, network ties, identification, and shared vision and goals serve as important predictors to determine user's behavior.

Based on the literature review, we adopt the *social capital* perspective particularly conductive to knowledge sharing to propose that social relationships act as a critical stimulus to user's attitude towards the KMS. It is suggested that positive social relationships of an individual with other users of KMS in the organization would stimulate positive attitude towards KMS and thus a critical determinant of knowledge sharing behavior. The stronger the social relationships of an individual with other users of KMS in an organization, we expect the stronger the attitude towards knowledge sharing.

In addition, perceptions about a positive social interaction may be particularly important with respect to the creation of a knowledge sharing culture, thereby enhance one's willingness to perform such behavior (Constant et al., 1994). Knowledge sharing motivation is determined by the characteristics of the direct environment of the employee. Prior empirical studies have supported the strong evidence of *organizational culture* as significant antecedent in knowledge sharing behavior (S.I, & Rowland, 2004; Kim & Lee, 2006; Willem & Buelens, 2007). Thus we have the second propositions:

Proposition 2a: Individuals who have more positive social relationships would have more positive attitudes toward knowledge sharing.

Proposition 2b: An organizational culture has a positive relationship with individual knowledge sharing behavior.

Situational Variables

Situation variables refer to individual difference and task characteristics. *Individual differences* can be generally interpreted as dissimilarities among people, including differences in perceptions and behaviors, traits and personality characteristics, and variables that imply differences attributable to circumstances such as education and experience (Agarwal and Prasad, 1999).

Although there have not been much attention on the effect of individual differences to knowledge sharing in the literature, certain demographic variables (such as position, experience, education, tenure, awareness) may influence whether an individual intend to share their knowledge.

Employees' *position* and *expertise* may affect their knowledge sharing behaviors through the size and utility of their social networks; experienced employees may simply be more able to share their knowledge because they know more of the right people in the organization (Catherine & Kevin, 2003). Previous literature suggests that *education* and *experience* may have an effect on knowledge sharing (Constant et al., 1994). Individuals with longer *tenure* in the shared practice are likely to better understand how their expertise is relevant, and are thus better able to share their knowledge with others. *Awareness* refers to the recognition of an opportunity to contribute. While people believe that knowledge is power, they must understand that sharing knowledge is power. When people are aware of the benefits of KM that bring to them and organization, they are more likely to share knowledge.

Task characteristics refer to the type of knowledge and KM strategies in our study. Smith (2001) argues that people have slightly different types of tacit and explicit knowledge and apply them in unique ways.

Organizations manage their knowledge sharing in two ways – either through personalization strategy or through codification strategy. Clearly, both structured, technology-driven approach (codification strategy) and less structured approach (personalization strategy) are needed to consider for effective knowledge exchange. *The type of knowledge* and *KM strategies* may be critical factors necessary to facilitate the knowledge sharing, thereby determining such behavior to perform.

Although TAM suggests that external variables (such as individual abilities, the task, and situational constraints) influence user intentions only indirectly by influencing perceived usefulness and perceived ease of use, there are some research studied those variables as moderating factors, or even as control variables (S.I & Rowland, 2004; Kim & Lee, 2006).

Therefore, we posit that there would be two pathways through which individual difference or task characteristics influence the knowledge sharing behavior: a direct effect on beliefs (motivational variables) and a moderating effect on motivation-intention relationship. Thus, we have our third propositions:

Proposition 3a: Individual differences and task characteristics would influence the individual's beliefs or motivations to share knowledge.

Proposition 3b: Individual differences and task characteristics would moderate the relationship between the individual's beliefs (motivations) and intention to share knowledge.

Organizational Facilitating Conditions

Organizational facilitating conditions reflect the availability of resources needed to engage in a behavior (Taylor & Todd, 1995). Organizational facilitating conditions refer to some objective conditions in the environment that individuals agree to make the action of usage easy to accomplish.

Prior research indicates that facilitating conditions act as a direct antecedent of usage behavior in IS continuance stage (Vankatesh et al., 2003). In the context of KMS, organizational facilitating conditions are operationalized as the degree to which an individual believes that organizational and technical infrastructure exists to support knowledge sharing activity. As discussed earlier, specifically effective organizational facilitation, such as *organizational structure, training, reward system, and the availability of IT*, would encourage the individual's intention of KMS acceptance to actual sharing (Taylor & Todd, 1995). Therefore, we suggest that strong organizational facilitating conditions may predict actual sharing behavior. This lead to the following proposition:

Proposition 4: Organizational facilitating conditions would moderate the relationship between intention to share and actual sharing behavior.

CONTRIBUTIONS, LIMITATIONS, AND FURTHER EXTENTIONS

This paper reviews past literature in user acceptance of IT and KM and proposes a comprehensive framework. A number of *contributions* result from this study.

The *first* contribution is a compressive view of IS acceptance and social literature, particularly the traditional models and their line of research for knowledge management. Review of literature has led to the creation of the research framework which proposes the study of individual's knowledge sharing behavior and factors that influence those behaviors.

Secondly, the combination of user acceptance models (TRA, TAM) with behavioral models (SCT, SET) and inclusion of the environmental, situational and organizational variables to the traditional beliefs (motivational variable) may add in value to obtain a better understanding of individual knowledge sharing behavior in organizations. The key variables indentified from prior research are important factors that have been validated to influence individual knowledge sharing behavior. When studying the acceptance of a particular KMS by a particular user group in a certain setting, future researchers can select some of the variables from each category and put the model into testing.

Thirdly, we also provide possible research and managerial implications and future research directions. Studying individual knowledge sharing behavior can give researchers and practitioners a better understanding of the factors that influence KMS acceptance and continuance intention and take these factors into consideration when designing, developing and evaluating knowledge management systems. This framework could guide organizations in their knowledge management initiatives, in order to analyze their environmental factors, and determine what organizational and technological factors need to be addressed.

The proposed framework also has some *limitations*. The framework has presented the relationships between variables of different categories; however, causal relationships between each pair of variables have not been explicitly shown since there are subcategories divided. For example, it is proposed that situational variables are determinants of user beliefs (motivational variables), but whether the individual differences or task characteristics have effect on system specific motivations or personal cognitions is not explicit. Besides, there may have an overlapping aspect among variables in the same category. For example, outcome expectation and perceived benefits can be regarded as personal cognitions and measured in either intrinsic or extrinsic ways. In addition, certain variable can be categorized differently such as reward system can be placed in environmental variables as regards one of the knowledge sharing cultures for a specific organization. However, the purpose of this framework is to identify and integrate the factors influencing the individual knowledge sharing behavior to view a comprehensive picture of KMS acceptance and continuance, clarification of the detail relationship between variables are not meant to be covered in the framework. This limitation can be addressed if future researchers apply this framework to study a specific context.

Further research can extend this study is several ways. With the rapid advances being made in the field of practice related to knowledge management, there is a significant gap between research and practice in this area (Grover & Davenport, 2001). The increasing sophistication in technology-based knowledge management systems call attention to one area where more research is needed to examine how different individuals respond to *different characteristics of a KMS* such as professional virtual community, electronic network of practice, etc. Within user acceptance literature, in order to explain the technology usage and underlying knowledge sharing behavior in organizational context, the *complimentary theories* of habitual or automatic behaviors such as Agency Theory, Psychological Reactance Theory, Response to authority, and Response to liking etc. could also be considered for identifying influential variables to perform behavior. *In-depth investigative method* such as case studies could be used to identify factors that motivate and inhibit knowledge-sharing behavior within *specific organizational settings*. An *organization's size* may also be related to its knowledge sharing culture, if employees in smaller organizations are more likely to rely on each other and to interact with each other socially. Subsequent research could then be done to verify whether these factors apply across organizations such as public organizations, SMEs, multinational firms, and non-governmental organizations, using methods that allow results to be generalized to larger populations. Additionally, further research studying the effects of different *types of culture* such as professional culture, organizational subcultures and national culture which may influence the individual knowledge sharing behavior, would also be interesting. Finally, new research on *longitudinal study* in the area of investigating the relations between intention to perform knowledge sharing behavior and actual performance of such behaviors may also be able to identify emerging factors that influence the *continuance intention* that have not been documented in the literature thus far.

CONCLUSION

It is clear that knowledge sharing in organizations is a multifaceted complex process. Knowledge in organizations is dynamic in nature and is dependent on social relationships between individuals for its creation, sharing, and use. Based on the review of major theories and models of user acceptance of KMS and the examination of empirical research in line, we try to build a richer framework which proposes the study of individual's knowledge sharing behavior in organizations considering four categories of variables: motivational variables, environmental variables, situational variables, and organizational facilitating conditions. Key variables falling into each category have been identified and propositions based on the framework are discussed. Both managerial and research implications are drawn from the framework. Limitations of proposed framework are pointed out and the future directions are suggested. It is hoped that this effort will shed the light to KM literature in understanding toward individual's knowledge sharing behavior for both academic researchers and practitioners.

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