

DETERMINANTS OF KNOWLEDGE SHARING
BEHAVIORS: DEVELOPING AND TESTING
AN INTEGRATED THEORETICAL
MODEL

by

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ABSTRACT

DETERMINANTS OF KNOWLEDGE SHARING
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Knowledge sharing has been identified as the key enabler of knowledge management. To leverage knowledge resources and to support knowledge sharing, organizations are employing knowledge management systems. While knowledge management systems are important, practical implementations have found that technology alone cannot guarantee that knowledge will be shared. The objective of this research study was to examine factors that promote or discourage knowledge sharing behaviors of knowledge workers in the organizational context. Drawing from multiple

streams of research including social psychology, organizational learning, knowledge management, information systems and so forth, this research developed an integrated theoretical model and unveiled three sets of critical factors: psychological, organizational and technological that are believed to affect the knowledge sharing behaviors.

The posited theoretical model was validated using a field survey of knowledge workers. The results of the study provide empirical support for the overall structure theorized in the research model. 11 of the 12 hypothesized relationships were supported. Knowledge sharing behavior was predicted by the knowledge workers intention towards knowledge sharing and perceived behavioral control. Knowledge sharing intention in turn was predicted by knowledge workers attitude towards knowledge sharing, subjective norm and perceived behavioral control. The knowledge workers perceptions of reciprocity, reputation, enjoyment in helping others were positively associated with favorable attitude towards knowledge sharing. The perceptions of loss of knowledge power exerted a negative effect on the attitude. Organizational climate positively influenced knowledge workers subjective norm. Additionally, facilitating tools and technology was positively associated with high levels of perceived behavioral control towards knowledge sharing.

Based on the findings, the study discussed implications for theory and practice. Overall, the results of the study advance prior research in the area of knowledge sharing by shedding light on the determinants of knowledge sharing behaviors of knowledge workers. In addition to contributing to theory, the findings of the study also yield

insights for practice. These insights could be used by organizations in developing realistic environments that are conducive to knowledge sharing.

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CHAPTER 1

INTRODUCTION

1.1 Research Background

In the contemporary knowledge-intensive economy, knowledge is recognized as a critical strategic resource for the organizations. Following the resource based view (Barney, 1991), the knowledge-based perspective of the firm regards knowledge to be the source of firm's competitive advantage (Nonaka and Takeuchi, 1995; Conner and Prahalad, 1996; Grant, 1996; Nahapiet and Ghoshal, 1998; Pettigrew and Whip, 1993). Knowledge, the researchers contend, is the source of competitive advantage because it signifies intangible assets that are unique, inimitable and non-substitutable (Grant, 1996; Spender, 1996; Liebeskind, 1996). However, Alavi and Leidner (2001) observe that the source for competitive advantage resides not in the mere existence of knowledge at any given point of time, but rather in the organization's capability to effectively use the existing knowledge to generate new knowledge assets and to act upon them.

To leverage and manage organizational knowledge resources, organizations are adopting knowledge management (KM) initiatives and are investing heavily in information and communication technologies in the form of knowledge management systems (KMS) (Davenport & Prusak, 1998; Alavi and Leidner, 2001; Osterloh et. al.,

2000; Zack, 1999). Knowledge management rallies around building the organization's ability to acquire, organize and diffuse the knowledge throughout the organization with the objective of improving its effectiveness, efficiency and competitiveness (Alavi and Leidner, 1999). Organizational spending on KM is estimated to increase from \$2.7 billion in 2002 to \$4.8 billion in 2007 (Babcock, 2004).

A key enabler of knowledge management is knowledge sharing (Nonaka and Takeuchi, 1995; Alavi and Leidner, 2001). Sharing knowledge, many organizations assert is crucial to exploiting core competencies and to achieve sustained competitive advantage (Argote and Ingram, 2000; Gold et al., 2001). Prahalad and Hamel (1990) observe that organization's core competencies reside in the collective learning of the organization be it production, marketing or technological capabilities, that are inimitable by the competitors. To allow collective learning and to grow knowledge assets, an organization must develop an effective knowledge sharing process and encourage its employees and partners to share knowledge about customers, competitors, markets, products and so forth (Bock & Kim, 2002; Pan & Scarbrough, 1998; O'Dell & Grayson, 1998; Osterloh et al., 2000).

Hansen, Nohria & Tierney (1999) mention two KM strategies that are commonly used by successful organizations to share knowledge: codification and personalization. Codification strategy presumes that knowledge can be disconnected from its source and as such deals with the capture and storage of knowledge representations in electronic repositories / databases, independent of the individual that generated it. The electronic repositories / databases which contains organizational

knowledge facilitates knowledge transfer among the organizational members. For example, at the end of a project, a team may create best practices or lessons learned document based on their experiences of the project and store it in the repository. As part of the repository, this best practices or lessons learned document can be accessed by other teams resulting in the dissemination of knowledge across the organization.

Personalization strategy, on the other hand presumes that knowledge cannot be disconnected from its source. Knowledge can be shared through person-to-person interactions. The interactions can be face-to-face with a shared context or mediated by technology as in email, instant messaging, text messaging, videoconferencing, groupware etc. While the role of technology in codification strategy is to capture the knowledge representation and store it in a computer, its role in personalization is to facilitate the communication of knowledge. Given the growth of distributed work and global teams, personalization through technology mediation is becoming increasingly important. Communication and collaborative tools and technologies are allowing temporarily and globally dispersed individuals to work together and to engage in knowledge sharing through interpersonal communication.

Irrespective of the knowledge sharing strategy (codification versus personalization) adopted, technology is certainly making knowledge sharing a reality. As such, organizations are investing heavily in tools and technologies in the form of electronic knowledge management systems (KMS) (Davenport and Prusak, 1998; Alavi and Leidner, 2001; Ruggles, 1998; Kankanhalli, Tan and Wei, 2005;

Wasko and Faraj, 2005). Some of the tools and technologies that are commonly implemented to support knowledge sharing include

- ❑ Group Ware and Collaboration tools
- ❑ Expertise “Yellow Pages” (computerized directory for locating experts having specific knowledge)
- ❑ Knowledge Repository (containing existing expertise, lessons learned, best practices etc)
- ❑ Intranets (including corporate portals)
- ❑ Email (listserv etc)
- ❑ Discussion forum (using tools like bulletin board, chat room etc)
- ❑ e-learning tools (interactive systems for learning)
- ❑ Desktop computer conferencing (using networked PC simultaneously for discussion and information exchange with tools such as net meeting, instant messaging, etc)
- ❑ Videoconferencing
- ❑ Teleconferencing

While tools and technologies are important for supporting knowledge sharing strategies, practical implementations have found that the mere availability of technology does not guarantee that knowledge will be shared (Ruggles, 1998; McDermott 1999; Orlikowski 1996; Cross and Baird 2000). There is a lack of understanding of the factors that shape knowledge sharing behaviors in organizational context.

1.2 Motivation for Research

Knowledge sharing has been recognized as a positive force for the survival of an organization. Yet, the factors that promote or discourage knowledge sharing behaviors in the organizational context are poorly understood (Bock et al., 2005; Connelly and Kelloway, 2003; Ruggles, 1998). Identification of factors that motivate employees to share knowledge for the benefit of other employees and the firm is regarded as a high priority issue for organizations (Hall, 2001; Smith and Farquhar, 2000; Prusak, 1999; Boisot and Griffiths, 1999). While the factors that influence knowledge sharing behaviors of employees can be speculated, it is crucial that we carefully examine the underlying antecedents of knowledge sharing, if we really want to add value to the practitioners of knowledge sharing. To date, little empirical research exists on what environments and mechanisms are conducive to knowledge sharing. Even much less empirical research exists on the deeper individual issues that shape individuals beliefs, attitudes, intentions, and behaviors in knowledge sharing (Andrews & Delahaye 2000; Hinds & Pfeffer 2003). The studies of Bock et al., 2005 and Ryu et al., 2003 show some encouraging developments. However, even these studies did not measure explicitly employee's actual knowledge sharing behavior.

Citing the growing significance of knowledge sharing to the success of knowledge management and to organizational survival, several researchers have called for further investigation of the factors that shape knowledge sharing behaviors in the organizational context. The objective of this research is to examine the factors that influence knowledge sharing behaviors of knowledge workers. As knowledge sharing

does not happen in vacuum, but is influenced by psychological, organizational and technological factors, the study will examine the effects of the same on knowledge sharing behavior.

1.3 Research Questions

The research questions that this study will address include:

- What are the antecedents and determinants that are predictive of knowledge sharing intention of knowledge workers in the organizational context? How do these antecedents and determinants eventually influence the actual knowledge sharing behavior?
 - Does attitude towards knowledge sharing influence knowledge worker's intention to share knowledge?
 - Does subjective norm towards knowledge sharing influence knowledge worker's intention to share knowledge?
 - Does perceived behavioral control towards knowledge sharing influence knowledge worker's intention to share knowledge?
 - Does intention towards knowledge sharing influence the knowledge worker's actual knowledge sharing behavior?
 - Does perceived behavioral control towards knowledge sharing influence the knowledge worker's actual knowledge sharing behavior?
- What influence extrinsic and intrinsic motivational drivers have on the knowledge workers attitude towards knowledge sharing?

- Does perceived organizational incentives influence knowledge worker's attitude towards knowledge sharing behavior?
- Does perceived reciprocal benefits influence knowledge worker's attitude towards knowledge sharing behavior?
- Does perceived reputation enhancement influence knowledge worker's attitude towards knowledge sharing behavior?
- Does perceived loss of knowledge power influence knowledge worker's attitude towards knowledge sharing behavior?
- Does perceived enjoyment in helping others influence knowledge worker's attitude towards knowledge sharing behavior?
- Does an organizational climate characterized by fairness, innovativeness and affiliation influence knowledge worker's subjective norm towards knowledge sharing behavior?
- Does the availability and perceived ease of use of tools and technology to share knowledge influence knowledge worker's behavioral control towards knowledge sharing behavior?

1.4 Outline of Dissertation

The rest of the dissertation is organized as follows. Chapter two provides a review of literature on the concepts of knowledge, knowledge management, knowledge sharing and the factors that influence knowledge sharing behavior of individuals in the organizational context. Chapter three describes the conceptual model and develops the research hypothesis. Chapter four discusses the development of survey instrument to

measure the constructs in the research model. Chapter five reports the data analysis and presents the results including significant and non-significant findings. Chapter six discusses the findings and reflects on the theoretical and practical implications of the study along with the limitations and future research directions.

CHAPTER 2

LITERATURE REVIEW

This chapter provides a review of literature on the concepts of knowledge, knowledge management, knowledge sharing and the factors that influence knowledge sharing behavior of knowledge workers in the organizational context.

2.1 The Notion of Knowledge

A review of the literature in strategic management, organizational theory, knowledge management and information systems disciplines indicate the existence of several definitions and view points of knowledge. A commonly held view, particularly in IS literature, appears to be the one that uses a hierarchy of data, information and knowledge to describe the characteristics of knowledge (Alavi and Leidner, 2001). This hierarchical approach distinguishes data, information and knowledge incorporating additional elements at each level of the hierarchy (Vance, 1997; Davenport and Prusak, 1998; Tuomi, 1999). Data, according to this hierarchy, represents raw numbers, objective facts and observations. It has no context and is therefore not directly meaningful (Zack, 1999). Information is the result of placing data within a meaningful context (Zack, 1999). It can be conceived as processed data with relevance and purpose. Knowledge is validated and authenticated information (Alavi and Liedner, 2001) that is ready to apply to decisions and actions. It includes a collection of skills, principles,

insights, instincts, ideas, rules and procedures that aid in decision making behavior and actions.

This hierarchical approach of knowledge although helpful, has rarely withstood scrupulous evaluation. For instance, Tuomi (1999) disagrees with the placement of knowledge at the top of the data-information-knowledge chain. He reverses the commonly accepted hierarchy from data to knowledge contending that knowledge must be present before information can be devised from it and before data can be collected to form information. Further, he notes that raw data do not exist since all data are influenced by knowledge processes and thoughts that lead to its identification and collection. As such, according to him, knowledge resides in individuals minds. When individuals articulate or verbalize it giving it a structure, it becomes information. Information becomes data when it is given a fixed representation and standard interpretation.

Building on the above perspectives of knowledge hierarchy, Alavi and Leidner (2001) observe that the distinguishing factor between information and knowledge is not found in the content, structure, accuracy or utility of the information or knowledge. Rather, knowledge is simply information that exists in the individual's mind. It is personalized information associated to facts, procedures, concepts, interpretations, ideas, observations, and judgments. Researchers assert that this knowledge need not be new, unique, useful or accurate. They argue that information becomes knowledge, when it is processed by the individuals and knowledge becomes information when it is

articulated and structured in the form of texts, graphics, words and other symbolic forms.

Other definitions of knowledge also exist. Zack (1999) define knowledge as “that which we come to believe and value on the basis of the meaningful organized accumulation of information through experience, communication, or inference”. Davenport and Prusak (1998) define knowledge as a “fluid mix of framed experience, values, contextual information and expert insight that provides a framework for evaluating and incorporating new experiences and information”. Much of the published research to date has adopted Davenport and Prusak (1998) definition.

2.1.1 Classifications of Knowledge

Some other common methods of defining knowledge is to categorize knowledge into different forms. For instance, Nonaka (1994), following the work of Polanyi (1966), categorizes knowledge into two forms: explicit and tacit. Explicit knowledge, according to the researcher, is knowledge that can be formalized, documented, archived, codified, and can easily be communicated or transferred between individuals. This includes theoretical approaches, manuals, databases, plans, business documents, guidelines, process models etc. Tacit knowledge, in contrast, is deeply rooted in individual’s actions, experiences, ideals, values and is far more difficult to write down or formalize. Polanyi (1966) summarizes the fundamental nature of tacit knowledge in the phrase “We know more than we can tell”. He exemplifies tacit knowledge by providing everyday example such as the ability to recognize the face of an acquaintance. Nonaka (1994) observes that tacit knowledge comprises two components:

technical and cognitive. The technical component refers to “know-how” or informal personal skills of crafts and the cognitive component refers to individual’s deeply ingrained beliefs, ideals, values, schemata and mental models. The researcher notes that the cognitive component, while difficult to articulate and formalize, shapes the way we see the world.

Knowledge can also be viewed as individual or collective (Nonaka, 1994). Individual knowledge exists in the heads of individuals, while collective knowledge exists in the collective actions of the groups and organizations. Nonaka (1994) regards organizational knowledge creation as “knowledge spiral” in which there is a continuous interaction among individuals and continuous conversion of explicit knowledge to tacit knowledge and vice versa. This incessant interaction and conversion in turn results in joint creation of knowledge by individuals and organizations. Organizations play an important role in activating the explicit and tacit dimensions of knowledge and in providing a forum for the knowledge spiral through four modes of knowledge creation: socialization, externalization, combination and internalization. Socialization refers to the exchange of tacit knowledge among members through the social interactions and shared experiences. Externalization refers to the translation of tacit knowledge into explicit knowledge through models, concepts, metaphors, analogies, stories etc. Combination refers to the generation of new explicit knowledge by combining and bundling together different bodies of explicit knowledge and internalization refers to the creation of new tacit knowledge from explicit knowledge. All of these conversion modes are highly interdependent and tangled.

Although explicit-tacit dichotomy of knowledge is widely cited, other classifications of knowledge have also been presented. For instance, Zack (1999) categorized knowledge into declarative (know-what), procedural (know-how) and causal (know-why). Another classification from a purely pragmatic perspective includes knowledge about customers, knowledge about products, knowledge about processes, knowledge about competitors, and knowledge about business frameworks (Alavi and Leidner, 2001)

2.1.2 Perspectives on Knowledge

Knowledge can be looked at from several perspectives. For instance, knowledge can be considered as a state of mind, an object, a process, a condition of having access to information and a capability (Alavi and Leidner, 2001; Wasko and Faraj, 2000). The perspective on knowledge viewed as state of mind centers around enhancing individuals personal knowledge so they can effectively apply it to the organization's requirements. The objective perspective regards knowledge as a thing or object, independent of human action (Wasko and Faraj, 2000). Knowledge can be stored, retrieved and manipulated. The third perspective views knowledge as a process and centers on applying expertise. It posits that knowledge does not exist independent of human action. Instead, it builds through social construction of meaning. The fourth perspective on knowledge viewed as a condition of access to information is an extension to the object view. This view contends that organizational knowledge must be organized in a way that it is easy to access and retrieve. Finally, the perspective on knowledge viewed as a capability builds on capability view and asserts that knowledge has a potential to

influence future action. It theorizes that knowledge has the capability to build intangible assets and intellectual capital.

Alavi and Leidner (2001) contend that each of the above knowledge perspectives require different strategies and different type of tools and technologies to manage knowledge. For instance, if knowledge is viewed as object then knowledge management initiatives should highlight the significance of building knowledge stocks in the organizations. KMS such as knowledge repositories should capture this type of knowledge. Similarly, if knowledge is viewed as process then knowledge management initiatives should focus on the flow of knowledge as in the processes of knowledge creation, knowledge sharing and knowledge distribution.

2.2 Knowledge Management

Review of the prior research on knowledge management (KM) indicates the existence of multiple definitions of KM. For instance, Alavi and Leidner (1999) define knowledge management (KM) as "a systemic and organizationally specified process for acquiring, organizing, and communicating both tacit and explicit knowledge of employees so that other employees may make use of it to be more effective and productive in their work". O'Dell et al., (1998) define KM as "a conscious strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organizational performance." Beckman (1999) define KM as "the formalization of and access to experience, knowledge and expertise that create new capabilities, enable superior performance, encourage innovation and enhance customer value." Malhotra (1998), is

of the opinion that "Knowledge Management caters to the critical issues of organizational adaptation, survival, and competence in face of increasingly discontinuous environmental change.... Essentially, it embodies organizational processes that seek synergistic combination of data and information processing capacity of information technologies, and the creative and innovative capacity of human beings."

As the breadth of these definitions illustrate, KM is a set of things involving various activities. It encompasses theories, models, processes and technologies that support the protection, development and exploitation of knowledge assets. By managing intellectual capital that exists in both explicit and tacit forms, KM enhances an organization's ability to learn from its environment and to incorporate knowledge into business processes. It creates a new value for the organization by improving its efficiency, effectiveness and competitiveness. Davenport, De Long and Beers (1998) regard most KM projects as having one of the following objectives: (1) making knowledge visible through KMS such as maps, yellow pages and hypertext tools (2) promoting knowledge intensive culture that encourage knowledge sharing, particularly the proactive acquisition and contribution of knowledge (3) developing knowledge infrastructure which includes a web of people and technologies with the objective of promoting interaction and collaboration among employees.

2.3 Knowledge Sharing

Review of the extant literature on knowledge sharing indicates that there is no all-round definition of knowledge sharing. Many researchers have defined knowledge sharing from their own point of view. Some researchers even considered knowledge

sharing, knowledge flows and knowledge transfer as exchangeable terms and defined them as such. For instance, Alavi and Leidner (2001) liken knowledge sharing to knowledge transfer and define it as the process of disseminating knowledge through out the organization. The dissemination can happen between individuals, groups or organizations using any type or number of communication channels. Similarly, Gupta and Govindarajan (2000), equating knowledge sharing to knowledge flows theorize that knowledge flows comprise of five elements: value of the source knowledge, willingness of the source to share knowledge, media richness of the communication channel, willingness of the recipient to acquire knowledge and the absorptive capacity of the recipient. Davenport and Prusak (1998) define knowledge sharing as process that involve exchanging knowledge between individuals and groups. Connelly and Kelloway (2003) define knowledge sharing as “a set of behaviors that involve the exchange of information or assistance to other. It is separate from information sharing, which typically involves management making information on the organization available to employees. Whereas knowledge sharing contains an element of reciprocity, information sharing can be unidirectional and unrequested”.

2.4 Knowledge Management Systems

The applications of technology to KM are manifold. As such, a new class of information systems applications called knowledge management systems (KMS) have emerged. Alavi and Leidner (2001) define knowledge management systems (KMS) as “a class of information systems applied to managing organizational knowledge. That is, they are IT-based systems developed to support and enhance the organizational

processes of knowledge creation, storage/retrieval, transfer and application”. Some of the examples of KMS include knowledge repositories, knowledge networks, directories of subject matter expertise, intranets including corporate portals, group ware and collaboration tools, desktop computer conferencing and so forth.

2.5 Factors Influencing Knowledge Sharing Behavior

Much of the literature on the factors influencing knowledge sharing behavior of knowledge workers has been conceptual (Kollock 1999; Markus 2001) or qualitative (Goodman and Darr 1998; Orlikowski 1993; Wasko and Faraj 2000) with some practitioner papers for anecdotal support (Alavi & Leidner, 2001; Davenport & Prusak, 1998, Haldin-Herrgard, 2000; Hinds & Pfeffer, 2003, Buckman, 1998). Other studies have employed either laboratory experiments (Constant et al. 1994) or questionnaire surveys (Bock, Zmud, Kim and Lee, 2005; Constant et al. 1996; Jarvenpaa and Staples 2000; Wasko et al., 2005; Kankanhalli et al., 2005). Collectively, these studies have identified a number of factors that are believed to influence knowledge sharing behaviors of individuals. They range from hard issues such as tools and technologies (Alavi & Leidner, 2001; O’Dell and Grayson, 1998; Haldin-Herrgard, 2000; Hall, 2001; Hlupic et al, 2002), to soft issues such as motivations and provision of incentives to encourage knowledge sharing (Bock et al.,2005; Ardichvili et al., 2003; Hall, 2001; Hinds and Pfeffer, 2003), organizational culture, personal values and self-identities (Jarvenpaa and Staples, 2001; Lee et al., 2003; Janz et al’s., 2003), national culture (Chow et al., 2000), trust (McDermott and O’Dell, 2001), care (von Krogh, 1998) organizational resources like time and space (Davenport & Prusak, 1998; Haldin-

Herrgard, 2000; Hinds and Pfeffer 2003; Leonard and Sensiper 1998) and access to knowledgeable people in the organization (Brown & Duguid, 2000).

Using theories of collective action, Wasko and Faraj (2005) examined why individuals in electronic networks of practice contribute knowledge to others, primarily strangers when the contributor does not have any immediate benefits and free-riders are able to acquire the same knowledge as everyone else. The study defined electronic networks of practice as computer-mediated discussion forums where individuals exchange ideas on problems of practice with others based on common interests. Researchers employed archival, network, survey and content analysis data to examine the knowledge sharing activities of members in an electronic network supporting a professional legal association. Consistent with the past research in electronic communities of practice, the results of their study indicate that individuals contribute their knowledge when they believe that participation enhances the professional reputation, when they have necessary expertise to share and when they become part of the structural network. An interesting finding of this study is that individuals contribute regardless of expectations of reciprocity or high levels of commitment to the network.

Bock, Zmud, Kim and Lee (2005) examined factors that are believed to influence individuals' knowledge-sharing intentions. Researchers drew upon the Theory of Reasoned Action (TRA) (Ajzen and Fishbein 1980) for the study's theoretical framework. To this framework, they have added extrinsic motivators, social psychological forces and organizational climate factors. Using field survey of 154 managers from 27 Korean organizations, the researchers found that the attitude towards

knowledge sharing along with the subjective norms and organizational climate influence individual's intention to engage in knowledge sharing behavior. Other findings of the study indicate that anticipated reciprocal relationships positively influence attitudes towards knowledge sharing while sense of self-worth and organizational climate influence subjective norms. A surprising finding of the study is that anticipated extrinsic rewards negatively influence the knowledge sharing behavior. One of the limitation of this study is that while researchers examined the individuals intention to share knowledge, they did not examine the actual knowledge-sharing behavior.

Connelly and Kelloway (2003) investigated a number of factors that impact employees perceptions of a knowledge sharing culture. The identified factors can be broadly categorized into groups: organizational factors and individual factors. Organizational factors include individuals' perceptions regarding management support for knowledge sharing, their perceptions about a positive social interaction culture, organization's size, and the presence of technology that can facilitate knowledge sharing. Individual factors include age, gender and organizational tenure. The research findings suggest perceptions about management's support for knowledge sharing, and perceptions of a positive social interaction culture to be significant predictors of a positive knowledge sharing culture. Organizational size was negatively related to positive knowledge sharing culture such that smaller organizations were linked more with positive knowledge sharing culture. Lastly, gender was found to be significant moderator such that female participants needed more positive social interaction culture

before they would perceive a knowledge sharing culture as positive in contrast to their male counterparts.

Constant, Keisler and Sproull (1994) studied the factors that support or constrain information sharing in technologically advanced organizations. The factors they looked into are work experience, computer experience, year of training and perceptions about organizational ownership of information. Using interdependence theory (Kelley & Thibaut, 1978), the researchers advanced a theory of information sharing. Researchers contend that information sharing behavior is affected by rational self-interest as well as the social and organizational context. The results of their laboratory studies indicate that attitudes about information sharing depend on the form of information. While sharing tangible information depend on pro-social attitudes and norms of organizational ownership, sharing expertise depends on people's own identity and self-expressive needs.

Jarvenpaa and Staples (2000) has extended Constant et al.,1994 work from information systems perspective. They studied the factors affecting the use of collaborative technologies such as electronic mail, World Wide Web, list serves, and other collaborative systems for sharing information in an organization. Drawing on Constant et al., 1994 research, the researchers theorize that perceptions of information culture, attitudes regarding information ownership and propensity to share, as well as task and personal factors influence people's use of collaborative media. Findings suggest that the significant predictors of individual's use of collaborative technology for

information sharing to be task characteristics, perceived information usefulness and the user's computer comfort.

Using Nonaka's model and adapting a process oriented perspective, Lee et al., (2003) developed an integrative research model that interconnects knowledge management enablers and processes with organizational performance. The findings of the empirical examination of the model suggest that collaboration, trust, learning and centralization affect knowledge creation and sharing process. Researchers emphasize the significance of trust based culture for effective knowledge creation and note that organizations may have difficulty building a knowledge creating environment due to the lack of adequate culture in spite of their well built IT.

The importance of culture for effective KM is also highlighted by Janz et al's., (2003) theoretical model which explains the relationships between knowledge related activities and organizational and individual characteristics that promote the creation and dissemination of knowledge through out organization. Researchers note that knowledge flow in an organization depends on the trust in the organization as a whole as well as the specific individuals and suggest that organizations provide a climate of trust built on culture that encourages and provides incentives for sharing knowledge in all its manifestations such as learning, mentoring, collaboration, sharing ideas and stories etc.

Chow, Deng and Ho (2000) studied how individual's openness in knowledge sharing is affected by the interaction between national culture and the two contextual factors: the nature of the available knowledge for sharing and the knowledge sharer's relationship to the potential recipient. The study investigated the impact of

individualism/collectivism, concern for face, Confucian dynamism, ingroup / outgroup attributes that researchers hypothesized would affect knowledge sharing. Researchers employed quantitative and open-ended questionnaires to two scenarios and collected data from 104 managers from United States (US) and 38 managers from People's Republic of China (PRC). Consistent with the culture-based expectation, the findings of the study indicate that when there is no conflict between self and collective interests, both the managers in the individualistic (US) and collectivistic (PRC) culture were equally willing to share knowledge. However, when there is a conflict, managers in the collectivistic culture (PRC) exhibited a higher propensity to share, thereby placing collective interests ahead of their own. Also consistent with the researchers prediction, managers in the collectivistic culture are significantly less inclined to share knowledge with the potential recipient who is not a member of the “ingroup”. One potential explanation the researchers offer for this behavior is that collectivist behaviors exist only to preserve group harmony. As such, group enhancing behaviors are only beneficial to the members of the group. On the other hand, individualistic cultures do not give much importance to group enhancing behavior. Consequently, group membership has less influence

Osterloh et al., (2000) assert that effective knowledge creation and transfer is closely related to the motivation management. They analyzed various organizational and motivational devices with respect to their suitability to generate and transfer knowledge. In doing so, they noted that certain organizational forms have the capacity

to crowd out intrinsic motivation and therefore are detrimental to the effective transfer of knowledge.

Markus (2001) emphasizes the role knowledge management systems and knowledge repositories play in increasing organizational effectiveness. The researcher developed a theory of knowledge reusability by synthesizing a wide variety of sources and identified four distinct knowledge reuse situations involving different types of reusers and reuse. The four types of knowledge reusers are: shared work producers, shared work practitioners, expertise seeking novices and secondary knowledge miners. Markus asserts that each type of knowledge reuser has different needs from knowledge repositories and therefore the successful reuse of knowledge is dependent upon the quality and content of repositories. To ensure successful reuse, Markus suggest that organizations should consider a number of factors such as who should author the repositories, how to provide incentives for valuable contributions and what role should the human and technical intermediaries play for managing repositories and facilitating their use. The researcher suggests that the knowledge distance between the knowledge reusers and knowledge producers determine how much and what kind of intervention is needed.

Kankanhalli, Tan and Wei (2005) investigated factors affecting electronic knowledge repositories (EKR) usage from the perspective of knowledge contributors. The research model draws on constructs from social exchange theory to account for cost and benefit factors associated with EKR usage and constructs from social capital theory to account for the influence of contextual factors such as generalized trust, pro-sharing

norms and identification. An interesting result of this study is that contextual factors (generalized trust, pro-sharing norms, and identification) moderate the impact of extrinsic benefits (reciprocity and organizational reward) on EKR usage by contributors but not the intrinsic benefits (knowledge self-efficacy and enjoyment in helping others). Another finding of this study is that loss of knowledge power and image does not impact EKR usage by knowledge contributors. A plausible explanation the researchers offer for this finding is that knowledge contribution may have been voluntary in the surveyed organizations.

CHAPTER 3

RESEARCH MODEL AND HYPOTHESIS

The focus of this chapter is to develop the research model and the hypothesis for examining the factors influencing knowledge sharing behaviors in organizational context. The current study adopts the theory of planned behavior as theoretical framework to model knowledge sharing behaviors in the organizational context. The theory of planned behavior (TPB) and the choice of using it as the framework to study knowledge sharing behaviors is discussed in the next section. Following this, research model is proposed and hypothesis developed.

3.1 Theory of Planned Behavior

The theory of planned behavior (TPB) of Ajzen (1991) is perhaps the most influential and the popular social-psychological model for explaining and predicting human behavior in specific contexts (Ajzen, 2001). TPB is an extension of the researcher's earlier work Theory of Reasoned Action (TRA) (Ajzen and Fishbein, 1980). The extension was a result of a finding that behavior appeared to be not 100% voluntary and under control. This resulted in the introduction of a new determinant, perceived behavioral control. With this introduction, the theory was named theory of planned behavior.

According to TPB, the primary determinants of an individual's behavioral action are intention (I) and perceived behavioral control (PBC). Intention is an indication of individual's readiness to engage in a behavior. Intention in turn is a function of individual's attitude towards a behavior (A), subjective norm (SN) and perceived behavioral control (PBC) with each determinant weighted for its significance in relation to the behavior and population in question. Attitude towards a behavior (A) is based on behavioral beliefs. Behavioral beliefs are beliefs about the expected consequences of a specified behavior and the favorable or unfavorable evaluation of these consequences. Subjective Norm (SN) is based on normative beliefs. Normative beliefs are beliefs about the perceived social pressure from important referent group to perform or not to perform a specified behavior. Normative beliefs together with the motivation to comply with these referent group expectations determine subjective norm. Perceived Behavioral Control (PBC) is based on control beliefs. Control beliefs are beliefs about the perceived presence or absence of factors that may facilitate or impede the performance of behavior in interest. Control beliefs together with the perceived power of each factor determine PBC. PBC boosts intention because individuals are not motivated to undertake tasks at which they fail. Additionally, PBC is also expected to influence actual behavior, especially, when there is an agreement between individual's perceptions of behavior control and the actual control. The greater one's belief that one possesses resources and opportunities, the fewer impediments one anticipates and as such has greater perceived control over the behavior. Figure 3.1 presents the components of the theory of planned behavior.

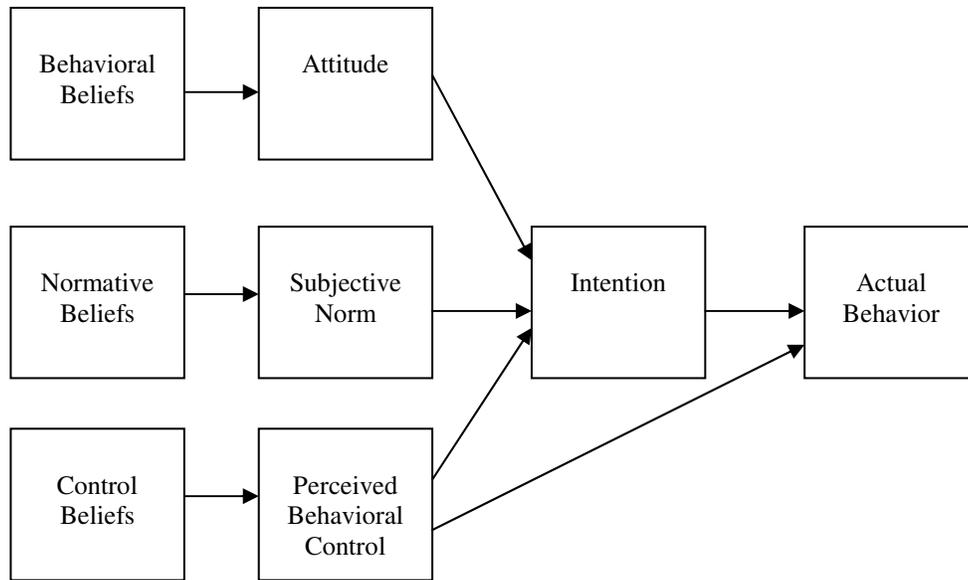


Figure 3.1 Components of Theory of Planned Behavior

TPB has been successfully used in empirical research to predict wide range of human behaviors. For example, Hrubes and Ajzen (2001) used it to predict hunting behaviors, Beck and Ajzen (2001) used it to predict dishonest actions, Astrom and Mwangsi (2000) used it to predict teachers intention to provide dietary counseling, Moan and Rise (2005) used it to predict students intention to quit smoking and Norman and Hoyle(2004) used to predict breast self-examination behavior. A number of studies in information systems have also used TPB to predict the usage of technology (Morris et al., 2005; George, 2004).

This research adopts the theory of planned behavior (TPB) as theoretical basis for explaining and predicting the motivational influences of individual knowledge

sharing behavior. TPB is chosen over TRA because TPB has occasionally explained the actual behavior better than TRA. For example, Ravis and Sheeran (2003) observe that intentions typically account for 19 to 38 percent variance in actual behavior (Ajzen, 1991; Armitage & Conner, 2001; Sheeran & Orbell, 1998) with attitude and subjective norm explaining between 33 to 50 percent variance in intention (Ajzen, 1991; Armitage & Conner, 2001; Sheeran & Taylor, 1997). With the addition of PBC construct, the accounted variance in intention increases by 5 to 12 percent (Ajzen, 1991; Armitage & Conner, 2001; Conner & Armitage, 1998; Sheeran & Taylor, 1997) and the accounted variance in actual behavior increases by 2 to 12 percent (Armitage & Conner, 2001; Godin & Kok, 1996). Moreover, the construct PBC includes concepts like time, resources, ability and opportunities to perform the behavior in interest. In determining knowledge sharing behavior, facilitating conditions such as time, ability, resources and opportunities are very important.

3.2 Research Model

The research model uses theory of planned behavior (TPB) as theoretical framework and supplements it with the constructs from economic exchange theory, social exchange theory, self determination theory and so forth to analyze the motivational factors that influence knowledge sharing behaviors of knowledge workers. Figure 3.2 presents the research model.

RESEARCH MODEL

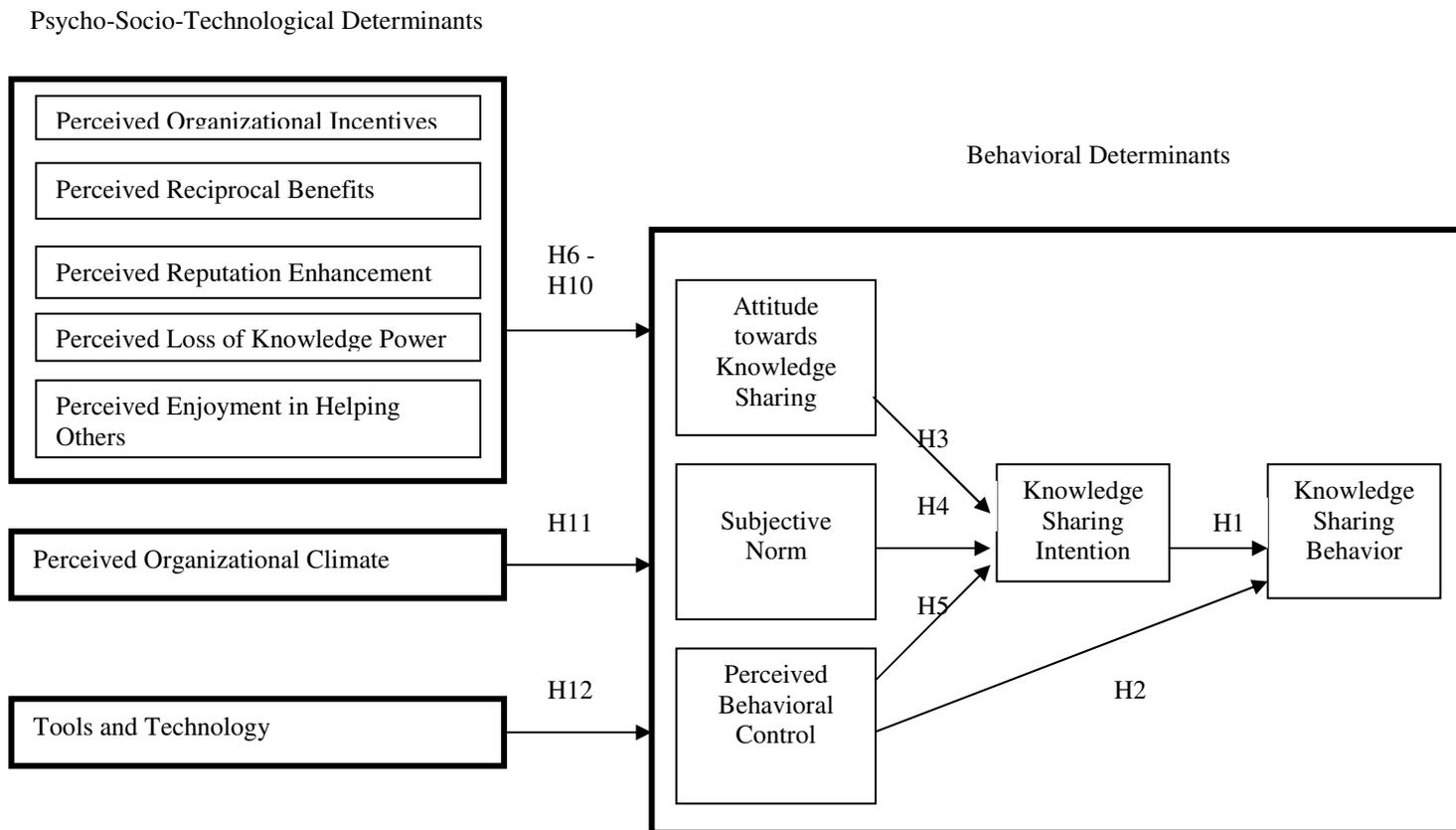


Figure 3.2 – Research Model

3.3 Research Hypothesis Development

To examine the research model, the following hypothesis are proposed.

3.3.1 Antecedents of Knowledge Sharing Behavior

Following TPB, knowledge sharing behavior of knowledge worker is theorized to be collectively determined by his/her intention towards knowledge sharing and his/her perceived behavioral control. Knowledge sharing behavior is the degree to which knowledge worker actually shares knowledge with other members of his/her organization. Intention measures knowledge worker's readiness to engage in knowledge sharing. Consistent with TPB, it is expected that favorable intention to share knowledge will lead to greater sharing of knowledge. Thus it is hypothesized that

H1 - A higher level of intention towards knowledge sharing will lead to greater sharing of knowledge.

Perceived behavioral control factors are dispositional factors that refer to the knowledge worker's beliefs about the perceived presence or absence of necessary resources and opportunities that may facilitate or impede knowledge sharing. PBC is expected to influence the knowledge sharing behaviors, especially, when there is an agreement between individual's perceptions of behavior control and the actual control. The greater the knowledge worker's belief that he/she possesses resources and opportunities, the fewer impediments he/she anticipates and as such has greater perceived control over the behavior. Thus it is hypothesized that

H2 - A higher level of behavioral control towards knowledge sharing will lead to greater sharing of knowledge.

3.3.2 Antecedents of Knowledge Sharing Intention

TPB suggests that behavioral intention is collectively determined by the individual's attitude, subjective norm and perceived behavioral control.

3.3.2.1 Attitude towards Knowledge Sharing

Attitude towards knowledge sharing is formed from behavioral beliefs and refers to the degree of positive/negative feelings an individual has towards the intention to share knowledge with other members of the organization. Higher attitudinal disposition towards knowledge sharing should increase knowledge sharing intention. Thus it is theorized that

H3- A more favorable attitude toward knowledge sharing will lead to greater intention to share knowledge.

3.3.2.2 Subjective Norm

According to TPB, subjective norm is formed from normative beliefs and refers to the individual's belief that important relevant others expect him/her to engage in behavior of interest. In the organizational context, these relevant others include executive board, senior management, supervisor and the peer group. Industry surveys suggest that senior management drive knowledge management efforts. Management has control over employee compensation policies, performance appraisal and career advancement. As such, it is only natural that employees would want to comply with the management expectations of engaging in knowledge sharing behavior. Similarly, peer group acceptance also has an important effect on one's professional experience. Previously published research has shown subjective norm to be an important antecedent

to behavioral intention (Bock, Zmud, Kim and Lee, 2005; Mathieson 1991; Taylor and Todd 1995; Thompson et al. 1991). Thus, it is proposed that employee's normative beliefs about the management and peer group expectations have a positive effect on his/her intention to share knowledge.

H4 - A higher level of subjective norm supportive of knowledge sharing will lead to greater intention to share knowledge.

3.3.2.3 Perceived Behavioral Control

Perceived behavioral control is formed from control beliefs and refers to the individual's beliefs about the perceived presence or absence of requisite resources and opportunities that may facilitate or impede knowledge sharing. The facilitating conditions for knowledge sharing include technical and non-technical supports such as the availability and ease of use of tools and technology, time, resources and so forth. TPB suggests that perceived behavioral control boosts intention because individuals are only motivated to undertake tasks at which they succeed. Taylor and Todd (1995) found perceived behavioral control to be a significant predictor of technology usage intentions. Thus it is theorized that

H5 - A higher level of behavioral control towards knowledge sharing will lead to greater intention to share knowledge.

3.3.3 Antecedents of Knowledge Sharing Attitude

Although knowledge sharing attitude is represented as having direct influence on the knowledge sharing intention in the research model, attitude indeed is formed from a collection of behavioral beliefs. Self-determination theory identifies the

motivational influences of these beliefs to be both autonomous and controlled. Autonomy means approving one's actions with highest reflexivity. Behavior is autonomous to the extent an individual experiences choice and acts with a sense of true volition because of the personal significance of the behavior. An example of autonomous motivation is intrinsic motivation. When knowledge workers engage in knowledge sharing voluntarily because they find it interesting, they are sharing the knowledge wholly volitionally. In contrast, behaviors are controlled to the extent individuals perceive a sense of pressure to perform them. An example of controlled motivation is extrinsic motivation. When individuals engage in knowledge sharing either because of the perceived pressure from the management or with the expectation of some incentives in return, their behavior is externally regulated and controlled. Prior research in knowledge sharing has identified extrinsic motivators to be organizational rewards, expectations of reciprocity, reputation and loss of knowledge power (Gomez-Mejia and Balkin, 1990; Malhotra and Galletta, 1999; Bock et al, 2005; Deluga, 1998; Major et al., 1995; Parkhe, 1993; Sparrowe and Linden, 1997; Wasko and Faraj, 2000; Yamagishi and Cook, 1993; Davenport and Prusak, 1998; Kankanhalli, 2005, Gray, 2001; Thibaut and Kelley, 1986; Orlikowski, 1993; Constant et al 1996; Kollock 1999) and intrinsic motivators to be pro-social behavior, altruism, enjoyment in helping others and community advancement (Wasko and Faraj 2000; Brockner, 1988; Gardner and Pierce, 1998; Gecas, 1989; Stajkovic and Luthans, 1998).

3.3.3.1 Perceived Organizational Incentives as an antecedent to Attitude towards Knowledge Sharing

Economic exchange theory posits that an individual is guided by his/her rational self interest. i.e an individual behaves after calculating the expected rewards and costs incurred by his or her behavior. Knowledge sharing involves costs for the participants. These costs may include time, energy, potential loss of ownership, power etc. Previously published studies highlight the importance of economic incentives and observe that individuals engage in knowledge sharing when they expect to receive economic benefits such as increased pay, bonuses, job security, career advancement etc for sharing knowledge (Ba et al, 2001; Beer and Nohria 2000; Hall, 2001; Davenport and Prusak, 1998; Jarvenpaa & Staples, 2000; Ruggles, 1998). Examples of economic incentives for encouraging individuals to share knowledge in organizations can also be seen at American Productivity Quality Center website – <http://www/apqc.org>. As such, it is theorized that knowledge sharing is most likely to occur when participants believe that rewards exceed costs. This leads to the sixth hypothesis

H6 – Perceived organizational incentives have a positive effect on the knowledge worker's attitude towards knowledge sharing

3.3.3.2 Perceived Reciprocal Benefits as an antecedent to Attitude towards Knowledge Sharing

Social exchange theory (Blau, 1964) describes human behavior in terms of social exchanges. Social exchanges differ from economic exchanges in that the value in the exchange behavior is not clearly defined. Some researchers contend that the value of social exchange lies in the maintenance of reputation, power and long-term

relationships for future reciprocal benefits. Reciprocity acts as a benefit because it results in feelings of personal obligation, gratitude and trust. Prior research suggests that individuals engage in knowledge sharing with the expectation that their future knowledge requests will be met by others (Connolly and Thom, 1990; Wasko & Faraj, 2000; Kankanhalli, Tan and Wei, 2005; Bock, Zmud, Kim and Lee, 2005). Connolly and Thom (1990) highlighted reciprocity to be significant motivator for contributing to the discretionary databases. Wasko and Faraj (2000) found that individuals engaging in knowledge sharing in electronic communities of practice believe in reciprocity. Bock & Kim (2002) have also noted the importance of reciprocity in the context of knowledge sharing. Similarly, Kankanhalli, Tan and Wei (2005)'s study indicates reciprocity to be a salient motivator for individual's knowledge contribution to electronic knowledge repositories, under conditions of weak pro-sharing norms. Bock, Zmud, Kim and Lee (2005) also found that anticipated reciprocal relationships influence individuals' attitudes toward knowledge sharing. Thus it is theorized that knowledge worker's belief that his/her future knowledge needs will be met by others in return for sharing knowledge is likely to have positive effect on attitudes towards knowledge sharing. This leads to the seventh hypothesis.

H7 – Perceived Reciprocal benefits have a positive effect on the knowledge worker's attitude towards knowledge sharing

3.3.3.3 Perceived Reputation Enhancement as an antecedent to Attitude towards Knowledge Sharing

Social exchange theory posits that social exchange engenders social rewards such as feelings of approval, status and respect. In today's knowledge economy,

expertise is highly valued. By showing their expertise to others, employees earn recognition and respect resulting in improved self-concept (Constant et al., 1994; Constant et al., 1996; Hall, 2001; Kankanhalli et al., 2005). O'Dell and Grayson(1998) suggest that employees share their best practices because of their desire to be recognized by experts and peers. Kollock (1999) found that employees with high technical knowledge have better status in the work place. Thus it is theorized that employee's belief that sharing knowledge will enhance his/her reputation and status in the profession is likely to be an important motivator for offering valuable advise to others.

H8 - Perceived reputation enhancement has a positive effect on the knowledge worker's attitude towards knowledge sharing

3.3.3.4 Perceived Loss of Knowledge Power as an antecedent to Attitude towards Knowledge Sharing

Prior research suggests that by sharing valuable knowledge, individuals give up ownership to that knowledge and thereby lose benefits stemming from it (Gray, 2001; Davenport and Prusak, 1998). This may put them in a precarious position of losing their value to the organization, making them more replaceable. The greater the individual's substitutability, the lower is his organizational power (Hickson et al., 1971; Mintzberg 1973; Pfeffer, 1992). As knowledge is considered as a source of power, individuals may fear losing the power, if that knowledge is transferred to others.(Davenport and Prusak, 1998; Gray, 2001; Thibault & Kelley, 1996). This suggests a negative relationship between loss of knowledge power and attitude towards knowledge sharing, thus leading to the fifth hypothesis

H9 – Perceived loss of knowledge power has a negative effect on the knowledge worker’s attitude towards knowledge sharing

3.3.3.5 Perceived Enjoyment in Helping Others as an antecedent to Attitude towards Knowledge Sharing

This construct is based on the concept of altruism. Altruism exists when people perform a behavior intending to benefit others without expecting anything in return. People help others because they draw intrinsic enjoyment from helping others (Davenport and Prusak, 1998; Krebs 1975; Smith 1981; Kankanhalli et al., 2005).

Individuals share knowledge because they believe helping others with challenging problems is interesting and because helping others makes them feel good (Kollock, 1999). Wasko and Faraj (2000) observe that individuals in electronic networks are intrinsically motivated to share knowledge with others because they derive enjoyment in helping others. Participants are motivated to share knowledge with others because they consider helping others and sharing knowledge “is the right thing to do”. People feel that they are morally obligated to share knowledge in order to contribute positively to the community advancement. By fulfilling their own altruistic and pro-social motives, people derive intrinsic enjoyment. Similar findings were also observed in studies by (Lakhani & von Hippel, 2000; Lerner & Triole, 2000; Ba et al, 2001; Constant et al. 1994; Constant et al. 1996). Therefore, the tenth hypothesis predicts the following:

H10 - Perceived enjoyment in helping others has a positive effect on the knowledge worker’s attitude towards knowledge sharing

3.3.4 Antecedents of Subjective Norm

3.3.4.1 Perceived Organizational Climate as an antecedent to Subjective Norm

Organizational climate is the shared values, norms, meanings, beliefs, myths and underlying assumptions within an organization. Organizational climate guides the employees behavior by conveying to them what behavior is appropriate and desirable. Subjective norms are formed when employees internalize and evaluate organizational values and norms. The effects of organizational climate on knowledge sharing has been widely studied (Constant et al. 1996; Huber 2001; Orlikowski 1993; Buckman, 1998; McDermott & O'Dell, 2001; Bock et al., 2005; Connelly and Kelloway, 2003). The general consensus among these researchers is that organizational climate is a critical driver of knowledge sharing and that some climates are more conducive to knowledge sharing than others. Some of the salient aspects of climates that are conducive to knowledge sharing were identified as embracement of pro-social norms, focus on learning, tolerance for mistakes, high trustworthiness, identification with the interests of the organization and so forth (Hinds and Pfeffer 2003; Dixon 2000; Jarvenpaa and Staples 2000; Leonard and Sensiper 1998; Constant et al. 1994, 1996; Wasko and Faraj 2000). Jarvenpaa & Staples (2001) identified the formal cultural dimensions that are supportive of knowledge sharing as solidarity, sociability, employee-oriented, need for achievement and collectivism. Bock, Zmud, Kim and Lee (2005) categorized cultural dimensions to be fairness, innovativeness, and affiliation. Fairness is the perception that organizational practices are just. Fairness builds trust among the employees and of the organization and motivates employees to exert pro-social behavior in sharing

knowledge. Innovativeness is the perception that creativity and learning are highly valued and mistakes are tolerated. Affiliation is the perception that togetherness exists among the employees of the organization. Affiliation induces the caring and pro-social behavior, necessary for motivating employees to help each other. Ajzen and Fishbein (1980) contend that external factors such as organizational climate can influence the subjective norm of individuals by cueing to them the desirable behavior that is expected of them. This leads to the eleventh hypothesis.

H11 - A higher level of perceived organizational climate characterized by fairness, innovativeness and affiliation will lead to greater subjective norm to share knowledge.

3.3.5 Antecedents of Perceived Behavioral Control

3.3.5.1 Tools and Technology as an antecedent to Perceived behavioral Control

Information and communication technologies in the form of knowledge management systems (KMS) facilitate collaborative work and enable knowledge sharing, but only if they are actually used. Previous research in information systems suggests that individuals act in accordance to their beliefs about the availability and ease of use of the systems. So it is hypothesized that tools and technology that are perceived to be highly available and ease to use positively influence knowledge workers perceived behavioral control towards knowledge sharing.

H12 - Tools and Technology have a positive effect on knowledge worker's perceived behavioral control towards knowledge sharing.

CHAPTER 4

SURVEY INSTRUMENT DEVELOPMENT

A comprehensive survey instrument was constructed to measure the constructs in the research model. A copy of the survey instrument can be found in Appendix B. The measures for each construct along with the survey introduction are discussed in detail next.

4.1 Survey Introduction

The cover letter as well as the research participation information form were specifically designed for this study to inform the participants the purpose of the survey and the participants rights as research subjects. The research participation form notifies the participants that the participation in the survey is completely voluntary and anonymous and provides the assurance that the data will be treated with strictest confidentiality. A copy of the research participation form is attached as Appendix A.

To ensure the correct comprehension of the terminology used and to level the participants understanding of the concept knowledge, an explanation for three different types of knowledge was provided at the beginning of the survey instrument. The concept knowledge was clarified as including know-why (understanding cause and effect relationships), Know-how (skill and procedures), and know-what (important factual information that does not change quickly).

4.2 Construct Measures

The measures used to operationalize constructs were generated based upon previously validated instruments (Ajzen, 1991; Bock et al, 2005; Taylor and Todd, 1995; Wasko and Faraj, 2005; Teigland and Wasko, 2003; Kankanhalli et al., 2005; Lee, 2001, Ryu et al., 2003). The scale used to measure each construct had a number of items, including some reverse items and was based on a 7 point likert scale. Multiple items and reverse items were used in order to improve the reliability and validity. The operational measures of each construct are discussed next.

4.2.1 Knowledge Sharing Behavior

A seven item scale was constructed to assess knowledge sharing behavior. Items used to measure knowledge sharing behavior were developed based upon Lee (2001), Teigland and Wasko (2003) and Bock et al (2005) studies. The internal reliabilities reported by Lee (2001) are 0.901 for the explicit knowledge sharing scale and 0.758 for implicit knowledge sharing scale. Bock et al., (2005) studied individuals intention to share knowledge and reported reliability coefficients 0.92 for intention to share explicit knowledge scale and 0.93 for intention to share implicit knowledge scale. The measures generated based on Bock et al.,(2005) intention to share knowledge scale were adjusted to reflect actual knowledge sharing behavior in this research. The items measured how frequently respondents shared work-related knowledge with their coworkers in the past year. Responses were documented on a 7 point Likert scale with anchors on 1 “Very

Infrequently” to 4 “Moderate Frequency (Few Times per month)” to 7 “Very Frequently (Many times daily)”.

Table 4.1 Knowledge Sharing Behavior Scale Items

	Survey Items
AKS1	I shared factual knowledge (know-what) from work with my co-workers.
AKS2	I shared business knowledge about the customers, products, suppliers and competitors with my co-workers.
AKS3	I shared internal reports and other official documents with my co-workers.
AKS4	I shared work experiences with my co-workers.
AKS5	I shared know-how or tricks of the trade from work with my co-workers.
AKS6	I shared expertise from education or training with my co-workers.
AKS7	I shared know-why knowledge from work with my co-workers

4.2.2 Knowledge Sharing Intention

The measures for the intention towards knowledge sharing behavior were adapted from Bock et al., (2005) study. The researchers reported reliability coefficients 0.92 for intention to share explicit knowledge scale and 0.93 for intention to share implicit knowledge scale providing indication that the measures are valid and reliable. The questionnaire items measured the respondents perceptions of the degree to which they believed that they will engage in knowledge sharing act. Responses were documented along a 7 point Likert scale ranging from 1 “Strongly Disagree” to 7 “Strongly Agree”

Table 4.2 Knowledge Sharing Intention Scale Items

	Survey Items
INT1	If given opportunity, I would share factual knowledge (know-what) from work with my co-workers.

Table 4.2 *Continued.*

INT2	If given opportunity, I would share business knowledge about the customers, products, suppliers and competitors with my co-workers.
INT3	If given opportunity, I would share internal reports and other official documents with my co-workers.
INT4	If given opportunity, I would share work experiences with my co-workers.
INT5	If given opportunity, I would share know-how or tricks of the trade from work with my co-workers.
INT6	If given opportunity, I would share expertise from education or training with my co-workers.
INT7	If given opportunity, I would share know-why knowledge from work with my co-workers

4.2.3 Knowledge Sharing Attitude

The scale measuring the attitude towards knowledge sharing had five items and was derived from Morris et al.,(2005) and Bock et al.,(2005) studies. The internal reliability reported by Morris et al.,(2005) was 0.85, while the internal reliability reported by Bock et al.,(2005) was 0.91. These reliabilities exceed the recommended level of 0.70 suggesting that the measures are valid and reliable. The questionnaire items measured the respondents perceptions of the degree to which they had positive or negative feelings towards knowledge sharing. Responses were recorded using 7 point Likert scale with anchors on 1 “Strongly Disagree” to 7 “Strongly Agree”.

Table 4.3 Knowledge Sharing Attitude Scale Items

	Survey Items
ATK1	To me, sharing knowledge with my co-workers is harmful.
ATK2	To me, sharing knowledge with my co-workers is good.
ATK3	To me, sharing knowledge with my co-workers is pleasant.
ATK4	To me, sharing knowledge with my co-workers is worthless.
ATK5	To me, sharing knowledge with my co-workers is wise.

4.2.4 Subjective Norm

Subjective norm was measured using five items adapted from Bock et al., (2005) study. Bock et al.,(2005) scale measured normative beliefs about knowledge sharing and reported composite reliability at 0.82. The items measured the respondents perceptions of the degree to which they believed that people (management and peer group) who bear pressure on their actions expected them to engage in knowledge sharing behavior multiplied by the degree of compliance with these people bearings. Responses were documented on a 7 point Likert scale with anchors on 1 “Strongly Disagree” to 7 “Strongly Agree”.

Table 4.4 Subjective Norm Scale Items

	Survey Items
SNK1	My CEO thinks that I should share knowledge with my co-workers.
SNK2	My boss thinks that I should share knowledge with my co-workers.
SNK3	My colleagues think I should share knowledge with my co-workers.
SNK4	Generally speaking, I try to follow the CEO's policy and intention.
SNK5	Generally speaking, I accept and carry out my boss's decision even though it is different from mine.

4.2.5 Perceived Behavioral Control

The operational measures for perceived behavioral control were generated based on the validated scales developed by Taylor and Todd (1995). Taylor and Todd (1995) reported reliability at 0.70. The questionnaire items were adjusted to reflect knowledge sharing behavior. The items measured the respondents perceptions of the degree to which they believed that it is easy or difficult to engage in the knowledge sharing

behavior. Responses were recorded using 7 point Likert scale with anchors on 1 “Strongly Disagree” to 7 “Strongly Agree”.

Table 4.5 Perceived Behavioral Control Scale Items

	Survey Items
PBK1	I have enough time available to share knowledge with my co-workers.
PBK2	I have the necessary tools to share knowledge with my co-workers.
PBK3	I have the ability to share knowledge with my co-workers.
PBK4	Sharing knowledge with my co-workers is within my control.
PBK5	I am able to share knowledge with my co-workers easily.
PBK6	Even if I wanted to share, I do not have the means to share knowledge.

4.2.6 Perceived Organizational Incentives

The measures for perceived organizational incentives were adapted from Kankanhalli et al.,(2005) study. The reliability reported by the researchers was 0.96. The five items measured the respondents perceptions of the degree to which they believed that they would receive organizational incentives for engaging in the knowledge sharing behavior. Responses were documented along a 7 point Likert scale ranging from 1 “Strongly Disagree” to 7 “Strongly Agree”

Table 4.6 Perceived Organizational Incentives Scale Items

	Survey Items
POI1	Sharing knowledge with my co-workers improves the likelihood of getting a better work assignment for me.
POI2	Sharing knowledge with my co-workers improves the likelihood of getting a promotion for me.
POI3	Sharing knowledge with my co-workers improves the likelihood of getting a higher salary for me.
POI4	Sharing knowledge with my co-workers improves the likelihood of getting a bonus for me.
POI5	I expect to get more job security when I share knowledge with my co-workers.

4.2.7 Perceived Reciprocal Benefits

The scale for measuring perceived reciprocal benefits was derived from the validated scales developed by Kankanhalli et al., (2005) and Wasko and Faraj (2005) studies. Kankanhalli et al.,(2005) studied the usage of electronic knowledge repositories to share knowledge and reported cronbach's alpha 0.85. Wasko and Faraj (2005) studied knowledge sharing behavior in electronic networks and reported composite reliability .90. Both these reliabilities exceed the recommended level of 0.70 providing a good indication that the operational measures used for reciprocal benefits are valid and reliable. The three questionnaire items for this subscale measured the respondents perceptions of the degree to which they believed that sharing knowledge with coworkers would lead to their future requests for knowledge being answered. Responses were recorded using a 7 point Likert scale ranging from 1 "Strongly Disagree" to 7 "Strongly Agree"

Table 4.7 Perceived Reciprocal Benefits Scale Items

	Survey Items
PRB1	When I share knowledge with my co-workers, I expect them to respond to my knowledge needs.
PRB2	When I share knowledge with my co-workers, I believe that my queries for knowledge will be answered in the future.
PRB3	I know that my co-workers help me, so it is only fair to help them out when they are in need of knowledge.

4.2.8 Perceived Reputation Enhancement

The questionnaire items for assessing perceived reputation enhancement were generated based on the validated instrument developed by Kankanhalli et al.,(2005) and Wasko and Faraj (2005). Kankanhalli et al.,(2005) reported composite reliability 0.89 while Wasko and Faraj (2005) reported composite reliability 0.91 suggesting that these are valid measures. The six questionnaire items measured the respondents perceptions of the degree to which they believed that sharing knowledge with coworkers would improve their reputation in the organization. Responses were documented on a 7 point Likert scale with anchors on 1 “Strongly Disagree” to 7 “Strongly Agree”

Table 4.8 Perceived Reputation Enhancement Scale Items

	Survey Items
PRE1	My co-workers respect me, when I share knowledge with them.
PRE2	Sharing knowledge with my co-workers improves others recognition of me.
PRE3	My superiors praise me when I share knowledge with my co-workers.
PRE4	I believe my status in the organization improves, when I share knowledge with my co-workers.
PRE5	Organizational members who share knowledge with others have more prestige.
PRE6	I share my knowledge to improve my reputation in the organization.

4.2.9 Perceived Loss of Knowledge Power

The measures for perceived loss of knowledge power were adapted from Kankanhalli et al.,(2005) study. The reliability reported by the researchers was 0.95. The four questionnaire items measured the respondents perceptions of the degree to which they believed that they would lose power and unique value in the organization for

sharing knowledge with their coworkers. Responses were documented along a 7 point Likert scale ranging from 1 “Strongly Disagree” to 7 “Strongly Agree”.

Table 4.9 Perceived Loss of Knowledge Power Scale Items

	Survey Items
PLK1	Sharing knowledge with my co-workers makes me lose my unique value in the organization.
PLK2	Sharing knowledge with my co-workers makes me lose my power base in the organization.
PLK3	When I share knowledge with my co-workers, I believe I will lose my knowledge that no one else has.
PLK4	Sharing knowledge with my co-workers makes me lose my knowledge that makes me stand out with respect to others.

4.2.10 Perceived Enjoyment in Helping Others

The scale for measuring perceived enjoyment in helping others was adapted from the validated scales developed by Kankanhalli et al.,(2005) and Wasko and Faraj (2005). The composite reliabilities reported by Kankanhalli et al.,(2005) and Wasko and Faraj (2005) are 0.96 and 0.88 respectively. These reliabilities exceed recommended level of 0.70 indicating that the measures are valid. The four questionnaire items measured the respondents perceptions of the degree to which they believed that they would derive pleasure from helping co-workers with their knowledge needs. Responses were recorded using a 7 point Likert scale ranging from 1 “Strongly Disagree” to 7 “Strongly Agree”.

Table 4.10 Perceived Enjoyment in Helping Others Scale Items

	Survey Items
PEH1	I enjoy sharing knowledge with my co-workers.
PEH2	I enjoy helping my coworkers by sharing knowledge.

Table 4.10 *Continued.*

PEH3	It feels good to help my co-workers solve their work related problems.
PEH4	Sharing knowledge with my co-workers gives me pleasure.

4.2.11 *Perceived Organizational Climate*

The questionnaire items for perceived organizational climate were adapted from the validated instrument developed by Bock et al., (2005) and were measured in terms of affiliation, innovativeness and fairness. Bock et al., (2005) define affiliation as “perception of togetherness”, innovativeness as “the perception that change and creativity are encouraged, including risk-taking in new areas where one has little or no prior experience” and fairness as “the perception that organizational practices are equitable and non-arbitrary or capricious”. The reliabilities reported by researchers were 0.89 for affiliation, 0.87 for innovativeness and 0.87 for fairness. Responses for these questionnaire items were documented using a 7 point Likert scale ranging from 1 “Strongly Disagree” to 7 “Strongly Agree”.

Table 4.11 Affiliation Scale Items

	Survey Items
AFN1	Members in our department keep close ties with each other.
AFN2	Members in our department consider other members standpoint highly.
AFN3	Members in our department have a strong feeling of one team.
AFN4	Members in our department cooperate well with each other.

Table 4.12 Innovativeness Scale Items

	Survey Items
INO1	Our department encourages suggesting ideas for new opportunities.
INO2	Our department puts much value on taking risks even if that turns out to be a failure.
INO3	Our department encourages finding new methods to perform a task.

Table 4.13 Fairness Scale Items

	Survey Items
FAI1	Members in our department can trust department head's judgment to be good.
FAI2	In our department, objectives which are given to us are reasonable.
FAI3	In our department, our boss doesn't show favoritism to anyone.

4.2.12 Tools and Technology

The measures for facilitating tools and technology were adapted from the Knowledge Management Questionnaire developed by Teng and Song of Information Systems Department at University of Texas at Arlington. Teng and Song's scale for tools and technology was derived from DeLone and McLean's (2003) study. Two sets of questionnaire items were used. The first set of questionnaire items measured the respondents usage of tools and technology to share knowledge with co-workers. Responses were recorded along a seven point frequency of usage scale ranging from 1 "Very Infrequently" to 4 "Moderate Frequency(Few times per month)" to 7 "Very Frequently(Many times daily)". Table 4.14 lists the questionnaire items.

Table 4.14 Usage of Tools and Technology Scale Items

	Survey Items
UTT1	I use e-mail to share knowledge with my co-workers.
UTT2	I use discussion forum (using tools like electronic bulletin board, chat room etc) to share knowledge with my co-workers.
UTT3	I use desktop computer conferencing(using networked PC simultaneously for discussion and information exchange with tools such as net meeting, instant messaging, etc) to share knowledge with my co-workers.
UTT4	I share knowledge by inputting it into knowledge repository/company databases (containing existing expertise, lessons learned, best practices etc).
UTT5	I use intranet (including corporate portal) to share knowledge with my co-workers.
UTT6	I use computerized directory on experts with specific knowledge to locate the expertise that my co-workers need.
UTT7	I use videoconferencing to share knowledge with my co-workers.
UTT8	I use teleconferencing to share knowledge my co-workers.
UTT9	I share knowledge through face-to-face discussions with my co-workers

The second set of questionnaire items measured the respondents perceptions of the degree to which they believed that the facilitating tools and technology for sharing knowledge are available and are easy to use. Responses were documented on a 7 point Likert scale with anchors on 1 “Strongly Disagree” to 7 “Strongly Agree”. The questionnaire items for this set of subscale are listed in table 4.15

Table 4.15 Tools and Technology Scale Items

	Survey Items
FTT1	Whenever I want to share knowledge, I can easily access tools and technology in our organization.
FTT2	In our organization, it is easy to use tools and technology to share knowledge.
FTT3	In our organization, tools and technology for sharing knowledge is reliable.
FTT4	Tools and technology for sharing knowledge is available when it is needed.
FTT5	Tools and technology for sharing knowledge can be customized to fit individual needs.

Table 4.15 *Continued.*

FTT6	I am satisfied with the overall quality of tools and technology for sharing knowledge in our organization.
FTT7	Tools and technology for sharing knowledge is intimidating to me.
FTT8	I hesitate to use tools and technology to share knowledge for fear of making mistakes.

4.2.13 Demographic Information

This section of the survey contained a series of questions related to the demographics of the respondents. Demographic information such as gender, age, education, organizational tenure, industry, job title, organization size were collected for supplementary analysis.

4.3 Survey Instrument Reliability

A summary of the of the constructs along with their related literature and reliabilities is shown in table 4.16. The reliabilities shown were reported by the individual researchers in their papers. As can be seen, the reliabilities exceed the recommended value of 0.70, providing support for the validity of the measures used in the research.

Table 4.16 Survey Instrument Reliability

Construct	Source	Composite Reliability / Chronbach's Alpha
Knowledge Sharing Behavior	Based-upon Lee(2001); Bock et al., (2005)	0.90 (Explicit)
		0.75 (Implicit)
		0.92 (Explicit)
		0.93 (Implicit)
Knowledge Sharing Intention	Adapted from Bock et al.,(2005)	0.92 (Explicit) 0.93 (Implicit)

Table 4.16 *Continued.*

Knowledge Sharing Attitude	Based-upon Morris et al.,(2005)	0.85
	Bock et al.,(2005)	0.91
Subjective Norm	Adapted from Bock et al.,(2005)	0.82
Perceived Behavioral Control	Adapted from Taylor and Todd(1995)	0.70
Perceived Organizational Incentives	Adapted from Kankanhalli et al(2005)	0.96
Perceived Reciprocal Benefits	Adapted from Kankanhalli et al(2005) ;	0.85
	Wasko and Faraj (2005)	0.90
Perceived Reputation Enhancement	Adapted from Kankanhalli et al(2005) ;	0.89
	Wasko and Faraj (2005)	0.91
Perceived Loss of Knowledge Power	Kankanhalli et al.,(2005) ;	0.95
Perceived Enjoyment in Helping Others	Adapted from Kankanhalli et al(2005) ;	0.96
	Wasko and Faraj (2005)	0.88
Affiliation	Adapted from Bock et al.,(2005)	0.89
Innovativeness	Adapted from Bock et al.,(2005)	0.87
Fairness	Adapted from Bock et al.,(2005)	0.87
Tools and Technology	Based-upon Teng and Song (2005)	

4.4 Pilot Test

As stated earlier, the survey instrument was developed based on the previously validated scales. A pilot test was conducted to validate the survey instrument using a group of faculty and the Ph.D students. Participants thoroughly examined the item wording, applicability, readability, understandability, operationability and content validity. Participants recommendations were evaluated and changes were integrated into

the survey instrument. The refined survey instrument was assessed once again using 30 cohort MBA students with extensive work experience. The completed responses were analyzed to ensure that the survey instrument is measuring the constructs of interest and that the item wording is clear and unambiguous. The final survey instrument was given to the dissertation chairs for their approval. The approved survey instrument is attached as Appendix B.

4.5 Approval for the Research

The training and the paper work required to comply with the state and federal law requirements for conducting research on human subjects was completed, and the permission to conduct the research study was obtained from Institutional Review Board (IRB), the office of Research Compliance at the University of Texas at Arlington.

CHAPTER 5

DATA ANALYSIS AND RESULTS

This chapter discusses the results from the data analysis. First, the demographic characteristics of the survey respondents is presented. Second, the tools and technology used by the respondents to share knowledge is reported. Third, the selection of the data analytical technique is discussed. Fourth, the results from the assessment of measurement model are reported. Fifth, the results from the assessment of structural model and tests of hypothesis are analyzed.

5.1 Sample Respondent Characteristics

A field study using survey methodology was used to collect data for empirically examining the research model and the hypothesis. Full-time employees enrolled in MBA and senior level classes in the college of business at UTA were surveyed. A total of 213 individuals participated in the survey. Of these 213 completed surveys, 12 responses were discarded because the respondents position title failed to qualify them as knowledge workers. Although, all workers use knowledge to some extent, Peter Drucker (1959) contends that knowledge workers are different from production workers. The researcher observes that knowledge worker is anyone who works for living at the tasks that primarily deal with information or require developing and using knowledge to solve problems. Examples of knowledge workers include scientists,

managers, academicians, doctors, lawyers, software developers and so forth. Kelloway and Barling(2000) also note that knowledge work primarily “comprise the creation of knowledge, the application of knowledge, the transmission of knowledge and the acquisition of knowledge”.

According to these definitions, 12 survey respondents failed to qualify as knowledge workers. The discarded respondents reported position titles such as meat clerk, bartender, cashier, teller, intern, graduate assistant and so forth. Another 21 responses were also removed from the sample because the respondents did not indicate their job title. Since the focus of this study was knowledge work, every effort was made to ascertain that the respondents are knowledge workers in order to strengthen the validity of the research.

As a result of the elimination, the final sample consisted of 180 respondents. The key characteristics of these respondents are summarized in Table 5.1. A series of histograms are also presented to provide a graphical representation of the findings in each of the demographic categories. The categories shown are gender, age, position, organizational tenure, education, organization size and industry type.

Table 5.1 Profile of Respondents

Measure	Item	Frequency	Percent
Gender	Male	99	55.00
	Female	81	45.00
Age	18-21	1	0.56
	21-30	97	53.89
	31-40	57	31.67
	41-50	18	10.00
	51-60	6	3.33
	> 60	1	0.56
Position	Professional	111	61.67
	Advanced Professional	29	16.11
	Management	20	11.11
	Executive	20	11.11
Organizational Tenure	0-2	69	38.33
	3-5	54	30.00
	5-10	43	23.89
	11-20	11	6.11
	21-30	2	1.11
	> 30	1	0.56
Education	High School	7	3.89
	Associate	19	10.56
	Bachelor	98	54.44
	Masters	50	27.78
	Doctorate	2	1.11
	Other – Some college	4	2.22
Organization Size	< 50	33	18.44
	51-200	40	22.35
	201-500	20	11.17
	>500	86	48.04

Of the 180 respondents, 99(55%) were males and 81(45%) were females. The gender distribution is shown in figure 5.1.

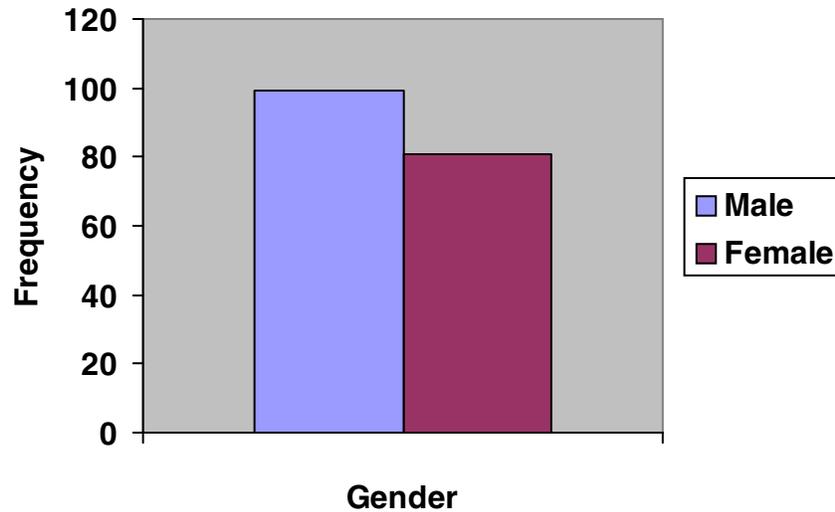


Figure 5.1 Gender

The respondent ages ranged from approximately 18 years to 65 years and above. 0.56 % were between the ages of 18 and 20; 53.89% were between ages of 21 and 30; 31.67% were between ages of 31-40; 10% were between ages of 41-50; 3.33% were between ages of 51-60 and 0.56% were above 60 years. Examination of age category indicates that the sample has slightly younger respondents. Figure 5.2 shows a graphical depiction of the respondent age category distribution.

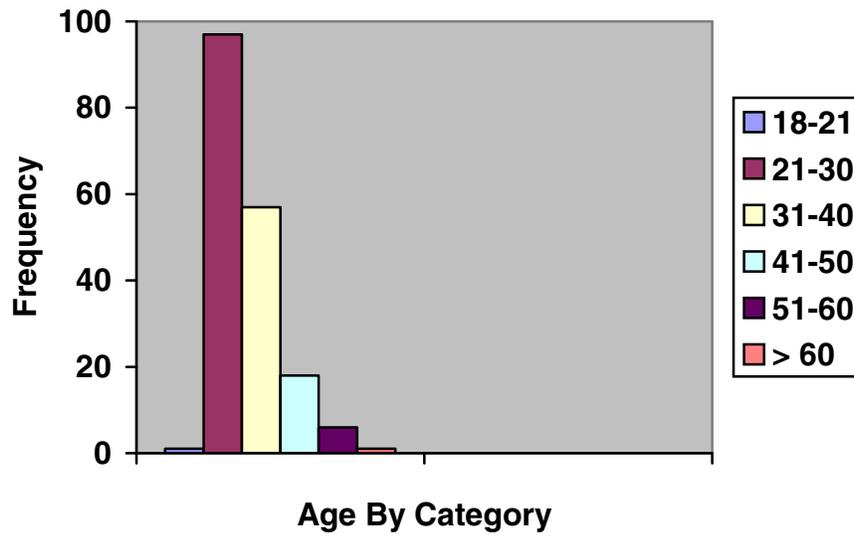


Figure 5.2 Respondents Age by Category

The majority of the respondents are well-educated and have university degrees. 54.44% individuals had a bachelors degree, 27.78% had a masters degree, 1.11% had doctoral degree with the rest having some college, associate or high school education. Figure 5.3 below provides a graphical representation of the distribution of respondents education category.

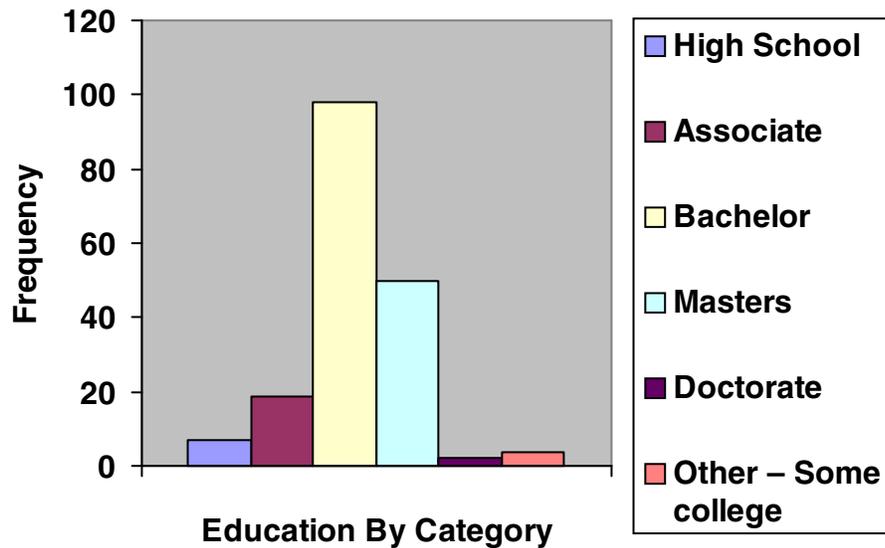


Figure 5.3 Respondents Education by Category

The respondents reported a wide range of position titles. Some of these include vice-president, director, executive, manager, analyst, engineer, scientist, project manager, assistant project manager, senior accountant, consultant dietician, photography consultant, research learning specialist, systems developer, team lead, controller, financial analyst, database analyst, programmer, web developer, business process analyst, clinical laboratory specialist, systems integration specialist, HR generalist, recruiter, coordinator and so on. In total, more than 50 unique position titles were reported.

To simplify reporting, these position titles were grouped into four categories: professional, advanced professional, management, executive. Position titles such as analyst, engineer, programmer, technician, accountant etc were grouped under professional category. Scientist, specialist, team lead and any other senior positions

were grouped under advanced professional category. Similarly, managers were grouped under management category and position titles such as director, vice president etc were grouped under executive category. The analysis of the respondent positions indicate that 61.67% of the respondents are professionals and 16.11% are advanced professionals. Both the management and executive categories accounted for 22.22% of the total respondents. Figure 5.4 provides a graphical representation of the distribution of respondents in position category.

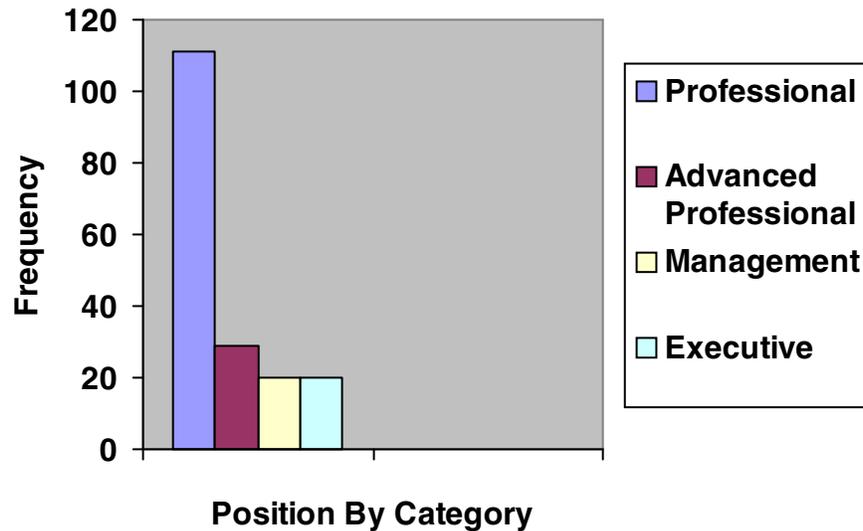


Figure 5.4 Respondents Position by Category

The organization tenure of the respondents ranged from less than 2 years to over 30 years. 38.33% had been with the organization for 2 years or less, 30% for 3 to 5 years, 23.89% for 5 to 10 years, 6.11% for 11 to 20 years, 1.11% for 21 to 30 years and 0.56% over 30 years. Figure 5.5 shows respondents distribution for the organizational tenure category.

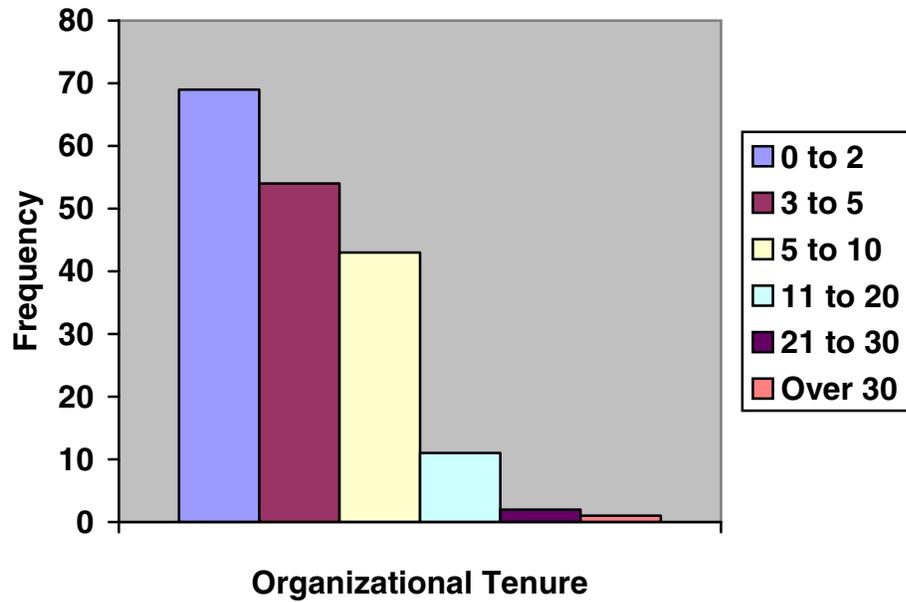


Figure 5.5 Respondents Organizational Tenure

The respondent organizations within these industries also varied in size with 18.44% accounting for 50 or less employees, 22.35% for 51 to 200, 11.17% for 201 to 500 and 48.04% for above 500 employees. Figure 5.6 shows the distribution of organizations by size.

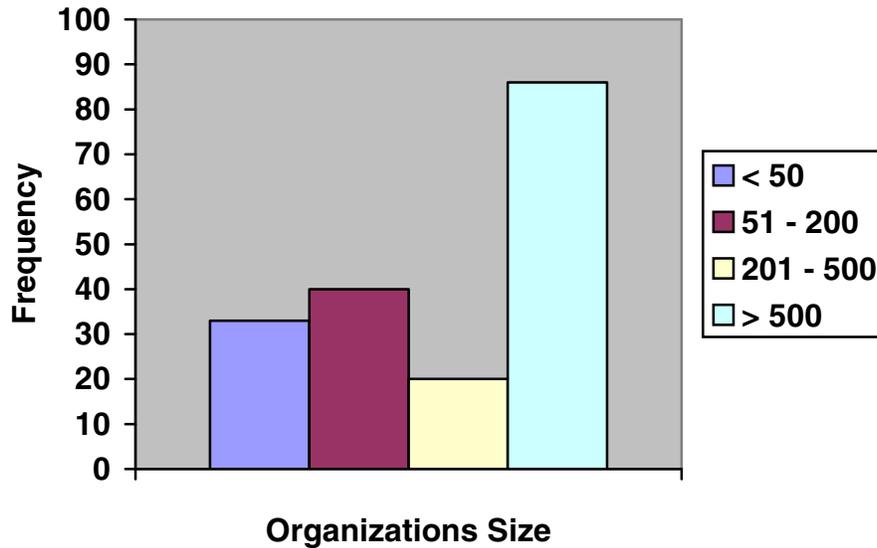


Figure 5.6 Organizations By Size

The respondents represented diverse industries. The type of industries represented within the sample included manufacturing (13.97%), IT/telecommunications (12.85%), banking/insurance/financial service (11.73%), consulting/business Service (6.15%), health care (13.41%), hotel/entertainment/service industry (5.59%), constructions/architecture/engineering (6.70%), government, including military (3.91%), education (3.91%), transportation (3.35%), retail (7.26%) and others(11.17%). Table 5.2 provides a summary of the respondents from each industry.

Table 5.2 Industry Type

Industry Type	Number of Responses	Percent
Manufacturing	25	13.97
IT/Telecommunications	23	12.85
Banking/Insurance/Financial Service	21	11.73
Consulting/Business Service	11	6.15
Health Care	24	13.41
Hotel/Entertainment/Service Industry	10	5.59
Constructions/Architecture/Engineering	12	6.70
Government, including Military	7	3.91
Education	7	3.91
Transportation	6	3.35
Retail	13	7.26
Others	20	11.17

Overall, the respondent distributions for each of the demographic categories indicate that the respondents are fairly representative of general population.

5.2 Respondent Utilization of Tools and Technology to Share Knowledge

Respondents usage of tools and technology to share knowledge with coworkers was measured in terms of e-mail, discussion forum (using tools like electronic bulletin board, chat room etc), desktop computer conferencing, knowledge repository/company databases (containing existing expertise, lessons learned, best practices etc), intranet (including corporate portal), computerized directory on experts, videoconferencing, teleconferencing and so forth. Responses were recorded along a seven point frequency of usage scale ranging from 1 “Very Infrequently” to 4 “Moderate Frequency(Few times per month)” to 7 “Very Frequently(Many times daily)”. The means and standard deviations for the usage of various tools and technologies is reported in Table 5.3.

Table 5.3 Usage of Tools and Technology to Share Knowledge

Tools and Technology	Mean	S.D
E-mail	5.08	1.99
Discussion forum	2.83	1.91
Desktop computer conferencing	2.83	2.03
Knowledge repository/company databases	3.14	2.14
Intranet (including corporate portal)	3.34	2.14
Computerized directory on experts	2.91	2.05
Videoconference	1.86	1.42
Teleconference	2.92	2.07
Face to Face discussions	6.12	1.24

A series of histograms below provide a graphical representation of respondents usage of various tools and technologies to share knowledge with coworkers.

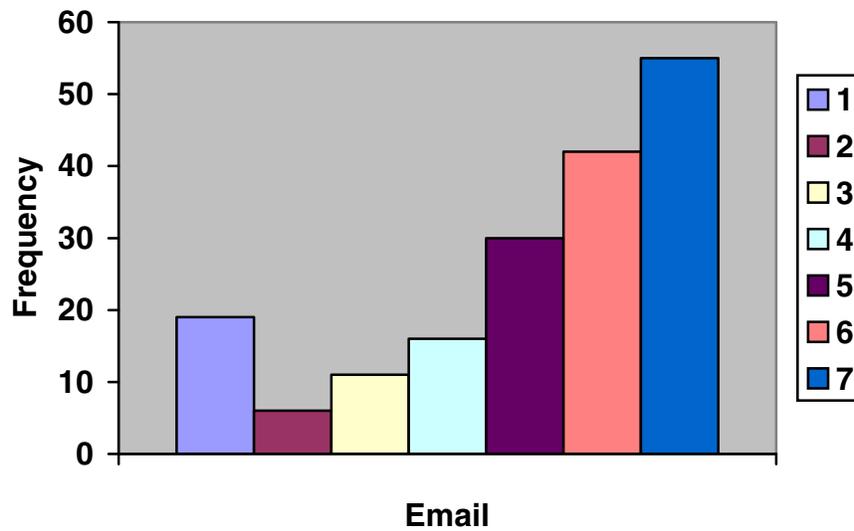


Figure 5.7 Respondents Usage of Email to Share Knowledge

As can be seen from the figure 5.7, the majority of respondents reported utilizing email to share knowledge with co-workers. 30.56% used email many times daily, 48.89% used it few times per month with rest of them using it infrequently.

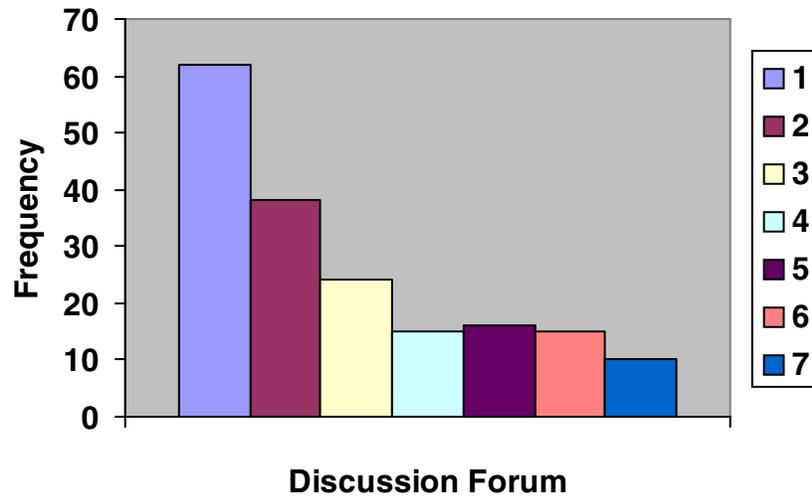


Figure 5.8 Respondents Usage of Discussion Forum to Share Knowledge

5.56% of the respondents used discussion forums on a daily basis to share knowledge with co-workers. 25.55% of the respondents reported using it few times a month, while 68.89% reported using it infrequently to share knowledge with co-workers.

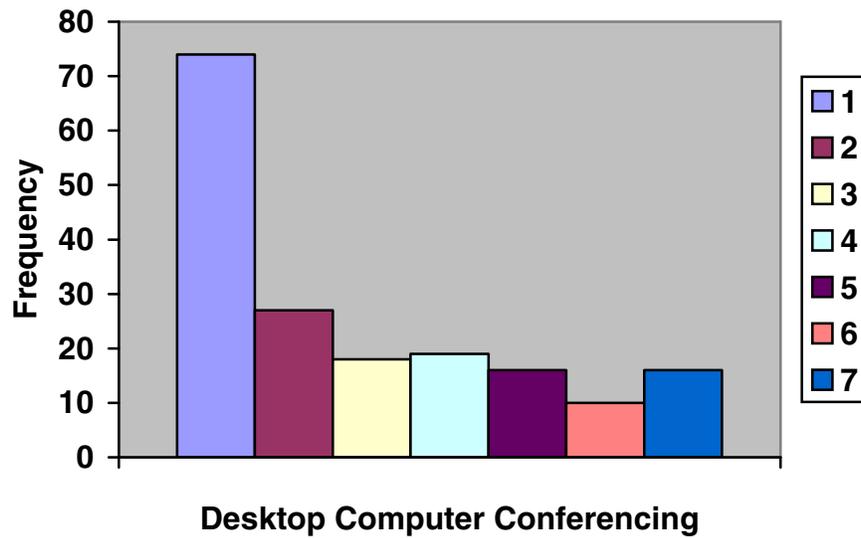


Figure 5.9 Respondents Usage of Desktop Computer Conferencing to Share Knowledge

8.89% of the respondents utilized desktop conferencing on a daily basis to share knowledge with co-workers. 25.01% of the respondents reported using it few times a month, while 66.11% reported using it infrequently to share knowledge with co-workers.

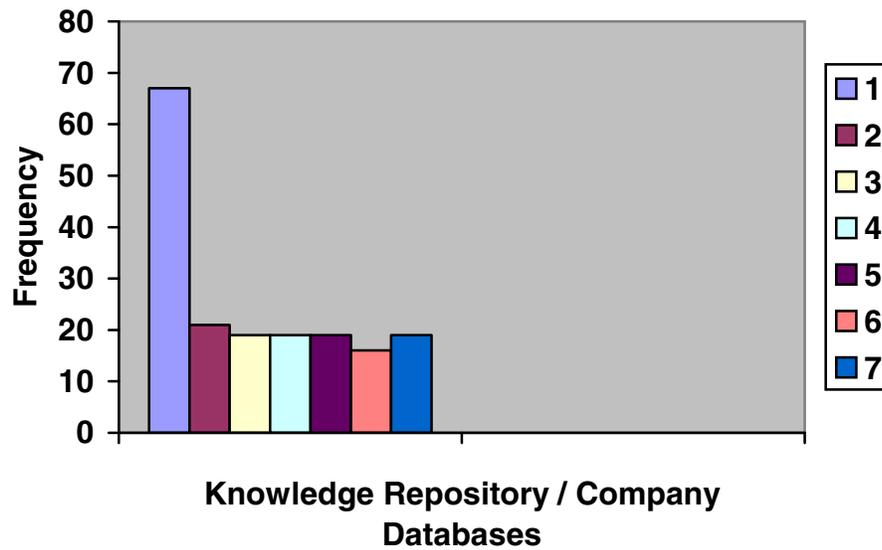


Figure 5.10 Respondents Usage of Knowledge Repository / Company Databases to Codify Knowledge

10.56% of the respondents used knowledge repositories / company databases on a daily basis to codify knowledge. 30.01% of the respondents reported using it few times a month, while 59.44% reported using it infrequently to share knowledge with co-workers.

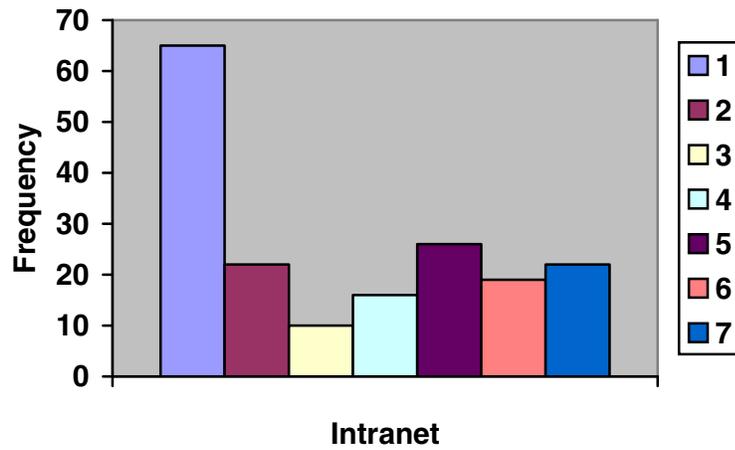


Figure 5.11 Respondents Usage of Intranet to Share Knowledge

12.22% of the respondents used intranet including corporate portals on a daily basis to share knowledge with co-workers. 33.89% of the respondents reported using it few times a month, while 53.89% reported using it infrequently to share knowledge with co-workers.

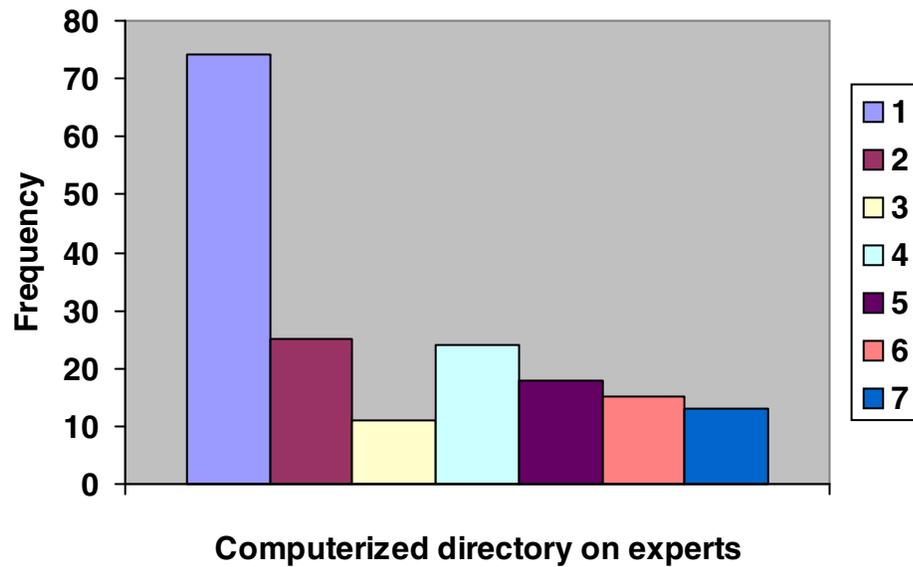


Figure 5.12 Respondents Usage of Computerized Directory to Locate Experts

7.22% of the respondents used computerized directory on experts many times daily to locate experts. 31.66% of the respondents reported using it few times a month, while 61.11% reported using it infrequently to share knowledge with co-workers.

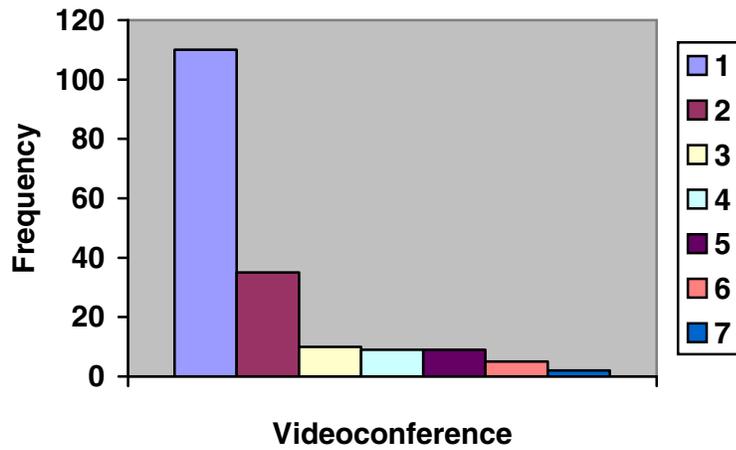


Figure 5.13 Respondents Usage of Videoconference to Share Knowledge

1.11% of the respondents used video conferencing many times daily to share knowledge with co-workers. 12.78% of the respondents reported using it few times a month, while 86.11% reported using it infrequently to share knowledge with co-workers.

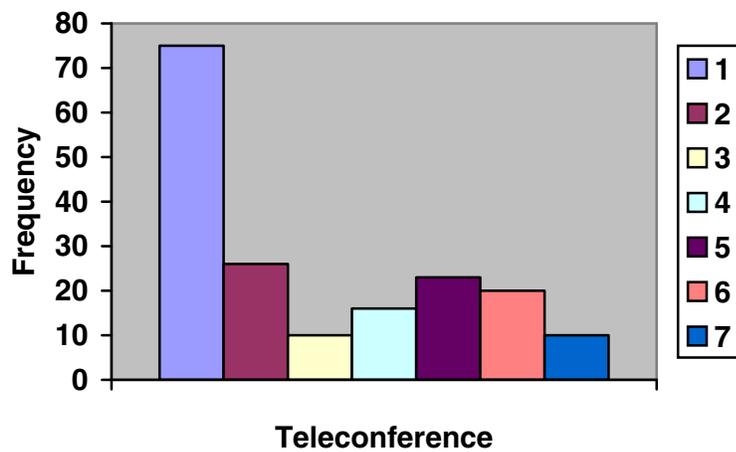


Figure 5.14 Respondents Usage of Teleconference to Share Knowledge

5.56% of the respondents reported using teleconferencing many times daily to share knowledge with co-workers. 32.78% of the respondents reported using it few times a month, while 61.67% reported using it infrequently to share knowledge with co-workers.

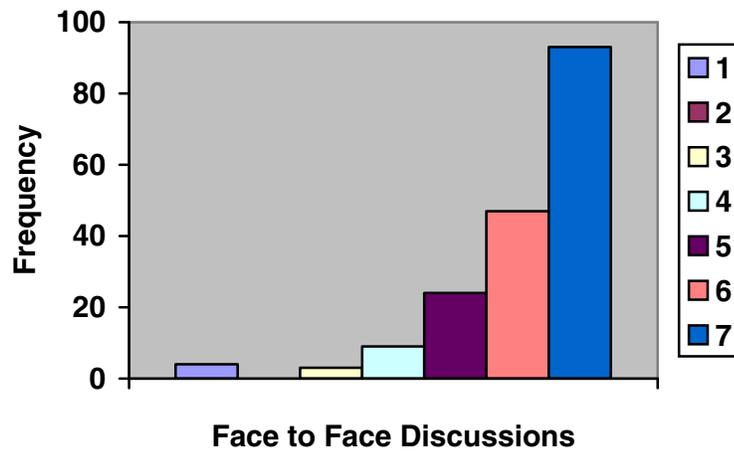


Figure 5.15 Respondents Usage of Face to Face Discussions to Share Knowledge

An overwhelming majority of respondents reported utilizing face to face discussions to share knowledge with co-workers. 51.67% used face to face discussions many times daily, 44.44 used it few times per month with rest of them using it infrequently.

5.3 Selection of Data Analytical Technique

The Partial Least Squares (PLS) is a latent structural equation modeling technique that assesses the psychometric properties of the scales used to measure the theoretical constructs and estimates the hypothesized relationships among the constructs (Barclay et al., 1995). In recent years, the popularity of PLS has increased among researchers resulting in its extensive application in MIS research (Chin & Todd, 1995; Compeau & Higgins, 1995; Gefen & Straub, 1997).

This research study chose PLS as the primary data analysis technique. PLS was chosen over alternative structural equation modeling techniques such as LISREL, AMOS, EQS for the following reasons: First, the objective of this exploratory research was to develop an integrated model of factors that predict knowledge sharing behaviors. PLS is prediction oriented where as other tools such as LISREL are parameter oriented. Second, PLS handles latent constructs that are modeled as formative indicators, reflective indicators or some combination of both. Covariance methods such as LISREL are valid for only reflective measures. They can not handle constructs with formative measures. The research model in the current study has both formative and reflective indicators. Third, PLS places minimal demands in terms of sample size. The sample size required for testing the research model in PLS is equal to the largest of the following two possibilities: (1) 10 times the number of indicators on the most complex formative construct (2) 10 times the largest number of independent constructs leading to an endogenous construct (Chin, 1998; Chin & Newsted, 1999). Fourth, PLS does not

assume multivariate normality and it takes into account the measurement error when analyzing the structural model.

5.4 Data Analysis

As recommended by Hair et al., (1998), the current study used two-stage model building process for analyzing data. The adequacy of the measurement model is assessed in the first stage. The structural relationships are examined in the second stage.

5.4.1 Assessment of the Measurement Model

The measurement model specifies the relationship between the indicators and the latent construct they are intended to measure. Assessment of the measurement model requires examining two type of validities: convergent validity and discriminant validity (Chin, 1998). Convergent validity indicates the degree to which theoretically similar constructs are highly correlated with each other. Alternatively, discriminant validity indicates the degree to which a given construct is different from other constructs. Collectively, these two validities provide some evidence regarding the goodness of fit of the measurement model.

5.4.1.1 Convergent Validity

Convergent validity was assessed in two ways: First, by evaluating the loadings of the individual measures to their respective constructs and second, by computing the composite reliabilities. Partial Least Squares (PLS Graph, version 3.00) was used to assess convergent validity. Two separate analysis were carried out. An initial PLS run with boot strapping procedure (200 resamples) generated weights, loadings, composite reliabilities, average variance extracted (AVE) and t-values for each measurement item

in relation to its theorized construct. The loadings for each measurement item were analyzed. 62 of the original 72 items had loadings greater than the recommended value of 0.70 (Chin, 1998). One item had a loading of 0.694. Since this loading is close to the recommended level of 0.70, it was decided to keep this item in the model. Remaining 9 items with loadings less than the recommended value of 0.70 were dropped from the model. The items dropped from the model are PRE6, FAI3, FTT7, FTT8, PBK6, SNK4, SNK5, INT3 and AKS3. Consistent with Bock et al., (2005) study, a second order construct was created for organizational climate using the factor scores for the first order constructs: affiliation, innovativeness and fairness.

The trimmed model was rerun and reevaluated. The weights, loadings, standard error and t-values for the measurement items in the trimmed model are presented in table 5.3.

Table 5.4 Weights and Loadings of the Measures

Construct	Items	Weight	Loading	Standard Error	t-value
Perceived Organizational Incentives(POI)	POI1	0.2257	0.8212	0.0383	21.4453
	POI2	0.1977	0.8984	0.0360	24.9574
	POI3	0.2105	0.9122	0.0315	29.0016
	POI4	0.1957	0.8130	0.0500	16.2584
	POI5	0.3323	0.8604	0.0270	31.9120
Perceived Reciprocal Benefits(PRB)	PRB1	0.2886	0.7181	0.0747	9.6125
	PRB2	0.3896	0.8448	0.0406	20.7911
	PRB3	0.5538	0.8370	0.0521	16.0739
Perceived Reputation Enhancement(PRE)	PRE1	0.3703	0.7959	0.0287	27.7372
	PRE2	0.2261	0.8297	0.0397	20.8838
	PRE3	0.2080	0.8017	0.0512	15.6629
	PRE4	0.2567	0.8400	0.0390	21.5137
	PRE5	0.1748	0.7738	0.0587	13.1917
Perceived Loss of Knowledge Power(PLK)	PLK1	0.2766	0.9153	0.0215	42.6407
	PLK2	0.3168	0.9559	0.0069	138.3103
	PLK3	0.2803	0.9298	0.0147	63.4444
	PLK4	0.2102	0.8721	0.0412	21.1756
Perceived Enjoyment in Helping Others(PEH)	PEH1	0.2885	0.9164	0.0150	61.1114
	PEH2	0.2830	0.9390	0.0121	77.7229
	PEH3	0.2564	0.8960	0.0298	30.0562
	PEH4	0.2651	0.9061	0.0197	45.9928
Affiliation(AFN)	AFN1	0.2728	0.7636	0.0353	21.6014
	AFN2	0.2949	0.8082	0.0526	15.3601
	AFN3	0.3353	0.8573	0.0215	39.8341
	AFN4	0.3144	0.8456	0.0267	31.6179
Innovativeness(INO)	INO1	0.4298	0.8700	0.0216	40.3706
	INO2	0.3478	0.8006	0.0337	23.7664
	INO3	0.4015	0.8659	0.0266	32.5928
Fairness(FAI)	FAI1	0.5894	0.8871	0.0183	48.5402
	FAI2	0.5493	0.8687	0.0249	34.8469
Organizational Climate(OCL)	OCL1	0.4063	0.8308	0.0242	34.3167
	OCL2	0.3846	0.7900	0.0542	14.5670
	OCL3	0.4222	0.8494	0.0291	29.1393
Facilitating Tools and Technology(FTT)	FTT1	0.1843	0.9082	0.0206	43.9936
	FTT2	0.1765	0.9385	0.0154	60.9138
	FTT3	0.1775	0.9095	0.0165	55.0444
	FTT4	0.1947	0.9235	0.0135	68.2447
	FTT5	0.1959	0.8326	0.0268	31.0694

Table 5.4 *Continued.*

	FTT6	0.1762	0.9224	0.0131	70.2879
Attitude towards Knowledge Sharing(ATK)	ATK1	0.2375	0.8079	0.0324	24.9469
	ATK2	0.2917	0.8839	0.0167	53.0793
	ATK3	0.2367	0.7746	0.0332	23.3247
	ATK4	0.2038	0.7607	0.0373	20.4026
	ATK5	0.2634	0.8043	0.0329	24.4307
Subjective Norm towards Knowledge Sharing(SNK)	SNK1	0.3352	0.9331	0.0149	62.5726
	SNK2	0.4103	0.9075	0.0252	36.0248
	SNK3	0.3630	0.8674	0.0315	27.5513
Perceived Behavioral Control towards Knowledge Sharing(PBK)	PBK1	0.1952	0.7361	0.0465	15.8347
	PBK2	0.2549	0.8600	0.0218	39.5231
	PBK3	0.2788	0.8276	0.0290	28.5029
	PBK4	0.2431	0.8407	0.0268	31.3125
	PBK5	0.2479	0.8149	0.0653	12.4775
Intention to Share Knowledge(INT)	INT1	0.2278	0.7523	0.0464	16.2177
	INT2	0.1784	0.7005	0.0543	12.9113
	INT3	0.1759	0.7253	0.0718	10.1032
	INT4	0.2071	0.8235	0.0434	18.9735
	INT5	0.2324	0.8397	0.0329	25.5596
	INT6	0.2429	0.8664	0.0228	37.9924
Actual Knowledge Sharing(AKS)	AKS1	0.1989	0.8410	0.0334	25.1652
	AKS2	0.1613	0.6940	0.0662	10.4795
	AKS3	0.1999	0.8790	0.0227	38.7860
	AKS4	0.2067	0.8990	0.0150	59.7608
	AKS5	0.1968	0.8620	0.0278	30.9826
	AKS6	0.2092	0.9063	0.0167	54.3266
* The standard errors and t-values are for loadings					

As can be seen, the loadings for the measurement items are well over the recommended level of 0.70 or higher. Item loadings of 0.70 or higher imply that more than 50% of the variance is shared between the measurement item and its theorized construct (Barclay et al., 1995).

Table 5.4 reports the resulting number of items per construct, composite reliabilities and average variance extracted. Composite reliability values greater than

0.80 indicate good internal consistency (Nunnally et al.,1994). As is evident from Table 5.4, the composite reliabilities range from 0.843 to 0.965 exceeding the recommended value of 0.80 with a majority of them over and above 0.90.

Table 5.5 Composite Reliabilities and Average Variance Extracted of the Constructs

Measures	Items	Composite Reliability	Average Variance Extracted
Perceived Organizational Incentives(POI)	5	0.935	0.743
Perceived Reciprocal Benefits(PRB)	3	0.843	0.643
Perceived Reputation Enhancement(PRE)	5	0.904	0.654
Perceived Loss of Knowledge Power(PLK)	4	0.956	0.844
Perceived Enjoyment in Helping Others(PEH)	4	0.953	0.836
Affiliation(AFN)	4	0.891	0.672
Innovativeness(INO)	3	0.883	0.716
Fairness(FAI)	2	0.871	0.771
Organizational Culture(OCL)	3	0.864	0.679
Facilitating Information Technology(FTT)	6	0.965	0.822
Attitude towards Knowledge Sharing(ATK)	5	0.903	0.652
Subjective Norm towards Knowledge Sharing(SNK)	3	0.930	0.816
Perceived Behavioral Control towards Knowledge Sharing(PBK)	5	0.909	0.667
Intention to Share Knowledge(INT)	6	0.907	0.619
Actual Knowledge Sharing(AKS)	6	0.939	0.722

5.4.1.2 Discriminant Validity

Discriminant validity determines the extent to which one construct is different from all other constructs in the research model. Two procedures were used to assess discriminant validity (Chin, 1998; Gefen and Straub, 2005).

- Analysis of the correlations of the latent variable scores with the measurement items. To establish discriminant validity, measures of a

construct should be distinct and the measures should load more strongly on their theorized construct than on the other constructs in the research model. In other words, the loadings should be greater than the cross loadings.

- Examination of the average variance extracted (AVE) to ensure that each construct shares larger variance with its measures than with the other latent constructs in the research model. As a rule of thumb, the square root of the AVE for an individual construct should be much larger than the variance shared between the construct and other constructs in the model (Chin, 1998) and should be greater than 0.5 recommended value (Fornell and Larcker, 1981). AVE loading greater than 0.5 implies that the construct accounts for at least 50% of measurement variance.

Partial Least Squares (PLS Graph, version 3.0) was used to evaluate the discriminant validity. Table 5.5 presents the loadings and cross loadings. Examination of the loadings and cross-loadings indicate that all the measurement items load highly on their own latent construct than on other constructs.

Table 5.6 Measurement Indicator to Construct Correlation

	POI	PRB	PRE	PLK	PEH	AFN	INO	FAI	FIT	ATK	SNK	PBK	INT	AKS
POI1	0.82	0.33	0.49	-0.04	0.23	0.36	0.30	0.26	0.39	0.22	0.18	0.33	0.15	0.42
POI2	0.90	0.29	0.46	-0.04	0.18	0.26	0.26	0.19	0.27	0.19	0.20	0.24	0.15	0.36
POI3	0.91	0.33	0.45	-0.05	0.23	0.28	0.21	0.22	0.23	0.20	0.17	0.25	0.18	0.41
POI4	0.81	0.29	0.41	-0.06	0.14	0.25	0.16	0.14	0.20	0.19	0.10	0.23	0.16	0.35
POI5	0.86	0.36	0.57	-0.19	0.31	0.37	0.29	0.19	0.29	0.32	0.14	0.36	0.21	0.46
PRB1	0.35	0.72	0.34	0.03	0.25	0.08	0.13	0.20	0.15	0.23	0.19	0.23	0.19	0.30
PRB2	0.30	0.84	0.45	-0.05	0.32	0.21	0.22	0.21	0.20	0.31	0.25	0.35	0.24	0.36
PRB3	0.29	0.84	0.50	-0.26	0.46	0.34	0.19	0.33	0.19	0.43	0.33	0.39	0.50	0.37
PRE1	0.35	0.51	0.80	-0.28	0.49	0.42	0.26	0.26	0.17	0.51	0.27	0.47	0.45	0.52
PRE2	0.46	0.46	0.83	-0.12	0.32	0.35	0.27	0.20	0.23	0.31	0.25	0.40	0.34	0.36
PRE3	0.47	0.39	0.80	-0.11	0.28	0.38	0.44	0.40	0.33	0.29	0.32	0.37	0.28	0.42
PRE4	0.53	0.42	0.84	-0.21	0.38	0.33	0.30	0.35	0.19	0.36	0.22	0.33	0.32	0.44
PRE5	0.57	0.41	0.77	-0.15	0.26	0.27	0.28	0.26	0.19	0.24	0.13	0.23	0.20	0.33
PLK1	-0.09	-0.11	-0.25	0.92	-0.36	-0.19	-0.04	-0.20	-0.03	-0.47	-0.14	-0.25	-0.41	-0.25
PLK2	-0.10	-0.20	-0.24	0.96	-0.45	-0.14	0.02	-0.22	0.01	-0.54	-0.21	-0.23	-0.46	-0.26
PLK3	-0.08	-0.16	-0.19	0.93	-0.43	-0.09	0.03	-0.18	0.07	-0.48	-0.15	-0.15	-0.39	-0.18
PLK4	-0.11	-0.08	-0.17	0.87	-0.37	-0.05	0.05	-0.16	0.01	-0.36	-0.09	-0.14	-0.35	-0.16
PEH1	0.23	0.40	0.43	-0.46	0.92	0.19	0.09	0.29	0.10	0.68	0.43	0.51	0.60	0.50
PEH2	0.22	0.43	0.44	-0.43	0.94	0.21	0.14	0.34	0.08	0.66	0.42	0.45	0.57	0.51
PEH3	0.24	0.43	0.40	-0.33	0.90	0.27	0.20	0.27	0.08	0.60	0.44	0.41	0.55	0.48
PEH4	0.30	0.40	0.41	-0.39	0.91	0.23	0.17	0.24	0.11	0.62	0.45	0.43	0.50	0.50
AFN1	0.27	0.25	0.39	-0.03	0.07	0.76	0.44	0.29	0.24	0.11	0.18	0.30	0.09	0.30
AFN2	0.41	0.28	0.39	-0.13	0.19	0.81	0.44	0.37	0.13	0.22	0.19	0.21	0.17	0.28
AFN3	0.27	0.26	0.36	-0.11	0.27	0.86	0.48	0.51	0.30	0.20	0.15	0.28	0.12	0.25
AFN4	0.24	0.18	0.34	-0.16	0.25	0.85	0.51	0.37	0.20	0.31	0.18	0.27	0.20	0.21
INO1	0.27	0.21	0.39	-0.07	0.17	0.56	0.87	0.48	0.29	0.26	0.30	0.23	0.12	0.20

Table 5.6 *Continued.*

INO2	0.20	0.14	0.23	0.15	0.04	0.39	0.80	0.36	0.30	0.10	0.15	0.16	-0.06	0.10
INO3	0.27	0.22	0.32	-0.02	0.18	0.49	0.87	0.43	0.25	0.22	0.22	0.22	0.11	0.16
FAI1	0.18	0.26	0.29	-0.13	0.25	0.43	0.48	0.89	0.20	0.21	0.10	0.19	0.13	0.20
FAI2	0.23	0.31	0.35	-0.25	0.30	0.40	0.41	0.87	0.27	0.30	0.23	0.30	0.27	0.28
FTT1	0.31	0.26	0.30	-0.02	0.12	0.21	0.29	0.28	0.91	0.09	0.26	0.36	0.10	0.35
FTT2	0.32	0.17	0.23	0.02	0.07	0.29	0.34	0.23	0.94	0.06	0.26	0.35	0.06	0.29
FTT3	0.22	0.18	0.24	-0.01	0.11	0.23	0.29	0.23	0.91	0.06	0.24	0.35	0.04	0.29
FTT4	0.32	0.25	0.25	0.00	0.11	0.22	0.28	0.28	0.92	0.10	0.21	0.38	0.08	0.33
FTT5	0.29	0.16	0.21	0.01	0.06	0.28	0.27	0.18	0.83	0.08	0.16	0.39	0.07	0.33
FTT6	0.29	0.19	0.21	0.08	0.06	0.24	0.31	0.26	0.92	0.04	0.21	0.35	0.00	0.31
ATK1	0.18	0.25	0.32	-0.45	0.52	0.16	0.19	0.22	0.01	0.81	0.36	0.35	0.59	0.36
ATK2	0.26	0.43	0.40	-0.45	0.70	0.21	0.21	0.33	0.12	0.88	0.50	0.46	0.70	0.45
ATK3	0.24	0.35	0.34	-0.38	0.56	0.27	0.19	0.17	0.09	0.77	0.36	0.41	0.57	0.45
ATK4	0.20	0.30	0.38	-0.33	0.44	0.24	0.23	0.19	0.06	0.76	0.37	0.42	0.50	0.42
ATK5	0.23	0.37	0.40	-0.44	0.58	0.19	0.13	0.24	0.04	0.80	0.42	0.47	0.65	0.41
SNK1	0.14	0.23	0.21	-0.12	0.36	0.20	0.25	0.13	0.24	0.41	0.93	0.38	0.42	0.36
SNK2	0.18	0.30	0.34	-0.20	0.51	0.16	0.20	0.21	0.18	0.53	0.91	0.51	0.55	0.39
SNK3	0.16	0.37	0.26	-0.12	0.39	0.22	0.29	0.16	0.26	0.41	0.87	0.43	0.45	0.37
PBK1	0.32	0.26	0.34	-0.15	0.25	0.15	0.04	0.15	0.31	0.30	0.24	0.74	0.32	0.36
PBK2	0.30	0.35	0.35	-0.17	0.38	0.35	0.29	0.29	0.43	0.40	0.38	0.86	0.42	0.45
PBK3	0.21	0.38	0.39	-0.29	0.56	0.27	0.19	0.25	0.18	0.62	0.53	0.83	0.61	0.55
PBK4	0.28	0.37	0.44	-0.10	0.35	0.25	0.23	0.20	0.39	0.38	0.47	0.84	0.36	0.48
PBK5	0.30	0.33	0.39	-0.15	0.43	0.27	0.21	0.22	0.35	0.39	0.35	0.81	0.39	0.51
INT1	0.09	0.29	0.34	-0.32	0.55	0.16	0.10	0.23	0.01	0.67	0.45	0.38	0.75	0.42
INT2	0.13	0.34	0.31	-0.32	0.45	0.12	0.05	0.14	-0.06	0.52	0.41	0.26	0.70	0.32
INT3	0.14	0.37	0.32	-0.38	0.34	0.21	0.09	0.24	0.09	0.49	0.33	0.34	0.73	0.35
INT4	0.20	0.26	0.28	-0.35	0.42	0.11	-0.01	0.11	0.05	0.56	0.41	0.41	0.82	0.43

Table 5.6 *Continued.*

INT5	0.18	0.36	0.35	-0.35	0.53	0.13	0.04	0.17	0.13	0.62	0.47	0.52	0.84	0.47
INT6	0.20	0.39	0.38	-0.37	0.55	0.12	0.08	0.18	0.07	0.65	0.44	0.52	0.87	0.51
AKS1	0.42	0.36	0.44	-0.15	0.51	0.24	0.15	0.21	0.23	0.45	0.44	0.50	0.47	0.84
AKS2	0.31	0.28	0.35	-0.19	0.37	0.19	0.11	0.16	0.21	0.33	0.22	0.40	0.38	0.69
AKS3	0.40	0.41	0.46	-0.20	0.47	0.32	0.12	0.23	0.32	0.44	0.37	0.52	0.45	0.88
AKS4	0.45	0.39	0.49	-0.30	0.50	0.32	0.21	0.29	0.32	0.51	0.36	0.52	0.48	0.90
AKS5	0.40	0.37	0.48	-0.21	0.46	0.26	0.16	0.23	0.31	0.45	0.33	0.49	0.47	0.86
AKS6	0.42	0.38	0.49	-0.17	0.47	0.27	0.17	0.25	0.39	0.46	0.38	0.53	0.49	0.91

Table 5.7 presents the AVE analysis. The bolded diagonal elements in the table represent the square root of the AVE scores. The off-diagonal elements are the correlations between constructs. As can be seen, the square root of AVE values range from 0.79 to 0.91 exceeding 0.5 recommended value. AVE for each construct is significantly larger than any correlations involving the construct. That is all constructs share greater variance with their own measures than with other constructs in the model, thus establishing discriminant validity.

Table 5.7 AVE and Correlation between Constructs

	POI	PRB	PRE	PLK	PEH	AFN	INO	FAI	FTT	ATK	SNK	PBK	INT	AKS
POI	0.86													
PRB	0.38	0.80												
PRE	0.57	0.56	0.80											
PLK	-0.10	-0.15	-0.24	0.91										
PEH	0.27	0.45	0.46	-0.44	0.91									
AFN	0.37	0.30	0.45	-0.13	0.24	0.82								
INO	0.29	0.23	0.38	0.01	0.16	0.57	0.85							
FAI	0.23	0.32	0.36	-0.21	0.31	0.47	0.50	0.88						
FTT	0.32	0.22	0.27	0.01	0.10	0.27	0.33	0.27	0.91					
ATK	0.28	0.42	0.45	-0.51	0.70	0.26	0.23	0.29	0.08	0.81				
SNK	0.18	0.33	0.30	-0.16	0.47	0.21	0.27	0.19	0.24	0.52	0.90			
PBK	0.34	0.42	0.47	-0.21	0.49	0.32	0.24	0.28	0.40	0.52	0.49	0.82		
INT	0.20	0.42	0.42	-0.44	0.60	0.18	0.07	0.22	0.65	0.75	0.53	0.52	0.79	
AKS	0.47	0.43	0.53	-0.24	0.54	0.32	0.18	0.27	0.35	0.52	0.42	0.58	0.54	0.85

* The bolded diagonal elements are the square root of the AVE scores.

5.4.2 Assessment of the Structural Model

With the adequacy of measurement model established, the structural model was evaluated and hypothesis were tested. The structural model indicates the causal relationships among the latent constructs in the research model. Assessment of structural model was done first by determining the predictive power of the model and second by analyzing the hypothesized relationships among the latent constructs proposed in the research model. The R-square value of the dependent variables determine the predictive power of the research model and the path coefficients evaluate the strength of the hypothesized relationships.

Validation of structural model was accomplished with PLS-Graph version 3.0. The model was setup in PLS as per the guidelines given in the PLS-Graph Users Guide (Chin, 2001). Missing data were replaced with a “-1”. Following Chin (1998), bootstrap resampling Method (200 iterations) that uses randomly selected subsamples was employed to estimate the theoretical model and hypothesized relationships. The sample size of 180 exceeds the recommended minimum of 10 times the number of antecedent constructs leading to an endogenous construct (Barclay et al., 1995).

The results of the PLS-Graph output are shown in Figure 5.15. The R-Square values, path coefficients, t-value and the significance values are presented in Table 5.7

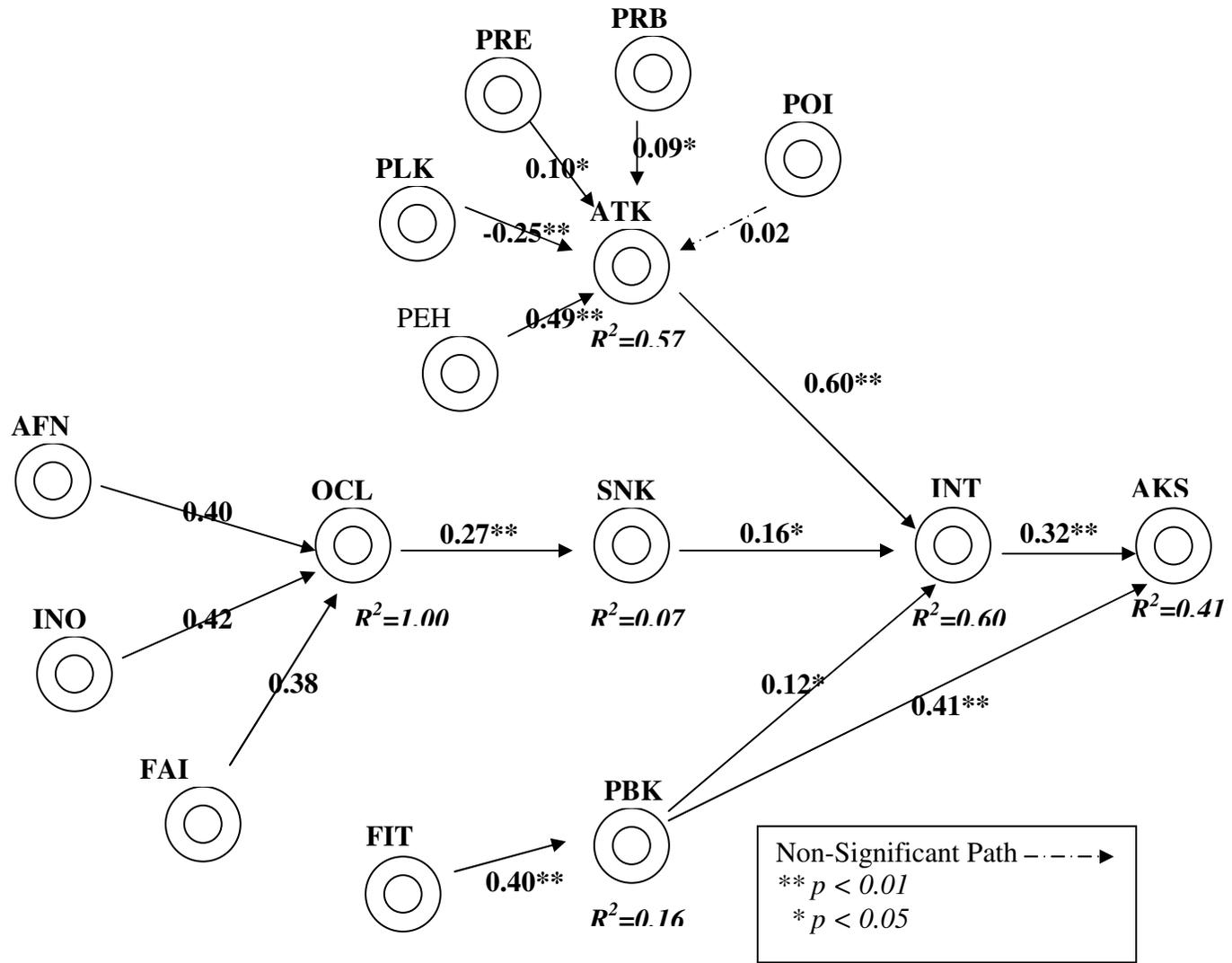


Figure 5.16 Results of PLS Analysis

As is evident from figure 5.1, the model has high predictive power. It explains approximately 41.3% of the variance in the actual knowledge sharing (AKS) and 60.8% of the variance in the intention to share knowledge (INT). The attitude towards knowledge sharing (ATK), subjective norm (SNK) and perceived behavioral Control (PBK) respectively account for 56.9% , 7.4% and 16.1% of the variance. Additionally, 11 of the 12 paths were found to be statistically significant. The standardized path coefficients ranged from 0.023 to 0.601. The overall fit of the model was good.

Table 5.8 Summary of R-Square, Path Coefficients and Significance Levels

Construct	R-Square	Beta Coefficient	t-value	<i>p</i>
ATK	0.569			
POI		0.023	0.419	>0.10
PRB		0.097	1.873	<0.05
PRE		0.103	1.853	<0.05
PLK		-0.252	3.781	<0.01
PEH		0.494	7.894	<0.01
SNK	0.074			
OCL		0.273	3.602	<0.01
PBK	0.161			
FIT		0.401	6.018	<0.01
INT	0.608			
ATK		0.601	8.343	<0.01
SNK		0.167	2.043	<0.05
PBK		0.128	2.011	<0.05
AKS	0.413			
INT		0.320	4.284	<0.01
PBK		0.415	6.583	<0.01

5.4.3 Tests of Hypothesis

The results of the hypothesis tests support 11 of the 12 posited relationships. Table 5.8 summarizes the results of the hypothesis testing.

H1: A higher level of intention towards knowledge sharing will lead to greater sharing of knowledge is supported because $\beta = 0.32$, $t > 4.284$, $p < 0.01$.

H2: A higher level of behavioral control towards knowledge sharing will lead to greater sharing of knowledge is supported because $\beta = 0.415$, $t > 6.583$, $p < 0.01$.

H3: A more favorable attitude toward knowledge sharing will lead to greater intention to share knowledge is supported because $\beta = 0.601$, $t > 8.343$, $p < 0.01$.

H4: A higher level of subjective norm supportive of knowledge sharing will lead to greater intention to share knowledge is supported because $\beta = 0.167$, $t > 2.043$, $p < 0.05$.

H5: A higher level of behavioral control towards knowledge sharing will lead to greater intention to share knowledge is supported because $\beta = 0.128$, $t > 2.011$, $p < 0.05$.

H6: Perceived organizational incentives have a positive effect on the knowledge worker's attitude towards knowledge sharing is not supported because $\beta = 0.023$, $t > 0.419$, $p > 0.10$.

H7: Perceived Reciprocal benefits have a positive effect on the knowledge worker's attitude towards knowledge sharing is supported because $\beta = 0.097$, $t > 1.873$, $p < 0.05$.

H8: Perceived reputation enhancement has a positive effect on the knowledge worker's attitude towards knowledge sharing is supported because $\beta = 0.103$, $t > 1.853$, $p < 0.05$.

H9: Perceived loss of knowledge power has a negative effect on the knowledge worker's attitude towards knowledge sharing is supported because $\beta = -0.252$, $t > 3.781$, $p < 0.01$.

H10: Perceived enjoyment in helping others has a positive effect on the knowledge worker's attitude towards knowledge sharing is supported because $\beta = 0.494$, $t > 7.894$, $p < 0.01$.

H11: A higher level of perceived organizational climate characterized by fairness, innovativeness and affiliation will lead to greater subjective norm to share knowledge is supported because $\beta = 0.273$, $t > 3.602$, $p < 0.01$.

H12: Tools and Technology have a positive effect on perceived behavioral control towards knowledge sharing is supported because $\beta = 0.401$, $t > 6.018$, $p < 0.01$.

Table 5.8 Results of Hypothesis Testing

	Hypothesis	Results
H1	A higher level of intention towards knowledge sharing will lead to greater sharing of knowledge.	Supported
H2	A higher level of behavioral control towards knowledge sharing will lead to greater sharing of knowledge.	Supported
H3	A more favorable attitude toward knowledge sharing will lead to greater intention to share knowledge.	Supported
H4	A higher level of subjective norm supportive of knowledge sharing will lead to greater intention to share knowledge.	Supported

Table 5.8 *Continued.*

H5	A higher level of behavioral control towards knowledge sharing will lead to greater intention to share knowledge.	Supported
H6	Perceived organizational incentives have a positive effect on the knowledge worker's attitude towards knowledge sharing.	Not Supported
H7	Perceived Reciprocal benefits have a positive effect on the knowledge worker's attitude towards knowledge sharing.	Supported
H8	Perceived reputation enhancement has a positive effect on the knowledge worker's attitude towards knowledge sharing.	Supported
H9	Perceived loss of knowledge power has a negative effect on the knowledge worker's attitude towards knowledge sharing	Supported
H10	Perceived enjoyment in helping others has a positive effect on the knowledge worker's attitude towards knowledge sharing.	Supported
H11	A higher level of perceived organizational climate characterized by fairness, innovativeness and affiliation will lead to greater subjective norm to share knowledge.	Supported
H12	Tools and Technology have a positive effect on perceived behavioral control towards knowledge sharing.	Supported

CHAPTER 6

DISCUSSION OF RESULTS

This chapter discusses the study's findings, implications, limitations and future research directions.

6.1 Overview of the Findings

The objective of this research study was to enhance our collective understanding of the factors affecting knowledge sharing behaviors of knowledge workers. The study drew upon theory and research from multiple streams of research such as social psychology, organizational learning, knowledge management, information systems and so forth and identified three sets of critical factors: psychological, organizational and technological that are believed to influence the knowledge sharing behaviors. The study applied theory of planned behavior framework (TPB) (Ajzen, 1991) to investigate the impact of these factors on knowledge sharing behaviors.

The results from the field survey of 180 knowledge workers provide empirical support for the overall structure theorized in the research model. Of the 12 hypothesis, 11 were supported. The results indicate that the significant predictors of knowledge sharing behaviors to be TPB components: intention towards knowledge sharing, attitude towards knowledge sharing, subjective norm towards knowledge sharing and perceived behavioral control towards knowledge; psychological factors: knowledge worker's

perceptions of reciprocal benefits, reputation enhancement, loss of knowledge power and enjoyment in helping others; organizational factors: perceptions of organization's climate; and technological factors: perceptions of organization's available tools technology that facilitate knowledge sharing. The predictors explained about 60 percent of the variance in the behavioral intention to share knowledge and 41 percent variance in the actual knowledge sharing behavior. The findings are a great improvement over previous studies on knowledge sharing behaviors (Bock and Kim, 2002; Bock et al., 2005; Ryu et al., 2003; Lin et al., 2004). The findings related to the individual predictors with respect to their hypothesis are discussed in detail next.

6.1.1 Antecedents of Knowledge Sharing Behavior

Following TPB, the study theorized the knowledge sharing behaviors of knowledge workers to be collectively determined by intention towards knowledge sharing and perceived behavioral control. As theorized, intention towards knowledge sharing and perceived behavioral control emerged as a significant predictors of actual knowledge sharing behaviors. Intention towards knowledge sharing had a significant effect on knowledge sharing behavior with a path coefficient of 0.32. Perceived behavioral control also had a substantial effect on knowledge sharing behavior at 0.41. Collectively, intentions towards knowledge sharing and perceived behavioral control explained about 41 percent of the variance in knowledge sharing behavior.

The finding that intention towards knowledge sharing was positively and significantly related to knowledge sharing behavior coincides with the findings of prior research on knowledge sharing using self-reported survey measures (Bock and Kim,

2002). However, while Bock and Kim's study explained only 1.6 percent of the variance in the knowledge sharing behavior, this study explained about 41 percent of the variance in knowledge sharing behavior. One potential explanation for the different results is that Bock and Kim, (2002) study applied theory of reasoned action to examine factors affecting knowledge sharing behaviors. This study applied theory of planned behavior for predicting and explaining the knowledge sharing behaviors. The theory of planned behavior (TPB), which is an extension of the theory of reasoned action (TRA) (Ajzen and Fishbein, 1980) has an additional construct perceived behavioral control. Perceived behavioral control factors are beliefs about the perceived presence or absence of necessary resources and opportunities that may facilitate or impede actual behavior. Perceived behavioral control influences actual behavior when there is an agreement between individual's perceptions of behavior control and the actual control. Prior research has shown that the addition of perceived behavioral construct increases the accounted variance in actual behavior by 2 to 12 percent over and above behavioral intention (Rivis and Sheeran, 2003; Armitage & Connor, 2001; Godin and Kok, 1996). The significant impact of perceived behavioral control on knowledge sharing behavior in this study suggests that knowledge sharing is not largely under volitional control. Knowledge workers are inclined to engage in knowledge sharing behaviors to the extent they have the time, resources and opportunities to do so.

One caveat to be noted, however, is that this study's measures of actual knowledge sharing behavior referred to the behavior carried out in the past. While the use of such measures is a common practice in research applying the theory of planned

behavior (Hrubes, Ajzen and Daigle 2001), it is possible that respondents may have provided biased self-reports of knowledge sharing behavior to be consistent with their intentions. However, in the current study, the questionnaire items for knowledge sharing behavior, measured how frequently respondents shared work-related knowledge with their coworkers. The use of seven point frequency scale is believed to mitigate the bias associated with self reports. Nevertheless, future research should investigate the research model using objective measures for knowledge sharing behaviors to make the findings of this study more robust.

6.1.2 Antecedents of Knowledge Sharing Intention

Consistent with the theory of planned behavior, the study hypothesized the predictors of knowledge sharing intention to be attitude towards knowledge sharing, subjective norm and perceived behavioral control. As hypothesized, attitude, subjective norm and perceived behavioral control emerged as significant predictors of intention towards knowledge sharing. These findings are consistent with the findings of prior TPB related research (Taylor and Todd, 1995; Mathieson, 1991; Bock and Kim, 2002, Bock et al., 2005; Ryu et al., 2003; Lin et al., 2004).

Attitude towards knowledge sharing had a strong effect on the behavioral intention to share knowledge with a path coefficient of 0.60. The high contribution of attitude towards knowledge sharing suggests that knowledge workers with favorable attitudinal disposition are more likely to engage in knowledge sharing.

Subjective norm and perceived behavioral control were found to have significant but moderate effect on behavioral intention at 0.167 and 0.128 respectively.

The significance of subjective norm implies that knowledge workers consider management and peer group expectations of knowledge sharing to be important. Knowledge workers are likely to engage in knowledge sharing when they perceive that their management and peer group value knowledge sharing and are likely to applaud the behavior. This finding highlights the importance of the social influence of top management and peer group in knowledge sharing. The impact of perceived behavioral control on the intention towards knowledge sharing indicates that knowledge workers are motivated to engage in knowledge sharing to the extent they believe they have the time, resources and opportunities to do so.

The attitude towards knowledge sharing, subjective norm and perceived behavioral control collectively explained about 60 percent of the variance in the behavioral intention to share knowledge.

6.1.3 Antecedents of Knowledge Sharing Attitude

The study applied a variety of extrinsic and intrinsic motivational drivers such as perceived organizational incentives, perceived reciprocal benefits, perceived reputation enhancement, perceived loss of knowledge power and perceived enjoyment in helping others as antecedents to attitude. Of these antecedents, only four of them emerged as significant predictors of knowledge workers attitude towards knowledge sharing. These were perceived reciprocal benefits, perceived reputation enhancement, perceived loss of knowledge power and perceived enjoyment in helping others. Perceived organizational incentives was found not to have a substantial impact, when all the motivators were included in the analysis.

6.1.3.1 Perceived Organizational Incentives

The study hypothesized a positive relationship between perceived organizational incentives and knowledge workers attitude towards knowledge sharing. Examination of path analysis obtained using PLS graph show interesting results. As hypothesized, perceived organizational incentives had a significant but moderate effect on attitude towards knowledge sharing with a path coefficient of 0.210. However, the independent contribution of perceived organizational incentives was washed out when other motivators were included in the analysis. When the other motivators (perceived reciprocal benefits, perceived reputation enhancement, perceived loss of knowledge power and perceived enjoyment in helping others) were entered into the research model, perceived organizational incentives demonstrated a weak positive effect on the knowledge workers attitude towards knowledge sharing at 0.023.

The insignificance of perceived organizational incentives when other motivators were included in the model suggest that for this sample of knowledge workers, economic incentives were not as important as other perceived benefits such as reciprocity, reputation, knowledge power and enjoyment in helping others.

A likely explanation for the insignificance of perceived organizational incentives when other motivators were included in the analysis can be found in the theory of information sharing advanced by Constant et al., (1994). The theory of information sharing is built upon the interdependence notion of social exchange theory (Kelley and Thibaut, 1978). The interdependence notion differentiates exchanges

between people acting alone and exchanges between people affected by their social and organizational context. Although, original social exchange theory did not include information exchange, Constant et al., (1994) extend the theory to the information exchange context, based on the premise that individuals liken information exchange to any other exchange that is affected by the social and organizational context. The social and organizational context influences individuals actions by compelling them to rise above their initial impulses to act from self-interest to consider the impacts of their actions in the long run. Specifically, the social and organizational context affects information exchange through the social concerns individuals have for such things as maintaining future relationships with coworkers, the balance of power, reputation, and the consequences of their actions on other desirable goals. The stronger the social concerns, the less likely the influence of economic incentives on the individual behaviors.

Another possible explanation for the insignificance of organizational incentives can be found in the pay-performance research. Kohn (1993) lists six reasons as to why economic incentives fail to change the attitudes that lie beneath people's behaviors. First, for most people, pay is not a main motivator. Second, similar to punishment, rewards are manipulative and as such have punitive effect on people. The researcher contends that "Do this and you'll get that is not really very different from Do this or here's what will happen to you". Individuals may highly desire incentives, but if receiving those incentives are contingent on certain behaviors, individuals are likely to experience the feelings of being controlled and manipulated by management over time.

Third, rewards damage relationships among employees as every one would be competing for the same limited incentives programs within the organization. Fourth, rewards ignore underlying causes for problematic behaviors. By using incentives as a substitute, management disregards their responsibility of providing the things that employees need to do good job such as constructive feedback, social support etc. Fifth, rewards inhibit taking risks. Sixth, rewards like punishments undermine the intrinsic motivation of people. People may be happy to collect paycheck, and may be even happier if well paid, but their motivation to do exceptional job is intrinsic. No incentive can ever match the power of their intrinsic motivation. If people, feel that they are being controlled, they tend to lose interest in their work

6.1.3.2 Perceived Reciprocal Benefits

Consistent with social exchange theory, perceived reciprocal benefits had a significant but moderate effect on the knowledge workers attitude towards knowledge sharing with a path coefficient of 0.097. This finding accords with the findings of prior research on discretionary databases, information exchange, communities of practice and open source programming communities where generalized reciprocity was consistently found to be an important predictor for knowledge contribution (Connolly and Thom, 1990; Constant et al., 1994; Wasko & Faraj, 2000; Lakhani & von Hippel, 2000; Lerner & Triole, 2000).

The significance of perceived reciprocal benefits provides some indication that knowledge workers are likely to engage in knowledge sharing with the expectation of receiving future help from others in return for sharing knowledge.

6.1.3.3 Perceived Reputation Enhancement

Also, consistent with social exchange theory, perceived reputation enhancement had a significant positive effect on the knowledge workers attitude towards knowledge sharing at 0.103. This finding suggests that knowledge workers are likely to engage in knowledge sharing with a desire to build their professional reputation. By sharing knowledge, knowledge workers show off their skill set and impress others. This results in being acknowledged, recognized and respected. Prior research on online communities of practice, open source programming communities and electronic knowledge repositories have indicated that increased reputation and visibility by coworkers and the relevant community to be an important motivator for participating in knowledge sharing (Wasko & Faraj, 2000; Kankanhalli, 2005; Hall 2001; Kollock 1999).

6.1.3.4 Perceived Loss of Knowledge Power

Perceived loss of knowledge power had a significant negative effect on the knowledge workers attitude towards knowledge sharing at -0.252 . This finding suggests that the more the knowledge workers hold beliefs that sharing knowledge reduces their power within the organization, the less likely they are to engage in knowledge sharing. The finding agrees with prior published research that highlights the influence of knowledge on the distribution of power within organizations (Gray, 2001; Davenport, 1997; Hall, 2004).

6.1.3.5 Perceived Enjoyment in Helping Others

Perceived enjoyment in helping others had a significant positive effect on knowledge workers attitude towards knowledge sharing at 0.494. One possible

explanation for the high contribution of enjoyment in helping others is that knowledge sharing behavior is akin to organizational citizenship behavior or prosocial behavior (Connelly and Kelloway, 2003). Prosocial organizational behaviors are actions that are performed with the intent to promote welfare of others (Brief and Motowidlo, 1986). Prosocial behaviors include positive social acts such as assisting, helping, sharing, donating, cooperating, and volunteering. Wasko and Faraj (2000) observe that participants in electronic networks help others primarily out of community interest, norms of generalized reciprocity and pro-social behavior. Participants are motivated to share knowledge with others because they consider helping others and sharing knowledge “is the right thing to do”. People feel that they are morally obligated to share knowledge in order to contribute positively to the community advancement. By fulfilling their own altruistic and pro-social motives, people derive intrinsic enjoyment.

Similar sentiments are also echoed by other researchers (Constant et al., 1994; Constant et al. 1996; Kollock, 1999; Kankanhalli et al., 2005; Lakhani & von Hippel, 2000; Lerner & Triole, 2000). Constant et al., (1994) contend that information as expertise is more of a personal possession and less of an organizational possession. Individuals are willing to share expertise more readily, because sharing what they possess reflects their personal identity and self-worth. It allows them to satisfy their own self-expressive needs as well as organizational citizenship behavior. By sharing knowledge, individuals derive significant personal benefits such as heightened self-esteem and pride, increased competence, increased social affiliation, enhanced reputation and stronger feelings of organizational commitment. Constant et al.,(1996)

also contend that individuals engage in information sharing to increase their self esteem and personal identity. Kankanhalli et al., (2005) in a study on electronic knowledge repository(EKR) usage found that individuals contribute to EKR because they feel good about helping others.

6.1.4 Antecedents of Subjective Norm

6.1.4.1 Perceived Organizational Climate

Organizational climate characterized by three dimensions: affiliation, innovation and fairness was applied as an antecedent to subjective norm. Similar to Bock et al., (2005) study, organizational climate was found to have substantial impact on subjective norm with a path coefficient of 0.27. The higher the perceptions of organizational climate to be conducive of knowledge sharing, the higher was the formation of subjective norm towards knowledge sharing. Organizational climate explained about 7 percent of variance in subjective norm towards knowledge sharing.

6.1.5 Antecedents of Perceived Behavioral Control

6.1.5.1 Tools and Technology

Tools and technology that facilitate knowledge sharing demonstrated a strong positive relationship with perceived behavioral control towards knowledge sharing at 0.40. This finding suggests that the knowledge workers are inclined to use tools and technology to share knowledge, to the extent they have high perceptions regarding their availability and the ease of use. Tools and technology explained about 16 percent of the variance in the perceived behavioral control. This is a significant finding since organizations are investing heavily in the development and acquisition of information

and communication technologies in the form of knowledge management systems (KMS).

6.2 Implications for Theory

From a theoretical perspective, the implications are manifold. First, this study extends prior research by identifying a variety of extrinsic and intrinsic motivational drivers that are likely to influence knowledge sharing behaviors and provides empirical evidence regarding the efficacy of these motivational drivers. Besides identifying factors that can predict knowledge sharing behaviors, the study also advances theory by uncovering other factors such as perceived organizational incentives that do not seem to affect knowledge sharing behaviors.

Second, the study offers a holistic perspective on the knowledge sharing behaviors by developing an intention based theoretical model using the lens of theory of planned behavior (TPB) and augmenting it with constructs from social exchange theory, economic exchange theory and self determination theory. The results provide a stronger model for knowledge sharing behaviors than previous models (Bock and Kim, 2002; Bock et al., 2005; Ryu et al., 2003; Lin et al., 2004) due to the comprehensiveness of factors identified, and provides a much better gestalt. The predictors explained about 60 percent of the variance in the behavioral intention to share knowledge and 41 percent variance in the actual knowledge sharing behaviors, suggesting that the posited model adequately conceptualizes the knowledge sharing phenomenon.

Third, the study demonstrates that the factors derived from theories of social psychology can predict knowledge sharing behaviors. The relatively high explanatory

power of the research model validates the predictive power of these theories in the knowledge sharing context.

6.3 Implications for Practice

From a pragmatic perspective, the results of the study have many implications for organizations initiating or striving to promote knowledge sharing behaviors of their knowledge workers.

First, prior to launching knowledge sharing initiatives, organizations should create an environment that is conducive to knowledge sharing. Organizations should develop and nurture cultural norms, practices and processes that build trust, collective cooperation and positive social interactions among knowledge workers. Work context exemplified by high levels of trust, collective cooperation, formal and informal networks facilitate knowledge exchanges among knowledge workers.

Second, management should demonstrate its support for knowledge sharing. Supportive organizational climate and intensified management commitment towards knowledge sharing promotes knowledge sharing behaviors. The study findings indicate that knowledge workers are likely to be influenced by the expectations of management and peer group in deciding to engage in knowledge sharing. So it may even be appropriate to exert some pressure on knowledge workers to share knowledge through the social influence of top management and peer group.

Third, the results of the study suggest that attitude towards knowledge sharing behavior affects intention and further the actual behavior of knowledge workers. Organizations should promote knowledge sharing behaviors by managing factors that

influence knowledge workers attitude towards knowledge sharing. Organizations should structure the knowledge sharing initiatives in such a way that they support the social concerns knowledge workers have for such things as realizing reciprocal benefits, reputation enhancement, enjoyment in helping others, balance of power and so forth. Specifically, the level of knowledge workers perceptions of reciprocity in the organization should be raised by promoting knowledge centric culture and by encouraging knowledge workers to help their co-workers with the knowledge needs. The situations where knowledge needs have been answered must be publicized to demonstrate the positive impacts of knowledge sharing. As and when possible, organizations should highlight the improved organizational performance resulting from sharing knowledge.

Fourth, techniques should also be developed to raise the level of the knowledge workers perceptions of reputation in the organization. Organizations should acknowledge the knowledge contributions made by knowledge workers and promote their reputation. Gaining recognition and reputation is likely to motivate knowledge workers to engage in knowledge sharing.

Fifth, organizations should address the knowledge workers fears about losing power in the organization. Knowledge workers perceptions of the loss of knowledge power should be mitigated by reassuring their position, power and status in the organization.

Sixth, organizations should encourage knowledge sharing behaviors by promoting pro-social and organizational citizenship behavior. Organizations should

acknowledge that some knowledge workers engage in knowledge sharing purely from altruistic or pro-social motives. With this in mind, knowledge sharing initiatives should be structured in such a way that they contribute to knowledge workers satisfaction. Organizations should raise the level of the knowledge workers perceptions of the enjoyment in helping others by publicizing the positive outcomes of the knowledge sharing. Knowledge workers with pro-social or altruistic motives are likely to engage in knowledge sharing more often, when they realize the benefits the organization or co-workers have accrued as a result of knowledge sharing.

Seventh, organizations should reconsider knowledge sharing incentives based on economic incentives. As Kohn (1993) observes economic incentives succeed only at creating temporary compliance. They do not produce lasting commitments. They even undermine the intrinsic motivation of knowledge workers by promoting self-interested behavior (Wasko and Faraj, 2000). As such, organizations should reevaluate the usage of economic incentives to motivate knowledge workers to share knowledge.

Eighth, knowledge sharing is time consuming. Organizations should ensure that knowledge workers have time, resources and opportunities to engage in knowledge sharing. Organizations should allocate time for engaging in knowledge sharing behaviors by integrating it into the work processes. Time needed to engage in knowledge exchanges should not be viewed as a cost factor.

Ninth, organizations should employ knowledge management systems to facilitate collaborative work and support knowledge sharing. The results of the study indicate that knowledge workers perception of facilitating tools and technology is an

important factor in deciding to engage in knowledge sharing. Organizations should enhance the level of the knowledge workers perception of facilitating tools and technology by employing appropriate systems that are easy to use.

6.4 Limitations and Future Research Directions

There are few limitations to this research study. First, the research setting for the current study was an educational institution. Respondents were limited to full time working employees enrolled in MBA and senior level classes in the college of business at the University of Texas at Arlington. As such, the study may limit the extent to which respondent behaviors can be generalized to the general work force. Typically, the criticism directed at the usage of students as subjects for research centers around the argument that students differ from the general population in regards to their perceptions about the theoretical phenomenon of interest. This may be a valid argument in cases where students have indistinct or unclear position. However, in this study, the respondents although taking classes are actually full time knowledge workers. Indeed, a majority of them come from professional ranks. Therefore, the results of this study can be regarded as being representative of the perceptions of the general knowledge work force. To further increase the generalizability however, future research should replicate the study's findings with larger samples and in different contexts. The study should also be replicated in countries with non-US cultures.

Second, the research setting used in this study made it difficult to obtain objective measures of knowledge sharing behaviors. As such, the current study used perceptual measures. The survey instrument relied on self-reported measures, in which

the findings are dependent upon knowledge worker's responses regarding his/her knowledge sharing behavior rather than on direct observation of such behavior. Self-reports of behavior are often criticized as being tainted with response bias, inaccuracy and so forth and as such are regarded as poor indicators of actual behavior. However, in some behavioral studies such as sexual behavior and condom use (Jaccard et al., 2002) self reports of behavior were found to be fairly accurate. Also, in the current study, the measures for knowledge sharing behavior, although perceptual are recorded using a seven point frequency scale which is believed to mitigate the bias associated with self reports. Never the less, future research should investigate the research model using objective measures for knowledge sharing behaviors to make the findings of this study more robust.

Third, the research design uses cross-sectional data, rather than longitudinal data. Cross-sectional data limits the extent to which causality can be inferred from the results. Fortunately, though, the posited causal relationships in the current study are grounded in well developed theory and practice and as such have the theoretical support for the direction of the relationship. Future research, however, will certainly benefit from collecting longitudinal data. A longitudinal examination of the multiple facets of the knowledge sharing behaviors would make the findings more robust.

Fourth, the study focuses on some of the motivating factors that influence knowledge sharing behaviors of knowledge workers. As such, the antecedents explain only a portion of the variance in the dependent variable (actual knowledge sharing behavior). There may be other factors which are not part of this study but may have

significant influence on knowledge sharing behaviors. Future research should add other constructs such as self-efficacy, personality traits, leadership styles, trust, organizational commitment, perceived ownership of knowledge, task inter dependence etc to the research model to determine their influence on knowledge sharing behaviors.

Fifth, the study's findings are based on the modest sample size of 180 respondents. Although PLS Graph handles small sample sizes and generates valid results, a larger sample with more statistical power would have permitted me to use other covariance based structural equation modeling tools such as LISREL. Future research should verify the findings of this research study using covariance based tools.

Sixth, conclusions drawn in this study are based on a single method – survey and a single set of respondents. As such, it leaves open the possibility for the existence of the common method bias. Future research should employ elaborate measures and multiple methodologies to triangulate the study's findings.

6.5 Conclusion

Knowledge sharing has been identified as the key enabler of knowledge management. To leverage knowledge resources and to support knowledge sharing, organizations are employing knowledge management systems. While knowledge management systems are important, practical implementations have shown that the mere availability of technology does not guarantee that knowledge will be shared. Citing the growing significance of knowledge sharing to the success of knowledge management and to the survival of organization, both academicians and practitioners

have called for the identification of factors that promote or discourage knowledge sharing behaviors in the organizational context.

This exploratory research attempted to fill the void in the extant research on knowledge sharing by investigating the factors that influence the knowledge sharing behaviors of knowledge workers. Drawing from multiple streams of research including social psychology, organizational learning, knowledge management, information systems, this research developed an integrated theoretical model and unveiled three sets of critical factors: psychological, organizational and technological that are believed to affect the knowledge sharing behaviors.

Using a field survey of 180 knowledge workers, the theoretical model was validated within the context of a single empirical study. The findings provided significant statistical support for the research model accounting for about 60 percent of the variance in the behavioral intention to share knowledge and 41 percent variance in the actual knowledge sharing behavior. 11 of the 12 hypothesized relationships were supported. Knowledge sharing behavior was predicted by the knowledge workers intention towards knowledge sharing and perceived behavioral control. Knowledge sharing intention in turn was predicted by knowledge workers attitude towards knowledge sharing, subjective norm and perceived behavioral control. The knowledge workers perceptions of reciprocity, reputation, enjoyment in helping others was positively associated with favorable attitude towards knowledge sharing. The perceptions of loss of knowledge power exerted a negative effect on the attitude. Organizational climate positively influenced knowledge workers subjective norm.

Additionally, facilitating tools and technology was positively associated with high levels of perceived behavioral control towards knowledge sharing.

Based on the findings, the study discussed theoretical and practical implications for sharing knowledge in the work context. Overall, the results of the study advance prior research in the area of knowledge sharing by shedding light on the determinants of knowledge sharing behavior of knowledge workers. The research model deepens our collective understanding of the underlying psychological processes that induce knowledge sharing behaviors. In addition to contributing to theory, the findings of the study also yield insights for practice. The insights could be used by organizations in developing realistic environments that are conducive to knowledge sharing.

APPENDIX A

RESEARCH PARTICPATION INFORMATION FORM



Research Participation Information Form

This is to certify that I am aware of and understand the following conditions for my participation in the research project entitled, “Determinants of Knowledge Sharing Behavior of Knowledge Workers” which is being conducted by Anitha Chennamaneni, Dr. M. K. Raja and Dr. James T. C. Teng at the University of Texas at Arlington:

- The purpose of the research is to examine factors contributing to the success of knowledge sharing in organizations.
- My participation involves the completion of a questionnaire which takes approximately 10-15 minutes to complete.
- The questionnaire is confidential and is not linked to my personal identity.
- Anitha Chennamaneni will keep the completed questionnaires in strict confidentiality.
- I can request to receive a summary of research findings.
- My participation is voluntary and I can choose to terminate it at any time without penalty.
- I may contact Anitha Chennamaneni, Dr. M. K. Raja, or Dr. James T. C. Teng for any questions regarding the research project by calling 817-272-3540 or 817-272-1430 or e-mailing raja@uta.edu or jtteng@uta.edu or anitha3@hotmail.com.
- I may also contact the office of Research Compliance 817-272-3723 at the University of Texas – Arlington regarding the questions related to my participation in this research project.

APPENDIX B

SURVEY QUESTIONNAIRE

Please indicate how strongly you agree or disagree with each statement by circling a number.
 1= Strongly Disagree 7 = Strongly Agree

Note: KNOWLEDGE includes know-what (important factual information – e.g., what drug is appropriate for an illness), know-how (skill and procedures – e.g., how to administer a drug), and know-why (understanding cause and effect relationships – e.g., understanding why a drug works).

Intention Towards Knowledge Sharing

If given opportunity, I would share factual knowledge (know-what) from work with my co-workers.	1	2	3	4	5	6	7
If given opportunity, I would share business knowledge about the customers, products, suppliers and competitors with my co-workers.	1	2	3	4	5	6	7
If given opportunity, I would share internal reports and other official documents with my co-workers.	1	2	3	4	5	6	7
If given opportunity, I would share work experiences with my co-workers.	1	2	3	4	5	6	7
If given opportunity, I would share know-how or tricks of the trade from work with my co-workers.	1	2	3	4	5	6	7
If given opportunity, I would share expertise from education or training with my co-workers.	1	2	3	4	5	6	7
If given opportunity, I would share know-why knowledge from work with my co-workers	1	2	3	4	5	6	7

Attitude Towards Knowledge Sharing

To me, sharing knowledge with my co-workers is harmful.	1	2	3	4	5	6	7
To me, sharing knowledge with my co-workers is good.	1	2	3	4	5	6	7
To me, sharing knowledge with my co-workers is pleasant.	1	2	3	4	5	6	7
To me, sharing knowledge with my co-workers is worthless.	1	2	3	4	5	6	7
To me, sharing knowledge with my co-workers is wise.	1	2	3	4	5	6	7

Subjective Norm towards Knowledge Sharing

My CEO thinks that I should share knowledge with my co-workers.	1	2	3	4	5	6	7
My boss thinks that I should share knowledge with my co-workers.	1	2	3	4	5	6	7
My colleagues think I should share knowledge with my co-workers.	1	2	3	4	5	6	7
Generally speaking, I try to follow the CEO's policy and intention.	1	2	3	4	5	6	7
Generally speaking, I accept and carry out my boss's decision even though it is different from mine.	1	2	3	4	5	6	7

Perceived Behavioral Control

I have enough time available to share knowledge with my co-workers.	1	2	3	4	5	6	7
I have the necessary tools to share knowledge with my co-workers.	1	2	3	4	5	6	7
I have the ability to share knowledge with my co-workers.	1	2	3	4	5	6	7
Sharing knowledge with my co-workers is within my control.	1	2	3	4	5	6	7
I am able to share knowledge with my co-workers easily.	1	2	3	4	5	6	7
Even if I wanted to share, I do not have the means to share knowledge.	1	2	3	4	5	6	7

Perceived Organizational Incentives

Sharing knowledge with my co-workers improves the likelihood of getting a better work assignment for me.	1	2	3	4	5	6	7
Sharing knowledge with my co-workers improves the likelihood of getting a promotion for me.	1	2	3	4	5	6	7
Sharing knowledge with my co-workers improves the likelihood of getting a higher salary for me.	1	2	3	4	5	6	7
Sharing knowledge with my co-workers improves the likelihood of getting a bonus for me.	1	2	3	4	5	6	7
I expect to get more job security when I share knowledge with my co-workers.	1	2	3	4	5	6	7

Perceived Reciprocal Benefits

When I share knowledge with my co-workers, I expect them to respond to my knowledge needs.	1	2	3	4	5	6	7
When I share knowledge with my co-workers, I believe that my queries for knowledge will be answered in the future.	1	2	3	4	5	6	7
I know that my co-workers help me, so it is only fair to help them out when they are in need of knowledge.	1	2	3	4	5	6	7

Perceived Reputation Enhancement

My co-workers respect me, when I share knowledge with them.	1	2	3	4	5	6	7
Sharing knowledge with my co-workers improves others recognition of me.	1	2	3	4	5	6	7
My superiors praise me when I share knowledge with my co-workers.	1	2	3	4	5	6	7
I believe my status in the organization improves, when I share knowledge with my co-workers.	1	2	3	4	5	6	7
Organizational members who share knowledge with others have more prestige.	1	2	3	4	5	6	7
I share my knowledge to improve my reputation in the organization.							

Perceived Loss of Knowledge Power

Sharing knowledge with my co-workers makes me lose my unique value in the organization.	1	2	3	4	5	6	7
Sharing knowledge with my co-workers makes me lose my power base in the organization.	1	2	3	4	5	6	7
When I share knowledge with my co-workers, I believe I will lose my knowledge that no one else has.	1	2	3	4	5	6	7
Sharing knowledge with my co-workers makes me lose my knowledge that makes me stand out with respect to others.	1	2	3	4	5	6	7

Perceived Enjoyment in Helping Others

I enjoy sharing knowledge with my co-workers.	1	2	3	4	5	6	7
I enjoy helping my coworkers by sharing knowledge.	1	2	3	4	5	6	7
It feels good to help my co-workers solve their work related problems.	1	2	3	4	5	6	7
Sharing knowledge with my co-workers gives me pleasure.	1	2	3	4	5	6	7

Affiliation

Members in our department keep close ties with each other.	1	2	3	4	5	6	7
Members in our department consider other members standpoint highly.	1	2	3	4	5	6	7
Members in our department have a strong feeling of one team.	1	2	3	4	5	6	7
Members in our department cooperate well with each other.	1	2	3	4	5	6	7

Innovativeness

Our department encourages suggesting ideas for new opportunities.	1	2	3	4	5	6	7
Our department puts much value on taking risks even if that turns out to be a failure.	1	2	3	4	5	6	7
Our department encourages finding new methods to perform a task.	1	2	3	4	5	6	7

Fairness

Members in our department can trust department head's judgment to be good.	1	2	3	4	5	6	7
In our department, objectives which are given to us are reasonable.	1	2	3	4	5	6	7
In our department, our boss doesn't show favoritism to anyone.	1	2	3	4	5	6	7

Knowledge Sharing Behavior

Please indicate how frequently you shared work-related knowledge with your co-workers in the past year.							
1 = Very Infrequently		4 = Moderate Frequency(Few times per month)					
7 = Very Frequently (Many times daily)							
I shared factual knowledge (know-what) from work with my co-workers.	1	2	3	4	5	6	7
I shared business knowledge about the customers, products, suppliers and competitors with my co-workers.	1	2	3	4	5	6	7
I shared internal reports and other official documents with my co-workers.	1	2	3	4	5	6	7
I shared work experiences with my co-workers.	1	2	3	4	5	6	7
I shared know-how or tricks of the trade from work with my co-workers.	1	2	3	4	5	6	7
I shared expertise from education or training with my co-workers.	1	2	3	4	5	6	7
I shared know-why knowledge from work with my co-workers	1	2	3	4	5	6	7

Usage of Tools and Technology

Please indicate how frequently each of the following tools is used by you to share knowledge.							
1 = Very Infrequently		4 = Moderate Frequency(Few times per month)					
7 = Very Frequently (Many times daily)							
I use e-mail to share knowledge with my co-workers.	1	2	3	4	5	6	7
I use discussion forum (using tools like electronic bulletin board, chat room etc) to share knowledge with my co-workers.	1	2	3	4	5	6	7
I use desktop computer conferencing(using networked PC simultaneously for discussion and information exchange with tools such as net meeting, instant messaging, etc) to share knowledge with my co-workers.	1	2	3	4	5	6	7
I share knowledge by inputting it into knowledge repository/company databases (containing existing expertise, lessons learned, best practices etc).	1	2	3	4	5	6	7
I use intranet (including corporate portal) to share knowledge with my co-workers.	1	2	3	4	5	6	7
I use computerized directory on experts with specific knowledge to locate the expertise that my co-workers need.	1	2	3	4	5	6	7
I use videoconferencing to share knowledge with my co-workers.	1	2	3	4	5	6	7
I use teleconferencing to share knowledge my co-workers.	1	2	3	4	5	6	7
I share knowledge through face-to-face discussions with my co-workers	1	2	3	4	5	6	7

Tools and Technology

Please indicate how strongly you agree or disagree with each statement by circling a number.							
1 = Strongly Disagree 7 = Strongly Agree							
Whenever I want to share knowledge, I can easily access tools and technology in our organization.	1	2	3	4	5	6	7
In our organization, it is easy to use tools and technology to share knowledge.	1	2	3	4	5	6	7
In our organization, tools and technology for sharing knowledge is reliable.	1	2	3	4	5	6	7
Tools and technology for sharing knowledge is available when it is needed.	1	2	3	4	5	6	7
Tools and technology for sharing knowledge can be customized to fit individual needs.	1	2	3	4	5	6	7
I am satisfied with the overall quality of tools and technology for sharing knowledge in our organization.	1	2	3	4	5	6	7
Tools and technology for sharing knowledge is intimidating to me.	1	2	3	4	5	6	7
I hesitate to use tools and technology to share knowledge for fear of making mistakes.	1	2	3	4	5	6	7

Demographics - Please check the category that is most appropriate.

Gender Male
 Female

Age Group 18 to 21 years old
 21 to 30 years old
 31 to 40 years old
 41 to 50 years old
 51 to 60 years old
 Above 60 years old

Level of education Some High School
 High School Degree
 Associate's Degree
 Bachelors Degree
 Masters Degree
 Doctorate Degree
 Other – Please Specify _____

Years with Organization Under 2 years
 3 to 5 years
 5 to 10 years
 11 to 20 years
 21 to 30 years
 Above 30 years
 Other – Please Specify _____
 Not Applicable – Never worked

Industry Manufacturing
 IT/Telecommunications
 Banking/Insurance/Financial Service
 Consulting/Business Service
 Health Care
 Hotel/Entertainment/Service Industry
 Constructions/Architecture/Engineering
 Government, including Military
 Education
 Other –Please Specify _____

Your Job Title _____

Your Organization's Size _____
 (Please estimate the total number of employees in your organization)

Please provide us any comments/suggestions that you may have related to knowledge sharing at work place or on the questionnaire:

Thank you for your time and cooperation.

REFERENCES

- Ajzen, I. "The Theory of Planned Behavior," *Organizational Behavior & Human Decision Processes* (50:2), 1991, pp. 179-211.
- Ajzen, I., and Fishbein, M. "Understanding Attitudes and Predicting Social Behavior," Prentice-Hall, Englewood Cliffs, NJ, 1980.
- Ajzen, I. "Nature and operation of attitudes," *Annual Review of Psychology*, (52), 2001, pp. 27-58.
- Alavi, M., and Leidner, D. E. "Knowledge Management Systems: Issues, Challenges and Benefits," *Communications of AIS* (1), 1999, pp. 1-37.
- Alavi, M., and Leidner, D. E. "Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues," *MIS Quarterly* (25:1), 2001, pp. 107-136.
- Andrews, K. M. & Delahaye, B. L. "Influences on knowledge processes in organizational learning: the psycho-social filter," *Journal of Management Studies*, (37:6), 2000, pp. 797-810
- Ardichvili, A., Page, V., & Wentling, T. "Motivation and barriers to participation in virtual knowledge-sharing communities of practice," *Journal of Knowledge Management*, (7:1), 2003, pp. 64-77.
- Argote, L., and Ingram, P. "Knowledge Transfer: A Basis for Competitive Advantage in Firms," *Organizational Behavior and Human Decision Processes* (82:1), 2000, pp. 150-169.
- Armitage, C.J., & Conner, M. "Efficacy of the theory of planned behavior: A meta-analytic review," *British Journal of Social Psychology*, (40), 2001, pp. 471-499
- Astrom, A.N. & Mwangosi, I.E. "Teachers Intention to Provide Dietary Counselling to Tanzanian Primary Schools," *American Journal of Health Behavior*, (24), 2001, pp. 281-289

- Ba, S., Stallaert, J., and Whinston, A. B. "Research Commentary: Introducing a Third Dimension in Information Systems Design--The Case for Incentive Alignment," *Information Systems Research* (12:3), 2001, pp. 225-239
- Babcock, P. "Shedding Light on Knowledge Management," *HR Magazine* (49:5), 2004, pp. 46-50.
- Barclay, D., Thompson, R., and Higgins, C. "The Partial Least Squares Approach to Causal Modeling: Personal Computer Adoption and Use as an Illustration," *Technology Studies: Special Issue on Research Methodology* (2:2), 1995, pp. 285-324.
- Barney, J. (1991). "Firm Resources and Sustained Competitive Advantage," *Journal of Management*, (17:1), 1991, pp. 99-120
- Beck, L. & Ajzen, I. "Predicting Dishonest Actions Using the Theory of Planned Behavior," *Journal of Research in Personality*, (25), 1991, pp.285-301
- Beckman, T. (1999). The current state of knowledge management. In J. Liebowitz (Ed.), *Knowledge Management Handbook*: CRS Press.
- Beer, M., & Nohria, N. "Cracking the code of change," *Harvard Business Review* (May/June), 2000, pp. 133-141.
- Blau, P. "Exchange and power in social life", 1964. New York: Wiley.
- Bock, G. W., and Kim, Y. G. "Breaking the Myths of Rewards: An Exploratory Study of Attitudes about Knowledge Sharing," *Information Resource Management Journal* (15:2), 2002, pp. 14-21.
- Bock, G. W., Zmud, R. W., Kim, Y. G., and Lee, J. N. "Behavioral Intention Formation in Knowledge Sharing: Examining the Roles of Extrinsic Motivators, Social-Psychological Forces, and Organizational Climate," *MIS Quarterly* (29:1), March 2005, pp. 87-111.
- Boisot, M., & Griffiths, D. "Possession is nine tenths of the law: managing a firm's knowledge base in a regime of weak appropriability,". *International Journal of Technology Management*, (17:6), 1999, pp. 662-676.
- Brief, A. P., & Motowidlo, S. J. "Prosocial organizational behaviors," *Academy of Management Review*, (11), 1986, pp. 710-725.
- Brown, J. S., and Duguid, P. "Organizational Learning and Communities of Practice," *Organization Science* (2:1), 1991, pp. 40-57.

Buckman, R. H. "Knowledge Sharing at Buckman Labs," *Journal of Business Strategy* (19:1), January/ February 1998, pp. 11-15.

Compeau, D. R., & Higgins, C. A. (1995). Application of social cognitive theory to training for computer skills. *Information Systems Research*, 6(2), 118-143.

Conner, M., & Armitage, C.J. "Extending the theory of planned behavior; A review and avenues for further research," *Journal of Applied Social Psychology*, (28), 1998, pp. 1429-1464

Conner, K. R., & Prahalad, C. K. "A resource-based theory of the firm: Knowledge versus opportunism," *Organization Science*, (7:5), 1996, pp. 477-501.

Cross, R., and Baird, L. "Technology Is Not Enough: Improving Performance by Building Organizational Memory," *Sloan Management Review* (41:3), 2000, pp. 69-78.

Connelly, C. E., & Kelloway, K. "Predictors of employees' perceptions of knowledge sharing cultures," *Leadership & Organizational Development Journal*, 24(5/6), 2003, pp. 294-301

Connolly, T., and Thorn, B. K. "Discretionary Databases: Theory, Data, and Implications," in *Organizations and Communication Technology*. J. Fulk and C. Steinfield (Eds.), Sage Publications, Newbury Park, CA, 1990, pp. 219-233.

Constant, D., Kiesler, S., and Sproull, L. "What's Mine Is Ours or Is It? A Study of Attitudes about Information Sharing," *Information Systems Research* (5:4), 1994, pp. 400-421.

Constant, D., Sproull, L., & Kiesler, S. "The kindness of strangers: The usefulness of electronic weak ties for technical advice," *Organization Science*, (7:2), 1996, pp. 119-135.

Chin, W. W. "The Partial Least Squares Approach to Structural Equation Modeling." in *Modern Methods for Business Research*. G. A. Marcoulides (ed.), Lawrence Erlbaum Associates, Mahwah, NJ, 1998. pp. 295-336.

Chin, W. "Issues and Opinion on Structural Equations Modeling," *MIS Quarterly* (22:1), 1998, pp. vii-xvi.

Chin, W.W. "The measurement and meaning of IT usage: Reconciling recent discrepancies between self reported and computer recorded usage," *Administrative Sciences Association of Canada - 24th Conference, IS Division Proceedings*, 1996, pp. 65-74.

Chin, W.W. "PLS - Graph User's Guide, Version 3.0," Soft Modeling, Inc, 2001, pp 1-18.

Chin, W. W., and Todd. P. A. "On the Use, Usefulness, and Ease of Use of Structural Equation Modeling in MIS Research: A Note of Caution," *MIS Quarterly* (19:2), 1995, pp. 237-246.

Chin, W.W., Newsted, P.R. (1999), "Structural equation modeling analysis with small samples using partial least squares", in Hoyle, R.R. (Eds), *Statistical Strategies for Small Sample Research*, Sage Publications, Thousand Oaks, CA, pp.307-41.

Chow, C. W., Deng, J. F., & Ho, J. L. "The openness of knowledge sharing within organizations: a comparative study of the United States and the People's Republic of China," *Journal of Management Accounting Research*, (12), 2000, pp. 65-95.

Cronbach, L. J. "Coefficient Alpha and the Internal Structure of Tests," *Psychometrika* (16), 1951, pp. 297-334.

Davenport, T., Prusak, L. "Working Knowledge," Harvard Business School Press, 1997, Boston, MA, .

Davenport, T. H., and Prusak, L. "Working Knowledge: How Organizations Manage What They Know," Harvard Business School Press, Boston, 1998.

Davenport, T. H., and Prusak, L, "Working Knowledge," Harvard Business School Press, Boston, 1998.

Davenport, T. H., De Long, D. W., & al, e. "Successful knowledge management Project," *Sloan Management Review*, (39:2), 1998, pp. 43-57.

Deluga, R. J. "Leader-Member Exchange Quality and Effectiveness Ratings: The Role of Subordinate-Supervisor Conscientiousness Similarity," *Group & Organization Management* (23:2), 1998. pp. 189-216.

Dixon, N. M. "Common Knowledge: How Companies Thrive by Sharing What They Know", Harvard Business School Press, Boston, 2000.

Dooley, D. "Social Research Methods," Prentice-Hall, Upper Saddle River, NJ, 2001.

Drucker, P. "The Landmarks of Tomorrow," Harper & Row, New York, NY, 1959.

Fishbein, M., and Ajzen, I. "Beliefs, Attitude, intention and Behavior: An introduction to Theory and Research", Addison-Wesley Publishing Company, Reading, MA, 1975.

- Fornell, C, and Larcker, D. F. "Structural Equation Models with Unobservable Variables and Measurement Errors," *Journal of Marketing Research* (18:2), 1981, pp. 39-50.
- Gardner, D. G., and Pierce, J. L. "Self-Esteem and Self-Efficacy Within the Organizational Context: An Empirical Examination." *Group & Organization Management* (23:1), 1998, pp. 48-70
- Gecas, V. "The Social Psychology of Self-Efficacy," *Annual Review of Sociology* (15), 1989, pp. 291-316.
- Gefen, D. & Straub, D.W. "Gender differences in the perception and use of E-mail: An extension to the technology acceptance model,". *MIS Quarterly*, (21:4), 1997, 389
- Gefen, D., D. W. Straub. "A practical guide to factorial validity using PLS-graph: Tutorial and annotated example,". *Communications of the Association for Information Systems* (16:5), 2005, pp. 91–109.
- George, J., 2004, "The theory of planned behavior and Internet Purchasing", *Internet Research*, (14:3), pp. 198-212
- Goodman, P. S., and Darr, E. D. "Computer-Aided Systems and Communities: Mechanisms for Organizational Learning in Distributed Environments," *MIS Quarterly* (22:4), 1998, pp. 417-440.
- Godin, G., & Kok, G. "The Theory of planned behavior: A review of its applications to health-related behaviors. *American Journal of Health Promotion*," (11), 1996, pp. 87-98.
- Gold, A.H., Malhotra, A., Segars, A.H. "Knowledge management: an organizational capabilities perspective", *Journal of Management Information Systems*, (18:1), 2001, pp.185-214.
- Gomez-Mejia, L. R., and Balkin, D. B. "Rethinking Rewards for Technical Employees," *Organizational Dynamics*, (18:4), 1990, pp. 62-76.
- Grant, R. M. "The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation," *California Management Review* (33:2), 1991, pp. 114-135.
- Grant, R. M. "Toward a Knowledge-Based Theory of the Firm," *Strategic Management Journal* (17), 1996, pp. 109-122.
- Gray, P. H. "The Impact of Knowledge Repositories on Power and Control in the Workplace," *Information Technology and People* (14:4), 2001, pp. 368-384.

- Gupta, A. K. & Govindarajan, V. "Knowledge Management's Social Dimension: Lessons from Nucor Steel," *Sloan Management Review* (42:1), 2000, pp. 71-80.
- Haldin-Herrgard, T. "Difficulties in diffusion of tacit knowledge in organizations," *Journal of Intellectual Capital*, (1:4), 2000, pp. 357-365
- Hall, H. "Social Exchange for Knowledge Exchange," paper presented at *Managing Knowledge: Conversations and Critiques*, University of Leicester Management Centre, April 10-11, 2001.
- Hall, H – *The intranet as actor: the role of the intranet in knowledge sharing*, 2004
- Hansen, M. T., Nohria, N., and Tierney, T. "What's Your Strategy for Managing Knowledge?," *Harvard Business Review* (77:2), 1999, pp. 106-116.
- Hair, J. F., Anderson, R. E., Tatham, R. L., and Black, W. C. "Multivariate Data Analysis (5th ed.)," Prentice Hall, Englewood Cliffs, NJ. 1998.
- Harris, R. G. "The knowledge-based economy: Intellectual origins and new economic perspectives," *International Journal of Management Reviews*, (3:1), 2001, pp. 21-40.
- Hinds, P. J., & Pfeffer, J. "Why Organizations Don't 'Know What They Know': Cognitive and Motivational Factors Affecting the Transfer of Expertise," in *Sharing Expertise: Beyond Knowledge Management*, M. Ackerman, V. Pipek, and V. Wulf (Eds.), MIT Press, Cambridge, MA, 2003, pp. 3-26.
- Hlupic, V., Pouloudi, A., Rzevski, G. "Towards an integrated approach to knowledge management: 'hard,' 'soft' and 'abstract' issues", *Knowledge and Process Management*, (9:2), 2002, pp. 90-102
- Hrubes, D. & Ajzen, I. "Predicting Hunting Intentions and Behavior. An application of the Theory of Planned Behavior," *Leisure Sciences*, (23), 2001, pp 165-178
- Huber, G. P. "Transfer of knowledge in knowledge management systems: Unexplored issues and suggested studies,". *European Journal of Information Systems*, (10:2), 2001, 72-79.
- Jaccard, J., McDonald, R., Wan, C. K., Dittus, P. J., & Quinlan, S. "The accuracy of self-reports of condom use and sexual behavior,". *Journal of Applied Social Psychology*, (32), 2002, pp. 1863–1905.

Janz, B. D., & Prasarnphanich, P. "Understanding the Antecedents of Effective Knowledge Management: The Importance of a Knowledge-Centered Culture," *Decision Sciences* (34:2), Spring 2003, pp. 351-384.

Jarvenpaa, S. L., and Staples, D. S. "The Use of Collaborative Electronic Media for information Sharing: An Exploratory Study of Determinants," *Journal of Strategic Information Systems* (9:2/3), 2000, pp. 129-154.

Jarvenpaa, S. L., and Staples, D. S. "Exploring Perceptions of Organizational Ownership of Information and Expertise", *Journal of Management Information Systems*, (18:1), Summer 2001, pp. 151-183.

Kankanhalli, Tan and Kwok-Kee., "Contributing Knowledge to Electronic Knowledge Repositories: An Empirical Investigation", *MIS Quarterly*, 29(1), 2005, pp. 113-145.

Kelley, H. H., and Thibaut, J. W. "Interpersonal Relations: A Theory of Interdependence," Wiley, New York, 1978.

Kelloway, E.K., Barling, J. "Knowledge work as organizational behaviour", *International Journal of Management Reviews*,(2), 2000, pp. 287-304.

Kohn, A. "Why Incentive Plans Cannot Work," *Harvard Business Review*, Sep-Oct., 1993, pp. 54-63

Kollock, P. "The Economies of Online Cooperation: Gifts and Public Goods in Cyberspace," in *Communities in Cyberspace*. M. Smith and P. Kollock (Eds.), Routledge, New York, 1999, pp. 220-239.

Krebs, D. L. "Empathy and Altruism," *Journal of Personality and Social Psychology* (32:6), 1975, pp. 1132-1146.

Lakhani, K., & von Hippel, E. "How open source software works: "Free" user-to-user assistance," MIT Sloan School of Management Working Paper No. 4117(May), 2000.

Lee, J. "The impact of knowledge sharing, organizational capability and partnership quality on IS outsourcing success," *Information & Management*, (38:5), 2001, pp. 323-335.

Lee, H. & Choi, B. "Knowledge management enablers, processes, and organisational performance: An integrative view and empirical examination', *Journal of Management Information Systems*, (20:1), 2003 pp. 179-228

Leonard, D., & Sensiper, S. (1998). The role of tacit knowledge in group innovation. *California Management Review*, (40:3), pp. 112-132.

Leonard-Barton, D. "Core capabilities and core rigidities: A paradox in managing new product development." *Strategic Management Journal*, (13), 1992, pp. 111-125.

Lerner, J., & Triole, J. "The simple economics of open source,". NBER Working Paper w7600, 2000

Liebeskind, J. P. "Knowledge. Strategy, and the Theory of the Firm," *Strategic Management Journal* (17:Special Issue), 1996, pp. 93-108

Lin, H.F. and Lee, G.G. "Perceptions of senior managers toward knowledge-sharing behavior,". *Management Decision*, (42:1), 2004, pp. 108-125.

Major, D. A., Kozlowski. S. W. J., Chao. G. T., and Gardner. P. D. "A Longitudinal Investigation of Newcomer Expectations, Early Socialization Outcomes, and the Moderating Effects of Role Development Factors." *Journal of Applied Psychology* (80:3), 1995. pp. 418-432.

Malhotra, Y., 1998, Knowledge management, knowledge organizations and knowledge workers: a view from the front lines, *Maeil Business Newspaper*, February 19, available at: <http://www.brint.com/interview/maeil.htm>

Malhotra, Y., and Galletta, D. F. "Extending the Technology Acceptance Model to Account for Social Influence: Theoretical Bases and Empirical Validation," in *Proceedings of the 32nd Hawaii International Conference on System Science*, IEEE Computer Society Press, Los Alamitos, CA, 1999.

Mathieson, K. "Predicting User Intentions: Comparing the Technology Acceptance Model with the Theory of Planned Behavior," *Information Systems Research* (2:3), 1991, pp. 173-191.

Markus, M. L. "Towards a Theory of Knowledge Reuse: Types of Knowledge Reuse Situations and Factors in Reuse Success," *Journal of Management Information Systems* (18:1), 2001, pp. 57-94.

McDermott, R. "How to build communities of practice in team organizations: learning across teams,". *Knowledge Management Review*, (2:2), 1999, pp. 32-36.

McDermott, R., & O'Dell, C. "Overcoming cultural barriers to sharing knowledge," *Journal of Knowledge Management*, (5:1), 2001, pp. 76-85

Moan, I. S. & Rise, J. "Quitting Smoking: Applying an Extended Version of the Theory of Planned Behavior to Predict Intention and Behavior," *Journal of Applied Biobehavioral Research*, (10:1), 2005, pp. 39-68

- Morris, M., Venkatesh V., Ackerman, P. "Gender and Age Differences in Employee Decisions About New Technology: An Extension to the Theory of Planned Behavior", *IEEE Transactions on Engineering Management* (52:1), 2005, pp. 69-84
- Nahapiet, J., & Ghoshal, S. "Social Capital, Intellectual Capital, and the Organizational Advantage," *Academy of Management Review*, (23:2), 1998, pp. 242-266.
- Nonaka, I. "A dynamic theory of organizational knowledge creation," *Organization Science*, (5:1), 1994, pp. 134-139.
- Nonaka, I. & Takeuchi, H. "The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation". New York: Oxford University Press, 1995.
- Norman, P. & Hoyle S . "The Theory of Planned Behavior and Breast Self-Examination: Distinguishing between Perceived Control and Self-Efficacy," *Journal of Applied Social Psychology*, (34:4), 2004, pp. 694-710.
- Nunnally, J. (1994), *Psychometric Theory*, McGraw-Hill, New York, NY.
- O'Dell, C., & Grayson, J. C. "If Only We Knew What We Know: the Transfer of Internal Knowledge and Best Practice,". New York: The Free Press, 1998
- Orlikowski, W. J. "Learning from Notes: Organizational Issues in Groupware Implementation," *Information Society* (9:3), 1993, pp. 237-251.
- Orlikowski, W. J. "Learning from notes: organizational issues in groupware Implementation,". In R. Kling (Ed.), *Computerization and controversy: value conflicts and social choices* (2nd ed.). San Diego: CA Academic Press. 1996
- Osterloh, M., and Frey, B. S. "Motivation, Knowledge Transfer, and Organizational Forms," *Organization Science* (11:5), 2000, pp. 538-550.
- Pan, S., & Scarbrough, H. "A socio-technical view of knowledge-sharing at Buckman Laboratories,". *Journal of Knowledge Management*, (2:1), 1998, pp. 55-66
- Parkhe, A. "Strategic Alliance Structuring: A Game Theoretic and Transaction Cost Examination of Interfirm Cooperation." *Academy of Management Journal* (36:4), 1993, pp. 794-829.
- Pettigrew, A., Whipp, R. "Managing Change for Competitive Success," Blackwell, Cambridge, MA, 1993

- Pfeffer, J. "Managing with Power: Politics and Influence in Organizations", Harvard Business School Press, Boston, 1992.
- Polanyi, M. "The Tacit Dimension, London," UK: Routledge and Keoan, 1966.
- Prahalad, C. K. and Hamel, G. "The core competence of the corporation." Harvard Business Review, (May-June), (68:3), 1990, pp. 79-91.
- Prusak, L. (1999). "What's up with knowledge management: a personal view,". In J. Cortada & J. Woods (Eds.), The knowledge management year book (pp. 1-7). Boston: Butterworth Heinemann.
- Rivis, A & Sheeran, P. "Descriptive Norms as an Additional Predictor in the Theory of Planned Behaviour: A Meta-Analysis," (22:3),2003, pp. 218-233
- Ruggles, R. "The State of the Notion: Knowledge Management in Practice," California Management Review (40:3), 1998, pp. 80-89.
- Ryu, S., Ho, S.H., Han, I. "Knowledge sharing behavior of physicians in hospitals," Expert Systems with Applications, (25:1), 2003, pp. 113-22
- Sheeran, P., & Orbell, S. "Do Intentions predict Condom use? Meta-analysis and examination of six moderator variables," British Journal of Social Psychology, (37) pp. 231-250
- Sheeran, P., & Taylor, S. "Predicting intentions to use condoms: Meta analysis and comparison of the theories of reasoned action and planned behavior," Journal of Applied Social Psychology (29) pp. 1624 – 1675.
- Smith, D. H. "Altruism, Volunteers, and Volunteerism," Journal of Voluntary Action Research (10:1), 1981, pp. 21-36.
- Smith, R. G., & Farquhar, A. "The road ahead for knowledge management", AI Magazine, (21:4), 2000, pp. 17-40.
- Sparrowe, R. T., and Linden, R. C. "Process and Structure in Leader-Member Exchange," Academy of Management Review (22:2), 1997, pp. 522-552.
- Spender, J. C. "Making Knowledge the Basis of a Dynamic Theory of the Firm," Strategic Management Journal (17:2), Winter 1996, pp. 45-82.
- Stajkovic, A. D., and Luthans, F. "Social Cognitive Theory and Self-Efficacy: Going Beyond Traditional Motivational and Behavioral Approaches," Organizational Dynamics. Spring 1998, pp. 62-74.

Taylor, S., and Todd P. A. "Understanding Information Technology Usage: A Test of Competing Models," *Information Systems Research* (6:3), 1995, pp. 144-

Teigland, R & Wasko, Molly McLure. "Integrating Knowledge through Information Trading: Examining the Relationship between Boundary Spanning Communication and Individual performance, *Decision Sciences*, (34:2), 2003, pp.

Thibaut, J. W., and Kelley, H. H. "The Social Psychology of Groups," New Brunswick, Transaction Books, 1986.

Thompson, R. L., Higgins, C. A., and Howell, J. M. "Personal Computing: Toward a Conceptual Model of Utilization," *MIS Quarterly* (16:1), 1991, pp. 125-143.

Thorn, B. K., and Connolly, T. "Discretionary Data Bases: A Theory and Some Experimental Findings," *Communication Research* (14:5), 1987, pp. 512-528.

Tuomi, I. "Data is More Than Knowledge: Implications of the Reversed Hierarchy for Knowledge Management and Organizational Memory," in *Proceedings of the Thirty-Second Hawaii International Conference on Systems Sciences*, IEEE Computer Society Press, Los Alamitos, CA, 1999.

Vance, D.M. "Information, knowledge and wisdom: The epistemic hierarchy and computer-based information systems," *Proceedings of the 1997 AIS Americas Conference*.

von Krogh, G. "Care in Knowledge Creation." *California Management Review* (40:3), 1998, pp. 133-153

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

Wasko, M, M., and Faraj, S. "Why Should I Share? Examining Knowledge Contribution in Networks of Practice," *MIS Quarterly* (29:1), 2005, pp. 35-57.

Yamagishi, T., and Cook, K. S. "Generalized Exchange and Social Dilemmas," *Social Psychology Quarterly* (56:4), 1993, pp. 235-248.

Zack, M. H. "Managing Codified Knowledge," *Sloan Management Review* (40:4), 1999, pp. 45-58.

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