

ENTERPRISE SOCIAL SOFTWARE: AN EMPIRICAL ASSESSMENT OF
KNOWLEDGE SHARING IN THE WORKPLACE

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Social software has become pervasive including technologies such as blogs, wikis, and social networking sites. Interactive Web 2.0 technology is distinguished from earlier Internet channels, with content provided not only from the website host, but also and most importantly, user-generated content. These social technologies are increasingly entering the enterprise, involving complex social and psychological aspects as well as an understanding of traditional technology acceptance factors.

Organizations trying to reap potential benefits of enterprise social software (ESS) must successfully implement and maintain ESS tools. This research develops a framework for assessing knowledge sharing based on reciprocal determinism theory and augmented with technology acceptance, sociological, and psychological factors.

Semi-structured interviews with IT professionals, followed by a written survey of employees using ESS are used to collect data. The hermeneutic circle methodology is used to analyze the interview transcripts and structural equation modeling is used to analyze the survey data. Results show technological advantage has no significant effect on the intention to share knowledge, but community cohesiveness and individual willingness significantly affect knowledge sharing intention and behavior. The study offers a synthesized model of variables affecting knowledge sharing as well as a better understanding of best practices for organizations to consider when implementing and maintaining ESS tools for employee knowledge sharing and collaboration.

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CHAPTER 1

INTRODUCTION

Background

Social software tools, otherwise known as social media, are some of the latest buzzwords in the growing use of Internet-based communications. Social communication has existed for hundreds of years in some form or another. From the days of the telegraph individuals have been utilizing some type of information communication technology (ICT) to transmit information. Early efforts focused on communication from one individual to another (one-to-one), such as the telegraph and the telephone. The early days of Internet use saw communication progress rapidly as technology developed that allowed information to be shared from one individual to many others (one-to-many), as with websites and email. However, the communication truly became social with the emergence of interactive Web 2.0 applications, making it possible for many individuals to interact with many others (many-to-many).

Social software has become pervasive in our daily lives with the introduction of social media tools such as blogs, wikis, and social networking sites. These types of ICT are distinguished from earlier Internet technology channels that allowed only one-to-many communication, such as a static website that was updated only by a webmaster. In contrast, the interactive nature of Web 2.0 technologies allows for many-to-many communication with content provided not only from the website host, but also and most importantly, user-generated content. The ability of users to contribute content has led to a plethora of information sharing on the Internet via wikis, blogs, and media sharing sites such as Wikipedia and YouTube.

Similarly, internal employee web sites, or intranets, have been around for several years in the organization. However, most of these intranets follow a one-to-many publishing model, with only one or a few employees allowed to post content that is available for all to see. But the majority of employees cannot add or edit the content in these traditional one-to-many intranets. The “social” aspect of social software facilitates many-to-many publishing with user-generated content uploaded by any employee and publicly shared across the organization, offering a wide array of potential benefits.

When employees are allowed to author content, a stronger sense of investment and ownership in the organization is realized, providing a stronger cohesiveness across a geographically diverse workforce (Baehr & Alex-Brown, 2010). This fosters a greater willingness to share knowledge with others as employees interact more often, and relationships are strengthened by those increased interactions (Baehr & Alex-Brown, 2010). Inexpensive and accessible Web 2.0 tools can be used to capture, structure, and maintain knowledge from experts in an organization to both create and retain value of scarce knowledge (Jackson, 2010). This makes the use of these social software tools attractive to the organization in light of ever tightening budgets in today’s business environment. Researchers note the increasing adoption of these social technologies in organizations, “Web 2.0 technologies are rapidly making their way into corporate technology infrastructures and architectures” (Andriole, 2010, p. 68).

Problem Statement

The problem facing the organization attempting to increase knowledge sharing and reap the potential benefits of social software technologies lies in the successful implementation and maintenance of tools that allow sharing of user-generated content.

While many organizations are turning to social software technologies to enhance knowledge collaboration, not all embrace those technologies or realize the full benefits they can bring in part because of concerns about security and trust (Andriole, 2010; Bulgurcu, Cavusoglu, & Benbasat, 2010; Jarvenpaa & Leidner, 1999). There is a call for “vigilant collaboration” in order to overcome the challenges of these security and privacy concerns (Jarvenpaa & Majchrzak, 2010). Noting that online knowledge collaborations are risky for the participants, these researchers suggest that by appraising each other’s actions, participants can collaborate and share knowledge and at the same time protect themselves from harm (Jarvenpaa & Majchrzak, 2010). Research also shows that even though employees are often the weakest link in information security, they can also be one of the best assets in efforts to reduce risks related to security (Bulgurcu et al., 2010).

Allowing employees to share their knowledge via user-generated content on the company intranet means putting considerable trust in those employees, and in turn, should make employees more likely to trust the company and its leadership. In any social interaction, issues of trust among the participants arise as well as other sociological issues such as community identification (Hsu & Lin, 2008), social influence (Chang & Cheung, 2001; Sledgianowski & Kulviwat, 2009; Venkatesh, Morris, Davis, & Davis, 2003) and expected reciprocal benefits (Bock & Kim, 2002; Bock, Zmud, Kim, & Lee, 2005; Hsu & Lin, 2008). In addition, personality traits identified in the psychological literature have been shown to influence individuals’ intention to share knowledge (Cho, Guo, & Che-Jen Su, 2007; Matzler & Mueller, 2011).

To be effective, the social software tools need to be intuitive, and include features that make editing, tagging, and bookmarking that shared knowledge seamless for the employee (Andriole, 2010). That seamless effort can be achieved by providing employees with the tools they are accustomed to in their own daily lives. In a twist to the usual order of technology diffusion, the adoption of technology is shifting from a pattern which originates in the organization and is then pushed to the individual. Instead, personal devices such as smart phones and tablets which allow truly ubiquitous access to the Internet have led to a phenomenon known as the consumerization of information technology (IT). The consumerization of IT involves individuals pushing their own technology patterns into the organization.

One study found that more than two thirds of workers polled said they first learned about new technologies and applications in their personal lives and then use those products and services in the workplace (Nunziata, 2011). As individual technology usage patterns and habits continue to evolve through popular social networking applications available on the Internet, organizations are increasingly being compelled to accommodate their employees' requests for the technology they have become accustomed to in their personal lives. Web 2.0 applications – known for their interactive features that allow sharing of content and information – are now becoming known as Enterprise 2.0 applications as they spread into the organization and provide the same ability for sharing knowledge and information within the organization (Andriole, 2010; Jackson, 2010). It is incumbent on the organization to provide employees with the social software tools that will allow for this easy sharing of knowledge.

Knowledge –a fundamental asset for the organization – and the effective sharing of that knowledge is a primary objective for the enterprise seeking a competitive advantage, and has become even more crucial in the digital economy (Bock & Kim, 2002; Wasko & Faraj, 2005). Efforts to transfer knowledge efficiently and effectively are the focus of organizations incorporating various types of social software into their knowledge management processes. These technologies offer the opportunity for collaboration among employees to mushroom in comparison to traditional forms of one-to-many communication such as the company intranet, the company newsletter, the weekly meeting or even email.

The research literature has increasingly examined employees working in virtual environments as globalization becomes the new norm for organizations and they begin employing the use of social software tools (Gillam & Oppenheim, 2006; Lipnack & Stamps, 1999; Ratcheva, 2008). As organizations continue to increase their virtual workspaces, a stream of research has focused on investigating virtual team members using various forms of computer mediated communication (CMC) that have become associated with the term social software. Researchers have found that technologies such as chat, groupware, internet telephony, computer conferencing systems, blogs, and Wikis have opened up new avenues for spontaneous and instant communication in organizations and present opportunities not possible just a few years ago (Gloor, Paasivaara, Schoder, & Willems, 2008; Lipnack & Stamps, 1999; Peters & Manz, 2007; Wakefield, Leidner, & Garrison, 2008).

A case study on the impact and value of corporate blogs found that the blog was a sustainable forum that could lead to benefits of “a shared understanding of

organizational roles, increased sense of group cohesiveness, improved work processes, and improved professional and personal ties,” (Baehr & Alex-Brown, 2010 p. 358). It has even been suggested that wikis can not only benefit the organization, but the IS discipline as well. As purveyors of information technologies, the argument is made that IS academicians above others should embrace the new Web 2.0 technologies to enhance their core practices of research, review, and teaching (Kane & Fichman, 2009).

In the organization, employees – especially those working in virtual teams – who utilize social software technologies are changing the corporate blueprint by being able to engage in more dynamic and flexible interactions than traditional face-to-face teams (Peters & Manz, 2007). Virtual teams offer unprecedented levels of flexibility and responsiveness with numerous ways to connect and communicate (Powell, Piccolo, & Ives, 2004). Additionally, knowledge capabilities that are enhanced by using information technologies were found to contribute to firm innovation (Joshi, Chi, Datta, & Han, 2010).

Enterprise 2.0 technologies – including collaboration tools such as wikis, blogs, and social networking platforms – provide employees in the organization effective ways to connect, collaborate, form communities, and share information and knowledge (Jackson, 2010). Because knowledge is identified as one of the most fundamental assets of the organization, understanding the factors that motivate people within the organization to share their knowledge can help create systems and processes that lead to a productive workplace. Since people are a key ingredient in knowledge sharing, understanding individual characteristics that motivate an individual’s intention to share knowledge is essential.

Research Question

Organizations face changing patterns of communication as a result of new technologies, globalization, and increased competition. In order to successfully facilitate technology supported collaboration among employees using enterprise social software, organizations must understand the traditional technology acceptance factors commonly used to measure the intention to use a technology as well as factors unique to social software which could further motivate employees to share knowledge. In addition, the interactions occurring within these online communities involve complex social and psychological aspects. Understanding these issues is critical in effectively managing these online interactions for long-term success in order to detect, avoid, and effectively resolve the potential issues with using such technologies. This raises the research question that this study addresses: What are the factors that lead to employee knowledge sharing when using enterprise social software tools?

Purpose and Contribution

The purpose of this study is to empirically test a framework to measure the knowledge sharing of employees who use social software tools in the enterprise. The study is based on a synthesized model of variables affecting knowledge sharing that is theoretically grounded in reciprocal determinism theory and augmented with elements of technology acceptance, sociological, and psychological theories. In order to realize the full organizational benefits of social software technologies, it is necessary to investigate how these various factors affect knowledge sharing. This dissertation has both academic and practical contributions.

The study contributes to research literature by offering a synthesized model of variables that are theoretically grounded in reciprocal determinism theory and supplemented with factors from technology acceptance, sociological, and psychological theories. Additionally, this study is unique in incorporating both hedonic as well as utilitarian elements of technology acceptance into the organizational context. Because social software tools involve social interactions with co-workers, it is expected that an element of pleasure is also a component of the employee acceptance of the technology. Finally, while there is an abundance of extant research on knowledge sharing in the organization, it has been mainly directed at either the group or organizational level of analysis. This dissertation fills the gap in the literature by examining knowledge sharing from the individual level of analysis. The practical contributions, as mentioned above, include a better understanding of best practices for organizations to consider when implementing social software tools to more effectively provide employees with the opportunity to collaborate and share knowledge.

Research Design

This study employs a mixed methodology of qualitative and quantitative research using semi-structured interviews and written survey instruments. The interviews were conducted with IT professionals involved specifically with the implementation and maintenance of such tools within their organization. A pilot survey was developed from theoretical foundations uncovered in the literature review and supplemented with findings from the interviews. The pilot survey was administered to undergraduate students enrolled in online courses at a college of business requiring online collaboration using wikis and discussion forums to further refine the critical factors

influencing knowledge sharing intention. The final survey was administered to employees using social software tools in their organization to evaluate their knowledge sharing intention and actual knowledge sharing behavior.

Organization of the Dissertation

The remainder of this dissertation is organized in the following manner. Chapter 2 includes a review of the relevant literature on social media, knowledge sharing and the theories and constructs selected for this study. In Chapter 2 the proposed model and hypotheses are also presented. Chapter 3 presents a discussion of the proposed methodological approach followed in this study including data collection methods. Chapter 3 also presents the initial stages of the research which informed the final model and associated hypotheses to be tested. Chapter 4 reviews the data analysis techniques and presents the results of the final model tested in this study. Chapter 5 discusses the findings and conclusions

CHAPTER 2

LITERATURE REVIEW

This chapter presents the major streams of literature to establish the theoretical foundation of the study. The first research stream deals with relevant literature about social software tools, the context used for examining knowledge sharing in this study. The next research stream reviews the extant literature about knowledge sharing, the dependent variable of this dissertation. The theoretical foundations covered include technology acceptance, sociological factors, and psychological factors thought to influence knowledge sharing. Based upon the literature, the theoretical framework for the study is developed to guide the semi-structured interviews with information technology (IT) professionals. The chapter concludes with the proposed research model and the associated constructs and hypotheses.

Social Software

The popularity of some Web 2.0 technologies – collectively known as social media or social software to indicate their interactive nature – has been well documented and researched. Social software technologies include collaboration tools such as social networking sites, blogs, wikis, podcasts, folksonomies, mashups, social bookmarking/tagging systems, and crowdsourcing. Gartner Inc., an information technology research and advisory company, reports that businesses are getting social in terms of social features being integrated into applications and lines are blurring between transactional tools and social environments (Austin, Nikos, Rozwell, & Landry, 2010).

Some of these information technologies such as social networking sites Facebook, Twitter, and YouTube are instantly recognizable and their impact on individual behavior has been increasingly examined (Dwyer, Hiltz, & Passerini, 2007; Harden, 2010; Kreps, 2010; Shi, Lee, Cheung, & Chen, 2010; Sledgianowski & Kulviwat, 2009). But others such as blogs, wikis, and social bookmarking are just beginning to receive attention in the research literature regarding their effect on individuals, groups, and the organization itself (Baehr & Alex-Brown, 2010; Kane & Fichman, 2009; Warr, 2008).

Interviews, observations, and surveys with managers and executives in various organizations revealed that wikis, blogs and RSS feeds had the greatest impact on business value for those implementing them (Andriole, 2010). While it has been noted that wikis present the potential to be inaccurate due to their anonymous authorship, they have also been found to self-regulate as the result of so many participants error-checking and editing the content (Warr, 2008). Researchers suggest that as purveyors of information systems (IS), IS academicians especially should embrace wikis and other Web 2.0 technologies to enhance our core practices of research, review, and teaching (Kane & Fichman, 2009). Wikis and blogs exist to serve the users' community and the resulting collection of user-generated content is deemed "collective intelligence," (Warr, 2008).

It has also been suggested that as baby-boomers begin to leave the workforce in growing numbers, they take with them critical amounts of "tacit knowledge, operational heuristics, stories and organizational history," (Jackson, 2010). The author proposes that wikis and other forms of social media can be an effective and inexpensive way to

capture, store, structure, share, and maintain that knowledge. This type of knowledge sharing process also offers the added benefit of providing the tools expected in the workplace of a younger workforce that has become accustomed to such levels of connectivity and interactivity.

While social networking sites such as Facebook have received increasing attention in the information systems literature, the focus has predominantly been on the hedonic context that such social media technologies cater to (Dwyer et al., 2007; Harden, 2010; Kreps, 2010; Shi et al., 2010; Sledgianowski & Kulviwat, 2009). However, their impact in the enterprise is still in the early stages of investigation (Andriole, 2010; Sarrel, 2010; Warr, 2008). While researchers note the organization's concern about privacy and security, especially when intellectual property or proprietary information is involved, they also point out that Web 2.0 collaboration tools with their social features can provide the organization with a powerful and inexpensive way to share valuable knowledge and link experts within the firm (Andriole, 2010; Sarrel, 2010).

Document-centric collaboration tools are no longer adequate to fully support and promote innovation and productivity within the organization (Sarrel, 2010). The rich context that social software can provide through the integration of audio, video, social profiles, expertise location, and community-building services make the use of social software tools in the enterprise an enhancement to traditional knowledge collaboration efforts. A crucial part of social software is the social profile which allows detailed information about the user's experience, knowledge, and a place to store his or her own user-generated content, as well as a method for finding other expertise within the organization (Sarrel, 2010).

A survey of 619 business technology professionals that were either using or testing Enterprise 2.0 products found that enterprise social networking tools are increasingly being used, but not just because they are the popular product of the moment (Rapoza, 2011). Businesses want to see value from implementation of these social software tools, which translates to increased collaboration and knowledge sharing. Many successful applications of both private and public social networks by public organizations and government offices have been reported in an assessment of enterprise social networking (Turban, Bolloju, & Liang, 2011). But their study also noted the downside in deployment of these systems, ranging from simple employee time wasting to the serious leakage of company secrets (Turban et al., 2011). Some of these issues are associated with external social networking activities. While most businesses are understandably concerned with allowing employees to use external social networks such as Facebook, LinkedIn, and Twitter for business purposes, the focus of the current dissertation research is on internal social software applications. The inclusion of external social networking tools requires the consideration of other salient factors such as company image and customer relationship management and is outside the scope of this study.

Social Software Research and Level of Analysis

Much of the extant research on social software has focused on the concepts of individual user acceptance and continuance intention – largely in a hedonic context (Dwyer et al., 2007; Harden, 2010; Kreps, 2010; Shi et al., 2010; Sledgianowski & Kulviwat, 2009). An overview of the frequent concepts studied in social software literature over the past decade is summarized in Table 1. The concepts are broken

down by level of research analysis. The table reveals that research of social software at the individual level has primarily focused on issues of acceptance, continuance intention, and trust. Social software literature at the group level of analysis is predominantly centered on performance and trust of the team or group. Finally, the organizational level of analysis in social software research has primarily focused on performance and knowledge sharing.

Table 1

Social Software Research – Concept Matrix by Unit of Analysis

| Concepts Articles/Unit of Analysis | User Acceptance | | | Continuance Intention | | | Performance | | | Trust | | | Knowledge Sharing | | |
|---------------------------------------|-----------------|---|---|-----------------------|---|---|-------------|---|---|-------|---|---|-------------------|---|---|
| | O | G | I | O | G | I | O | G | I | O | G | I | O | G | I |
| Ahuja et al 2003 | | | | | | | | X | | | | | | | |
| Andriole 2010 | | | | | | | X | | | X | | | X | | |
| Baehr & Alex-Brown, 2010 | | | | | | | X | | | | | | X | | |
| Chai et al., 2011 | | | | | | | | | | | | X | | | X |
| Chen, 2007 | | | | | | X | | | | | | | | | |
| Chiu et al, 2006 | | | | | | | | | | | X | | | X | |
| Choi et al, 2010 | | | | | | | | | | | | | | | |
| Dennis et al., 2008 | | | X | | | | | | X | | | | | | |
| Dwyer et al, 2007 | | | | | | | | | | | | X | | | |
| Featherman & Pavlou, 2003 | | | X | | | | | | | | | X | | | |
| Ford & Staples, 2010 | | | | | | | | | | | | | | | |
| Furumo, 2009 | | | | | | | | X | | | | | | | |
| Holsapple & Wu, 2007 | | | X | | | | | | | | | | | | |
| Hsu & Lin, 2008 | | | X | | X | | | | | | | X | | | X |
| Jackson, 2010 | | | | | | | | | | | | | X | | |
| Jarvenpaa et al, 2003 | | | | | | | | | | | X | | | | |
| Karla, 2010 | | | | | | | | | | | | | | | |
| Kim, D. et al, 2009 | | | | | | X | | | | | | X | | | |
| Kim, G. et al, 2009 | | | X | | | | | | | | | X | | | |
| Krasnova et al, 2010 | | | | | | | | | | | | X | | | |
| Lin & Bhattacharjee, 2010 | | | X | | X | | | | | | | | | | |
| Lin et al, 2005 | | | | | X | | | | | | | | | | |
| Lin, 2007 | | | | | | | X | | | | | | X | | |
| Mitchell & Zigurs, 2009 | | | | | | | | | | | X | | | | |
| Peters & Manz, 2007 | | | | | | | | | | | X | | | X | |
| Qin et al., 2011 | | | X | | | | | | | | | | | | |
| Robert et al, 2008 | | | | | | | | X | | | | | | X | |
| Sarker et al., 2011 | | | | | | | | | X | | | X | | | |
| Shi et al, 2010 | | | | | X | | | | | | | | | | |
| Sledgianowski & Kulviwat, 2009 | | | X | | X | | | | | | | X | | | |
| Staples & Webster, 2008 | | | | | | | | | | | X | | | X | |
| Wakefield, 2008 | | | | | | | | | | | | | | | |
| Wang & Wei, 2011 | | | | | | | | | | | | X | | | X |

Legend: O (organizational), G (group), I (individual)

The gap in the literature appears to be the investigation of knowledge sharing at the individual level among employees using social software tools in the enterprise.

While a few studies are beginning to investigate this outcome at the individual level using social software (Chai, Das, & Rao, 2011; Hsu & Lin, 2008; Wang & Wei, 2011), the research is in the early stages and a consensus of the critical factors affecting knowledge sharing is required. Therefore, the purpose of this dissertation is to develop a comprehensive set of factors predicting knowledge sharing of employees using the organization's internal social software based on elements of technology factors, sociological factors, and psychological factors. This study contributes to the literature by filling this gap and providing a better understanding of employees' knowledge sharing intentions and knowledge sharing behaviors when using social software tools in the organization.

Knowledge Sharing

Knowledge sharing has been studied extensively in the literature through varied lenses. A summary of theoretical foundations used to investigate knowledge sharing is presented in Table 2. Some of the common theories used to research knowledge sharing include dimensions from technology acceptance, sociological, and psychological theories.

While a variety of knowledge sharing predictors has been investigated, what is missing in the literature is a model that synthesizes the critical factors from each of these theories which are all relevant in the context of using enterprise social software. The current research empirically tests a framework for assessing knowledge sharing using a theoretical foundation of reciprocal determinism, drawn from social learning theory (Bandura, 1977), and integrated with factors from technology acceptance, sociological, and psychological theories.

Table 2

Major Knowledge Sharing Theories

| <i>Theoretical Concept</i> | <i>Specific Theories Used</i> | <i>Authors</i> |
|----------------------------|--|---|
| Technology acceptance | TRA TAM UTAUT | Bock & Kim 2002; Ford & Staples 2010; Hsu & Lin 2008; Teh & Yong 2011 |
| Psychological factors | Personality Traits Internal vs External Motivators Self-Determination Theory | Matzler et al. 2008; Matzler & Mueller 2011; Reinholt et al. 2011 |
| Sociological factors | Social Capital Theory Social Cognitive Theory Social Exchange Theory Social Role Theory | Bock & Kim 2002; Chai et al. 2011; Chiu et al. 2006; Hsu & Lin 2008; Huysman & Wulf 2006; Robert et al. 2008; Staples & Webster 2008; Teh & Sun 2012; Teh & Yong 2011 |

This table highlights a major area of focus in the literature on technology acceptance theories such as the theory of reasoned action (TRA), the technology acceptance model (TAM) and the unified theory of acceptance and usage of technology (UTAUT) (Bock & Kim, 2002; Ford & Staples, 2010; Hsu & Lin, 2008; Teh & Yong, 2011). Some studies have incorporated psychological foundations as well, such as personality factors, internal versus external motivators, and self-determination theory (Cho et al., 2007; Karkoulian & Osman, 2009; Matzler, Renzl, Müller, Herting, & Mooradian, 2008; Matzler & Mueller, 2011; Reinholt, Pedersen, & Foss, 2011), and even a study that incorporates economic theory (Bock & Kim, 2002). However, the bulk of the studies examine knowledge sharing through the theoretical lens of sociological theories such as social capital, social cognitive, social exchange and social role theories (Bock & Kim, 2002; Chiu, Hsu, & Wang, 2006; Hsu & Lin, 2008; Robert, Dennis, & Ahuja, 2008; Staples & Webster, 2008; Teh & Yong, 2011; Teh & Sun, 2012).

Clearly, for knowledge sharing to occur, there must be a social interaction that occurs between one employee and another, and certainly when social software tools

are the vehicle for that interaction. Therefore, it is expected that sociological theories would be of primary interest in determining factors that influence knowledge sharing as well as psychological factors impacting an individual's motivations. Since this study is investigating social software technologies as the means for sharing that knowledge, it is further expected that technology acceptance factors will also have an impact on knowledge sharing intention and behavior.

Knowledge is an integral element of an organization's resources, and frequently stressed as one of the most important assets a firm possesses. Knowledge has been described as the foundation of a firm's competitive advantage and one of the key drivers of the firm's value (Bock et al., 2005; Gold, Malhotra, & Segars, 2001; Grant, 1996; Teece, 1998; Wasko & Faraj, 2005). This organizational advantage is created by an organization's ability to create and share knowledge, resulting in greater social capital and thus intellectual capital (Nahapiet & Ghoshal, 1998; van den Hooff & Huysman, 2009; Wasko & Faraj, 2005). Social capital theory has also been investigated as a basis to analyze the collaborations of online interactions (Jarvenpaa & Leidner, 1999).

Online knowledge collaboration occurs when either the Internet or the intranet are used as a vehicle for the exchange of knowledge (Jarvenpaa & Leidner, 1999). The value of knowledge is two-fold in that once created, it can be used repeatedly by many others in the organization, and also by the fact that knowledge, once shared, stimulates new knowledge (Alavi & Leidner, 2001; Peters & Manz, 2007). Knowledge creation is facilitated in the social processes of interaction and communication practices that exist in the virtual environment provided by social media (Ratcheva, 2008).

Research has pointed to the importance of individuals' willingness to share the knowledge they have acquired or created with others in the organization (Bock et al., 2005). Recent studies indicate there are two types of knowledge sharing: 1) full knowledge sharing where the knowledge is given freely, and 2) partial knowledge sharing where some of the information is protected or withheld (Ford & Staples, 2010). Individuals in the organization must also have the means with which to make their knowledge available to others in their firm (van den Hooff & Huysman, 2009). Just as important is the necessity of the speed and efficiency of the social community within the organization that allows the dissemination of available knowledge. The social software tools need to be intuitive, and include features that make editing, tagging, and bookmarking that shared knowledge seamless for the employee. (Warr, 2008)

Increasingly organizations are finding that effectively managing their knowledge resources is a crucial step toward gaining or maintaining a competitive advantage (Alavi & Leidner, 2001); (Choi, Lee, & Yoo, 2010). There is a distinction made between simple information management – essentially the consolidation of data – as compared to knowledge management, which is a complex process that involves recognizing, creating, transforming, and distributing knowledge (Gold et al., 2001). Inexpensive and accessible Web 2.0 tools can be used to capture, structure, store, share and maintain knowledge from experts in an organization to both create and retain value of scarce knowledge (Jackson, 2010). It is this easy availability which makes these forms of knowledge sharing so appealing to businesses. Table 3 summarizes some of the concepts that have been included in knowledge sharing research.

Table 3

Selected Knowledge Sharing Concepts in Literature

| <i>Concepts Researched</i> | <i>Authors</i> |
|---|---|
| Community Factors | Chiu et al. 2006; Hsu & Lin 2008; Wang & Wei 2011; |
| Expected Associations or Relationships | Bock & Kim 2002; Hsu & Lin 2008 |
| Job Attitudes | Teh & Sun 2011 |
| Performance | Andriole 2010; Baehr & Alex-Brown 2010; Chiu et al. 2006; Jarvenpaa & Leidner 1999; Robert et al. 2008; |
| Trust | Andriole 2010; Chiu et al. 2006; Ford & Staples 2010; Hsu & Lin 2008; Staples & Webster 2008; |
| Organizational Factors | Bock et al. 2005; Hsu & Lin 2008; Teh & Sun 2011 |
| Extrinsic/Intrinsic Rewards | Kankanhalli et al. 2006 |
| Expected Rewards or Reciprocal Benefits | Bock & Kim 2002; Chiu et al. 2006; Hsu & Lin 2008; |
| Reputation | Hsu & Lin 2008; |
| Big Five Personality Traits | Matzler & Mueller, 2011; Cho et al. 2007; Karkoulian & Osman 2009 |

This study contributes to the literature by incorporating both hedonic and utilitarian technology acceptance factors affecting knowledge sharing in the organizational context, as well as examining technology factors unique to social software. Additionally, this study is unique in providing a synthesis of technology acceptance dimensions, sociological dimensions, and psychological dimensions to provide a comprehensive analysis of factors that influence knowledge sharing by employees using social software within their organization. This dissertation provides this comprehensive theoretical framework in the context of social software use, which changes the scope of many social activities that are typically investigated in traditional face-to-face interactions when studying knowledge sharing.

Research Questions

The specific research questions are:

1. Are the traditional technology acceptance factors of perceived usefulness, perceived ease of use, and perceived enjoyment, as well as technology factors specific to social software including convenience, immediacy of feedback, availability, richness of cues, and control positively correlated with the knowledge sharing intention of employees using their organization's internal social software tools?
2. Are the sociological factors of community identification, social influence, expected reciprocal benefits, and trust in other members of the online community positively correlated with the knowledge sharing intention of employees using their organization's internal social software tools?
3. Are the psychological factors of disposition to trust, openness to experience, and conscientiousness positively correlated with the knowledge sharing intention of employees using their organization's internal social software tools?
4. Is knowledge sharing intention positively related to employees' knowledge sharing behavior when using their organization's internal social software tools?

Conceptual Model and Hypotheses

The purpose of this dissertation is to answer the previous questions with the development of a comprehensive set of factors predicting employees' knowledge sharing intention and behavior when using internal enterprise social software. The conceptual model is based on a theoretical foundation of reciprocal determinism, drawn from social learning theory (Bandura, 1977), and integrated with factors from technology acceptance, sociological, and psychological theories. In addition, control variables of gender, age, job classification, and job tenure will be measured to examine any variance in knowledge sharing among these demographic subsets.

Reciprocal determinism theory posits that an individual's behavior is influenced by the environment and characteristics of the person (Bandura 1977). Contextualized in this study, the behavior represented is knowledge sharing. The environmental factors include the second-order constructs of technological advantage, the perceived advantage for an employee using ESS tools, and community cohesiveness, the belief that participating in the community provides greater connectedness to other members. The personal factor includes the second-order construct of individual willingness, the inherent characteristics that indicate an individual's willingness to engage in certain behavior. An overview of reciprocal determinism as contextualized in this study is shown in Figure 1. The arrows in the overview model are bi-directional to indicate the reciprocal nature of these relationships. However, in the research model, the relationships are analyzed as one-way causality relationships.

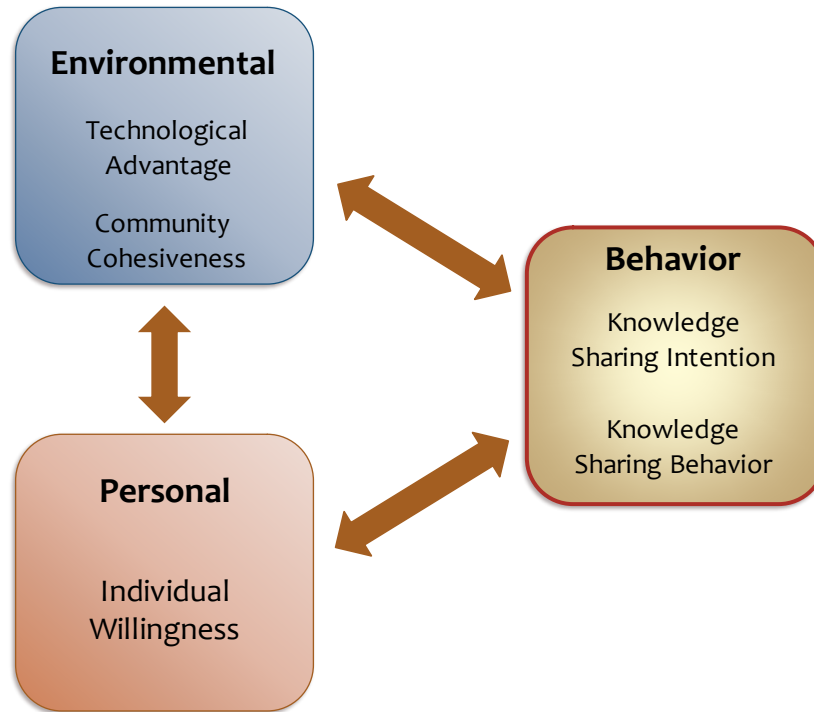


Figure 1. Overview of conceptual model

Technological advantage is a second-order, formative construct comprised of the technology factors of perceived ease of use, perceived usefulness, perceived enjoyment, immediacy of feedback, richness of cues, convenience, availability, and control. Community cohesiveness is a second-order, formative construct comprised of sociological factors including community identification, social influence, expected reciprocal benefits, and trust in members. Individual Willingness is a second-order, formative construct comprised of the inherent psychological factors of disposition to trust, openness to experience, and conscientiousness. The initial research model was drawn from the literature and supplemented with findings from the interviews as shown in Figure 2. Each of the constructs and associated hypotheses are discussed below.

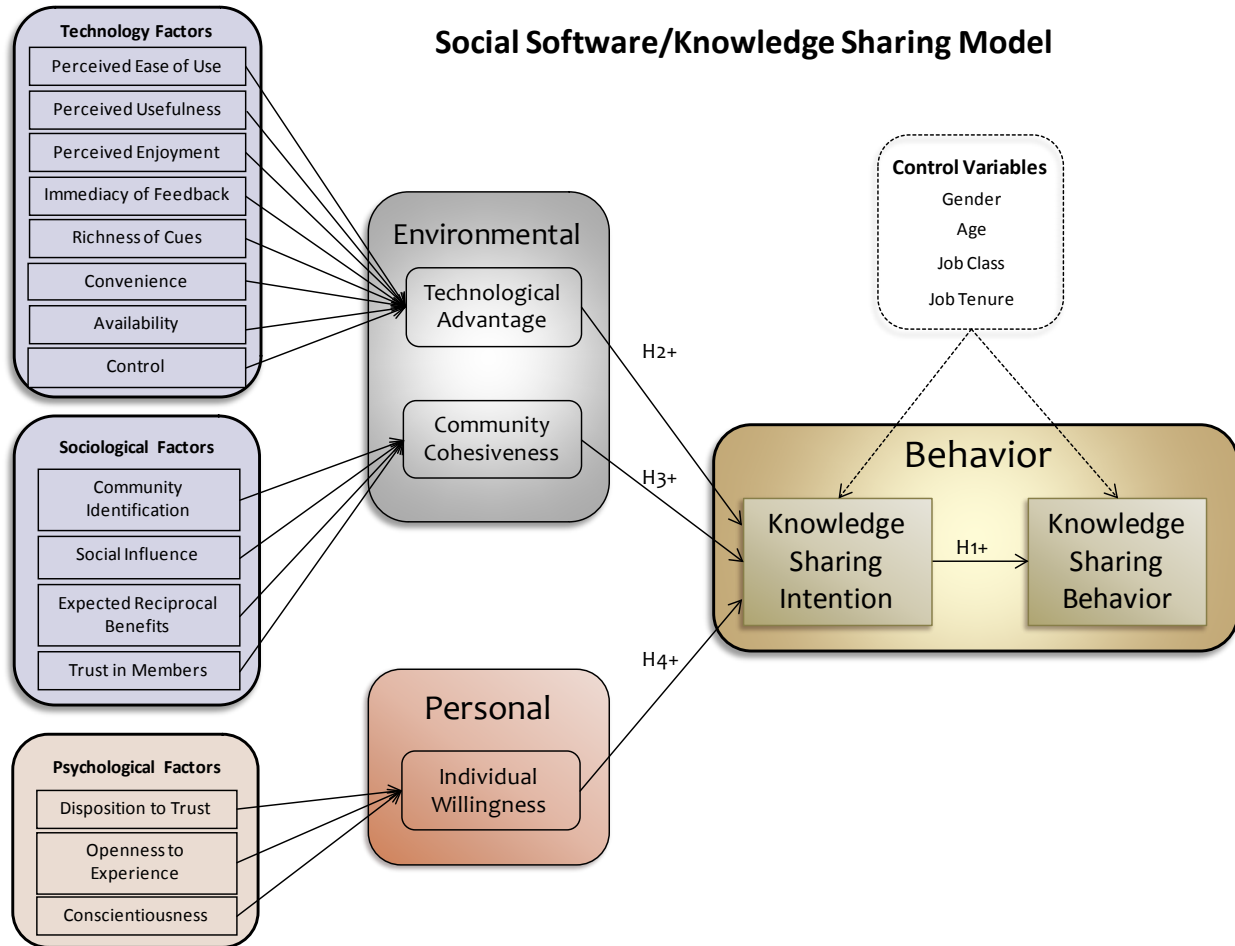


Figure 2. Initial conceptual model

Knowledge Sharing

IS research has shown inconsistent results for the relationship between knowledge sharing intentions and actual knowledge sharing behavior, from either not at all related, weakly related, or substantially related (Bock & Kim, 2002; Ford & Staples, 2010; H. Lin & Lee, 2004; Teh & Yong, 2011). It is the intention of this study to test the strength of correlation between knowledge sharing intention and actual knowledge sharing behavior to allow better understanding of the relationship between the intention and the behavior.

Given strong theoretical foundations indicating that behavioral actions are based on behavioral intentions (Bock et al., 2005); (Fishbein & Ajzen, 1975) (Venkatesh et al., 2003) and support in some studies for the relationship between knowledge sharing intentions and actual knowledge sharing behavior (Bock & Kim, 2002);(H. Lin & Lee, 2004), it is hypothesized that:

H1: Knowledge sharing intention has a positive effect on knowledge sharing behavior.

Technology Factors

Technology acceptance models represent the dominant paradigm of individual acceptance and use of information systems (Bhattacharjee, 2001; Karahanna, Straub, & Chervany, 1999; Malhotra & Galletta, 2005; Venkatesh et al., 2003). These models are rooted in the theory of reasoned action (TRA), which suggests that a person's attitude toward a particular behavior is either positive or negative and is affected by subjective norms, or the perception that most of the people who matter to an individual believe the action should or should not be performed (Fishbein & Ajzen, 1975). The current study provides a synthesis of technology acceptance theory and socio-psychological theories to develop an overarching framework for knowledge sharing when using social software in the enterprise.

Perceived Ease of Use and Perceived Usefulness

With its roots in social psychology, TRA was the basis of the technology acceptance model (TAM) which has been extended numerous times, primarily looking at user acceptance of information systems as determined by perceived ease of use and perceived usefulness (Davis, 1989). While these constructs have been investigated

repeatedly and could be considered to have minimal bearing on tools that most employees are already comfortable with using in their own personal lives, it is believed that their inclusion in the analysis is pertinent. For one reason, these constructs have been shown repeatedly to influence technology acceptance. If for no other reason, including perceived ease of use and perceived usefulness can validate whether these constructs have become passé when investigating the evolving social software technologies.

Perceived Enjoyment

Building upon the foundations of TRA and TAM, the unified theory of acceptance and usage of technology (UTAUT) was introduced as an attempt to bring together the most significant predictors determined from a study comparing previous theories of acceptance and usage (Venkatesh et al., 2003). UTAUT suggests that expectancies of performance and effort, along with facilitating conditions and social influence are direct determinants of intention to use. Social influences are defined similarly to subjective norms in TRA, or simply as the degree to which an individual believes that others who are deemed important to that individual believe the action should or should not be performed (Venkatesh et al., 2003).

TAM and UTAUT models have been modified to include other benefits that are more salient when considering the use of social computing in hedonic contexts. Enjoyment or playfulness has been incorporated in a consistent manner when researching the use of social media sites (Krasnova, Spiekermann, Koroleva, & Hildebrand, 2010; C. Lin & Ha, 2010; C. S. Lin, Wu, & Tsai, 2005; Moon & Kim, 2001).

Early research conducted into the use of web technologies introduced the perceived playfulness variable into an extended TAM model (Moon & Kim, 2001).

When investigating user acceptance of hedonic systems, research found that predictors vary depending on the context in which the system is used, being either utilitarian or hedonic (van der Heijden, 2004). Similarly, research looking at the use of a hedonic system such as a social networking site (SNS) found that the intrinsic motivator of perceived playfulness or enjoyment one gains by using the system had the strongest impact on intent to use (Sledgianowski & Kulviwat, 2009). Research also found empirical support for the measure of perceived playfulness as a determinant of satisfaction with a web site (C. S. Lin et al., 2005). Additionally, research has shown support for including perceived enjoyment in the technology acceptance model to explain user attitudes about blogging, another web activity (Hsu & Lin, 2008).

The intention to use and actual use of SNSs was empirically tested by combining factors from both TAM and UTAUT to develop a social network site adoption model (Sledgianowski & Kulviwat, 2009). The study combined traditional acceptance factors of perceived ease of use and perceived usefulness with playfulness, a construct which has also been labeled enjoyment. Since the origin of social networking platforms springs from a hedonic context, some aspect of that enjoyment factor is expected to remain even in an organizational setting.

The current study is investigating the use of social media tools in the organization. Thus, it is expected that both utilitarian factors of perceived ease of use and perceived usefulness as well as the hedonic technology factor of perceived enjoyment will affect the intention to share knowledge when using these tools.

Additionally, it is expected that the use of social software tools includes technology factors that are unique to the particular nature of the social media itself. Media synchronicity theory is an extension of media richness theory, both of which deal with the characteristics specific to the media itself (Dennis, Fuller, & Valacich, 2008). Studies in IS literature have investigated various constructs drawn from media synchronicity theory, which includes rehearsability, reprocessability, parallelism, immediacy of feedback and symbol sets, depending on the context specific to the study (Dennis et al., 2008).

As the current study is focused on enterprise social software, it is expected that the constructs of rehearsability (the ability to refine a message before sending), reprocessability (the ability to refer back to the message that was sent as often as necessary for further processing of the information), and parallelism (the ability to support multiple conversations at once) are reasonably expected to be inherent and intuitive when using these social software tools and therefore would not have a significant bearing on knowledge sharing intention. However, immediacy of feedback and symbol sets are both thought to have unique factors which apply specifically to the use of social software that impacts the effectiveness of communication when using such tools and thus, keeping users engaged in the knowledge sharing behaviors.

Immediacy of Feedback

Immediacy of feedback is a technology factor that describes how soon users can get feedback regarding the knowledge they have shared on the organization's social intranet. Stemming from media synchronicity theory, immediacy of feedback is a social media characteristic that speaks to the speed of the communication transmission

(Dennis et al., 2008). The faster the communications are transmitted, the quicker feedback between individuals can occur, resembling a typical conversation. The ability of the enterprise social software to supply immediate feedback “enables improved behavior coordination and shared focus to exist between individuals working together,” (Dennis et al., 2008).

Immediacy of feedback has been investigated in a study comparing both traditional (face-to-face) collaboration with CMC and found that participants in face-to-face interactions were more effective than those using CMC tools because of a lack of immediacy of feedback that led to lowered interest or dropped conversations when using CMC tools (Kerr & Murthy, 2009). In another study researchers found that a lack of immediacy of feedback in asynchronous media can contribute to task conflict (Kankanhalli, Tan, & Wei, 2006).

Immediacy of feedback was also examined as an antecedent of ethical decision making when using social media technologies such as NetMeeting and wikis (Sarker, Sarker, Chatterjee, & Valacich, 2010). Immediacy of feedback was not found to have a significant effect on ethical decision making in that particular study. However, it is expected that this unique characteristic of social software tools will in fact have a significant effect on knowledge sharing in the enterprise because of the ability of the tool to quickly engage participants in feedback, keeping the parties exchanging knowledge involved in the process.

Richness of Cues

Another media characteristic also derived from media synchronicity and media richness theory is the concept of symbol sets (Dennis et al., 2008). Symbol sets have

been conceptualized as the richness of cues or the multiplicity of cues that are available through the features of the media such as text (written symbols), verbal cues (tone of voice), and nonverbal cues (physical gestures) (Dennis & Kinney, 1998). Research has often found that a lack of visual cues hampers effective communication when using CMC. Truly social software offers many features to overcome this deficiency, such as emoticons or “smiley faces, text (a colon and a parenthesis to indicate smile or a semi-colon and a parenthesis to indicate a wink or even a “Like” button). Thus, it is expected that social software features which provide the ability to convey a more meaningful communication through richness of cues will have a significant effect on knowledge sharing intention.

Convenience

Convenience is a construct that has been used in marketing literature regarding the use of self-service technologies (Collier & Sherrell, 2010). Convenience is defined in this study as the perceived time and effort required in *contributing* one’s knowledge using the social software. Convenience is a technology factor thought to have a significant impact on knowledge sharing intention when using the social software tool. Contributing knowledge must involve as little effort as possible to encourage employees to use the technology and facilitate knowledge sharing.

Availability

In contrast, availability of knowledge shared by others is a specific characteristic of the technology that is defined as the perceived time and effort required in *finding* knowledge shared by others in the organization. Just as contributing knowledge must

involve as little effort as possible, finding desired knowledge must also be as effortless as possible in order to facilitate knowledge sharing intention. While the definitions of each of these two constructs are similar, it is believed that the contrasting direction of the knowledge flow which distinguishes each one is significant enough to be evaluated individually. It is the purpose of this research to test the validity of these proposed constructs with a pilot survey to establish the most empirically valid items to be included in the final survey instrument.

Control

Control is a construct that has also been used in marketing literature regarding the use of self-service technologies (Collier & Sherrell, 2010). Regarding self-service technologies, control referred to the customer feeling a sense of being in control over the transaction. Control is defined in the context of the current study as a technology factor of social software that allows users to access or edit the knowledge contributions, either their own or those posted by others. It is thought that allowing user-generated content on the social intranet is one method of gaining a significant buy-in from employees and therefore motivates them to use the social software tools for sharing their knowledge.

Research has shown however, that of significant importance to both managers as well as non-managerial employees when using social software tools in the enterprise are issues of security and privacy related to sharing knowledge in an organizational environment (Andriole, 2010; Jarvenpaa & Majchrzak, 2010). It is therefore believed that the perception of control offered by the social software tools will have a significant effect on the intention to share knowledge.

Technological advantage is a second-order formative construct that is defined as being the perceived advantage an employee gains by using the social software tools. The formative construct is comprised of perceived usefulness, perceived ease of use, perceived enjoyment, richness of cues, immediacy of feedback, availability, convenience, and control. Therefore, the following hypothesis is presented:

H2: The greater the extent to which technological advantage is perceived to be characterized by technology factors of perceived ease of use, perceived usefulness, perceived enjoyment, immediacy of feedback, richness of cues, convenience, availability, and control, the greater the intent to share knowledge.

Sociological Factors

As noted above, sociological theories have been used to investigate knowledge sharing intentions in the literature using social capital theory, social cognitive theory, social exchange theory, and social role theory (Bock et al., 2005; Chai et al., 2011; Chiu et al., 2006; Hsu & Lin, 2008; Huysman & Wulf, 2006; Robert et al., 2008; Staples & Webster, 2008; Teh & Yong, 2011; Teh & Yong, 2011; Teh & Yong, 2011; Teh & Sun, 2012; Teh & Sun, 2012; Teh & Sun, 2012). It is therefore apparent that in the context of social interactions, sociological factors will play a role in the intentions to share knowledge when using social software tools in the enterprise. Many different sociological factors have been investigated in past knowledge sharing research, but the purpose of the current research is to present those factors thought to have the most significant effect of knowledge sharing intention. Those factors are community

identification, social influence, expected reciprocal benefits, and trust in members of the online community. These factors are discussed in the following section.

Community Identification

Researchers studying interactive technologies such as wikis and blogs have identified the community itself as an important factor to examine when evaluating a user's intention to engage in those types of activities (Hsu & Lin, 2008; Wang & Wei, 2011). Wang and Wei (2011) identify a virtual knowledge community as being one in which members share knowledge through electronic forms or the use of ICT. Community identification has been conceptualized as community members' perceptions of having similar values which lead to a sense of belonging and loyalty to their community (Chiu et al., 2006).

While results have been mixed in terms of community identification having a significant effect on knowledge sharing intentions, it is believed that as a new community arises within the organization through the use of social software tools, participation and willingness to share knowledge should increase as people using those tools identify themselves as members of the online community.

Social Influence

Social influence or social norms is defined as the degree to which an individual perceives that important others believe he or she should use the new system (Venkatesh et al., 2003). Expectations of others are especially significant in the context of a social networking site because it refers to the extent to which members in a society (coworkers in this case) influence each other's behavior and experience social pressure

to perform in a particular manner (Sledgianowski & Kulviwat, 2009). Social influence was found to be a strong predictor of usage intentions as the more users perceive social influence, the more they perceive the system as useful (Dickinger, Arami, & Meyer, 2008).

When looking at using the Internet at work, researchers found that social influence is positively related to intention to use (Chang & Cheung, 2001). In mandatory settings, such as in the organization, it is suggested that social influence is only important in the early stages of experience with the technology (Venkatesh et al., 2003). Positive social influence to use an online social community was found to increase the online community self-disclosure in a group of working professionals (Posey, Lowry, Roberts, & Ellis, 2010). Social influence was also found to be a critical factor in the adoption of an instant messaging service (Glass & Li, 2010). Therefore, a positive social influence is thought to be a key determinant in influencing the employee's knowledge sharing intention when using the organization's internal social software tools.

Expected Reciprocal Benefits

The concepts of perceived benefit and perceived risk in IS research can be found in the literature related to online purchasing activities and adoption of e-services (Featherman & Pavlou, 2003; Im, Kim, & Han, 2008; D. Kim, Ferrin, & Rao, 2009; Pavlou, 2003). While these two constructs have been investigated separately, it is believed that the risks that are inherent in participating in an online community within the organization are captured in the concept of trust in other members, which is discussed below. A high degree of trust was shown to eliminate uncertainty and perceived risks in

most online transactions (Pavlou, 2003). Therefore, the focus of the current study is on the expected reciprocal benefits from using the enterprise social software.

Perceived benefits were found to provide potentially strong incentives to purchase a product or service online (D. Kim et al., 2009). This study defined perceived benefit as a “consumer’s subjective perceptions about the potential positive values from the online transaction with a certain Website,” (D. Kim et al., 2009). This study contextualized perceived benefit in terms of utilitarian benefit, providing a value through a product or service. As the current study is looking at knowledge sharing, perceived benefit is contextualized to include the intangible benefits of social presence, or social capital. Assessing social capital as an aspect of knowledge sharing in a social computing environment must include the value participants assign to their knowledge-sharing activities and tools (Baehr & Alex-Brown, 2010). Therefore, perceived benefit is defined in this study as the subjective perceptions about the potential positive values resulting from the online interactions with the company’s social software tools.

The positive values expected as benefits of using social software are considered to be reciprocal because of the interactive nature of these technologies (Bock & Kim, 2002; Bock et al., 2005; Hsu & Lin, 2008). One shares knowledge with others and has a reasonable expectation that they will reciprocate with the sharing of their own knowledge. Knowledge sharing using social software has been examined through the lens of a knowledge market, with the market transaction being the sharing of knowledge and both knowledge buyers and sellers requiring reciprocal benefits from the exchange (Hsu & Lin, 2008). These benefits include strengthened relationships that are mutually beneficial among the members of the community, enhancing the employees’ desires to

maintain both the provision and reception of knowledge opportunities (Brock et al., 2005). These reciprocal benefits can thereby increase the employee's social capital (Wasko & Faraj, 2005).

Trust in Members

The concept of trust has been researched in terms of both antecedent factors as well as affect in numerous approaches, categorized as having different dimensions, including disposition to trust, institution-based trust, and trusting beliefs (Chen & Barnes, 2007; D. Kim et al., 2009; G. Kim, Shin, & Lee, 2009; Wu & Sukoco, 2010). Disposition to trust is the willingness to depend on others or the willingness of a party to be vulnerable to the actions of another, while institution-based trust refers to structural or environmental mechanisms in place that will ensure trustworthy behavior of individual members, and finally trusting beliefs are concerned with the other party's integrity, ability and benevolence or a general belief or trusting intentions that another party could be trusted (Gefen, Karahanna, & Straub, 2003; G. Kim et al., 2009; Wu & Sukoco, 2010).

Disposition to trust is thought to be an inherent characteristic of an individual, and is included in the psychological factors discussed below. Institution-based trust is expected to be of marginal significance, as the current study is investigating only on the use of internal social software tools, and therefore it is expected that the individual user will not have to be concerned with whether the IT department has put in the proper security to protect the community from external malicious attacks. Rather, the community members will only be concerned with what other users of the online

community might do with the knowledge that is shared. Therefore, the current study focuses on the trust in other members of the organizational online community.

Thus, the central trust is in those people with whom the knowledge is shared, as sharing has been shown to increase recipients' power over the one sharing while decreasing the sharer's own power over those particular others (Ford & Staples, 2010). Therefore, in the context of knowledge sharing, trust in members is defined as the belief that other members of the online community are knowledgeable and will not take advantage of others' contributions. Trusting beliefs regarding the other members' integrity, ability and benevolence when using enterprise social software tools are expected to have a significant effect on knowledge sharing intention, since the risk of knowledge sharing lies primarily in what other members are likely do with the information shared.

Trust is a crucial element for realizing the potential benefits of using social software in the organization to promote knowledge sharing. Trust has been identified as an important determinant of successful performance in virtual environments in much of the extant literature (Jarvenpaa, Shaw, & Staples, 2004; Morris, Marshall, & Rainer Jr., 2002; Peters & Manz, 2007; Staples & Webster, 2008). The importance of trust in the context of knowledge sharing has been shown to be especially important in virtual teams, and thus to team effectiveness (Staples & Webster, 2008). While trust is an important element in any virtual transaction, it is especially critical within the context of a virtual team environment (Peters & Manz, 2007). This study found that as virtual teams operate in conditions of uncertainty, coordinated action of the virtual team members can only be achieved if trust among the members exists. The importance of trust in virtual

team environments is highlighted because the technology used in virtual workspaces can change the context of human relationships by changing their physical infrastructures, tasks, and social dimensions (Jarvenpaa et al., 2004).

Other research has found that teams with higher levels of trust are better able to handle the complex and uncertain aspects of a virtual environment than teams reporting low levels of trust (Jarvenpaa & Leidner, 1999). The study supports the notion that trust and communication are interlinked, each depending in some manner on the other. The theory of swift trust is appropriate in virtual teams that may meet only for limited time periods. The concept of swift trust is based on the notion of trust being imported from previous experiences, as members of virtual teams have little or no history of working together, and thus, no basis for forming interpersonal relationships necessary for trust in the traditional sense. In such instances, members of a virtual team will deemphasize the interpersonal relationship building at the inception of the team's creation, instead importing trust initially and then maintaining that trust through member actions (Jarvenpaa & Leidner, 1999).

Similar research also found support for swift, action-based trust in virtual group dynamics (Suchan & Hayzak, 2001). The authors report that members of a virtual team who developed trust early in the group's inception were better able to resolve conflicts and solve problems, giving credence to the swift trust theory. Other factors that contribute to perceived vulnerabilities in online collaborations include socially ambiguous identities as participants share only partial information about themselves, do not share common interests, and also the limited social cues that are provided in an online environment (Jarvenpaa & Majchrzak, 2010).

Research indicates that virtual teams experience high levels of conflict and face greater difficulty in building trust (Dabbish & Kraut, 2008);(Hinds & Bailey, 2003);(Powell et al., 2004). Additionally, greater trust in an SNS has been found to have a direct effect on intention to use that site as well as to continue to stay loyal to that provider (Sledgianowski & Kulviwat, 2009). This research of SNS adoption found that trust has a significant positive effect on intention to use an SNS.

Thus, the potential benefits from collaborating through social software technologies can be erased by the drawbacks of the inability to develop trust among the users. Gartner, Inc. reported on the emergence of social software use in many businesses (Austin et al., 2010). The report highlighted the fact that while business opportunities from “social intelligence” are driving the investments into social media tools in the organization, there is also fear and uncertainty that is holding many back or hampering their efforts to successfully integrate these technologies into their knowledge sharing operations (Austin et al., 2010). Prior research suggests that an individual facing a high level of risk will evaluate his or her level of trust with another party to determine the likely outcome of their interaction (G. Kim et al., 2009).

Community cohesiveness is a second-order formative construct that is defined as the belief of employees that participating in the community provides greater connectedness to other members in their online community at work. The formative construct is comprised of community identification, social influence, expected reciprocal benefits, and trust in members described above. Therefore, the following hypothesis is presented:

H3: The greater the extent to which community cohesiveness is perceived to be characterized by community identification, social influence, expected reciprocal benefits, and trust in members, the greater the intent to share knowledge.

Psychological Factors

Not only are issues related to the technology itself or the environment and social context of knowledge sharing relevant, but so too are individual differences. With a review of the technological and sociological factors believed to influence knowledge sharing when using enterprise social software complete, the next step is to assess the relevant psychological factors. While there are relatively few studies in the IS literature using the theoretical lens of psychological theories, their use in examining knowledge sharing is increasing (Cho et al., 2007; Karkoulian & Osman, 2009; Matzler et al., 2008; Matzler & Mueller, 2011).

With individuals being a critical element of knowledge sharing, research on complex socio-psychological issues that affect interpersonal interactions with co-workers is necessary. Because of the changing patterns of communication as a result of technology, globalization, and increased competition, social computing environments are increasingly encroaching on the enterprise. As employees are either required to or simply desire to use social software tools to collaborate and share knowledge in the workplace, it is important to understand the individual differences that affect knowledge sharing intention and behavior. These psychological factors include disposition to trust, openness to experience, and conscientiousness and are discussed below.

Disposition to Trust

Trust in other members of the online community is an important factor to consider when assessing the intention to share knowledge in the social context of using enterprise social software. However, equally important is an individual's inherent disposition to trust. In evaluating the trustworthiness of others in the organization, people may refer only to their own preexisting psychological dispositions (Dirks & Ferrin, 2001). Disposition to trust has been defined in the literature as the willingness to depend on others or the willingness of a party to be vulnerable to the actions of another (Chen & Barnes, 2007; Gefen et al., 2003).

This disposition to trust refers to the fact that an individual develops beliefs of others' initial trustworthiness based on factors related to the situation and the individual himself or herself, rather than the other's behavior (Jarvenpaa et al., 2004). Several researchers have examined trust in virtual teams in the organization and found disposition to trust was a significant predictor (Jarvenpaa et al., 2004; Peters & Manz, 2007; Staples & Webster, 2008). Thus, the inherent psychological characteristic, disposition to trust, is expected to have a significant effect on the intention to share knowledge.

Openness to Experience

It is argued that environmental and organizational factors are not the only important predictors of an individual's intention to behave in a particular manner such as sharing knowledge, but also critical are personality traits (Matzler et al., 2008; Matzler & Mueller, 2011; Reinholt et al., 2011). When examining personality traits of an individual,

research has identified five pertinent traits: extraversion, neuroticism, openness to experience, agreeableness, and conscientiousness, collectively known as the “Big Five” traits (P. T. Costa & McCrae, 1992b; Loehlin, McCrae, Costa, & John, 1998). Research has shown the five personality traits are related to employee behavior in varying degrees (Judge & Ilies, 2002). These personality traits have been linked to both heredity and observable behaviors, but the observable behaviors are more closely related to narrower and domain-specific facets of each personality trait (Loehlin et al., 1998; Matzler & Mueller, 2011).

The domain-specific facets of the traits openness to experience and conscientiousness have been linked to knowledge sharing in the literature (Matzler & Mueller, 2011). Those who score high on openness to experience have an active imagination, preference for variety, intellectual curiosity, and independence of judgment (Matzler & Mueller, 2011). Openness to experience is important when using a new form of ITC such as enterprise social software. While many employees have likely grown accustomed to these tools in their own personal lives, incorporating them into their daily routines at work could require a certain flexibility and willingness to conduct the activities of their job in a new way. Thus it is expected that individuals who possess higher degrees of openness to experience will be more willing to engage in knowledge sharing through the use of enterprise social software.

Conscientiousness

The personality trait of conscientiousness is related to individuals who are considered to be dependable, reliable, and responsible (Matzler & Mueller, 2011). Conscientious individuals try to find new ways to get their tasks accomplished and are

not afraid of a challenging or difficult situation. Individuals with a high degree of conscientiousness are believed to make plans and carry them through and like to be prepared (Buchanan, Johnson, & Goldberg, 2005). A conscientious employee does not like to waste time and therefore it is believed that a person with higher levels of conscientiousness will be more likely to take advantage of the increased efficiency of knowledge sharing using social software in the organization.

Individual willingness is a second-order formative construct defined as the inherent characteristics that indicate an individual's willingness to engage in certain behavior. The formative construct is comprised of the psychological factors described above including disposition to trust, conscientiousness, and openness. Therefore it is hypothesized that:

H4: The greater the extent to which individual willingness is perceived to be characterized by disposition to trust, openness to experience, and conscientiousness, the greater the intent to share knowledge.

CHAPTER 3

RESEARCH METHOD

This chapter describes the research methodology employed to test the research Hypotheses H1 - H4. The sampling frame, methods of data collection, development of the research instrument, and data analysis methods used are described in this section.

Research Population and Sample

This dissertation is concerned with the knowledge sharing of employees in the organization, thus the population of interest is employees using social software tools within their organization. Therefore, the goal of the study was to both interview and survey employees identified as participating in the implementation, maintenance, and routine use of social software tools within their organizations. The initial steps of the data collection involved individual semi-structured, in-depth interviews with information technology (IT) professionals involved specifically with the implementation and maintenance of such tools in their organization. The IT professionals chosen for the interviews were selected from a variety of companies engaged in a range of industries to gauge their perceptions about social software technology used in their own organizations. Companies were selected in service, manufacturing, energy, and technology sectors to allow a more generalized analysis of the findings.

Analysis from the results of the interviews was used to supplement the factors identified in the literature to establish an initial set of constructs thought to motivate knowledge sharing among employees using social software tools. Using these synthesized set of factors, a conceptual research model was constructed, pilot tested, and refined. The refined factors were then utilized to develop the final survey which was

distributed to employees who use social software tools to communicate or collaborate with their colleagues.

Determining sample size through a priori power analysis is recommended to discover the appropriate sample size when utilizing a survey (Cohen, 1988). In testing a null hypothesis, the power of a statistical test lies in the probability that it will be rejected, or that the phenomenon of interest does in fact exist (Cohen, 1988). The concept of power is related to Type I error (α), Type II error (β), sample size (N) and effect size (ES). Using a priori power analysis, the required sample size (N) is calculated by holding the other three elements constant. Using the power analysis software G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007) with $\alpha = .05$, $\beta = .95$ and $ES = .2$ suggested a sample size of 141 respondents is necessary for the final survey instrument. This requirement was met.

Research Design

The research design for this dissertation follows a triangulation of qualitative and quantitative methodologies. A mixed method of research employing both positivist and interpretivist analysis can provide a deeper understanding of the data by gaining an insight from one method that is not discovered in the other. Therefore, the two methods have been found to be complementary rather than mutually exclusive and can thus provide a more complete view of the phenomenon of interest (Trauth & Jessup, 2000). This research uses a combination of qualitative and quantitative methodologies carried out in two-stages: 1) semi-structured, in-depth interviews with IT professionals, and 2) a written sample survey administered to employees in organizations using social software tools.

Semi-Structured Interviews

Interpretive methods such as interviews do not have generalizability as their main goal, but rather a deeper understanding of the structure of the phenomenon in question (Orlikowski & Baroudi, 1991). The interviews for this study were conducted with IT professionals in a cross-section of industries. The variety of interviewees assisted in validating the initial research model and the measurement items, as well as adding credence to the generalizability of the findings.

The purpose of this study is to develop a framework for knowledge sharing using ESS that is relevant to IS theory and to practice. Supplementing a model developed from literature with factors implied by practitioners as critical ensures both theoretically and practically relevant factors are incorporated. Following Bock et al. (2005) who note that prior literature is sufficient to draw upon when the subject is mature, but may be insufficient when the subject is in its infancy as ESS tools are, this study employs interviews with IT professionals to validate and supplement where needed the factors drawn from knowledge sharing theory.

The individual interviews were supplemented by a focus group of graduate students identified as working in an IT capacity. This step of the data collection process involved asking the same interview questions for further comparison and confirmation of the concepts presented in the initial interviews. The interviews consisted of the researcher asking a list of questions (shown in Table 4) identified in both academic and practitioner publications as being critical factors to consider when implementing social software platforms. The individuals interviewed consisted of IT professionals in various capacities within their organization, such as a CIO, an IT project manager, a software

and systems manager, and a knowledge management director. The recruiting script for the IT professionals contacted is presented in Appendix A.

Table 4

Interview Questions for Companies Using Social Media Tools

| |
|---|
| 1. What type of social media tools does your company employ? (blogs, social networking platforms, microblogs, RSS feeds, wikis, mashups, videos, etc.) |
| 2. How long has your company been using this tool/s? |
| 3. How was the rollout of the new system advertised to current employees? |
| 4. Is participation mandatory? (e.g., creating a profile page?) |
| 5. What type of reception has the system received from employees? |
| 6. Was there any resistance to the implementation from management or IT? |
| 7. Was there any effort to integrate the tools w/existing systems/platforms? |
| 8. What sorts of methods are used to motivate employees' use of the tools? |
| 9. What role does corporate culture play in the attitudes and opinions about the value of using social media tools? |
| 10. What target level of use did the company hope to achieve initially? In one year? Longer? |
| 11. Were any key performance indicators identified as the original objectives for implementing the use of this tool/s? If so, what were the targeted benefits/objectives? (generating revenues, reducing costs, etc?) |
| 12. Were there any benefits that have occurred that were unexpected? |
| 13. What types of obstacles/barriers/disadvantages have been encountered in the use of this tool/s? |
| 14. How have security concerns been addressed for the individual? For the company? |
| 15. Was the push for implementing enterprise collaboration tools from the top-down, the bottom-up, or a combination? |
| 16. How was the strategy developed to implement the collaboration tool? (deploy, then find a way to make it work; develop strategy, then find right technology; limited rollout, testing, then grow from there, etc?) |
| 17. Was implementation department wide, enterprise wide, pilot, full deployment, etc? |
| 18. Was implementation accompanied by structured or unstructured collaboration/participation policies? |
| 19. Is the community monitored by a dedicated employee/s such as a community manager (publishing info/events, curating, tagging, etc.)? |
| 20. Is there regular monitoring/measuring/reporting of community activity? |

The interviews were analyzed hermeneutically, using an iterative process known as the hermeneutic circle in which the qualitative interpretation involves moving from individual pieces of observations (text) to the whole of the social phenomenon being studied (context), and then back again to the observations. Each one of the iterations involves moving between understanding the meaning of a phenomenon and back to the observations until any additional iteration yields no more insight into the phenomenon being studied (Klein & Myers, 1999).

Following Butler's (1998) depiction of the hermeneutic circle, the initial iteration consists of moving from the researcher's own pre-understanding of knowledge sharing supplemented with the "whole" from the knowledge sharing literature to the individual "parts" of literature including theories, concepts, findings, etc. The next circle or iteration involves a fusion of the researcher's understanding from the previous circle to the interviews with IT professionals, and the "world views" of each individual for themes and concepts. The next circle represents the researcher's horizon evolving through a fusion of the theoretical literature and the phenomenon studied in the interviews. Each successive iteration of the circle results in the researcher's horizon consisting of a cumulative perspective from the "fusion of horizons" (Butler 1998).

Using these principles in the analysis of the interviews, interviewees' responses to the researcher's questions represented the pieces of the observations, while the development of interpretations based on theory represented the whole. Using constant comparative analysis, differences and similarities among the individual participants were identified (Charmaz, 2006; Corbin & Strauss, 2008). This comparison allowed initial concepts to be identified and linked to higher order categories as described above in the

“fusion of horizons” (Butler, 1998). By gaining multiple perspectives from the constant comparison, theoretical sampling is achieved (Charmaz, 2006). In contrast to quantitative methodologies with statistical generalization as the goal, theoretical sampling allows categories and their subcategories to emerge in an inductive process (Corbin & Strauss, 2008).

Initial data analysis consisted of using an open, inductive coding scheme to gain a holistic understanding of the phenomena (Corbin & Strauss, 2008). The qualitative data analysis software package MAXQDA 10 was employed to organize the coding scheme. The coding was developed by taking phrases and blocks of data from the interviews which were read and then coded into categories and subcategories suggested by the hermeneutic circle process described above.

The process of coding the data involved the use of memo writing to organize the coding scheme into levels of categories. Higher level categories were derived from the set of concepts that were initially identified and refined with each of the evolving iterations. Memos assist the researcher in determining which direction to take next and serve as a blueprint of the thought processes involved in developing the categories (Charmaz, 2006; Corbin & Strauss, 2008). This coding process resulted in 10 categories with 50 associated subcategories, presented in Table 5.

Table 5

Interview Text Coding System

| Knowledge Management | 84 Items |
|-----------------------------|---------------------|
| | collaboration |
| | communication |
| | policies/procedures |
| | document management |
| | knowledge sharing |

(table continues)

Table 5 (continued).

| | |
|--------------------------------|----------------------------|
| Motivation/Employee use | 70 Items |
| | no training |
| | market/promote/training |
| | encouragement |
| | voluntary |
| | mandatory |
| | target level of use |
| | monitoring |
| | measuring |
| Social Software Tools | 52 Items |
| | external |
| | personal profile |
| | social networking |
| | instant messaging |
| | online community |
| | usage levels/reports |
| | community manager |
| | blog |
| | wiki |
| Benefits | 30 Items |
| | career enhancement |
| | relationships |
| | Training |
| | Satisfaction |
| | Productivity |
| Employee Acceptance | 26 Items |
| | technical employees |
| | privacy |
| | corporate culture |
| | negative |
| | positive |
| Security | 24 Items |
| | trust |
| | partition data |
| | proprietary/tight control |
| IT Implementation | 24 Items |
| | unstructured |
| | structured |
| | enterprise-wide deployment |
| | localized deployment |
| | both top and bottom |
| | bottom-up |
| | top-down |
| Software System | 11 Items |
| | custom |
| | integration w/existing |
| | SharePoint |
| | open source |
| Disadvantages/Obstacles | 7 Items |
| | overwhelmed/too much |
| | caution |
| | embarrassment |
| Use Duration | 4 Items |

In reviewing the memos and coding scheme, the major concepts (top four) that emerged were related to 1) knowledge management issues, 2) motivating employee use of the ESS tools, 3) social software tools and features, and 4) benefits to employees and the company. The most important theme that emerged from the interview data dealt with knowledge management issues. All interviewees pointed to the goal of some type of knowledge management as a primary driving force to implement the ESS tools in their organization. These reasons included providing for better collaboration, knowledge sharing, document management or simple communication with employees about company policies and procedures.

The second major theme derived from the interview data was related to issues of employee motivation and use of the social software tools. A majority of interviewees (12) offered some type of encouragement for employees to use the social software by providing promotion of the new system to employees through internal marketing channels or else by word of mouth from other employees. However, a similar majority also allowed for voluntary use of the social system by employees, with the general view being that mandating use would have a negative impact on willingness to participate.

The third most cited theme was related to the actual social software itself. The mechanics or features of the technology were cited in relation to how the ESS tools were used or the types of features it provided. Subcategories such as personal profile or instant messaging are some examples that emerged as part of this major theme, which is incorporated in the technology factors of the model.

Finally, the benefits of using a social computing environment – either for the employee or for the organization itself – emerged as the third most dominant theme in

the interview data. Again, a majority of respondents (11) cited productivity as a potential area of improvement among employees using ESS tools. Other benefits mentioned as a potential benefit of using the social computing system were career enhancement, stronger relationships, and individual satisfaction from being known as a valuable contributor to the online community.

These major themes – knowledge management, motivation of employee use, social software tools, and benefits of using the social software – are all incorporated into the theoretical model in the current study. Knowledge management is reflected in the dependent variable of knowledge sharing, reinforcing it as the phenomenon of interest. Social software tools, motivation of employee use and benefits of using the social software are represented in the formative factors of technological advantage, community cohesiveness, and individual willingness as the factors that influence or motivate employee use of ESS tools for the purpose of knowledge sharing. The insights drawn from the analysis of the interview data helped to inform the construction of the initial model with the following findings:

1. The traditional construct of perceived ease of use does not have a significant impact on employees' willingness to use the social software tools in the organization, as most are already familiar with such tools. Sample comments include, "Training is not provided, because most of these tools are intuitive," and "If someone doesn't know how to use an application, nowadays they can just go to YouTube and watch a quick video demonstrating it."

2. The construct of critical mass identified in the literature as being a significant predictor of social networking applications was not as important in the organization because all employees are available through the social platforms, whether they are frequent users or not. The majority of interviewees reported participation was not mandatory, such as this one, “We haven’t mandated usage of our collaboration tools only because we knew in our gut, in our heart, that when we put it out there, people were just going to flock to it, and they have.”
3. Privacy and security were not critical to the end user, but were found to be of significant importance to management because of the threats when opening the system to external users. As social technologies being examined in this study were strictly internal, issues of misuse among co-workers was not a significant concern for interviewees. A typical response was, “If you create something and someone else benefits from your work, are you given proper credit for that? That’s not a big concern for us.” However, when considering external threats, responses included, “Considering that we deal with the government on defense and a lot of things, we have training every year for all employees on proprietary information control.... The tools that we have set up on SharePoint and stuff have made it a lot easier to keep that in check.... We’re still working out, still implementing the processes on being able to share data on a SharePoint site to external customers or external contractors. But yeah, those are pretty mature processes on that, internally.”

As a result of the concepts drawn from the interview findings described above, perceived ease of use was not found to be an important factor in motivating employees to use the ESS tools. However, because the construct has been validated to such an extent in the IT literature, the decision was made to retain it in the initial conceptual model. With such strong theoretical support for perceived ease of use as a predictor of technology use, it is expected that it may still be an important predictor of knowledge sharing when using social software technologies.

Critical mass, however, was removed from the model, as it is believed that the concept of network externalities, or having a significant amount of other users in the network, is a valid concern only for those using public social networks, such as friends looking for other friends or singles looking for other singles. For those using a private, internal organizational social network however, the critical mass of users is already available and thus was not expected to be a significant factor in predicting knowledge sharing intention.

Privacy and security issues were identified in both the academic and practitioner literature as being a critical factor to consider when implementing any social software technology in the organization. However, as mentioned above, the main security concern from the organizational perspective was on external social networks and the risks inherent in opening the network to the outside. As one interviewee noted, “Just protecting ourselves from viruses, malware that sneaks into the company differently than before, that’s a huge concern.”

Of course some of the interviewees from organizations such as an aerospace company and a financial services company that deal with proprietary information,

protecting that information on an external network presents serious concerns. However, for the individual sharing knowledge internally with co-workers this is not a serious risk. From the interviews, it was noted that the concern lies in training the employees on what information cannot leave the company, but that is not related to using internal company social software. Therefore, privacy and security were dropped from the initial research model. The development of factors in the initial research model will be discussed in detail in the following section.

Additional concepts drawn from the interviews included the general belief that younger employees appear more enthusiastic about using these social tools, possibly because they are more likely to have experience with them in their personal life. In fact, one respondent said, "It is the younger employees that are really pressing for these tools in their jobs, much more so than employees of the older generation." In fact, a related concept revealed in the interview data included some employees with longer tenure also being reluctant to participate in the new online communities. A typical comment was, "Some employees have gotten used to doing their job in a certain way and feel like it's an imposition to have to use a new system."

Additionally, the interview data showed those employees with more technical positions were more responsive to trying the new technologies. Two of the companies chosen for interview participants included software firms. Both interviewees from these technology companies, as well as those in firms with a large percentage of engineers or other technical positions, indicated that employees with high technical expertise were likely to be more enthusiastic about using a new technology such as ESS. Thus, the study collected information for the following demographic variables: 1) Age, 2) Job

tenure, 3) Job classification, and 4) Gender. Although gender was not identified in the interviews as having an impact on the use of the social software tools, it is of interest to measure in any technology study.

Field Survey

Pilot Study Development

The second stage in the research design included the development of a survey administered to employees using social software tools in their organization to evaluate their knowledge sharing intention and behavior. Field surveys offer many advantages to the researcher including: 1) the strength of better external validity as the data are collected in real social settings and thus provide better generalizability, 2) their ability to capture and control for a large number of variables, and 3) their ability to study a problem from multiple perspectives or using multiple theories (Kerlinger & Lee, 2000). As this study provides a synthesis of multiple perspectives from multiple theories, a survey is the appropriate choice for data collection. The survey development was carried out in several steps, described below.

The first step was developing a pilot survey by taking survey items for each construct from validated scales where possible, with some items adapted to fit the context of social software use where necessary. Second, the developmental constructs introduced in this study were discussed with a group of IS academic researchers for definition and determination of appropriate scale items. Next, the survey instrument was presented to a small group of graduate research fellows for purposes of clarity in the instructions, wording, and sequencing of questions. Finally, the survey instrument was reviewed by two IS academic experts experienced in publishing research on social

software. Changes were made to the final survey instrument based on the feedback obtained. Questions were based on a 7-point Likert scale and included basic demographic information. The pilot survey instrument is listed in Appendix A and contains 16 constructs, each of which are described below.

Perceived Ease of Use

Perceived ease of use is a construct drawn from technology acceptance models (i.e., TAM and UTAUT) widely used as a measure of intention to use a particular technology. The items used for the survey instrument in this study are taken from Moore and Benbasat (1991). There were four items in these authors' instrument, which were adapted to the context of a KS tool, with one additional item specific to a KS tool for a total of five items.

Perceived Usefulness

The perceived usefulness construct is also drawn from technology acceptance models and is also a widely used measure of intention to use a specific technology. Perceived usefulness has also been given the label of relative advantage (Moore & Benbasat, 1991) and items for this construct were also drawn from these authors and adapted to fit the knowledge sharing context. The construct is measure by a total of five items on the survey.

Perceived Enjoyment

Perceived enjoyment was investigated by van der Heijden (2004) as a construct that was expected to be a stronger determinant of intention to use a hedonic

technology. it has been increasingly investigated in studies on social technologies (Dickinger et al., 2008; Krasnova et al., 2010; C. Lin & Ha, 2010; C. Lin & Bhattacharjee, 2010; Sledgianowski & Kulviwat, 2009). The survey instrument in this study uses three items to measure perceived enjoyment based on van der Heijden (2004) and Hsu and Lin (2008).

Convenience and Control

Convenience and control are constructs that have been used in marketing literature regarding the use of self-service technologies (Collier & Sherrell, 2010). The items used to measure convenience in the current study were adapted from that study with minor modifications to fit the context of knowledge sharing in the enterprise. There are a total of four items measuring convenience in the pilot survey.

The control construct was also adapted from Collier (2010) and in the current study is related to a technology factor of social software that allows users to access or edit the knowledge contributions, either their own or those posted by others. These items were also adapted to fit the context of the current study. A total of four items were developed for this construct.

Availability

Availability is a developmental construct introduced in this study to reflect a characteristic of the technology. it is defined as the perceived time and effort required in *finding* knowledge shared by others in the organization. Four items were composed to measure this construct such as “It takes very little time to find the information I need using the KS tool.”

Immediacy of Feedback

Immediacy of feedback is a technology factor that describes how soon users can get feedback regarding the knowledge they have shared on the organization's social intranet and is drawn from media synchronicity theory (Dennis et al., 2008). A total of eight items were used to measure immediacy of feedback based on Sarker et al. (2010), a study employing media synchronicity theory to evaluate ethical decision making.

Richness of Cues

Another technology factor related specifically to the media itself is richness of cues, also known as symbol sets, and also derived from media synchronicity and media richness theory (Dennis et al., 2008). Sarker et al. (2010) only used two items to measure this construct in their study, and these were drawn on in the current study with modifications made to fit the context of knowledge sharing. However, for purposes of a more thorough analysis, three additional items were developed for a total of five items used in the pilot survey.

Community Identification

Community identification has been conceptualized as community members' perceptions of having similar values which lead to a sense of belonging and loyalty to their community and has been used as a determinant of knowledge sharing when using social software (Chiu et al., 2006; Hsu & Lin, 2008). The current study uses items taken from Hsu and Lin (2008) and includes four items.

Social Influence

Social influence is drawn from sociology and used in extended technology acceptance models such as UTAUT to measure the effect of other people's influence on an individual's behavioral intentions (Venkatesh et al., 2003). Items for social influence used in the pilot survey were taken from Venkatesh et al. (2003) and modified to fit the context of an online community used in knowledge sharing activities. A total of three items were used to measure social influence.

Expected Reciprocal Benefits

Expected reciprocal benefits are positive values that are expected as benefits of using the social software and are considered to be reciprocal because of the interactive nature of these technologies (Bock & Kim, 2002; Bock et al., 2005; Hsu & Lin, 2008). The current study uses items to measure expected reciprocal benefits from a synthesis of two studies (Bock et al., 2005; Hsu & Lin, 2008). The items from these two studies were combined because expected reciprocal benefits as measured by Hsu and Lin (2008) included an item about stronger relationships as a particular benefit, while Bock et al. (2005) measured expected reciprocal relationships specifically. Each study used four items, all of which were retained in the current survey instrument, for a total of eight items that were modified for the context of knowledge sharing.

Trust in Members

Trusting beliefs are concerned with the other party's integrity, ability and benevolence or a general belief or trusting intentions that another party could be trusted

(Gefen et al., 2003; G. Kim et al., 2009; Wu & Sukoco, 2010). Thus, in the context of knowledge sharing using social software the central trust is in those people with whom the knowledge is shared, as sharing has been shown to increase recipients' power over the one sharing while decreasing the sharer's own power over those particular others (Ford & Staples, 2010). Trust has been examined extensively in the literature, but in order to better fit the context of the current study, items were drawn for this construct from Chai, et al. (2011). The items were taken without modification as they related to trust in community members. A total of three items were used to measure this construct.

Disposition to Trust

Disposition to trust has been defined in the literature as the willingness to depend on others or the willingness of a party to be vulnerable to the actions of another (Chen & Barnes, 2007; Gefen et al., 2003). The items used to measure disposition to trust were adapted from two sources to increase the number of measurement items (Chen & Barnes, 2007; Cheung & Lee, 2006). A total of three items were used to measure disposition to trust in the survey instrument

Conscientiousness

The conscientiousness construct is a personality trait related to individuals who are considered to be dependable, reliable, and responsible (Matzler & Mueller, 2011). Numerous items have been used to measure this construct in psychology literature based on the measures of the Big Five personality traits that were put forth by Costa and McCrae (1992). The original scale included 240-items to measure the five personality traits in the NEO Personality Inventory—Revised (P. T. Costa & McCrae,

1992a). Researchers have used shorter measures when applying the personality traits as determinants of particular behavior (Buchanan et al., 2005; Matzler & Mueller, 2011). The items used in the current study were drawn from Matzler and Mueller (2011), as their study was investigating personality factors affecting knowledge sharing. A total of five items were used to measure this construct.

Openness to Experience

Openness to experience is another personality factor that has been linked to knowledge sharing intention (Matzler & Mueller, 2011). These authors used three items to measure openness to experience in their study. In order to improve the measurement of openness to experience, items were also adapted from Buchanan et al. (2005). A total of five scale items are used to measure openness to experience in the survey instrument.

Pilot Survey Administration

The pilot survey was distributed to a sample of undergraduate students in a college of business at a large southwestern university. The students were enrolled in online courses requiring online collaboration using wikis and discussion forums to further refine the critical factors influencing knowledge sharing intention. The goal was to develop a more precise set of factors with which to survey employees within organizations using social software tools.

While acknowledging the use of college students as subjects for a study focused on knowledge sharing in the enterprise may not be considered a representative sample, it is believed their situations are adequately similar to gain insight into factors influencing knowledge sharing. The students selected for the sample were required to collaborate

online as a part of their course, maintaining the link to employees who must access knowledge stored on the enterprise social intranet in order to accomplish their job tasks. Thus, these particular students were a suitable sample for the pilot survey.

Surveys were announced to the students in class or through an e-mail containing a link to the survey website. The surveys were administered through a web-based survey application. All responses were kept anonymous and no identifying information was collected for any survey respondent. The survey began by asking respondents to identify the one online collaboration tool used most often by them to share their knowledge with their classmates. Thereafter, the respondents were asked to base their answers to the individual factor items on the knowledge sharing tool previously identified. In addition, demographic information was also collected. This included information regarding the respondents' age, gender, and year of college classification.

A total of 342 respondents participated in the survey, with 32 responses being discarded for incomplete answers, identical answers for all questions, or a response time less than four minutes, indicating the questions were not read and answered carefully. This resulted in a usable response rate of 91%. The survey items were assessed for both reliability and validity using Cronbach's Alpha and exploratory factor analysis.

The exploratory factor analysis showed significant cross-loading among the items making up the technology factors. Particularly, perceived ease of use with items such as "My KS tool is easy to access," cross-loaded with convenience, which had items such as "It takes very little time to share my knowledge with the KS tool." It was determined to drop the items for perceived ease of use, because the findings from the interview

data analysis substantiated that perceived ease of use is not a critical factor toward employee willingness to share knowledge when using social software.

The items for convenience were retained even though this concept is related to ease of use. Convenience is believed to be part of the rationale for using social software tools. In a similar manner, the items for availability and control cross-loaded heavily with Perceived Usefulness and as their items were so similar, both Availability and Control were dropped from the analysis. The remaining constructs retained to form the 2nd order construct of technological advantage therefore include: 1) perceived usefulness, 2) perceived enjoyment, 3) richness of cues, 4) immediacy of feedback, and 5) convenience.

For the items comprising the sociological factors, there was cross-loading only for community identification, which cross-loaded with both social influence and expected reciprocal benefits. Thus, community identification was dropped from the analysis. The remaining constructs that form the 2nd order construct of community cohesiveness include 1) social influence, 2) expected reciprocal benefits, and 3) trust in members.

The factors for the 2nd order construct Individual Willingness did not show any cross-loading. However, all items with loadings of less than .7 were dropped from the analysis to achieve a parsimonious measurement instrument for the final survey, well above the recommended .5 cut-off (Hair Jr., Black, Babin, Anderson, & Tatham, 2006). The goal of the study was to survey employees routinely using social software tools in their workplace and while acknowledging that the survey instrument should be as brief as possible, it was also a goal to have robust measures. Therefore, IMMED1, IMMED6,

IMMED7, CONV1, USEFL5, RICH2, ERB6, ERB7, ERB8, CONSC1, KSB4, and KSB5 were dropped from the analysis for having factor loading values less than .7.

The Cronbach's alpha values were assessed for all constructs remaining in the research model. All constructs showed alpha values greater than the recommended .7 (Hair Jr. et al., 2006). The resulting constructs retained in the final research model are shown in Figure 3 below. The scale items associated with the final survey instrument are listed in

The resulting factors retained in the research model after pilot testing are shown in Figure 3. The associated survey instrument items are listed in Appendix B.

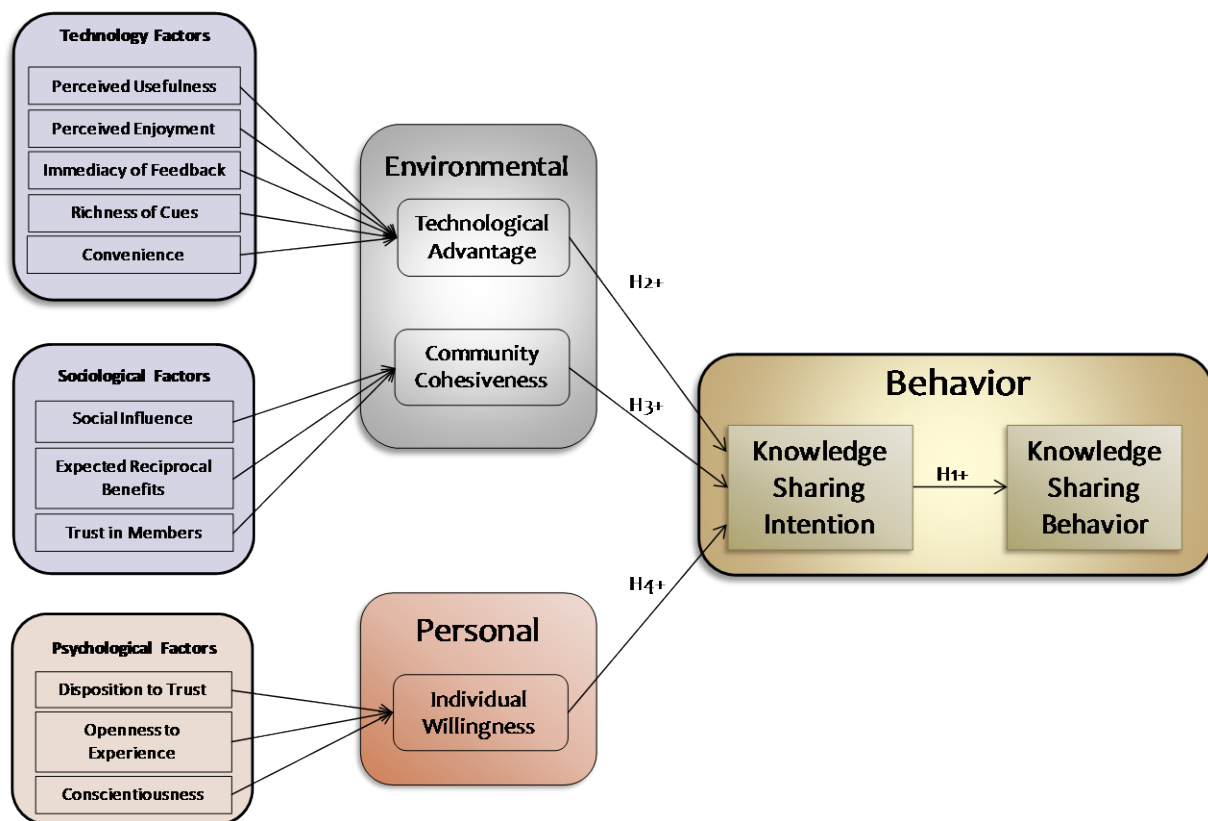


Figure 3. Research model after pilot testing

Final Survey Administration

As the population of interest was employees using social software tools within their organization, the final survey was administered to employees identified as routinely using these tools in their job. First, the IT professionals previously interviewed who expressed a desire to have their users participate in the survey were contacted by the researcher. A link to the online survey instrument was provided, along with a brief explanation describing the study for the IT professional to give their employees. Employees were notified of the availability of the survey by an email announcement, as well as a posting on their company's online social community. No incentives were offered for participating in the survey, other than the potential benefit of gaining a better understanding of the use of ESS tools. The surveys were administered through a web-based survey tool and completed by the employees accessing the survey through a web browser. All responses were kept confidential and no identifying information was collected for any individual respondent. After two weeks, a reminder posting was made on the company social network, accompanied by an e-mail reminder sent to the respondent population.

Additionally, graduate students in the college of business at a large southwestern university were also selected for participation in the final survey. Extra credit was offered for participating in the survey, and criteria were applied to filter out only those students who were currently or previously employed in a company where the use of ESS tools was part of the job. As with the employees in the previous group, the graduate students received a notice of the survey through an email with surveys administered through a web-based survey tool. All responses were kept confidential

and no identifying information was collected for any individual respondent. The instructors were responsible for making the announcement and for deciding how long the students had to participate in the survey.

CHAPTER 4

DATA ANALYSIS AND RESULTS

This chapter describes the steps involved in the data analysis process along with the associated results. A discussion of the respondents is presented first, including response rate, demographic data, and non-response bias. Next, analysis of the measurement instrument is discussed, including issues of construct validity and reliability. Finally, testing of the structural model and associated hypotheses are assessed and discussed.

Response Rate, Demographic Data and Non-Response Bias

IT professionals who participated in the initial interview process were contacted by the researcher to provide their employees with a link to the online survey. Individuals such as the CIO of a state government agency, the CIO of a multi-state utility services company, the intranet manager of a large higher education institution as well as numerous other contacts in manufacturing and service firms including technology, health care, retail, finance/insurance, utilities and the military were sent a brief explanation of the study with a link to the online survey to provide their employees. After two weeks, a reminder notice was sent to the employees indicating that one week was left to complete the survey. 151 responses were received from this group of participants. The recruiting script sent to these employees is presented in Appendix C.

In an effort to reach as many and varied employees using ESS tools as possible, two graduate classes in a college of business at a large southwestern university were also selected for participation in the final survey. Extra credit was offered by the instructors to the students for their participation in the survey. Graduate students are

recognized as largely being employed in professional positions while they complete their master's degrees. However, to acknowledge the possibility that some graduate students might not be currently employed, or even previously employed, criteria was set to filter out only those employees who were currently or previously employed in a job where these tools were used.

To narrow the respondents to only those who were currently or had previously used these tools in their place of employment, respondents were instructed to base their responses on their current job, former job, coursework, or impressions. Respondents were then asked to specify which of those categories represented the context of their responses. Only those responses based on "current job" or "former job" were retained in the final sample.

The graduate student sample was compared to the organizational respondent sample, to assess the appropriateness of pooling the two samples. Independent sample *t*-tests were run to compare the two groups. The results are presented in Table 6. Immediacy of Feedback and Knowledge Sharing Intention were the only predictor variables which showed a significant difference between the graduate student and organizational respondents. For all the remaining variables, no significant differences were revealed. For the demographic variables, there was no significant difference regarding Gender between the two groups. However, there was a significant difference between the groups in terms of Age, Job Classification, and Job Tenure. This was expected as many graduate students are early in their careers with less time for promotion and tenure. The isolated differences between the two groups justified pooling their data.

Table 6

Graduate Students vs Org. Respondents-Independent Samples Test

| | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | |
|----------------|---|------|------------------------------|--------|-----------------|-----------------|-----------------------|
| | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference |
| Convenience | 0.08 | 0.77 | -1.38 | 189.00 | 0.17 | -0.26 | 0.19 |
| Availability | 2.29 | 0.13 | -0.64 | 189.00 | 0.53 | -0.14 | 0.21 |
| Enjoyment | 0.33 | 0.57 | -0.62 | 189.00 | 0.53 | -0.16 | 0.25 |
| Immediacy | 0.79 | 0.38 | -2.05 | 189.00 | 0.04 | -0.44 | 0.21 |
| Richness | 1.71 | 0.19 | 1.28 | 189.00 | 0.20 | 0.38 | 0.30 |
| Useful | 0.16 | 0.69 | -0.75 | 189.00 | 0.45 | -0.14 | 0.19 |
| Social Infl. | 0.08 | 0.78 | -1.16 | 189.00 | 0.25 | -0.25 | 0.22 |
| ExRecBen. | 0.00 | 0.97 | -0.06 | 189.00 | 0.95 | -0.01 | 0.19 |
| Trust in Mem | 0.30 | 0.59 | -1.05 | 189.00 | 0.30 | -0.19 | 0.19 |
| Disp. to Trust | 0.11 | 0.74 | -0.30 | 189.00 | 0.76 | -0.06 | 0.20 |
| Conscient. | 0.02 | 0.89 | 0.89 | 189.00 | 0.38 | 0.09 | 0.10 |
| Openness | 1.29 | 0.26 | -1.68 | 189.00 | 0.10 | -0.26 | 0.15 |
| KS Intention | 4.37 | 0.04 | -2.84 | 189.00 | 0.01 | -0.34 | 0.12 |
| KS Behavior | 2.19 | 0.14 | -0.45 | 189.00 | 0.66 | -0.09 | 0.20 |
| Gender | 0.19 | 0.66 | 0.23 | 189.00 | 0.82 | 0.02 | 0.08 |
| Age | 16.86 | 0.00 | -10.87 | 135.00 | 0.00 | -1.77 | 0.16 |
| Job Class | 1.64 | 0.20 | -3.55 | 189.00 | 0.00 | -0.80 | 0.23 |
| Job Tenure | 18.23 | 0.00 | -3.76 | 135.00 | 0.00 | -4.46 | 1.18 |

A total of 66 responses were received from the graduate students, giving a total sample size of 217 when combined with the original employee data set. After filtering the graduate student data based on the use of ESS tools in the current or former job, 47 responses were retained from the sample as being based on actual workplace use of these tools. When combined with the original employee data set, this gave a total sample size of 198. Further cleaning of the combined data resulted in seven respondents removed for giving incomplete answers, or identical answers given to

every question, indicating invalid responses. This left a usable sample size of 191, or a usable response rate of 88%. Questions were based on a 7-point Likert scale and included basic demographic and job-specific information. Demographic information regarding the survey respondents is shown in Table 7.

Table 7

Demographic Data

| | |
|-----------------------------|----------|
| Gender | |
| <i>Male</i> | 62% |
| <i>Female</i> | 38% |
| Age | |
| <i>18-30</i> | 23% |
| <i>31-40</i> | 27% |
| <i>41-50</i> | 25% |
| <i>51-60</i> | 21% |
| <i>61 or above</i> | 4% |
| Organization Class | |
| <i>Service</i> | 93% |
| <i>Manufacturing</i> | 7% |
| Job Class | |
| <i>Non-managerial</i> | 24% |
| <i>Technical Specialist</i> | 29% |
| <i>1st Line Manager</i> | 17% |
| <i>Mid-level Manager</i> | 16% |
| <i>Top-level Manager</i> | 14% |
| Job Tenure | |
| <i>Average</i> | 6 years |
| <i>Maximum</i> | 33 years |
| <i>Minimum</i> | 4 months |

A large majority of the respondents were male, 62%, however the age ranges were fairly evenly distributed, save for those 61 or above at only 4%. The job classifications were more diverse, with only 14% of respondents classified as Top-level Manager, while almost one-third were Technical Specialists (29%). The average job

tenure was 6 years of service, but the length of employment range was wide with the maximum length at 33 years and the minimum at only 4 months. With such a diverse sample of respondents from such a diverse pool of industries, it is expected that the results of the data should have good generalizability.

Testing for non-response bias was achieved by comparing the group of responses received earlier to those received after the reminder notice was sent (Karahanna et al., 1999). Late respondents are considered similar to non-respondents because they may be reluctant to participate initially and require prompting. If upon comparison of the two groups, no statistically significant difference is found, it can be concluded that non-respondents do not differ significantly from respondents. The graduate student group was not considered in this comparison because the instructors were responsible for announcing the survey availability and for determining how long the students had to take it. For that reason, only the responses received directly from employees in various organizations were used in the non-response bias test.

The differences between the two groups were evaluated by using independent t -tests on each group's responses to each of the independent and dependent variables. The results are displayed in Table 8, and show no significant differences between the groups for each of the independent variables, and for the mediating dependent variable, suggesting that non-response bias is not a significant influence in this study.

The dependent variable knowledge sharing behavior showed an insignificant Levene's Test and therefore satisfies the homogeneity of variance between the two groups. However, the t -test for knowledge sharing behavior does show a significant difference between the early respondents and the late respondents with the t -test

significant at .041. A potential explanation for this difference is the apparent willingness and conscientiousness demonstrated by the early respondents' prompt response, two factors believed to affect knowledge sharing intention and behavior, as compared to those who had to be reminded or "nudged" to take the survey. Furthermore, with 18 individual, independent *t*-tests each at the .05 level of significance, if one were to control for experiment-wise error and perform a Bonferroni adjustment, then none of the variables would be significant (Kirk, 2013).

Table 8

Non-Response Bias Test/Independent Samples Test

| | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | |
|--------------|---|-------|------------------------------|---------|-----------------|-----------------|-----------------------|
| | <i>F</i> | Sig. | <i>t</i> | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference |
| Convenience | 0.152 | 0.697 | 0.143 | 154.00 | 0.887 | 0.026 | 0.182 |
| Enjoyment | 0.448 | 0.504 | -0.277 | 143.00 | 0.782 | -0.068 | 0.246 |
| Immediacy | 0.005 | 0.943 | 0.790 | 142.00 | 0.431 | 0.166 | 0.210 |
| Richness | 2.224 | 0.138 | -0.243 | 143.00 | 0.808 | -0.071 | 0.292 |
| Useful | 1.627 | 0.204 | 0.827 | 143.00 | 0.409 | 0.156 | 0.189 |
| Social Infl. | 1.674 | 0.198 | -0.999 | 143.00 | 0.320 | -0.207 | 0.207 |
| ExRecBen. | 1.325 | 0.252 | -1.239 | 143.00 | 0.217 | -0.225 | 0.182 |
| TrustMem | 0.188 | 0.665 | -0.719 | 143.00 | 0.474 | -0.130 | 0.181 |
| DispTrust | 0.874 | 0.351 | -0.703 | 143.00 | 0.483 | -0.145 | 0.206 |
| Conscient. | 0.482 | 0.489 | -0.952 | 142.00 | 0.343 | -0.091 | 0.096 |
| Openness | 0.003 | 0.953 | -0.156 | 143.00 | 0.876 | -0.023 | 0.149 |
| KS Intention | 0.066 | 0.798 | -0.232 | 143.00 | 0.817 | -0.026 | 0.111 |
| KS Behavior | 0.556 | 0.457 | -2.062 | 143.00 | 0.041 | -0.383 | 0.186 |
| Gender | 0.878 | 0.350 | -0.488 | 143.000 | 0.626 | -0.040 | 0.082 |
| Age | 0.044 | 0.834 | -0.982 | 142.000 | 0.328 | -0.180 | 0.183 |
| Job Class | 0.045 | 0.832 | -1.400 | 142.000 | 0.164 | -0.328 | 0.234 |
| Job Tenure | 0.126 | 0.723 | 0.418 | 87.000 | 0.677 | 0.680 | 1.626 |

Data Analysis

The data collected during the semi-structured interviews was analyzed using the hermeneutic circle method of analyzing qualitative data described in Chapter 3. The data collected from the surveys were analyzed using partial least squares, a structural equation modeling technique. The software package SPSS v. 10 was used to analyze the individual factor items and SmartPLS v. 2.0.M3 was used to assess the structural model in this study.

Content Validity

Content validity refers to how well the measurement instrument accurately reflects the phenomenon being studied. This judgment can be made with a critical review of both current research and by input from experts in the field to determine content validity (Kerlinger & Lee, 2000). Therefore, the survey instrument for this study was developed using established constructs validated in prior research where possible. In addition, IS academic experts were consulted for feedback on the content validity of the instrument to ensure the items made practical as well as theoretical sense.

External Validity

External validity refers to the degree to which the study can generalize the results of the study to other persons, across times and settings (Kerlinger & Lee, 2000). The population of interest in the current study was employees using social software technologies in the enterprise. Therefore, IT professionals involved in implementing and maintaining social computing platforms in their organizations were the sample subjects of the semi-structured interviews and employees in those same organizations plus several others were the subjects of the written sample survey. The use of college

students enrolled in courses requiring online collaboration using wikis and discussion forums as a part of their grade were deemed suitable sample subjects for the pilot survey to refine the final survey instrument. Both sample sets must rely on finding the knowledge required to complete their required tasks using social software tools.

Construct Validity

The adequacy of the measurement instrument is determined by examining the reliability of individual scale items and by establishing construct validity by determining both convergent and discriminant validities (Kerlinger & Lee, 2000). Reliability is concerned with consistency of results and implies that the results are dependable, stable and free from errors. The reliability of constructs is demonstrated when Cronbach's alpha values are higher than the generally accepted threshold of .70 (Hair, Black, Babin, Anderson, and Tatham, 2006). The results of the reliability testing are displayed in Table 11. All constructs had Cronbach's alpha values ranging from .80 to .98.

Construct validity is demonstrated when items have a factor loading of more than the generally accepted value of 0.5 on the construct in which they are supposed to load (Hair et al., 2006). Exploratory factor analysis (EFA) was conducted to discover the underlying structure of the data using principal components factor analysis with varimax rotation (Hair et al., 2006). Using a cutoff value of 0.6 or higher to increase the robustness of construct validity, two items were removed for having values less than 0.6: 1) KSB5 = .496 and 2) OPEN3 = .427. The item KSB5 was worded as, "I share my knowledge from my education or training with other employees." It was the only item for Knowledge Sharing Behavior that did not specifically mention using the knowledge

sharing tool, and is a likely reason it did not load as high as the other items. The item OPEN3 for openness was worded as, "I especially enjoy learning new things." The item loaded below the cut-off of 0.6 and cross-loaded with knowledge sharing intention and was dropped from the analysis. Several items were removed for loading on a construct other than the one they were supposed to represent. Items from the second-order formative construct of technological advantage cross-loaded significantly. The constructs that formed technological advantage included perceived usefulness, perceived enjoyment, immediacy of feedback, richness of cues, and convenience.

Richness of cues and perceived enjoyment did not experience any cross-loading. However, all three of the remaining technological constructs (immediacy of feedback, convenience, and perceived usefulness) cross-loaded with each other. After removing items one at a time, it was found that convenience cross-loaded regardless of what other items were retained or removed. Convenience was thus removed from the model.

Immediacy of feedback and perceived usefulness did not cross-load with any other items. However, they did cross-load with each other. The Cronbach's alpha for immediacy of feedback ($\alpha = .926$) was higher than that for perceived usefulness ($\alpha = .882$). For that reason and because immediacy of feedback is more closely related to the use of social media tools, it was determined to drop perceived usefulness from the model.

This left three constructs which form the second order construct of technological advantage: 1) richness of cues, 2) immediacy of feedback, and 3) perceived enjoyment. The original factor loadings are presented in Table 9 and the final factor loadings are shown in Table 10. Factor loadings less than 0.39 are suppressed from the results. The

final research model reflecting the remaining items is shown in Figure 4.

Table 9

Original Factor Loadings

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|
| USFL4 | .788 | | | | | | | | | | | |
| IMMED4 | .774 | | | | | | | | | | | |
| IMMED3 | .773 | | | | | | | | | | | |
| IMMED2 | .768 | | | | | | | | | | | |
| USFL2 | .759 | | | | | | | | | | | |
| IMMED1 | .718 | | | | | | | | | | | |
| CONV1 | .714 | | | | | | | | | | | |
| CONV2 | .677 | | | | | | | | .393 | | | |
| USFL3 | .658 | | | | | | | | | | | |
| CONV3 | .656 | | | | | | | | .416 | | | |
| USFL1 | .643 | | | | | | | | | | | |
| RICH3 | | .898 | | | | | | | | | | |
| RICH2 | | .892 | | | | | | | | | | |
| RICH4 | | .887 | | | | | | | | | | |
| RICH1 | | .885 | | | | | | | | | | |
| KSB3 | | | .870 | | | | | | | | | |
| KSB2 | | | .816 | | | | | | | | | |
| KSB6 | | | .655 | | | | | | | | | |
| KSB1 | | | .629 | | | | | | | | | |
| KSB4 | | | .620 | | | | | | | | | |
| KSB5 | | | .466 | | | | | | | | | |
| KSI4 | | | | .855 | | | | | | | | |
| KSI3 | | | | .836 | | | | | | | | |
| KSI2 | | | | .779 | | | | | | | | |
| KSI1 | | | | .744 | | | | | | | | |
| SocIn2 | | | | | .866 | | | | | | | |
| SocIn3 | | | | | .859 | | | | | | | |
| SocIn1 | | | | | .843 | | | | | | | |
| ERB1 | | | | | .534 | | | | | | | |
| ERB3 | | | | | | .787 | | | | | | |
| ERB4 | | | | | | .766 | | | | | | |
| ERB5 | | | | | | .711 | | | | | | |
| ERB2 | | | | | | .709 | | | | | | |
| DisTr2 | | | | | | | .936 | | | | | |
| DisTr3 | | | | | | | .932 | | | | | |
| DisTr1 | | | | | | | .903 | | | | | |
| CONSC3 | | | | | | | | .791 | | | | |
| CONSC1 | | | | | | | | .783 | | | | |
| CONSC2 | | | | | | | | .733 | | | | |
| CONSC4 | | | | | | | | .646 | | | | |
| ENJOY2 | | | | | | | | | .818 | | | |
| ENJOY1 | | | | | | | | | .803 | | | |
| ENJOY3 | | | | | | | | | .793 | | | |
| OPEN2 | | | | | | | | | | .843 | | |
| OPEN4 | | | | | | | | | | .843 | | |
| OPEN1 | | | | | | | | | | .834 | | |
| TrMem2 | | | | | | | | | | | .754 | |
| TrMem3 | | | | | | | | | | | .740 | |
| TrMem1 | | | | | | | | | | | .552 | |
| OPEN3 | | | | | | | | | | | | .628 |

USFL = Perceived Usefulness; IMMED = Immediacy; CONV = Convenience; RICH = Richness; KSB = Knowledge Sharing Behavior; KSI = Knowledge Sharing Intention; SocIn = Social Influence; ERB= Expected Reciprocal Benefits; DisTr = Disposition to Trust; CONSC= Conscientiousness; ENJOY = Perceived Enjoyment; OPEN = Openness; TrMem = Trust in members

Table 10

Final Factor Loadings

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|--------|------|------|------|------|------|------|------|------|------|------|------|
| ENJOY2 | | | | | | | | | | | |
| ENJOY1 | .875 | | | | | | | | | | |
| ENJOY3 | .859 | | | | | | | | | | |
| RICH3 | .831 | | | | | | | | | | |
| RICH2 | | .906 | | | | | | | | | |
| RICH1 | | .904 | | | | | | | | | |
| RICH4 | | .898 | | | | | | | | | |
| IMMED3 | | .896 | | | | | | | | | |
| IMMED4 | | | .838 | | | | | | | | |
| IMMED2 | | | .834 | | | | | | | | |
| IMMED1 | | | .817 | | | | | | | | |
| ERB3 | | | .753 | | | | | | | | |
| ERB4 | | | | .805 | | | | | | | |
| ERB5 | | | | .790 | | | | | | | |
| ERB2 | | | | .716 | | | | | | | |
| SocIn2 | | | | .711 | | | | | | | |
| SocIn1 | | | | | .869 | | | | | | |
| SocIn3 | | | | | .853 | | | | | | |
| TrMem2 | | | | | .837 | | | | | | |
| TrMem3 | | | | | | .794 | | | | | |
| TrMem1 | | | | | | .777 | | | | | |
| CONSC3 | | | | | | .650 | | | | | |
| CONSC1 | | | | | | | .807 | | | | |
| CONSC2 | | | | | | | .772 | | | | |
| CONSC4 | | | | | | | .764 | | | | |
| OPEN1 | | | | | | | .647 | | | | |
| OPEN4 | | | | | | | | .855 | | | |
| OPEN2 | | | | | | | | .849 | | | |
| DisTr2 | | | | | | | | .837 | | | |
| DisTr3 | | | | | | | | | .939 | | |
| DisTr1 | | | | | | | | | .935 | | |
| KSB3 | | | | | | | | | .915 | | |
| KSB2 | | | | | | | | | | .892 | |
| KSB1 | | | | | | | | | | .840 | |
| KSB6 | | | | | | | | | | .645 | |
| KSB4 | | | | | | | | | | .633 | |
| KSI4 | | | | | | | | | | .610 | |
| KSI3 | | | | | | | | | | | .874 |
| KSI1 | | | | | | | | | | | .851 |
| KSI2 | | | | | | | | | | | .774 |

ENJOY = Perceived Enjoyment; RICH = Richness; IMMED = Immediacy; SocIn = Social Influence; ERB= Expected Reciprocal Benefits; DisTr = Disposition to Trust; CONSC= Conscientiousness; OPEN = Openness; TrMem = Trust in Members; KSB = Knowledge Sharing Behavior; KSI = Knowledge Sharing Intention

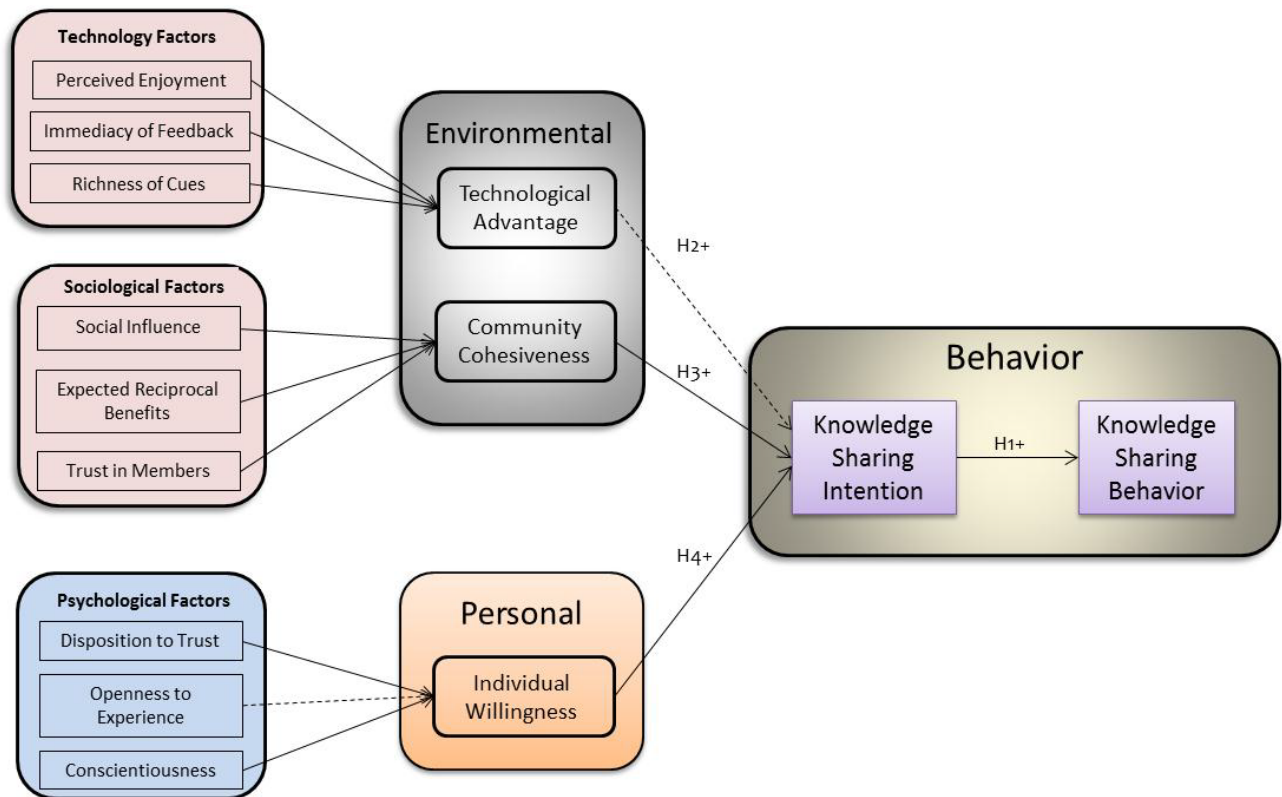


Figure 4 – Final Research Model

Harman's one-factor test was used to check for common method bias (Harman, 1976). After entering all the variables into an EFA with eigenvalues set to greater than one, the total variance explained was examined to assess whether common method bias was present. If common method bias is present, either 1) a single factor emerges from the factor analysis, or 2) one general factor accounts for the majority of the covariance among the variables (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The results show that 11 factors account for 81.47% of the variance in the data. The first factor accounts for 30.25% of the variance, not a majority. Therefore, no general factor is apparent.

Convergent validity provides a measure of the variance shared between a construct and its indicators. Convergent validity is demonstrated when items that

measure the same construct have high correlations in addition to items that have factor loadings of greater than 0.5 on the same construct. The final factor loadings in Table 10 reflect this criteria being met. Convergent validity is also demonstrated by the square root of the average variance extracted (AVE) values being higher than .50 (Fornell and Larcker, 1981). Table 11 shows the square root of the AVE values placed on the diagonal, each being higher than .50 with a range of .68 to .97.

Discriminant validity is shown when items measuring different constructs do not have high correlations or significant cross-loadings with other constructs. Table 8 shows no significant cross-loadings with any of the constructs in the measurement instrument. Additionally, the square roots of the AVEs should be higher than all of the correlations between any two constructs (Gefen & Straub, 2005). SmartPLS produced the item correlations and AVE values presented in Table 11.

The square-roots of the AVE values (placed on the diagonal) are higher than all inter-construct correlations showing both convergent and discriminant validity. Based on the factor analysis, the Cronbachs alpha values, construct correlations, and the analysis of average variance extracted (AVE) values described above, the measurement model appears to be valid, in terms of reliability, convergent and discriminant validity. This strong construct validity supports proceeding with the testing of the structural model.

Table 11

Reliabilities, AVE Values, and Correlations of 1st-order Constructs*

| | Composite Reliability | Cronbachs Alpha | AVE | CONSC | DisTr | ENJOY | ERB | IMMED | KSB | KSI | OPEN | RICH | SocIn | TrMem |
|--------------|-----------------------|-----------------|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| CONSC | 0.87 | 0.80 | 0.63 | 0.79 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DisTr | 0.97 | 0.96 | 0.92 | 0.22 | 0.96 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ENJOY | 0.97 | 0.95 | 0.91 | 0.16 | 0.19 | 0.96 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ERB | 0.96 | 0.94 | 0.85 | 0.44 | 0.27 | 0.43 | 0.92 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| IMMED | 0.95 | 0.93 | 0.82 | 0.19 | 0.10 | 0.53 | 0.48 | 0.91 | 0 | 0 | 0 | 0 | 0 | 0 |
| KSB | 0.90 | 0.87 | 0.65 | 0.26 | 0.20 | 0.39 | 0.52 | 0.44 | 0.81 | 0 | 0 | 0 | 0 | 0 |
| KSI | 0.91 | 0.87 | 0.72 | 0.29 | 0.23 | 0.06 | 0.29 | 0.17 | 0.35 | 0.85 | 0 | 0 | 0 | 0 |
| OPEN | 0.90 | 0.84 | 0.75 | -0.01 | 0.08 | -0.10 | -0.11 | -0.18 | -0.08 | 0.10 | 0.86 | 0 | 0 | 0 |
| RICH | 0.98 | 0.98 | 0.94 | 0.14 | 0.05 | 0.49 | 0.44 | 0.52 | 0.41 | 0.05 | -0.19 | 0.97 | 0 | 0 |
| SocIn | 0.97 | 0.95 | 0.92 | 0.33 | 0.29 | 0.36 | 0.53 | 0.40 | 0.34 | 0.24 | 0.16 | 0.20 | 0.96 | 0 |
| TrMem | 0.92 | 0.86 | 0.78 | 0.41 | 0.38 | 0.24 | 0.58 | 0.33 | 0.44 | 0.34 | -0.02 | 0.28 | 0.45 | 0.88 |

* Square roots of AVE values are placed on the diagonal. The off-diagonal values are correlations between latent constructs.

Testing of the Structural Model

The data were analyzed using the Partial Least Squares (PLS) statistical software tool SmartPLS to test the structural model and assess the hypotheses. SmartPLS is able to simultaneously examine the measurement model and the structural model. Therefore, the hypothesized relationships among the research constructs and the items to measure these constructs can be evaluated together. Additionally, PLS has a lower requirement for the minimal sample size (Chin, 1998). Therefore, SmartPLS was deemed as the appropriate tool for testing the model.

Hypotheses two and three (H2 and H3) were modified as a result of the final factor analysis to reflect the first-order constructs dropped from the second-order formative constructs of technological advantage and community cohesiveness. The hypotheses for the final research model are listed in Table 12.

Table 12

Final Research Model – Hypotheses

| | |
|------------|--|
| H1: | Knowledge sharing intention has a positive effect on knowledge sharing behavior. |
| H2: | The greater the extent to which technological advantage is perceived to be characterized by technology factors of immediacy of feedback, richness of cues, and convenience, the greater the intent to share knowledge. |
| H3: | The greater the extent to which community cohesiveness is perceived to be characterized by social influence, expected reciprocal benefits, and trust in members, the greater the intent to share knowledge. |
| H4: | The greater the extent to which individual willingness is perceived to be characterized by disposition to trust, openness to experience, and conscientiousness, the greater the intent to share knowledge. |

The PLS analysis yielded path coefficients for the structural model that allowed testing the strength of the relationship between each of the independent and dependent

variables. The levels of significance were estimated using t-statistics derived from a bootstrapping procedure with 500 re-samples. Knowledge sharing intention showed a significant positive relationship with knowledge sharing behavior, with a path coefficient of .362 and thus H1 was supported. Additionally, community cohesiveness showed a significant positive relationship with knowledge sharing intention, having a path coefficient of .277 and supporting H3. Individual willingness also showed a significant positive relationship with knowledge sharing intention with a path coefficient of .203 and supporting H4 as well.

However, the second-order formative construct of technological advantage had a path coefficient = -0.069. The *t*-value for the relationship between technological advantage and knowledge sharing intention was .803, less than the 1.96 *t*-value required for a 0.05 level of significance. This indicates an insignificant, negative effect of technological advantage on knowledge sharing intention and thus H2 was not supported.

R^2 values provide a measure of the model's predictive power for the dependent variables, and were also obtained in the PLS analysis. Figure 5 shows the R^2 values for the dependent variables of knowledge sharing intention and knowledge sharing behavior and the path coefficients of the individual relationships hypothesized in the final research model. PLS returned an R^2 value = .124 for the dependent variable knowledge sharing behavior and an R^2 = .157 for knowledge sharing intention.

Social Software/Knowledge Sharing Model

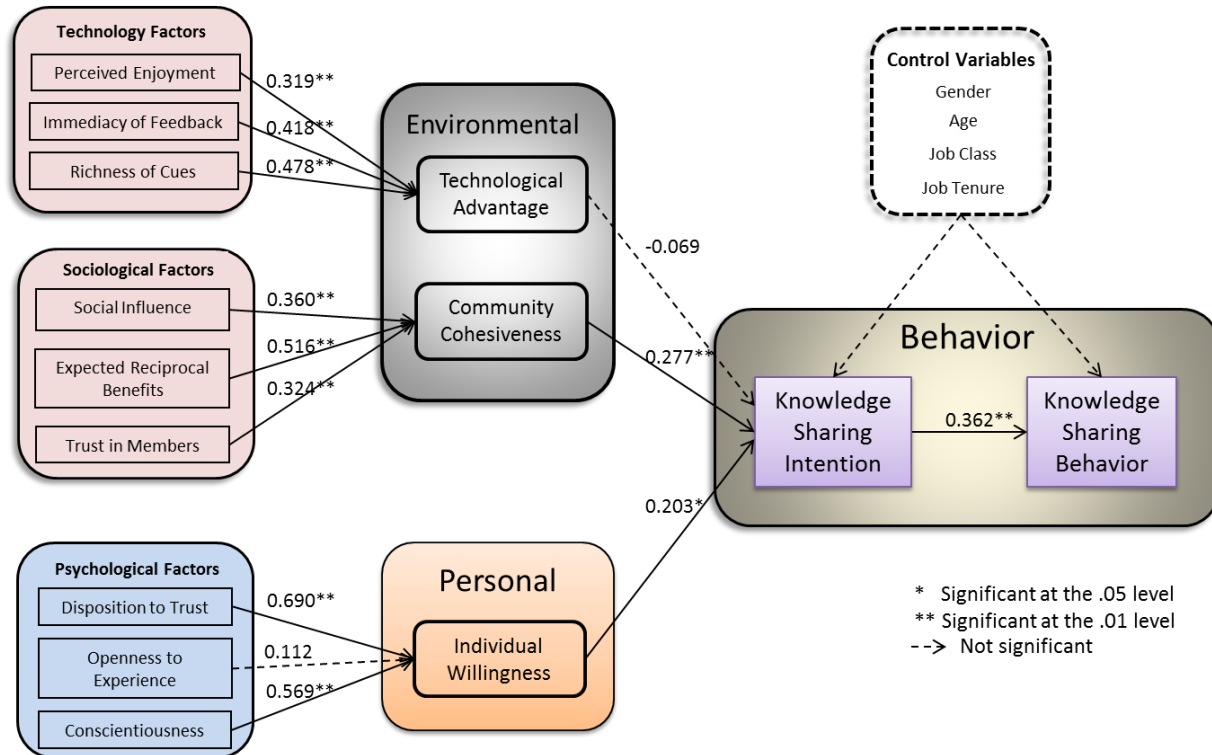


Figure 5 – Final model with path coefficients and level of significance

Next, the mediating effect of knowledge sharing intention (KSI) between the independent variables of technological advantage, community cohesiveness, and individual willingness and the dependent variable of knowledge sharing behavior (KSB) was tested. The direct effect of each independent variable on KSB was assessed in PLS. The direct effect of technological advantage on KSB showed a path coefficient of .319 with a *t*-value of 6.69, indicating a significant positive effect of technological advantage on knowledge sharing behavior. This is in contrast to the negative and insignificant effect of technological advantage on knowledge sharing intention and indicated KSI had no mediating effect between technological advantage and KSB. In

addition, when the direct effect of technological advantage on knowledge sharing behavior is assessed, the R^2 value of KSB improved to .399, meaning that approximately 40% of the variance in KSB is explained by the predictor variables.

Next, the direct effect of community cohesiveness on KSB was assessed with a path coefficient of .312 and a t -value = 3.48. This indicated that community cohesiveness also had a significant, positive relationship with KSB. However, the path between community cohesiveness and KSI also showed a significant, positive effect. Therefore, the relationship between community cohesiveness and KSB is only partially mediated by KSI.

Finally, the direct effect of individual willingness on KSB was assessed. SmartPLS showed a path coefficient of .206 and a t -value of .102 for this relationship. Therefore, there was no significant direct effect of individual willingness on KSB. Thus, KSI fully mediates the relationship between Individual Willingness and KSB. A summary of the hypotheses, path coefficients, and t -values of the hypothesized relationships is shown in Table 13.

Table 13

Summary of Hypotheses

| Hypothesis | Path Coefficient | t-value | Result |
|---|-------------------------|----------------|---------------|
| H1: Knowledge sharing intention has a positive effect on knowledge sharing behavior. | 0.362 | 6.91 | Supported |
| H2: The greater the extent to which technological advantage is perceived to be characterized by technology factors of perceived enjoyment, immediacy of feedback, and richness of cues, the greater the intent to share knowledge. | -0.069 | 0.803 | Not Supported |
| H3: The greater the extent to which community cohesiveness is perceived to be characterized by social influence, expected reciprocal benefits, and trust in members, the greater the intent to share knowledge. | 0.277 | 2.62 | Supported |
| H4: The greater the extent to which individual willingness is perceived to be characterized by disposition to trust, openness to experience, and conscientiousness, the greater the intent to share knowledge. | 0.203 | 2.21 | Supported |

CHAPTER 5

DISCUSSION AND CONCLUSION

This dissertation presents the effects of technological advantage, community cohesiveness, and individual willingness on the knowledge sharing intention and knowledge sharing behavior of employees using social software tools in their organization. This chapter provides a discussion of the findings. Limitations of the study are addressed, and implications for both theory and practice are presented. Finally, suggestions for future research in this area are discussed.

Findings and Discussion

This research proposed a framework to empirically assess the knowledge sharing intention and behavior of employees using social software tools in their organization. The knowledge sharing was assessed by measuring the effect of a technological advantage gained by using ESS tools, the community cohesiveness that comes from participating in the online community at work, and the individual willingness inherent in the employee. Each of these was a second-order construct formed by three separate first-order constructs. Additionally, the framework includes a mediating variable, knowledge sharing intention, and a dependent variable, knowledge sharing behavior. The findings of each of these variables and their hypothesized relationships are discussed next.

The IS literature shows strong support for the relationship between behavioral intention and actual behavior (Bock et al., 2005; Fishbein & Ajzen, 1975; Venkatesh et al., 2003). However, there are mixed results with some researchers finding a weak relationship between knowledge sharing intention and knowledge sharing behavior

(Ford & Staples, 2010). As a result, one of the goals of this study was to test the strength of this relationship. The results of the current study found that, as hypothesized in H1, there is a significant and positive relationship between knowledge sharing intention and knowledge sharing behavior. This finding supports numerous prior studies and strengthens the literature in regard to this issue.

The technological advantage that an employee perceives from using ESS tools was hypothesized to have a positive effect on knowledge sharing intention.

Technological advantage was a second-order construct formed by several individual first-order factors drawn from both technology acceptance and media synchronicity theories. Somewhat surprisingly, the technology acceptance factors began to drop out of the analysis, almost from the beginning of the study when interviewing IT professionals about the use of ESS tools in their organization.

The interview data suggested that ease of use, a familiar technology acceptance factor in IS literature, was not considered to be an important issue to employees. The general belief was that these social software tools were familiar to the employees in their own personal activities and did not represent any type of new or unfamiliar process. In other words, there was not thought to be any great learning curve associated with their use.

Likewise, the other well-known technology acceptance factor, usefulness, was not retained after the factor analysis because the items heavily cross-loaded with immediacy of feedback items. This indicated that the ability to gain an immediate response itself was the actual “useful” consequence of utilizing ESS tools. Convenience was a technology factor that was also dropped from the model during the final factor

analysis. Convenience was defined as the time and effort required when *contributing* one's knowledge when using the ESS tool. Convenience also was dropped from the analysis for cross-loading with immediacy of feedback. Once again, the data showed that the advantage of using this technology is the "convenient" consequence of an immediate response.

Similar in concept to convenience was the construct of availability, defined as the time and effort required in *finding* knowledge shared by other users of the ESS tool. Both availability and control were technology factors that were dropped in the early pilot testing phase of the research. Control was defined as the feature that allows users to access or edit the knowledge contributions, either their own or those posted by others. Accessing and editing common content is a key element in the growth of user-generated content, a critical aspect of social software tools, but neither were found to form a specific technological advantage.

Technological advantage originally was comprised of an overabundance of technology factors, an intentional effort aimed to account for any of the various factors that might form an advantage as a result of using these new tools in the organization. Because the use of ESS tools is still in its infancy, another goal of this research was to more precisely determine which factors regarding the technology itself create an advantage in the workplace. Perhaps one of the most interesting findings of this study was the reduced role of technology factors in forming a technological advantage gained from using social software. Only three of the original eight factors were retained to comprise technological advantage: 1) perceived enjoyment, 2) immediacy of feedback, and 3) richness of cues.

Early research on hedonic systems such as blogging or a social networking site found that the intrinsic motivator of perceived enjoyment one gains by using the system had a strong impact on attitude and intent to use (Hsu & Lin, 2008; Sledgianowski & Kulviwat, 2009). While ESS tools are specifically related to workplace environments, it is clear that their very social nature lends itself to an enjoyable interaction. Employees use these tools to share their knowledge or to find knowledge required to perform their job. However, in the course of doing so, they are also forming strengthened relationships with their co-workers and feeling a sense of community that makes the workplace environment a more enjoyable one.

Two of the three factors that comprised technological advantage were drawn from media synchronicity theory. This is not a surprising finding, considering that it is the media itself which provides the social interaction that employees find so valuable. immediacy of feedback is a technology factor that describes how soon users can get feedback regarding the knowledge they have shared on the organization's social intranet. The faster the communication occurs, the more the interaction resembles a typical conversation (Dennis et al., 2008). Clearly, there is an advantage to being able to communicate without delay in either direction that is provided by social software.

Of similar importance to a social interaction is the ability to provide deeper meaning through digital communication with richness of cues. Expressing individual views and meaning with non-verbal cues such as icons to indicate mood, or a "Like" button to indicate preferences is an advantage provided by the social software. Each of these three technology factors forms a technological advantage when using ESS tools.

However, one surprising finding from the study is that this technological advantage does not have a significant positive effect on knowledge sharing intention. A possible explanation for this result is the concept of consumerization of information technology mentioned previously. The consumerization of IT involves individuals pushing their own technology patterns into the organization. Individual technology usage patterns and habits have evolved through popular social networking applications available on the Internet and users have become accustomed to using them in their personal lives.

It is understood that intention to use is present to some extent because many employees have already requested this technology in their workplace. Merely providing the technology does not provide any further inducement or change the intention that already exists. However, providing the technology does create a perceived technological advantage that has a significant positive effect on Knowledge Sharing Behavior.

Community cohesiveness was hypothesized to have a positive effect on knowledge sharing intention. Community cohesiveness was a second-order construct formed originally by four first-order constructs: 1) community identification, 2) social influence, 3) expected reciprocal benefits, and 3) trust in members. Community identification was defined in this study as community members' perceptions of having similar values which lead to a sense of belonging and loyalty to their community (Chiu et al., 2006). However, community identification cross-loaded with both social influence and expected reciprocal benefits and was dropped from the analysis. Identifying with

the community is likely seen as being too similar to being influenced by others who are important to you or as part of the benefit of participating in the online community.

Social influence, however, continued to show strong results as one of the sociological factors which comprised community cohesiveness. Defined in this study as the perception of an individual that important others believe he or she should use the new system, social influence was found to increase the online community self-disclosure in a group of working professionals (Posey et al., 2010). Additionally, social influence was also found to be a critical factor in the adoption of an instant messaging service (Glass & Li, 2010). It is clearly an important factor in developing community cohesiveness among the online participants.

Expected reciprocal benefits were also an important element comprising community cohesiveness. Defined as the potential positive values resulting from online interactions using the company's social software tools, the positive values are considered to be reciprocal because of the interactive nature of these technologies (Bock & Kim, 2002; Bock et al., 2005; Hsu & Lin, 2008). Employees understandably expect a benefit from sharing their knowledge, and not just with a reciprocated trove of knowledge which they can draw upon. Just as important were the strong relationships, associations, and improved cooperation employees felt were possible from using the ESS tools.

While employees felt benefits were gained by using the social software, it was also acknowledged that certain risks were possible with participation in the online community. This concept was captured in the trust in members construct. Defined as the belief that other members of the online community are knowledgeable and will not

take advantage of others' contributions, trust in members was found to be a critical element of successful online interactions in prior research (Jarvenpaa et al., 2004; Peters & Manz, 2007). The importance of trust in the context of knowledge sharing has been shown to be especially important in virtual teams (Staples & Webster, 2008). The current research supported this strong theoretical foundation for the importance of trust in a virtual environment.

These three sociological factors comprised the second-order formative construct, community cohesiveness, which the data showed did have a significant, positive relationship with knowledge sharing behavior. Additionally, the path between community cohesiveness and knowledge sharing intention also showed a significant, positive effect. Therefore, the relationship between community cohesiveness and KSB is only partially mediated by KSI. Again, this can be interpreted as a result of the employees already having some pre-conceived intention to use the social software. However, as partial mediation does exist, it is apparent that the strengthened relationships and bonds formed by participating in the online community at work provide an additional inducement for employees to want to, or intend to use the social software to share their knowledge and perhaps some of their personal information as well.

Finally, the second-order formative construct of individual willingness, hypothesized to have a positive effect on knowledge sharing intention, was comprised of inherent personality factors which included: 1) disposition to trust, 2) openness to experience, and 3) conscientiousness. Not only were issues related to the technology itself or the environment and social context of knowledge sharing found to be relevant, but so too were individual differences. The individual willingness to use the social

software was found to have a significant positive relationship to knowledge sharing intention.

Disposition to trust is defined as the willingness to depend on others or the willingness of a party to be vulnerable to the actions of another (Chen & Barnes, 2007; Gefen et al., 2003). While the behaviors of others was an important element found in the trust in members construct, disposition to trust differs in that it is based on factors related to the situation and the individual himself or herself, rather than the other's behavior (Jarvenpaa et al., 2004). In other words, it is the inherent tendency to trust which is a part of an individual's personality and a part of individual willingness to use the ESS tools.

Openness to experience and conscientiousness are two factors drawn from the Big 5 personality factors defined in the psychology literature (P. T. Costa & McCrae, 1992b). These factors have been linked to knowledge sharing in prior research (Matzler & Mueller, 2011). However, the data in the current study did not support openness to experience as a significant element in the formation of individual willingness. A potential reason is that in the workplace environment, employees might feel a certain expectation to participate in an online environment when the company implements one, even if the use is not mandatory.

However the data showed that conscientiousness was a significant factor comprising individual willingness. Employees who see themselves as having clear goals and working hard toward achieving them are more likely to have an individual willingness. That individual willingness is positively related to the intention to share their knowledge or to seek knowledge from others using ESS tools.

Limitations

This study has several limitations that could potentially affect the interpretation of the results. Each of these limitations will be addressed next. First, the use of undergraduate college students for the pilot survey sample is a limitation that potentially weakens the factor analysis conducted to refine the items for the final survey of employees. College students are known to be weak representatives for workers in the organization. Realizing that employees on the job have little time to complete surveys, it was acknowledged that for the purpose of factor and item cleaning, using college students would preserve access to employees for the final survey. Despite the limitation the research proceeded with the use of students and every attempt was made to align the students as much as possible to the situation of workers in the organization. Those workers must use social software tools to find the knowledge needed to complete their job tasks. Similarly, the students used in the pilot survey sample were enrolled in online courses where use of social software was required to complete their course assignments.

Another limitation was the use of employees outside of the companies used in the interview process. The intention was to survey employees from the same companies used in the interview process in order to assess differences among the perceptions of those implementing ESS tools and those using them on a daily basis. However, permission was not granted by some of those interviewed to survey their employees. Therefore, the sample for the final survey was partially drawn from a different group than the companies of the interviewees. However, the sample was

drawn from a wide cross-section of employees in a wide array of industries to improve generalizability.

Related to the limitation of sample selection is the fact that the entire sample was drawn from a North American culture. Therefore the results are not generalizable to other cultures. Caution should be used when applying the results to any other populations in other cultures.

Contributions to Theory and Practice

Much of the extant research regarding social software has focused primarily on students as subjects, with a focus on the hedonic use of this type of technology. The current study, however, focused on the intraorganizational use of these social technologies among individual employees, rather than as a communication tool to reach external customers. The subjects for the interview phase of the study as well as the final survey were executives and employees using these tools in their daily work routines. This is an area that has been under researched and this dissertation provides valuable theoretical insights for the IS discipline as well as practical insights for the enterprise.

One of the most significant contributions of this research to IS theory is the finding that traditional technology acceptance factors are actually insignificant in the intention to share knowledge when using social software tools in the organization. Widely supported in previous research regarding acceptance and use of technology, perceived usefulness and perceived ease of use were not found to be factors that form a technological advantage when using these tools. In fact, a majority of the factors tested as possible elements of a technological advantage were not found to have an impact.

In a similar vein, the technological advantage gained from using ESS technology itself did not have a significant effect on knowledge sharing intentions. This is also in contrast to existing theory which supports the relationship between the various benefits gained from using information systems and the intention to use that technology. For social software, however, the current research indicates that the technology has become so ubiquitous in individuals' daily lives it provides no increase in the intention to use it beyond that which already exists. This study showed that the benefits of participating in online communities in the workplace are instead focused on the social and intellectual capital resulting from increased interactions, extending the literature on social capital theory used in IS literature.

Other contributions to theory include the successful triangulation of both qualitative and quantitative data as a methodology in IS research. The IS discipline is sometimes criticized for conducting primarily positivist research, and the current study extends the support for including interpretivist work as well. The qualitative data collected in this study were used to supplement the findings from literature with a deeper understanding of the phenomenon of interest – knowledge sharing among employees using ESS tools in this particular study.

This research also provides support in the IS literature for both sociological and psychological factors as predictors of knowledge sharing intention and knowledge sharing behavior. As the technology becomes more of a commodity, rather than a specialized tool requiring individual training and acceptance, researchers should focus more on the complex social and psychological aspects involved in social interactions of employees using ESS and less on traditional technology acceptance factors.

The implications for practitioners from this study's findings are related to those social and psychological aspects of ESS use. Managers implementing social software in the enterprise should be aware that for a successful implementation an investment in more than just the technology is required. Organizations need to recognize that the interactions occurring in an online work environment involve several sociological and psychological factors as described above, and provide effective community management of the online interactions.

The organization should employ a community manager skillful in human behavior such as resolving conflicts that arise in the online community, relationship building, and also communicating organizational information. A productive social environment must be fostered by striking a balance between organizational goals and individual user goals, monitored for appropriateness, and participation encouraged as a way to develop and strengthen relationships among co-workers. One way to do this is to recognize those employees who exhibit individual willingness and recruit them as early adopters who will then encourage other employees to use the ESS tools.

Directions for Future Research

Although research on social software is still in the early stages, there is a rush of organizations adding ESS tools to their technology assets in an effort to provide better opportunities for knowledge sharing among employees. Future research should examine other factors that might have an influence on knowledge sharing when using ESS tools, such as tangible rewards (higher employee evaluations for significant contributions, promotions or pay raises, etc.).

Another direction for future research is a focus on controlling for the effects of age, job classification, and job tenure variables on knowledge sharing behavior. The interview data suggested these variables may have some effect on an employee's use of ESS tools. While these demographic data were collected in the current study, measuring the effect of each one was outside the scope of this project.

Conclusion

The purpose of this dissertation was to propose and empirically test a framework for assessing knowledge sharing intention and knowledge sharing behavior among employees using ESS tools. This research studied the effects of technological advantage, community cohesiveness, and individual willingness on the knowledge sharing intention and knowledge sharing behavior of employees using social software tools in their organization. The study found that technological advantage had no significant effect on the intention to share knowledge, but did have a significant positive effect on actual knowledge sharing.

Additionally, the study found that sociological factors comprising community cohesiveness and psychological factors comprising individual willingness each had a significant positive effect on both the intention and the actual behavior of knowledge sharing. The study extends existing literature on the use of ESS tools and provides guidelines for organizations implementing social technologies as a way to foster knowledge sharing among employees.

APPENDIX A
INTERVIEW REQUEST OF IT PROFESSIONALS

Knowledge Sharing in the Workplace: Effect of Social Media

Tools

Our research team at the University of North Texas is investigating the effective use of social media tools in organizations. We believe that what we learn will allow you to improve knowledge sharing and collaboration among your employees. If the answer to any of the questions below is “yes” then we invite you and your company to participate in the study being conducted.

- Does your company employ the use of social media tools such as Sharepoint/InTouch?
- Would you like to see better effectiveness and efficiency as a result of your employees using these collaboration tools?
- Would you be interested in being a part of a study that investigates the effectiveness of using social media tools for knowledge collaboration/knowledge sharing?

Participation in this study can provide your organization with the following benefits:

- A better understanding of potential benefits from knowledge sharing and collaboration that social media tools can provide
- The ability to leverage more effective communication among employees into better productivity through the use of social media tools
- An awareness of the factors that can either inhibit or enhance the implementation and use of social media tools in the enterprise

If you would like to know more about this study, please contact Gina Harden at the address/phone number below.

Research project for PhD dissertation conducted by:
Gina Harden
PhD Candidate, Business Computer Information Systems
University of North Texas

APPENDIX B
SURVEY INSTRUMENT

Please select which *one (and only one)* of the following technologies *predominantly* used in your job as the information or knowledge sharing (KS) tool:

- SharePoint Wiki Blog Jive Yammer Alfresco

Other social networking site (please specify) _____

Other collaboration tool (please specify) _____

Based on the *predominant* KS tool identified above, please answer the following questions with regard to how the tool is used in your job for knowledge sharing. Answer the items on a scale of 1 -7 with 1=Strongly Agree and 7=Strongly Disagree:

| |
|---|
| Answer the following questions <u>BASED ON THE SPECIFIC KS TOOL</u> identified above: |
| PEU |
| My KS tool makes it easy to share my knowledge |
| The KS tool is a convenient way to share knowledge with other employees |
| This KS tool is a quick way to share knowledge with other employees |
| IMMED |
| Other users are able to respond immediately to any contribution made |
| Whenever someone made a contribution, others were able to provide very fast feedback on that |
| Rapid communication in both directions is possible with the KS tool used |
| The KS tool used allowed other users to receive immediate feedback from one another |
| RICH |
| I can express my views with verbal cues using the KS tool |
| The KS tool allows me to express my knowledge with non-verbal cues, such as icons or "Like" button |
| I can communicate my meaning with verbal cues using the KS tool |
| Using the KS tool, I can communicate my meaning using non-verbal cues, such as icons or "Like" button |
| USEFL |
| Using the KS tool is useful for getting information |
| Using the KS tool is useful for my work |
| Using the KS tool enables me to accomplish tasks quickly |
| Using the KS tool would enhance work effectiveness |
| ENJOY |
| While using this KS tool I experience pleasure |
| The process of using the KS tool is enjoyable |
| I have fun using this KS tool |

| |
|---|
| Answer the following questions <u>BASED ON THE ONLINE COMMUNITY</u> you participate in using the KS tool identified previously, such as SharePoint Discussion forum: |
| SocIn |
| People who are important to me think I should participate in the online community |
| People who influence my behavior think I should participate in the online community |
| People I respect think I should participate in the online community |
| ERB |
| Sharing my knowledge in the online community would strengthen the tie between me and other employees |
| Sharing my knowledge in the online community would create new relationships with new friends at work |
| My knowledge sharing would expand the scope of my association with other employees |
| My knowledge sharing would create smoother cooperation from other employees in the future |
| My knowledge sharing would create strong relationships with employees that have common interests |
| TrMem |
| The community members I interact with do not use personal information without the owner's permission |
| The community members I interact with are truthful in dealing with one another |
| The community members I interact with will not take advantage of others even when the opportunity arises |

| |
|--|
| Answer the following questions <u>Based On Your Own Beliefs:</u> |
| DispTr |
| It is easy for me to trust other people |
| I feel that people are generally trustworthy |
| I generally have faith that others are trustworthy |
| CONSC |
| I have a clear set of goals and work toward them in an orderly fashion |
| I work hard to accomplish my goals |
| When I make a commitment, I can always be counted on to follow through |
| I am a productive person who always gets the job done |
| OPEN |
| I often enjoy playing with theories or abstract ideas |
| I enjoy speculating on the nature of the universe or the human conditions |
| I especially enjoy learning new things |
| I find philosophical arguments stimulating |
| KSI |
| I initially will intend to share knowledge with others |
| I always will intend to share knowledge with other employees, if they ask |
| I always will make an effort to share knowledge with others |
| I always will plan to share knowledge with others |
| KSB |
| I frequently visit the KS community to get information and knowledge |
| I frequently leave my feedback/comments on other KS community posts |
| I spend some time on my KS contributions to update new information |
| I update my KS contributions regularly |
| I share my knowledge from my education or training with other employees |
| I post useful documents or files using the KS tool to share with other employees |

Please answer the following questions:

- My gender is: Male Female
- My age is: 18-30 31-40 41-50 51-60 61 or above
- My job classification is (*please select the option that most closely fits your position*):
 Non-managerial Technical specialist 1st line Mgr. Mid-level Mgr. Top-level Mgr.
- I would classify my organization as: Service Manufacturing
- On a scale of 1 – 5, the degree to which my firm is knowledge intensive, where firms such as banking, finance, insurance, electronics, consulting, telecommunications are highly (4 or 5) knowledge intensive:

| | | | | |
|--|--|--|--|--|
| 1 - No knowledge intensity <input type="checkbox"/> | 2 - Little knowledge intensity <input type="checkbox"/> | 3 - Some knowledge intensity <input type="checkbox"/> | 4 - High knowledge intensity <input type="checkbox"/> | 5 - Most knowledge intensity <input type="checkbox"/> |
|--|--|--|--|--|

- Length of time employed at this company _____
- What industry is your company in? _____

APPENDIX C
EMPLOYEE SURVEY REQUEST

My name is Gina Harden and I am a PhD candidate at the University of North Texas in Denton, Texas. For my dissertation research, I am investigating the effective use of social software tools in organizations to improve knowledge sharing and collaboration among employees. I would like to invite you to participate in a study about your company's social software technology.

The results of the study can provide a better understanding of how these tools are being used, as well as the potential benefits from their use, including more effective communication among employees.

The online survey should take approximately 15 minutes and all data collected will remain anonymous. Your opinions are highly valued and your participation is greatly appreciated.

You can begin the survey by clicking on the following link:

http://untbusiness.qualtrics.com/SE/?SID=SV_bHQMmF42HPZtb6J

APPENDIX D
IRB APPROVAL LETTERS

OFFICE OF THE VICE PRESIDENT FOR RESEARCH AND ECONOMIC DEVELOPMENT
February 7, 2012

Supervising Investigator: Dr. Sherry Ryan
Student Investigator: Gina Harden
Department of Information Technology and Decision Sciences
University of North Texas

Re: Human Subjects Application No. 11578

Dear Dr. Ryan:

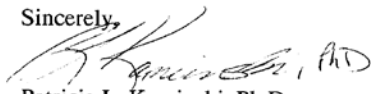
As permitted by federal law and regulations governing the use of human subjects in research projects (45 CFR 46), the UNT Institutional Review Board has reviewed your proposed project titled "Knowledge Sharing in the Workplace: A Social Networking Site Assessment." The risks inherent in this research are minimal, and the potential benefits to the subject outweigh those risks. The submitted protocol is hereby approved for the use of human subjects in this study. **Federal Policy 45 CFR 46.109(e) stipulates that IRB approval is for one year only, February 7, 2012 to February 6, 2013.**

Enclosed is the consent document with stamped IRB approval. Please copy and **use this form only** for your study subjects.

It is your responsibility according to U.S. Department of Health and Human Services regulations to submit annual and terminal progress reports to the IRB for this project. The IRB must also review this project prior to any modifications.

Please contact Shelia Bourns, Research Compliance Analyst, or Boyd Herndon, Director of Research Compliance, at extension 3940, if you wish to make changes or need additional information.

Sincerely,



Patricia L. Kaminski, Ph.D.
Associate Professor
Department of Psychology
Chair, Institutional Review Board

PK:sb



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Office of the Vice President of Research and Economic Development
OFFICE OF RESEARCH SERVICES

November 20, 2012

Sherry Ryan
Department of Information Technology and Decision Sciences
University of North Texas

RE: Human Subjects Application No. 11558

Dear Dr. Ryan:

The UNT Institutional Review Board has reviewed and approved the extension you requested to your project titled "Knowledge Sharing in the Workplace: A Social Enterprise 2.0 Assessment." Your extension period is for one year, **November 29, 2012 through November 28, 2013. Federal policy 45 CFR 46.109(e) stipulates that IRB approval is for one year only.**

Enclosed is the consent document with stamped IRB approval. Please copy and **use this form only** for your study subjects.

It is your responsibility according to U.S. Department of Health and Human Services regulations to submit annual and terminal progress reports to the IRB for this project. The IRB must also review this project prior to any modifications. **If continuing review is not granted before November 28, 2013, IRB approval of this research study expires on that date.**

Please contact Shelia Bourns, Research Compliance Analyst, or Boyd Herndon, Director of Research Compliance at extension 3940, if you wish to make changes or need additional information.

Sincerely,

Patricia L. Kaminski, Ph.D.
Associate Professor
Chair, Institutional Review Board

PK:sb

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Office of the Vice President of Research and Economic Development
OFFICE OF RESEARCH SERVICES

February 19, 2013

Supervising Investigator: Dr. Sherry Ryan
Student Investigator: Gina Harden
Department of Information Technology and Decision Sciences
University of North Texas

RE: Human Subjects Application No. 13-096

Dear Dr. Ryan:

In accordance with 45 CFR Part 46 Section 46.101, your study titled "Enterprise Social Software: An Empirical Assessment of Knowledge Sharing in the Workplace" has been determined to qualify for an exemption from further review by the UNT Institutional Review Board (IRB).

No changes may be made to your study's procedures or forms without prior written approval from the UNT IRB. Please contact Shelia Bourns, Research Compliance Analyst, ext. 4643, if you wish to make any such changes. Any changes to your procedures or forms after three years will require completion of a new IRB application.

We wish you success with your study.

Sincerely,

Patricia L. Kaminski, Ph.D.
Associate Professor
Chair, Institutional Review Board

PK:sb

UNIVERSITY OF NORTH TEXAS
1155 Union Circle #305250 Denton, Texas 76203-5017
940.565.3940 940.565.4277 fax <http://research.unt.edu>

APPENDIX E
CONSENT FORMS

Dear participant:

The purpose of this study is to examine the intention of students to share knowledge in their online courses using social media tools such as forums and wikis on Blackboard or PBWorks.

It will take about 20-25 minutes to complete the survey. There is no identifying information on this survey, the data will be kept confidential, and your anonymity will be maintained in all reports resulting from this study. There are no foreseeable risks involved in this study. Participants will receive extra credit given at their instructor's discretion. If participant so chooses, an alternative non-research activity with equivalent time and effort will be offered. Your decision to participate or to withdraw from the study will have no effect on your standing in this course or your course grade. If you are under the age of 18 years, please do not fill out this survey.

Your attention in filling out the survey carefully will be of great assistance to reach reliable results. Although there are no direct benefits to the respondents, the study is expected to have managerial and academic implications. The results of the study may enhance our understanding of the effects of sociological and psychological factors that influence the intention to share knowledge in an online environment.

This study is conducted by a doctoral student, Gina Harden, from the University of North Texas. This research project has been reviewed and approved by the UNT Institutional Review Board (940-565-3940). Contact the UNT IRB with any questions regarding the rights of research subjects.

Should you have any questions regarding this study, please contact the principal investigator, Dr. Sherry Ryan (tel: 940-565-3106) or email: ryans@unt.edu or student investigator, Gina Harder (tel: 940-565-3174 or email: Gina.Harden@unt.edu), ITDS Department, University of North Texas.

Please keep this notice for your records.

APPROVED BY THE UNT IRB

DATE:

4-20-12
GAS

University of North Texas Institutional Review Board

Informed Consent Form

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose, benefits and risks of the study and how it will be conducted.

Title of Study: "Knowledge Sharing in the Workplace: A Social Enterprise 2.0 Assessment"

Principal Investigator: Sherry Ryan, University of North Texas (UNT) Department of ITDS.

Student Investigator: Gina Harden, University of North Texas (UNT) Department of ITDS.

Purpose of the Study: You are being asked to participate in a research study which involves the perceived importance of trust, risk/benefit, technology acceptance and community factors associated with social media use in the workplace as it relates to intentions to share knowledge.

Study Procedures: The focus group will be asked approximately 20 questions in an interview with the research investigator conducted in the BLB Conference room at UNT during the 2012 spring semester. It will take about 30-45 minutes to complete the interview. The interview will be recorded for transcription purposes.

Foreseeable Risks: No foreseeable risks are involved in this study.

Benefits to the Subjects or Others: The benefits of this study include the potential for you and members of the information systems academic community to gain better insight into best practices for implementing a social community through the use of Enterprise 2.0 technologies.

Compensation for Participants: There will be no compensation for participating in this study. Your decision to participate or to withdraw from the study will have no effect on your standing in this course or your course grade.

Procedures for Maintaining Confidentiality of Research Records: There is no identifying information that will be asked in the interview, but in the event that any identifying information is disclosed about the respondents or their company, it will be removed and replaced with generic names in the transcript.

Questions about the Study: If you have any questions about the study, you may contact Dr. Sherry Ryan at 940-565-3106 or Gina Harden at 940-565-3174.

Review for the Protection of Participants: This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-3940 with any questions regarding the rights of research subjects.

Dear participant:

The purpose of this interview is to examine the perceived importance of trust, risk/benefit, technology acceptance and community factors associated with social media use in the workplace as it relates to knowledge sharing intentions of employees.

It will take about 30-45 minutes to complete the interview. The interview will be recorded for transcription purposes. There is no identifying information that will be asked, but in the event that any identifying information is disclosed about the respondents or their company, it will be removed and replaced with generic names in the transcript. The data will be kept confidential, and your anonymity will be maintained in all reports resulting from this study. There are no foreseeable risks involved in this study. Participating in this interview is voluntary and you may discontinue participation at any time.

Your participation in the interview will be of great assistance in future steps of this study. The benefits of this study include the potential for you and members of the information systems academic community to gain better insight into best practices for implementing a social community through the use of Enterprise 2.0 technologies.

This interview is conducted by a doctoral student, Gina Harden, from the University of North Texas. This research project has been reviewed and approved by the UNT Institutional Review Board (940-565-3940). Contact the UNT IRB with any questions regarding the rights of research subjects.

Should you have any questions regarding this study, please contact the principal investigator, Dr. Sherry Ryan (tel: 940-565-3106) or email: ryans@unt.edu or student investigator, Gina Harden (tel: 940-565-3174 or email: Gina.Harden@unt.edu), ITDS Department, University of North Texas.

Please keep this notice for your records.

APPROVED BY THE UNT IRB
FROM 11/29/12 TO 11/28/13
JB

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