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Three Research Essays on the Effects of Culture Across IT Diffusion Within Social Networks, Organizations, and Hospitals

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THREE RESEARCH ESSAYS ON THE EFFECTS OF CULTURE ACROSS IT DIFFUSION WITHIN SOCIAL NETWORKS, ORGANIZATIONS, AND HOSPITALS

by

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ABSTRACT
THREE RESEARCH ESSAYS ON THE EFFECTS OF CULTURE ACROSS IT DIFFUSION WITHIN SOCIAL NETWORKS, ORGANIZATIONS, AND HOSPITALS

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This dissertation focuses on two research streams: IT diffusion and culture, and each can be examined in various contexts. Specifically, this study investigates IT diffusion through online social network use, knowledge sharing towards the general organizational information systems, and hospital information systems usage. In terms of culture, espoused national cultural values, IT occupational subculture, and organizational cultural variables are examined in the following essays.

Essay1: Espoused National Cultural Values and Online Social Network Use: Towards an Extension of UTAUT

Prior research has developed a number of models for examining the acceptance and use of technology. This paper extends the unified theory of acceptance and use of technology (UTAUT) beyond the established demographic and contextual variables. Building upon research from social psychology and technology adoption, our proposed model incorporated three constructs into UTAUT: information privacy concerns, hedonic

motivation, and relationship expectancy. Motivated by research where individual differences were shown to moderate the relationships of the UTAUT model, this paper investigated the effect of espoused national culture values on social network adoption. Integrating these findings into UTAUT, we formulated a model to examine the individual use of social network sites. Using data from 379 respondents, the model explained over seventy percent of the variance in intentions to use online social networks. Overall, all hypotheses were supported. The findings from this research generated both theoretical and practical implications.

Essay2: Development and Testing of a Scale to Measure the Effect of IT Occupational Subculture on Knowledge Sharing within Organization Personnel

Based on an existing conceptual framework in culture, this study developed a scale to measure IT occupational subculture. The relationship between the occupational subculture of information technology personnel and knowledge sharing in organizations was investigated. It was suggested that knowledge sharing among IT personnel and business end-users was positively affected by some elements of IT occupational subculture. Overtime, IT occupational subculture is positively affected by knowledge sharing among IT personnel and business end-users. Drawing upon cross-cultural psychology, the study presented one possible approach through which occupational subculture manifests at the organizational level of analysis and impacts the knowledge sharing process. In doing so, behaviors related to knowledge sharing and IT diffusion at the organizational level were better understood beyond the limitations of previous IT diffusion studies.

Essay3: Differentiating Eustress from Distress: An Examination of Stress Associated with HIS Use across Organizational Culture

An interesting but not yet investigated research issue is why some users complain that they are tired of using information systems while some other users actively embrace the use of such systems in their daily routine, and that this taste and associated behavior varies from person to person. Based on the job demands-resources (JD-R) model, a framework was developed to explore the antecedents of distress (negative stress) and eustress (positive stress). This study was based within the context of using hospital information systems (HIS) and we investigated two different psychological processes that played a role in the development of HIS-use strain and motivation. Additionally, espoused organizational cultural values were found to be antecedents of perceived HIS-enabled job resources (literacy support, technical support provision, technology involvement facilitation, and innovation support). While HIS-enabled job resources were positively related to eustress, HIS-enabled job demands (HIS-complexity, HIS-overload, and HIS-uncertainty) were positively related to distress. Furthermore, HIS-enabled job resource (literacy support) was found to buffer the intensity and outcome of HIS-enabled use demands - distress.

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CHAPTER 1: Introduction

Based on empirical research to date, classical IT diffusion variables by themselves are limited in their ability to predict the adoption of technologies at an individual or organizational level. At the individual level, technology adoption and usage behavior might be varied across different technologies and contexts. At the organizational level, additional factors should be included to better explain IT adoption behavior, given that a high knowledge burden always exists among IT personnel and non-IT personnel (Fichman 1992). In this dissertation, IT diffusion is investigated at both the individual and organizational level, but in different contexts.

Individuals' online social network behavior might be different from the use of traditional information technology. Social network sites have been defined as "web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system" (Boyd and Ellison, 2007, p. 211). The increased use of online social networks such as Facebook, Twitter, and LinkedIn has changed the way people interact. Besides keeping up with friends, research has found that having fun, taking a break from work, and fighting boredom are the main reasons that participants use social network sites (Pempek et al. 2009). However, issues such as privacy concerns may hinder users' attempts to use these sites. While the previous theories/models of technology use have emphasized the importance of the economic value of technology, research on social network sites is targeted towards hedonic information systems (e.g. Dwyer et al. 2007). Thus, by

incorporating additional constructs, an extended model might produce an improvement in the variance explained in behavioral intention to use and ultimately the use of social network sites. The other important but as yet uninvestigated research topic is why people self-disclose in online social networks and share their personal stories, photos, and other knowledge.

Besides personal information sharing behavior in online social networks, organizational knowledge sharing is another interesting research topic. Knowledge, as the most important strategic resource in organizations, exists and is shared at various levels within organizations (Ipe, 2003). Knowledge is the appropriate collection of information the intent of which is to be useful (Bellinger, Castro, and Mills, 2004). The value of knowledge has been recognized as the essence of modern economic growth, in the way that economic prosperity depends upon the increased useful knowledge and its extended application (Teece, 1998). One of the key management issues is how to integrate and coordinate individual and organizational knowledge so that the results can be successful.

To date, our understanding of what factors impact knowledge sharing and how knowledge sharing influences technology diffusion is limited. If knowledge sharing is based on an organizational context, it is hard to be transferred across organizations with different cultures, structures, and goals (Lee, 2001; Nonaka and Takeuchi, 1995). It has been defined as "activities of transferring or disseminating knowledge from one person, group, or organization to another" (Lee, 2001, p.324). At the same time, knowledge sharing is an essential antecedent to strategic IT alignment, and that alignment between the IT plan and the business plan is significantly related to the use of IT for competitive

advantage (Kearns and Lederer, 2003). Thus, we argue that culture impacts knowledge sharing behavior and knowledge sharing shapes culture overtime, which eventually impacts IT diffusion in organizations.

With the proliferation and ubiquity of organizational information systems, it is becoming imperative for employees to constantly engage with these technologies in order to get work accomplished. Hospital Information Systems (HIS) can be defined as integrated systems that support the comprehensive information requirements of hospitals, patients, clinical services, ancillary services, and financial management. Forty years ago, Wennberg and Gittelsohn (1973) believed that a population-based HIS could guide planning and regulatory decision-making in healthcare. With the rapid advancement of information technology, HIS have been popularized in medical institutions with the presumption to enhance productivity. However, the unintended consequences of HIS implementation on employees may be counterproductive. Strain might occur when employees are forced to speed up their rate of work or take on additional duties but don't have the needed knowledge/abilities to perform various tasks using the HIS. On the other hand, there are also users who are able to cope with new computer technologies in a healthy manner and are motivated to actively participate in using the HIS. Thus, it is interesting to explore the influence of HIS implementation on stress (both distress and eustress) and the associated consequences and antecedents.

Research has already found that behavioral models do not universally hold across cultures (e.g. Hofestede 1991; Straub et al. 1997). Culture has been recognized as playing an important role in the adoption of new technologies (Leidner and Kayworth 2006).

Culture is defined as a general shared understanding, which results from commonly held assumptions and views of the world among organizational, group, and occupational members (Weber and Camerer, 2003; Guzman et al., 2008). Culture shapes people's mind and impacts their behaviors. For example, organizational culture is "A pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way you perceive, think, and feel in relation to those problems" (Schein,1992, p. 12).

While culture is a common concept which has been extensively investigated, a single definition of culture has yet to emerge and be accepted by researchers (Straub, Loch, Karahanna, Evaristo, and Srite, 2002; Taras, Rowney, and Steel, 2009). Taras et al. (2009) summarized the available definitions of culture and found several common components among all definitions. First, culture is a complicated multi-level construct, which is portrayed as having layers with basic assumptions and values as the core of culture and symbols, artifacts, and practices as the outer layers of the construct (Straub et al 2002). Second, culture is shared among the people within a group or society to which they belong. Third, culture is developed over a relatively long time. Finally, culture is relatively steady.

This dissertation comprises of three essays. In the chapter 2, essay 1 proposed a model that attempts to systematically investigate, theorize, and extend the Unified Theory of Acceptance and Use of Technology (UTAUT) in a social network context across national cultural boundaries. In the chapter 3, essay 2 developed a scale to measure IT

occupational subculture and examined its influence on knowledge sharing in the organizational technology diffusion process. In the chapter 4, essay 3 the antecedents of distress (negative stress) and eustress (positive stress) associated with using hospital information systems were examined. Specifically, espoused organizational culture was incorporated into this essay as one of the antecedents. Findings and implications of all the three essays are concluded in the chapter 5. Each essay is briefly summarized in the following paragraphs.

Essay1: Espoused National Cultural Values and Online Social Network Use: Towards an Extension of UTAUT

Numerous information system studies have examined technology acceptance, adoption, and diffusion. Based on the most prominent eight relevant theories/models of technology use, the model Unified Theory of Acceptance and Use of Technology (UTAUT) has been formulated to predict the behavioral intention to use technology in an organizational context (Venkatesh et al., 2003). This paper extended the UTAUT beyond its established demographic and contextual variables. Building upon research from social psychology and technology adoption, the research model incorporated three constructs into UTAUT: information privacy concerns, hedonic motivation, and relationship expectancy. Motivated by research where individual differences were shown to influence the relationships of the UTAUT model, this paper investigated the effect of espoused national culture values on social network adoption. Integrating these findings into UTAUT, a model was formulated to examine the individual use of social network sites.

Essay2: Development and Testing of a Scale to Measure the Effect of IT Occupational Subculture on Knowledge Sharing within Organization Personnel

Guzman, Stam, and Stanton (2008) found that IT personnel have established a distinct occupational subculture within organizations. The concept of occupational subculture is different from both professional and organizational culture. Certain values, beliefs, and behaviors might be common across all IT workers regardless of their place of employment (professional culture). All employees of a certain company, including IT personnel, might also have similar values (organizational culture). However, within an organization IT personnel can have a distinct occupational subculture that is influenced by both the organizational culture of the company and the professional culture of the IT profession. Generally, occupational subcultures within organizations arise from those people who share similar educational, personal, and work experiences, and are pursuing the same occupation and have a similar understanding of occupational and organizational ideologies in speech and behavior.

Based on existing conceptual framework in culture, this study developed a scale to measure IT occupational subculture. The relationship between the occupational subculture of information technology personnel and knowledge sharing in organizations was investigated. It was suggested that knowledge sharing among IT personnel and business end-users was positively affected by some elements of IT occupational subculture. Overtime, IT occupational subculture was positively affected by knowledge sharing among IT personnel and business end-users. Drawing upon cross-cultural psychology, the study presened one possible approach through which occupational

subculture manifests at the organizational level of analysis and impacts the knowledge sharing process. In doing so, behaviors related to knowledge sharing and IT diffusion at the organizational level will be better understood beyond the limitations of previous IT diffusion studies.

Essay3: Differentiating Eustress from Distress: An Examination of Stress Associated with HIS Use across Organizational Culture

An interesting but not yet investigated research issue is why some users complain that they are tired of using information systems while some other users actively embrace the use of information systems into their daily routine, and that this taste and associated behavior varies from person to person. Using both JD-R model and P-E fit model of stress as an overarching research foundation, a framework was developed to explore the antecedents of distress (negative stress) and eustress (positive stress). This study was based on the context of using hospital information systems (HIS) and we investigated two different psychological processes that play a role in the development of HIS-use strain and motivation. Through the interaction with HIS, individuals perceive objective characteristics of HIS and generate subjective feelings toward the HIS. The model representedstressors created by the use of HIS as three variables: HIS-complexity, HIS-overload, and HIS-uncertainty. These variables represented the HIS-enabled use demands. In the health impairment process, HIS-enabled use demands lead to distress. Dealing with the demands created by the use of HIS, as well as facilitating better use of HIS, HIS-enabled organizational resources re operationalized in this study as literacy support, technical support provision, technology involvement facilitation, and innovation support.

We argued that, by embracing relevant resources, the distress caused by the demands of using HIS would be buffered and individuals would be motivated to overcome challenges associated with the use of HIS. Moreover, we evaluated the impact of individual resources (i.e. general perceived self-efficacy and positive framing) and organizational culture on the overall process leading to distress and eustress.

CHAPTER 2: Espoused National Cultural Values and Online Social Network Use: towards an Extension of UTAUT

2.1. Introduction

Numerous information system studies have examined technology acceptance, adoption, and diffusion. Some of the most widely studied models include: the technology acceptance model (TAM; Davis, 1989), the theory of planned behavior (TPB; Fishibein and Ajzen 1975), innovation diffusion theory (IDT; Rogers 2010), and the unified theory of acceptance and use of technology (UTAUT; Venkatesh et al. 2003). Based on the most prominent eight relevant theories/models of technology use, UTAUT has been formulated to predict the behavioral intention to use technology in an organizational context (Venkatesh et al. 2003). A further study tailors UTAUT to a consumer use context, by adding three more constructs: hedonic motivation, price value, and habit (Venkatesh et al. 2012). Motivated by this recent extension we feel that technology adoption and usage behavior might be varied across different technologies and contexts. We extend UTAUT by adding a series of new constructs in a new context: social network use.

Social network sites have been defined as "web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system" (Boyd and Ellison, 2007, p. 211). The increased use of online social networks such as Facebook, Twitter, and

LinkedIn has changed the way people interact. These sites have been oriented towards various contexts across different user groups. Participants may use the sites to make new friends and locate old friends. The root motivation might be to facilitate communication and to build and maintain interpersonal relationships. Members present themselves in an online profile; find friends, colleagues, or just someone who has similar interests; view and post comments on each other's pages; and publish status, pictures, and life events. Besides keeping up with friends, research found that having fun, taking a break from work, and fighting boredom are the main reasons that participants use social network sites (Pempek et al. 2009). However, issues such as privacy concerns may hinder users' attempts to use these sites. While UTAUT is a baseline model which emphasizes the importance of the utilization value of technology, research on social network sites is generally targeted on hedonic information systems (e.g. Dwyer et al. 2007). Thus, by incorporating additional constructs into UTAUT, an extended model might produce an improvement in the variance explained in behavioral intention to use and ultimately the use of social network sites.

In addition to extending previous research on technology acceptance and social network sites, this study furthers our understanding of espoused national culture as individual and antecedent characteristics. Research has found that behavioral models do not universally hold across cultures (e.g. Hofestede 1991; Straub et al. 1997). Culture has been recognized as playing an important role in the adoption of new technologies (Leidner and Kayworth 2006). While culture is macro-level phenomenon, espoused national culture values have been modeled as individual difference variables (Srite and Karahanna 2006). Motivated by research where individual differences were shown to impact the

relationships of the UTAUT model (Venkatesh et al. 2003), the espoused national culture values are incorporated into the proposed model of social network acceptance as antecedents of key relationships. To our best knowledge, there are no studies on social network adoption across national culture boundaries. Thus, there is a need to identify the salient factors and to bridge this knowledge gap.

We contribute to the technology acceptance literature by proposing a model that attempts to systematically investigate and theorize the extended UTAUT in a social network context across cultural boundaries. The proposed model is presented in Figure 2.1. To empirically test the model, we have collected self-administrated survey data from social network users with various espoused national culture values. The overall research model is shown below.

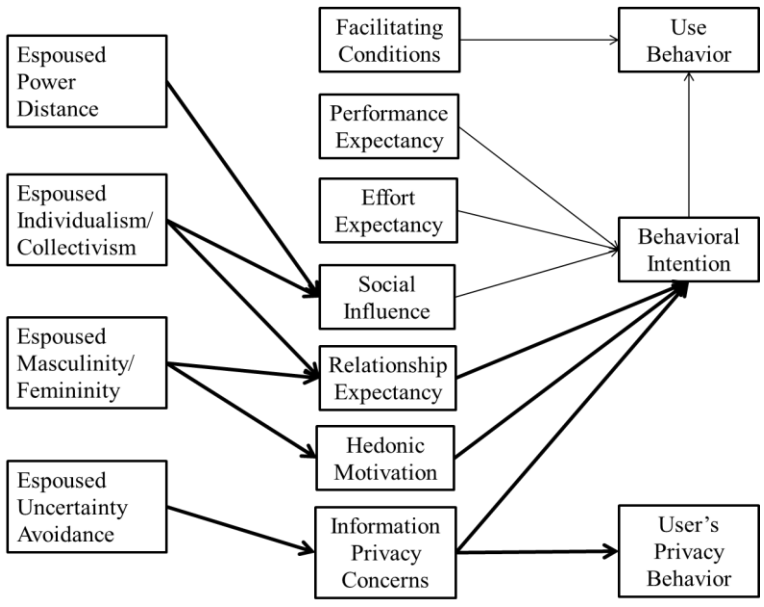


Figure 2.1 Research Model

2.2. Identifying Constructs and Hypothesis Development

2.2.1. Unified Theory of Acceptance and Use of Technology

The unified theory of acceptance and use of technology (UTAUT) is a unified model that integrates factors across eight previously published models: the theory of reasoned action (TRA), the technology acceptance model (TAM), the motivational model (MM), the theory of planned behavior (TPB), a model combining the technology acceptance model and the theory of planned behavior (C-TAM-TPB), the model of PC utilization (MPCU), the innovation diffusion theory (IDT), and the social cognitive theory (SCT). UTAUT is formulated with four core determinants of intention and usage: performance expectancy, effort expectancy, social influence, and facilitating conditions; and four moderators of key relationships: gender, age, experience, and voluntariness of use (Venkatesh et al. 2003).

According to the theory of reasoned action, individual behavior is driven by behavioral intentions which are a function of an individual's attitude toward the behavior and subjective norms surrounding the performance of the behavior. Attitude toward behavior is “an individual's positive or negative feelings about performing behavior” (Fishbein and Ajzen 1975, p.216). Subjective norm is defined as “the person's perception that most people who are important to him think he should or should not perform the behavior in question (Fishbein and Ajzen 1975, p.302).

The technology acceptance model is an adaptation of the theory of reasoned action to the field of IS. According to TAM, perceived usefulness and perceived ease of use determine

an individual's intention to use a system which is served as a mediator of actual system use (Davis 1989). In a later version of TAM, subjective norm was added as the third antecedent to behavioral intention to use.

The core constructs in the motivational model are extrinsic motivation an intrinsic motivation. Extrinsic motivation is the perception that a user wish to perform an activity "because it is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself, such as improved job performance, pay, or promotions" (Davis et al. 1992, p.1112). Intrinsic motivation is the perception that a user wish to perform an activity "for no apparent reinforcement other than the process of performing the activity per se" (Davis et al. 1992, p.1112).

According to the theory of planned behavior, individual behavior is driven by behavioral intentions which are a function of an individual's attitude toward the behavior (adapted from TRA), the subjective norms surrounding the performance of the behavior (adapted from TRA), and the individual's perceived ease of performing the behavior (perceived behavioral control) (Ajzen 1991).

The core constructs in the model of Combined TAM and TPB are: attitude toward behavior (adapted from TRA/TPB), subjective norm (adapted from TRA/TPB), perceived behavioral control (adapted from TRA/TPB), and perceived usefulness (adapted from TRA/TPB). It combines the predictors of TPB with perceived usefulness from TAM (Taylor and Todd 1995).

Derived from Triandis's (1977) theory of human behavior, Thompon et al. (1991) adapted the model to predict PC utilization. These predictors of PC utilization are: job-fit, "the extent to which an individual believes that using can enhance the performance of his or her job" (Thompson et al. 1991, p. 129); complexity, "the degree to which an innovation is perceived as relatively difficult to understand and use" (Thompson et al. 1991, p. 128); long-term consequences, "outcomes that have a pay-off in the future" (Thompson et al. 1991, p. 128); affect towards use, "feelings of joy, elation, or pleasure, or depression, disgust, displeasure, or hate associated by an individual with a particular act"; social factors (Thompson et al. 1991, p. 127); social factors, "the individual's internalization of the reference group's subjective culture, and specific interpersonal agreements that the individual has made with others, in specific social situations" (Thompson et al. 1991, p. 126); and facilitating conditions, "provision of support for users of PCs may be one type of facilitating condition that can influence system utilization" (Thompson et al. 1991, p. 129).

Innovation diffusion theory (Rogers 1995) has been applied a lot in the prediction of a variety of innovations. In this model, predicators of innovation diffusion are: relative advantage, "the degree to which an innovation is perceived as being better than its precursor" (Moore and Benbasat 1991, p. 195); ease of use, "the degree to which an innovation is perceived as being difficult to use" (Moore and Benbasat 1991, p. 195); image, the degree to which an innovation is perceived to enhance one's image or status in one's social system (Moore and Benbasat 1991); compatibility, "the degree to which an innovation is perceived as being consistent with the existing values, needs, and past experiences of potential adopters" (Moore and Benbasat 1991, p. 195); results

demonstrability, "the tangibility of the results of using the innovation, including their observability and communicability" (Moore and Benbasat 1991, p. 203); and voluntariness of use, "the degree to which use of the innovation is perceived as being voluntary, or of free will" (Moore and Benbasat 1991, p. 195).

The social cognitive theory used usage as a dependent variable. The predictors of usage are: outcome expectations-performance, performance-related consequences of the behavior; outcome expectations-personal, individual esteem and sense of accomplishment; self-efficacy, judgment of one's ability to use a technology; affect, an individual's liking for a particular behavior, anxiety, evoking anxious or emotional reactions when performing a behavior (Compeau and Higgins 1995).

After reviewing and empirically comparing the above eight user acceptance models, Venkatesh et al. (2003) formulated and validated the United Theory of Acceptance and Use of Technology (UTAUT). They theorized four constructs which played a significant role as direct determinants of user acceptance and usage behavior: performance expectance, effort expectancy, social influence, and facilitating conditions. Performance expectance is defined as "the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (Venkatesh et al. 2003, p. 447). It is pertained from five constructs in different models: perceived usefulness (TAM and C-TAM-TPB), extrinsic motivation (MM), job-fit (MPSS), relative advantage (IDT), and outcome expectations (SCT). Effort expectancy is defined as the "degree of ease associated with the use of the system" (Venkatesh et al. 2003, p. 450). Effort expectancy is defined as the degree of ease associated with the use of the systems. It is captured from

three constructs in different models: perceived ease of use (TAM), complexity (MPCU), and ease of use (IDT). Social influence is defined as "the degree to which an individual perceives that important others believe he or she should use the new systems" (Venkatesh et al. 2003, p. 451). Facilitating conditions are defined as "the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh et al. 2003, p. 453). It is captured from three constructs in different models: perceived behavioral control (TPB/DTPB, C-TAM-TPB), facilitating conditions (MPCU), and compatibility (IDT).

In this study, we adapt constructs and definitions from UTAUT to the social network acceptance and use context. In line with previous research, we define *performance expectancy* as the degree to which using social network will provide benefits to users in performing certain activities, in terms of utilization; *effort expectancy* is the degree of ease associated with social network usage; *social influence* is the extent to which users perceive that important others believe they should use social network; and *facilitating conditions* refer to users' perceptions of the resources and support available to perform a behavior when using social network. Since usage of social networks is a voluntary behavior, there is no variance in the voluntariness construct. Thus, we have dropped voluntariness of use from our model. The rest of the individual variables, namely age, gender, and experience are still theorized to moderate various relationships among constructs as in UTAUT as control variables.

2.2.2. Information Privacy Concerns

There is no unified concept of privacy which crosses cultures. According to an interdisciplinary review, the definition of privacy can be broadly classified as either *value-based* or *cognate-based*. The *value-based* definition views privacy as a human right integral to society's moral value system, but which can be assigned an economic value and be considered in a cost-benefit calculation at both the individual and societal levels. The *cognate-based* definition relates privacy to the individual's mind, perceptions, and cognition, which is about control of physical space and information (Smith et al. 2011).

Here, *information privacy* is defined as "the claim of individuals, groups, or institutions to determine for themselves when, how, and to what extent information about them is communicated to others" (Westin 1967, p. 7). Because it is almost impossible to measure privacy in and of itself, and also because cognitions and perceptions are more significant than rational assessments in terms of the salient relationships, *privacy concerns* has been often employed as the central construct to measure a privacy-related proxy of some sort (Smith et al. 2011). The concept of *information privacy concerns* refers to the subjective views of fairness within the context of information privacy (Campbell 1997; Molhotra et al. 2004).

Several researches have operationalized privacy concerns in detail: Smith et al. (1996) in their study on the concern for information privacy (CFIP) identified four data related dimensions: collection, errors, secondary use, and unauthorized access to information. Molhotra et al. (2004) adapted CFIP into the Internet context and operationalized the Internet user's information privacy concerns (IUIPC) with three dimensions: "whether

the exchange of personal information is equitable" (collection), "whether I have control over the data" (control), and "whether I am adequately informed about the use of the data" (awareness). Further, the privacy attitude scale developed by Buchanan, Paine, Joinson, and Reips (2007) measures the attitude towards the threats to informational privacy and other aspects of online privacy concern.

Behavioral reactions are the most prominent dependent variables relating to information privacy concerns, within which the most visible reactions are individuals' intention to reveal information and/or to engage in commerce (Smith et al. 2011). Similarly, online social networks also involve the behavioral intention to disclose information and engage in social activities. Thus, it is expected that behavioral intention towards the use of technology and use behaviors could also be the dependent variables to information privacy concerns.

Privacy within social network sites is a critical determinant of successful online interactions and self-disclosure. Sheehan and Hoy (1999) empirically found that as privacy concerns increased, users reported less frequency of registering for websites in the past and greater possibilities of providing incomplete information during registration. On the other hand, privacy emerged as an important issue, as Facebook users reveal a huge amount of information about themselves, even without awareness of privacy options and visibility of their profile (Acquisti and Gross 2006). Therefore, it is hypothesized that the relationship between information privacy concerns and intention to use online social networks is negative, as well as that between information privacy concerns and privacy related behavior. Thus, we hypothesize:

H1a: Users' information privacy concerns are negatively related to their behavioral intention to use online social networks.

H1b: Users' information privacy concerns are negatively related to their self-disclosure behavior when using online social networks.

2.2.3. Hedonic Motivation

Hedonic information systems refers to the "aim to provide self-fulfilling rather than instrumental value to the user, are strongly connected to home and leisure activities, focus on the fun-aspect of using information systems, and encourage prolonged rather than productive use" (Van der Heijden 2004, p. 695). Online social networks are hedonic systems, because of their hedonic nature: users experience fun and enjoyment when using the system; and the dominant design objective of online social networks is to encourage prolonged use.

Hedonic motivation refers to "the fun or pleasure derived from using a technology" (Venkatesh et al. 2012 p. 161). It has been shown to play an essential role in determining technology acceptance and use (Venkatesh et al. 2012). Van der Heijden (2004) found that hedonic motivation (conceptualized as perceived enjoyment) is a strong determent of intention to use technology. Thong et al. (2006) found that users' hedonic motivation (also conceptualized as perceived enjoyment) of IT is positively related to their continued IT usage intentions.

According to Self-Determination Theory, there are two kinds of motivation: extrinsic motivation and intrinsic motivation. Extrinsic motivation refers to "doing something

because it leads to a separable outcome" (Ryan and Deci 2000, p. 55); and intrinsic motivation refers to "doing something because it is inherently interesting or enjoyable" (Ryan and Deci 2000, p. 55). According to Davis et al. (1992), hedonic motivation can be described as an intrinsic motivation, while performance expectancy (conceptualized as perceived usefulness) belongs to extrinsic motivation. Since performance expectancy has been theorized as a user's belief that determines behavioral intention in UTAUT, hedonic motivation could also be a key user belief that affects behavioral intention, because many users participate in online social networks for fun and enjoyment rather than for performance enhancement. Thus, it is expected that the hedonic motivation would also become important in developing behavioral intention towards the use of a technology. Thus, we hypothesize:

H2: Users' hedonic motivation of online social networks is positively related to their behavioral intention to use online social networks.

2.2.4. Relationship Expectancy

Online social networks have been used mainly for social interaction. Previous research found that college students use Facebook as part of their daily routine and spend about half an hour every day, in which they observe content on Facebook more than posting online (Pempek et al. 2009). According to Raacke and Bonds-Raacke (2008), the most popular reasons to use friend-networking sites (such as Facebook) are: "to keep in touch with old friends" (96.0%) and "to keep in touch with current friends" (91.1%). Ellison et al. (2007) suggests that social network sites support pre-existing social relations. For example, Facebook has been used to maintain existing offline relationships or strengthen

offline connections. These findings also demonstrate a robust relationship between Facebook usage and social connections, especially in terms of supporting loose social ties and allowing users to create and maintain larger, diffuse networks of relationships (Ellison et al. 2007).

After reviewing previous literature (e.g. Günther et al. 2009; Venkatesh et al. 2012), we define *relationship expectancy* as the degree to which using social network will help individual to maintain or to establish social relationships in performing certain activities. Relationship expectancy is different from social influence, where the former refers to how actively an individual wishes to integrate themselves into a community; while the latter refers to how an individual reacts to others' opinions. Given that online social networks enable users to connect with each other, it is not surprising that relationship expectancy influences behavioral intention to use online social networks. Thus, we hypothesize:

H3: Users' relationships expectancy is positively related to their behavioral intention to use online social networks.

2.2.5. Culture

While culture is a common language word which has been extensively investigated, a single definition of culture has yet to emerge and be accepted by researchers (Straub, Loch, Karahanna, Evaristo, and Srite, 2002; Taras, Rowney, and Steel, 2009). Since there are multiple definitions of culture, Straub et al. (2002) have classified them into three

types: definitions based on problem solving, general all-encompassing definitions, and definitions based on shared values.

According to Straub et al. (2002), the view of cultural definitions based on problem solving persisted from the 1940's through the 1980's and into the early 1990's. These scholars focus on the outcomes of culture related to problem solving. They argued that a particular group of people are defined based on their habitual and traditional ways of thinking. Conversely, the view of general all-encompassing definitions treats culture as synonymous, abstract, and in some cases as an esoteric mind. Although culture can be defined in various ways, most researchers define culture through shared values.

Based on values, culture is defined as "a set of value patterns that are shared across individuals and within groups" (Straub et al. 2002, p. 15). Kroeber (1952) states that culture is formulated by the society, it falls into patterns and is transmitted and continued. Kluckhohn (1951) defines culture as "patterned ways of thinking, feeling and reacting, acquired and transmitted mainly by symbols, constituting the distinctive achievements of human groups, including their embodiments in artifacts; the essential core of culture consists of traditional (i.e., historically derived and selected) ideas and especially their attached values" (p. 86). Kluckhohn (1951) noted that culture shapes and influences the ways of thinking and provide different answers to the same question.

Inspired by Kluckhohn's insight, Hofstede conducted a comprehensive study of how values in the workplace are influenced by culture. He felt that culture is "the collective programming of the mind which distinguishes the members of one human group from another" (Hofstede 1980, p. 260). He analyzed responses to value statements from a large

data base of IBM employees collected between 1967 and 1973 covering 40 countries, from which four cultural dimensions were clustered and derived: power distance (PD), individualism versus collectivism (IC), masculinity versus femininity (MF), uncertainty avoidance (UA). Later, a fifth Dimension based on Confucian dynamism, which named long-term orientation (LT) was added based on research by Michael Bond who developed a Value Survey together with Chinese social scientists (Franke, Hofstede, and Bond 1991). In 2010, the sixth dimension named indulgence versus restraint was added.

While Hofstede (1980, 2001) has been favored by cross-cultural studies for many years, his culture model has been updated and expanded by the GLOBE study (House et al. 2004). GLOBE is an acronym for the "Global Leadership and Organizational Behavior Effectiveness" research program. GLOBE and Hofstede use similar research methodologies, and in fact "The scales to measure the first three dimensions (in GLOBE) are designed to reflect the same constructs as Hofstede's (2001) dimensions labelled Uncertainty Avoidance, Power Distance and Individualism" (House and Javidan, 2004: 13). Focusing on culture and leadership in 61 nations, they classified national cultures in terms of nine dimensions: performance orientation, future orientation, assertiveness, power distance, human orientation, institutional collectivism, in-group collectivism, uncertainty avoidance, and gender egalitarianism (House et al. 2002).

Trompenaars and Hampden-Turner (1998) proposed a model of seven dimensions of national culture for understanding cultural diversity in global business. The first five factors describing relationships with other people are: universalism versus particularism; individualism versus collectivism; neutral versus emotional; specific versus diffuse; and

achievement versus ascription. The remaining two dimensions are orientation in time and attitudes towards the environment. Although Trompenaars and Hampden-Turner's model of national culture had been referred by many researchers, Hofstede criticized their approach and stated that: "The origin of the first five of Trompenaars' "dimensions" is the "General Theory of Action" by functionalist sociologist Talcott Parsons, published with the co-authorship of Edward Shils (1951). Parsons' theory was speculative; it was one scholar's interpretation of reality as he perceived it, guided by a strong belief that all social phenomena should serve a function. . I know of no research supporting Parsons' claim that these pattern variables determine all human action, if such a claim could ever be supported. The other two of Trompenaars' "dimensions" are taken from a book by anthropologists Florence Kluckhohn and F. L. Strodtbeck (1961). Their classification of five "value orientations" was inspired by a field study of five geographically close, small ethnic or religious communities in south-western U.S.A," (Hofstede 1996, p.196).

Different from Hofstede who conceptualized cultural dimensions by analyzing employee attitude surveys and social phenomenon, Schwartz and Bilsky reviewed literatures related to values and constructed their value framework, which is based on needs derived from: individuals' requirements as biological organisms, society's requirement for coordinated social interaction, and groups' requirement for survival and support. They found seven culture level value types, namely: conservatism, intellectual autonomy, affective autonomy, hierarchy, mastery, egalitarian commitment and harmony. These values refer to people's beliefs about desired ways to select action and evaluate events. Cultural values guide people to behave differently depending on their priori internal specifications of goal types, interests served, and motivational domains (Schwartz and Bilsky 1987).

There is an argument related to which model of culture is more appropriate. The main streams are Hofstede's model of national cultural differences and Schwartz's value framework. Brett and Okumura concluded that Schwartz's framework was superior to Hofstede's because "it is based on a conceptualization of values; it was developed with systematic sampling, measurement and analysis techniques; and perhaps most important, its normative data are recent, collected in the late 1980s and early 1990s" (1998, pp. 500–501). Ng, Lee, and Soutar (2007) found that Hofstede's dimensions were less significant than Schwartz's value framework in terms of cultural distance in an international trade context. Steenkamp (2001) also emphasized the strong theoretical foundations of Schwartz's framework, but pointed out that the derivation of Schwartz's cultural dimensions was limited by the type of survey items, which were developed to measure individual-level value dimensions. Additionally, although Hofsede's cultural dimensions have been applied widely, the validity of Schwartz's value framework has not yet been empirically tested as thoroughly.

In this study, we choose to go with Hofstede's dimensions. His framework has been applied and examined a lot by cross-cultural researchers. The dimensions originally developed by Hofstede have been continually used in subsequent researches. According to a review (Taras et al. 2009), most facets the authors identified based on the analysis of 121 instruments for quantifying culture can be grouped into four major blocks related to Hofstede's dimensions. The high correlations between Hofstede's dimensions and constructs used by other researches confirmed their theoretical and empirical consistency.

Until now, researchers have not yet reached an agreement about how to measure culture. As indicated by Straub et al. (2002), a person's culture is not stable and is influenced by changing circumstances, conditions, stress, and various elements of culture, such as ethnic, national, and organizational culture. Based on social identity theory, they suggested that individual-level cultural values can be calibrated by how an individual identifies with a group or a society in certain circumstances. Moreover, they proposed a possible solution to issues related to the cultural studies: "(1) to adopt a theory-based conceptualization and measurement of an individual's culture and (2) to measure the strength of particular cultural features as part of the data gathering in positivist research" (Straub et al. 2002, p. 21).

2.2.6. Espoused National Cultural Values

Previous research found that behavioral models, such as the technology acceptance model (TAM; e.g. Straub et al. 1997), cannot yet be universally applied across cultures. A review of culture in information systems research indicates that culture is often closely intertwined with information flows and information technologies (Leidner and Kayworth 2006). According to Hofstede (1991, p. 5), culture is "learned, not inherited. It derived from one's social environment, not from one's genes. The collective programming of the mind distinguishes the members of one group or category of people from another".

Contrary to research that investigated how national culture impacts individual behavior (e.g. Cardon and Marshall 2008; Veiga et al. 2001), Srite and Karahanna (2006) formulated culture at the individual level through their use of espoused cultural values. Espoused national cultural values refer to "the degree to which an individual embraces

the values of his or her national culture" (Srite and Karahanna 2006, p. 681). Building on Hofstede's (1991) five dimensions of national culture, four espoused national cultural values: espoused individualism/collectivism, espoused power distance, espoused uncertainty avoidance, and espoused masculinity/femininity, were used to examine how culture influences technology acceptance through TAM (the dimension of long-term orientation was excluded). Results indicated that espoused national cultural values moderated the relationships in TAM (Srite and Karahanna 2006). Table 2.1 indicates the definitions of these four espoused cultural values.

Espoused Cultural Value	Definition (adapted from Srite and Karahanna 2006)
Individualism/Collectivism	Degree to which the individual emphasizes his/her own needs as opposed to the group needs and prefer to act as an individual rather than as a member of a group.
Power Distance	Degree to which large differentials of power and inequality are accepted as normal by the individual.
Uncertainty Avoidance	Level of risk accepted by the individual, which is gleaned by rule obedience, ritual behavior, and labor mobility
Masculinity/Femininity	Individuals who espouse masculine values emphasize work goals such as earnings, advancement, competitiveness, performance, and assertiveness; while individuals who espouse feminine values emphasize personal goals such as a friendly atmosphere, comfortable work environment, quality of life and warm personal relationships.

Table 2.1 Definitions of Espoused Cultural Values

2.2.7. Espoused Individualism/Collectivism

The first dimension of espoused national cultural values is *individualism/collectivism*, which refers to "the degree to which the individual emphasizes his/her own needs as opposed to the group needs and prefer to act as an individual rather than as a member of a

group" (Srite and Karahanna 2006, p. 682). This means that people who espouse individual values will tend to emphasize personal needs such as autonomy, independence, individual initiative and so on. On the other hand, people who espouse collectivistic values tend to emphasize with group needs such as group loyalty.

Triandis (1989) defined three aspects of the self: private, public, and collective. The private self refers to the cognitions that "involve traits, states, or behaviors of the person, such as 'I am…'" (Triandis 1989, p. 507); the public self refers to the cognitions that "concerning the generalized other, such as 'people think I am…'" (Triandis 1989, p. 507); and the collective self refers to the cognitions that "concerning a view of the self that is found in some collective (e.g., family, coworkers, tribe, scientific society)" (Triandis 1989, p. 507). For people who espoused individualistic values, the private self is more salient than the other aspects of self. Thus, they concentrate on the development and maintenance of a separate personal identity (Oyserman 1993). On the other hand, for people who espoused collectivistic values, the collective self is more salient than the private or public self. Thus, their group membership is a central aspect of their identity and their life satisfaction derives from successfully carrying out social roles and obligations (Oyserman et al. 2002).

Hofstede (2001) defined individualism as a focus on a loosely-knit social framework in which individuals are expected to look after themselves and their immediate families only. Conversely, collectivism refers to a concern for a tightly-knit framework in society in which individuals can expect their relatives or members of a particular in-group to take care of them in exchange for mutual loyalty. On this dimension, a society's position is

reflected in whether people's self-image is more salient in "I" or "we". Brewer and Venaik (2011) suggested that Hofstede's individualism–collectivism index should be relabeled as self-orientation vs. work-orientation and GLOBE's in-group collectivism as family collectivism.

In terms of attribution style, individualism implies that "judgment, reasoning, and causal inference are generally oriented toward the person rather than the situation or social context because the decontextualized self is assumed to be a stable, causal nexus" (Oyserman et al. 2002, p. 5). As opposed to individualism, collectivism implies that "(a) social context, situational constraints, and social roles figure prominently in person perception and causal reasoning and (b) meaning is contextualized and memory is likely to contain richly embedded detail" (Oyserman et al. 2002, p. 5).

According to a meta-analysis of individualism and collectivism in cultural products, such as advertising or popular texts, "cultural products that come from Western cultures (mostly the United States) are more individualistic, and less collectivistic, than cultural products that come from collectivistic cultures (including Korea, Japan, China, and Mexico) (Morling and Lamoreaux 2008). Ilies, Wagner, and Morgeson (2007) found that affective linkages between team members were moderated by collectivistic tendencies such that the strength of the linkage was stronger for those with collectivistic tendencies. Therefore, when people have more frequently sampled their collective self, they are more likely to be influenced by others. Thus, we hypothesize:

H4a: *Individuals with higher espoused collectivistic cultural values will perceive higher levels of social influence.*

With regard to relationality, individualism implies ambivalent consequences. Relationships and group memberships are needed to achieve personal goals, but they are costly to maintain. Oyserman et al. (2002) believed that individualists apply equity standards to evaluate relationships' costs and benefits, thus their relationships and group memberships are transitory. Conversely, collectivism implies that "(a) important group memberships are ascribed and fixed, viewed as 'facts of life' to which people must accommodate; (b) boundaries between in-groups and out-groups are stable, relatively impermeable, and important; and (c) in-group exchanges are based on equality or even generosity principles" (Oyserman et al. 2002, p. 5).

In an individualistic culture, the self and society are conceived as separate: an individual's identity is determined by his or her personal achievement rather than by group membership and group position in society (Hofstede 1991). Conversely, collectivism focuses on the group identity over individual identity. Furthermore, the essential assumption of collective culture is that groups bind and mutually obligate individuals (Oyserman et al. 2002). Triandis (2004) suggests that collectivistic cultural values show acceptance of mutual interpersonal relationships, which are required for a positive attitude in relationship expectancy. Further, Kim et al. (2011) examined cultural differences in motivations for using social network sites between American (who tend to hold individualistic cultures, Hofstede 2001) and Korean (who tend to hold collectivistic cultures, Hofstede 2001) college students and found that: Korean students focused on obtaining social support from existing social relationships through online social networks, while American students preference was the seeking of entertainment through the use of online social networks. Thus, we hypothesize:

H4b: *Individuals with higher espoused collectivistic cultural values will have higher levels of relationship expectancy.*

2.2.8. Espoused Power Distance

The second dimension of espoused national cultural values is *power distance*, which refers to "the degree to which large differentials of power and inequality are accepted as normal by the individual" (Srite and Karahanna 2006, p. 682). This means that individuals who espouse higher power distance values are more likely to accept that power and inequality are normal than do those who espouse lower power distance values.

Individuals with high power distance are likely to accept a hierarchical order in which everyone has a place and which needs no further justification. They believe that they should defer to people with authority and power, and follow organizational hierarchy. Alternatively, individuals with low power distance are comfortable in voicing their opinions and strive to equalize the distribution of power and demand justification for inequalities of power (Hofstede 2001).

Atwater, Wang, Smither, and Fleenor (2009) felt that people with high power distance were more concerned about status differences and how their behaviors appropriately reflected these differences when they interacted with others. The authors found that cultural characteristics moderated the relationship between self and others' ratings of leadership. Specifically, the relationship between self and subordinate ratings, as well as between self and peer ratings, was found to be more positive in countries characterized by high power distance. Ng, Koh, Ang, Kennedy, and Chan (2011) further argued that the

power distance value orientation moderated the relationship between rater source and rating bias in the way that the influence of power distance values on rating leniency and halo would be stronger for subordinates than for subordinates than for superiors.

Zhang, Winterich, and Mittal (2010) developed an associative mechanism to suggest that high power distance is related to greater self-control facing socially proscribed temptations. They argued that people with high power distance values developed the knowledge dealing with the desirability of restraint which might bring about socially proscribed behaviors when facing opportunities.

Compliance happens when an individual accepts social influence in order to achieve a favorable reaction from another person or group (Kelman 1958). Due to the effect of compliance, the higher the espoused power distance of an individual, the more likely he or she will be influenced by social norms. Further, Srite and Karahanna (2006) found that espoused power distance influences the relationship between authorized social norms and behavioral intention to use an IT.

More recently, there are many famous and eminent people who use online social networks and can be followed easily online (especially through twitter). Many users are fascinated to follow these individuals. Therefore, the spectacular VIP effect has been produced. Thus, we hypothesize:

H5: *Individuals with higher espoused power distance cultural values will perceive higher levels of social influence.*

2.2.9. Espoused Uncertainty Avoidance

The third dimension of espoused national cultural values is *uncertainty avoidance,* which refers to "the level of risk accepted by the individual, which can be gleaned by his/her emphasis on rule obedience, ritual behavior, and labor mobility" (Srite and Karahanna 2006, p. 682). This means that individuals who espouse higher levels of uncertainty avoidance will feel more threatened by ambiguous situations than those who espouse lower levels of uncertainty avoidance.

When using social network sites, users voluntarily reveal information about themselves or their social activities. Privacy concerns are derived from the uncertainty about the impact of sharing such information (Molhotra et al. 2004), such as whether the information sharing is fair, who has control over the data, and what the data can be used for. Researchers have investigated the potential threats to privacy associated with the utilization of social networks (Boyd and Ellison 2008). For example, Gross and Acquisti (2005) indicated that risks range from identity theft to online and physical stalking; from embarrassment to price discrimination and blackmailing. Smith et al. (2011) indicates that cross-cultural antecedents have been considered as independent variables of privacy concerns. Individuals who espouse high levels of uncertainty avoidance are characterized by limited risk taking, while people with lower espoused levels of uncertainty avoidance cultures are characterized as being more tolerant of differences in views and behavior (Thowfeek and Jaafar 2010). Thus, we hypothesize:

H6: *Individuals with higher espoused uncertainty avoidance cultural values will have higher levels of privacy concerns.*

2.2.10. Espoused Masculinity/Femininity

The last dimension of espoused national cultural values is *masculinity/femininity*, which refers to "the degree to which gender inequalities are espoused by an individual" (Srite and Karahanna 2006, p. 682). This means that individuals who espouse masculine values will give greater emphasis to work goals such as earnings, advancement, competitiveness, performance, and assertiveness. In contrast, individuals who espouse feminine values will put greater emphasis on personal goals such as a friendly atmosphere, comfortable work environment, quality of life, and warm personal relationships.

Hedonic motivation refers to the perceived enjoyment derived from using a technology (Venkatesh et al. 2012). Hedonic use is less concerned with achievement of utility and more concerned with the formation of a comfortable and less frustrating environment. People who espouse feminine cultural values are concerned more about quality of life than people who espouse masculinity cultural values (Hofstede 1991). Thus, we hypothesize:

H7a: *Individuals with higher espoused feminine cultural values will have higher levels of hedonic motivation.*

The motivation of relationship expectancy is to maintain or to establish social relationships. Srite and Karahanna (2006) suggested that such maintenance of personal relationships were typically values espoused by feminine cultures rather than masculine cultures: "because of a desire to appear agreeable, the concern for the socio-emotional well-being of others, the greater expressiveness, greater interdependence, and greater

level of social interaction, people who espouse feminine values show greater influencability" (Srite and Karahanna 2006, p.686). Besides, people who espouse feminine cultural values are more likely to be concerned about warm personal relationships than people who espouse masculine cultural values (Hofstede 1991). Thus, we hypothesize:

H7b: *Individuals with higher espoused feminine cultural values will have higher levels of relationship expectancy.*

The proposed research model with hypotheses indicated around each arrow is presented in Figure 2.2.

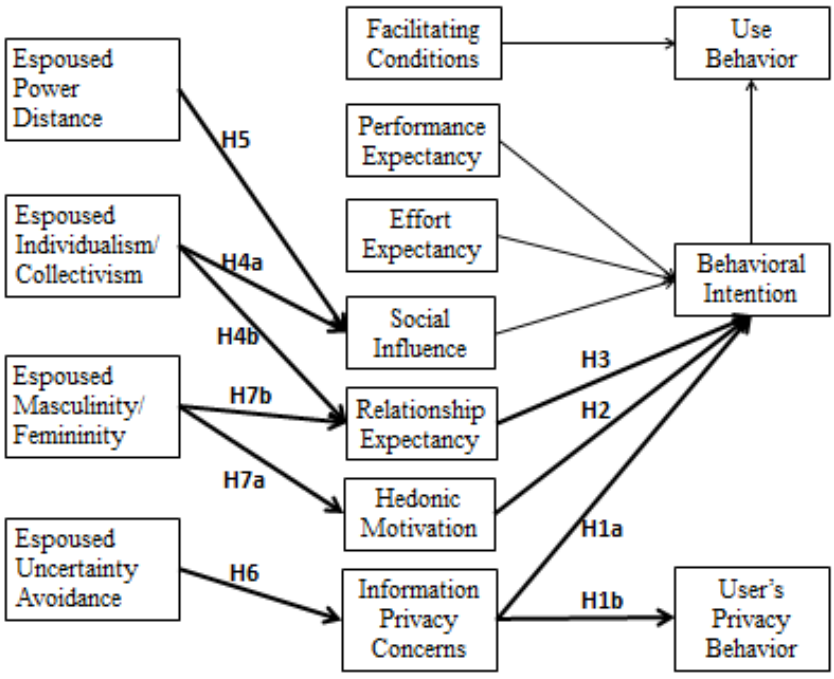


Figure 2.2 Research Model with Hypotheses

2.3. Research Methodology

2.3.1. Instrument Development

Most of the measurement items were adapted and/or revised from previous research on UTAUT, privacy concerns, hedonic motivation, and espoused cultural values section. All questionnaire items except demographics and use behavior used a 7-point Likert-type scale with 1 = Strongly Disagree, 3 = Neutral, and 7 = Strongly Agree.

We used the validated scales from Srite and Karahanna (2006) to measure the espoused individualism/collectivism, the espoused power distance, the espoused uncertainty avoidance, and the espoused masculinity/femininity. The original UTAUT constructs and hedonic motivation were assessed using scales derived from Venkatesh et al. (2012). The construct of information privacy concerns was measured using survey items adapted from Buchanan et al. (2007). Relationship expectancy was measured with items developed by us based on the previous literature, due to a lack of a previously validated scale. The questionnaire which contains all survey items is attached in Appendix A.

2.3.2. Data Collection

The responses from users of social network sites were collected through an online survey. Data was collected using student subjects at a large university in the Midwest of the US. Both international and domestic students in the university were contacted. When completing the survey, they were asked to focus on the social networks that they most often used, such as Facebook, twitter, google+, LinkedIn, etc.

Prior to sending the survey to participants, a pilot study was used to establish the reliability (measured by Cronbach's alpha) and validity (both convergent and discriminant validity) of the constructs. Partial least squares (PLS) analysis was used to test the research model and the psychometric properties of the scales. After analyzed the pilot date set with 91 useable responses, we revised some items of privacy concerns and added additional items to measure users' online self-disclosure behavior.

The primary collection was done at a U.S. university with a sample of students from all over the world to ensure sufficient variance in the espoused national cultural values. We received 379 responses that were originally from 18 countries.

2.4. Data Analysis

Testing was conducted using SmartPLS Version 2.0. The Partial Least Squares (PLS) approach, like other SEM techniques such as LISREL and AMOS, allowed researchers to simultaneously assess the measurement model parameters and structural path coefficients. The component-based PLS uses a least squares estimation procedure. PLS avoids many of the restrictive assumptions underlying covariance-based SEM techniques. Furthermore, it allows both formative and reflective constructs to be tested together.

According to the often-citied 10 times rule (Barclay, Higgins, and Thompson 1995), the sample size should be equal to the larger of: 1) 10 times the largest number of formative indicators used to measure a single construct, or 2) 10 times the largest number of structural paths directed at a particular construct in the structural model. In our model, all items were modeled as reflective indicators because they were viewed as effects (not

causes) of latent variables. The largest number of independent variables estimated for a dependent variable or formative factors is six. Thus, our sample size of 379 (not including the pilot sample size of 91) was more than adequate for the PLS estimation procedures. The measurement model in SmartPLS was assessed by examining reliability, convergent validity, and discriminant validity (Hair, Hult, Ringle, and Sarstedt 2013).

2.4.1. Pilot Study Analysis

Before we conduct the main data collection, we did a pilot study and received 91 useable responses. Table 2.2 shows the internal consistency reliabilities and correlations among constructs. Table 2.3 shows the factor structure matrix of the study variables, demonstrating strong convergent and discriminant validity, as most items exhibited high loadings (>0.707) on their respective constructs, and no item loaded higher on other constructs. Collectively, the psychometric properties of the constructs were excellent.

AVE	Composite Reliability (ICR)	Inter- construct correlations											
		PC	BI	EE	FC	HM	IC	MF	PE	PD	RE	SI	UA
0.52	0.81	**0.72**											
0.80	0.92	0.16	**0.89**										
0.79	0.94	-0.02	0.38	**0.89**									
0.64	0.84	-0.10	0.21	0.36	**0.80**								
0.93	0.97	0.02	0.75	0.41	0.26	**0.96**							
0.58	0.73	-0.06	0.33	0.18	-0.08	0.23	**0.76**						
0.70	0.82	-0.01	0.19	0.19	-0.03	0.13	0.24	**0.84**					
0.65	0.88	-0.11	0.56	0.30	0.20	0.63	0.24	0.25	**0.81**				
0.60	0.82	-0.03	0.21	-0.04	-0.07	0.16	0.36	0.39	0.16	**0.77**			
0.77	0.93	0.07	0.66	0.38	0.24	0.71	0.13	0.22	0.69	0.02	**0.88**		
0.84	0.94	0.04	0.52	0.22	0.14	0.51	0.33	0.23	0.49	0.13	0.50	**0.92**	
0.75	0.86	-0.20	0.11	0.05	0.14	0.18	-0.08	-0.10	0.04	-0.02	0.06	0.05	**0.87**

Table 2.2 Internal Consistency Reliabilities and Correlations among Constructs (Pilot Study)

* PC: Privacy Concerns; BI: Behavioral Intention; EE: Effort Expectancy; FC: Facilitating Conditions; HM: Hedonic Motivation; IC: Individualism/Collectivism; MF: Masculinity/Femininity; PE: Performance Expectancy; PD: Power Distance; RE: Relationship Expectancy; SI: Social Influence; UA: Uncertainty Avoidance.

	PC	BI	EE	FC	HM	IC	MF	PE	PD	RE	SI	UA
PC1	0.65	0.11	-0.22	-0.07	0.02	-0.03	-0.13	-0.07	-0.21	0.08	0.01	-0.03
PC2	0.74	0.09	-0.05	-0.09	-0.02	-0.11	-0.12	-0.07	-0.08	0.04	0.08	-0.16
PC3	0.76	0.18	0.13	-0.06	0.03	0.02	0.13	-0.14	0.08	0.04	-0.05	-0.17
PC4	0.74	0.04	-0.07	-0.07	0.04	-0.06	-0.03	0.02	0.01	0.06	0.12	-0.15
BI1	0.22	0.83	0.32	0.1	0.59	0.25	0.08	0.33	0.15	0.43	0.31	0.09
BI2	0.12	0.92	0.33	0.22	0.7	0.37	0.28	0.61	0.25	0.69	0.59	0.06
BI3	0.1	0.93	0.37	0.24	0.72	0.27	0.13	0.52	0.16	0.62	0.46	0.14
EE1	-0.1	0.24	0.9	0.26	0.31	0.18	0.23	0.26	-0.1	0.31	0.16	-0.04
EE2	0.06	0.41	0.89	0.34	0.47	0.17	0.16	0.25	-0.03	0.41	0.2	0.06
EE3	-0.03	0.36	0.93	0.32	0.36	0.19	0.11	0.32	0.05	0.33	0.19	0.04
EE4	-0.04	0.28	0.82	0.35	0.24	0.1	0.2	0.24	-0.09	0.25	0.25	0.1
FC1	-0.09	0.04	0.21	0.71	0.05	-0.15	-0.15	0.02	-0.14	0.07	0.04	0.11
FC2	0.02	0.06	0.28	0.69	0.08	-0.26	-0.06	0.04	-0.21	0.1	0.01	-0.03
FC3	-0.11	0.25	0.35	0.97	0.3	-0.02	0	0.24	-0.02	0.26	0.17	0.17
HM1	-0.01	0.73	0.41	0.25	0.98	0.24	0.16	0.65	0.19	0.69	0.49	0.2
HM2	0.01	0.74	0.39	0.27	0.97	0.2	0.18	0.61	0.17	0.69	0.51	0.16
HM3	0.07	0.7	0.37	0.24	0.94	0.24	0.04	0.54	0.08	0.65	0.46	0.16
IC2	-0.07	0.24	0.1	-0.12	0.15	0.91	0.19	0.23	0.31	0.09	0.32	-0.05
IC4	0.01	0.32	0.24	0.03	0.26	0.59	0.19	0.13	0.25	0.12	0.14	-0.09
MF10	-0.09	0.12	0.15	-0.18	0.01	0.26	0.67	0.07	0.36	0.08	0.22	-0.08
MF9	0.01	0.19	0.18	0.01	0.15	0.21	0.98	0.27	0.35	0.23	0.21	-0.1
PE1	-0.17	0.65	0.32	0.18	0.67	0.19	0.17	0.88	0.12	0.71	0.47	0.1
PE2	-0.05	0.43	0.2	0.21	0.47	0.16	0.21	0.89	0.14	0.59	0.38	0.02
PE3	-0.02	0.26	0.16	0.09	0.38	0.24	0.15	0.74	0.06	0.39	0.39	-0.03
PE4	-0.01	0.26	0.23	0.15	0.38	0.27	0.34	0.68	0.21	0.39	0.32	-0.04
PD1	-0.11	0.12	-0.07	-0.06	0.08	0.19	0.32	0	0.65	-0.08	0.05	0.07
PD3	-0.05	0.23	0	-0.07	0.2	0.36	0.3	0.15	0.91	0.04	0.14	-0.06
PD7	0.07	0.12	-0.06	-0.04	0.03	0.24	0.34	0.16	0.75	0.03	0.09	0.02
RE1	0.02	0.67	0.44	0.28	0.66	0.16	0.33	0.69	0.12	0.89	0.51	0.09
RE2	0.11	0.55	0.27	0.26	0.6	0.02	0.2	0.57	0.05	0.89	0.45	0.09
RE3	0.1	0.58	0.31	0.11	0.64	0.16	0.11	0.56	-0.02	0.89	0.39	0.03
RE4	0	0.47	0.26	0.18	0.57	0.09	0.05	0.59	-0.11	0.84	0.37	0
SI1	0.03	0.47	0.18	0.1	0.43	0.34	0.26	0.42	0.11	0.44	0.9	0.13
SI2	0.04	0.45	0.17	0.09	0.45	0.25	0.18	0.44	0.14	0.4	0.92	0.09
SI3	0.04	0.5	0.26	0.19	0.51	0.3	0.18	0.49	0.11	0.52	0.92	-0.08
UA2	-0.16	0.12	0.01	0.02	0.15	-0.12	-0.03	-0.05	0.07	0.08	0.01	0.86
UA3	-0.17	0.07	0.07	0.22	0.16	-0.03	-0.15	0.12	-0.09	0.03	0.07	0.88

Table 2.3 PLS Confirmatory Factor Analysis (Pilot Study)

2.4.2. Reliability of Main Study

When determining reliability, two things need to be achieved. 1) Internal consistencies reliability (ICR): composite reliability should be higher than of 0.708 (in exploratory research, 0.6 to 0.7 is considered acceptable). ICR is considered more robust than Cronbach's alpha because it weights items differently depending on factor loading considerations. 2) Indicator's reliability: the indicator's outer loadings should be higher than 0.708. Indicators with outer loadings between 0.4 and 0.7 should be considered for removal only if the deletion leads to an increase in composite reliability and average variance extracted (AVE; a measure of convergent validity, which is the degree to which a latent construct explains the variance of its indicators) above the suggested threshold value.

2.4.3. Validity of Main Study

Convergent and discriminant validity were assessed by applying two criteria: (1) the square root of the average variance extracted (AVE) by a construct from its indicators was at least 0.707 (i.e., AVE > 0.50) and was greater than that construct's correlation with other constructs, and (2) item loadings were at least 0.707, and that an item loaded more highly on the construct it was intended to measure than on any other construct.

Table 2.4 shows the internal consistency reliabilities and correlations among constructs. Table 2.5 shows the factor structure matrix of the study variables, demonstrating strong convergent and discriminant validity, as most items exhibited high loadings (>0.707) on

their respective constructs, and no item loaded higher on other constructs. Collectively, the psychometric properties of the constructs were excellent.

2.4.4. Hypotheses Testing of Main Study

The structural model and hypotheses were assessed by examining the significance of the path coefficients and the variance accounted for by the antecedent constructs. Figure 2.3 provides the results of hypothesis testing. Bootstrapping (with 379 cases and 5000 samples) was performed to test the statistical significance of each path coefficient using t-tests.

The model explained 72.6% of the variance of the dependent variable, behavioral intention ($R^2 = 0.726$). Overall, all hypotheses were well supported by the empirical test results. Results of the study are presented in Table 2.4. The model explained about 73 percent of the variation in behavioral intention to use. It also explains 33 percent of the variation in use behavior. All relationships of our extended UTAUT model were significant at the .05 level.

Previous research found that the variance in behavioral intention explained by UTAUT with direct effects only and UTAUT with moderated effects also was at 35 percent and 56 percent respectively, and the variance explained in technology use behavior was 26 percent and 40 percent respectively. In terms of explained variance, our research is in line with UTAUT2, which both extended UTAUT by including interaction terms. While UTAUT2's direct effects can explain 44 percentage of the variance in behavioral intention, our model explained 73 percent of the variance.

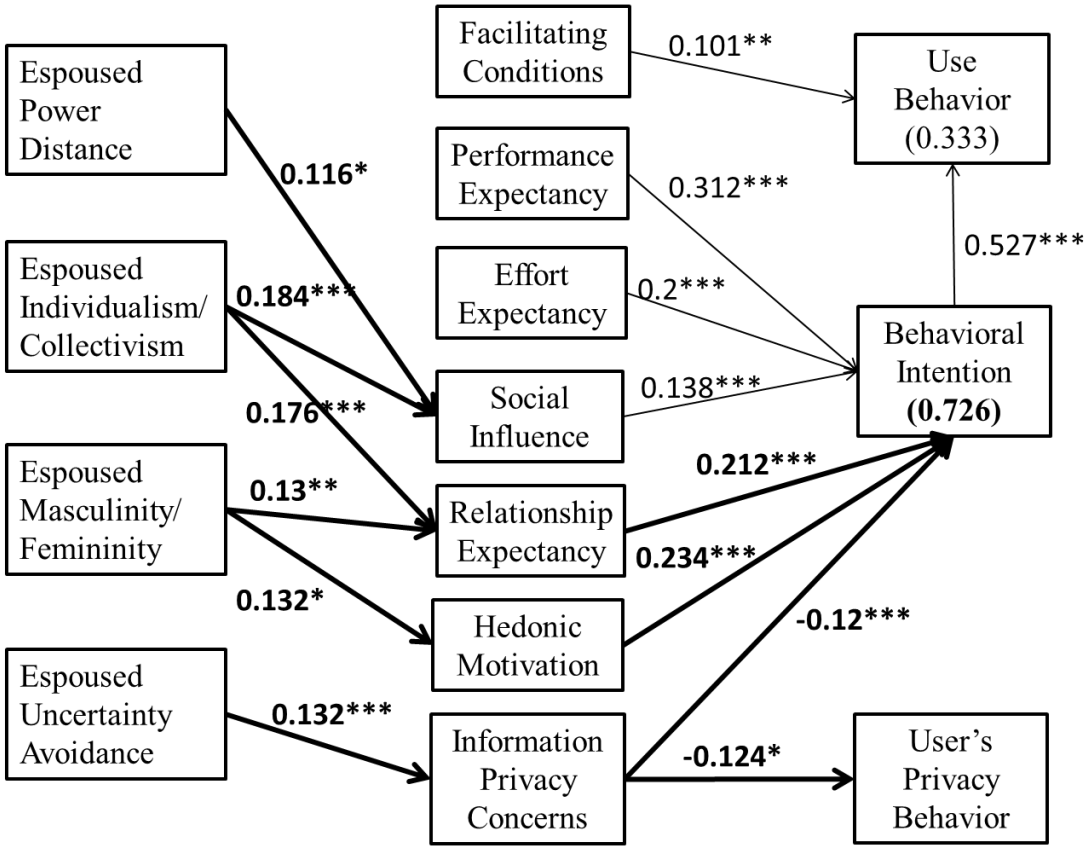
Constructs	AVE	Composite Reliability (ICR)	Inter- construct correlations												
			BI	EE	FC	HM	IC	MF	PC	PD	PE	RE	SI	UA	UB	UPB
BI	0.76	0.90	**0.87**													
EE	0.67	0.89	0.50	**0.82**												
FC	0.57	0.84	0.43	0.65	**0.75**											
HM	0.73	0.91	0.70	0.39	0.33	**0.85**										
IC	0.60	0.82	0.28	0.12	0.07	0.19	**0.78**									
MF	0.54	0.70	0.19	0.15	0.04	0.13	0.31	**0.73**								
PC	0.58	0.87	-0.06	-0.03	0.01	0.03	0.08	0.08	**0.76**							
PD	0.55	0.67	0.18	0.11	0.04	0.17	0.19	0.18	0.03	**0.74**						
PE	0.63	0.87	0.72	0.29	0.23	0.60	0.27	0.23	0.08	0.15	**0.79**					
RE	0.67	0.91	0.69	0.34	0.31	0.67	0.22	0.18	0.08	0.14	0.64	**0.82**				
SI	0.76	0.91	0.58	0.31	0.33	0.44	0.21	0.18	0.11	0.15	0.61	0.48	**0.87**			
UA	0.53	0.69	0.18	0.05	-0.02	0.15	0.23	0.22	0.13	0.20	0.24	0.18	0.18	**0.73**		
UB	0.84	0.91	0.57	0.37	0.33	0.49	0.15	0.19	-0.01	0.04	0.41	0.47	0.34	0.14	**0.92**	
UPB	0.62	0.75	-0.07	-0.03	-0.01	-0.14	0.03	-0.04	-0.12	-0.02	-0.14	-0.08	-0.04	-0.02	-0.14	**0.79**

Table 2.4 Internal Consistency Reliabilities and Correlations among Constructs (Main Study)

***BI: Behavioral Intention; EE: Effort Expectancy; FC: Facilitating Conditions; HM: Hedonic Motivation; IC: Individualism/Collectivism; MF: Masculinity/Femininity; PC: Privacy Concerns; PD: Power Distance; PE: Performance Expectancy; RE: Relationship Expectancy; SI: Social Influence; UA: Uncertainty Avoidance; UB: Use Behavior; UPB: User Privacy-related Bahavior.**

	BI	EE	FC	HM	IC	MF	PC	PD	PE	RE	SI	UA	UB	UPB
BI1	**0.85**	0.53	0.43	0.64	0.2	0.15	-0.09	0.22	0.54	0.58	0.43	0.13	0.49	-0.07
BI2	**0.85**	0.35	0.28	0.55	0.28	0.2	-0.02	0.11	0.69	0.61	0.55	0.19	0.5	-0.07
BI3	**0.91**	0.43	0.4	0.63	0.24	0.15	-0.04	0.14	0.65	0.62	0.53	0.15	0.5	-0.06
EE1	0.33	**0.79**	0.44	0.26	0.11	0.11	0.03	0.04	0.19	0.25	0.22	0.03	0.29	-0.03
EE2	0.53	**0.82**	0.51	0.43	0.13	0.14	-0.08	0.14	0.35	0.37	0.27	0.09	0.32	-0.01
EE3	0.34	**0.86**	0.58	0.25	0.09	0.1	0.03	0.09	0.14	0.21	0.22	0	0.31	-0.02
EE4	0.38	**0.8**	0.61	0.26	0.04	0.12	-0.03	0.06	0.23	0.25	0.3	0.01	0.27	-0.06
FC1	0.26	0.52	**0.74**	0.2	-0.02	-0.04	-0.02	0.09	0.03	0.21	0.16	-0.08	0.21	-0.05
FC2	0.28	0.64	**0.77**	0.18	0.02	0.04	0.02	0.01	0.07	0.15	0.19	-0.01	0.19	0.03
FC3	0.33	0.43	**0.75**	0.23	0.06	0.04	0.01	-0.02	0.23	0.23	0.21	-0.05	0.22	0.02
FC4	0.38	0.43	**0.75**	0.32	0.1	0.07	0.03	0.03	0.29	0.3	0.38	0.06	0.32	-0.02
HM1	0.65	0.37	0.37	**0.88**	0.17	0.11	0.02	0.18	0.51	0.59	0.38	0.1	0.45	-0.16
HM2	0.57	0.34	0.3	**0.9**	0.12	0.09	0	0.18	0.47	0.58	0.32	0.08	0.4	-0.15
HM3	0.62	0.4	0.3	**0.89**	0.15	0.09	0.02	0.13	0.5	0.59	0.41	0.12	0.44	-0.09
HM4	0.53	0.18	0.12	**0.71**	0.21	0.17	0.08	0.09	0.55	0.51	0.36	0.22	0.37	-0.1
IC1	0.19	0.05	0	0.11	**0.77**	0.27	0.07	0.11	0.22	0.13	0.13	0.2	0.13	0.08
IC2	0.19	0.04	-0.03	0.14	**0.81**	0.3	0.07	0.19	0.25	0.18	0.12	0.2	0.13	0
IC4	0.25	0.16	0.14	0.18	**0.74**	0.17	0.04	0.14	0.17	0.18	0.21	0.15	0.09	0
MF7	0.14	0.04	-0.12	0.05	0.27	**0.6**	0.15	0.07	0.25	0.13	0.15	0.24	0.12	-0.04
MF8	0.14	0.16	0.13	0.13	0.2	**0.85**	0.01	0.17	0.13	0.15	0.12	0.12	0.16	-0.03
PC2	-0.05	-0.07	-0.02	-0.01	0.09	0.04	**0.74**	0.01	0.11	0.04	0.09	0.09	-0.03	-0.11
PC3	-0.07	-0.07	-0.03	0.02	0.03	0.03	**0.8**	-0.03	0.08	0.04	0.06	0.09	-0.04	-0.08
PC4	0.02	0.02	0.07	0.02	0.12	0.12	**0.69**	0.12	0.06	0.06	0.16	0.11	0.07	-0.08
PC5	-0.02	0.05	0.04	0.06	0.1	0.12	**0.76**	0.06	0.06	0.13	0.11	0.12	-0.01	-0.05
PC6	-0.08	-0.01	0.01	0.05	-0.01	0.03	**0.82**	-0.01	0.02	0.05	0.02	0.1	-0.02	-0.14
PD1	0.05	0.03	-0.06	0.05	0.15	0.05	-0.08	**0.39**	0.02	0.07	0.04	0.19	0	0.04
PD6	0.18	0.11	0.05	0.17	0.17	0.18	0.06	**0.97**	0.15	0.14	0.15	0.17	0.04	-0.03
PE1	0.75	0.35	0.26	0.65	0.24	0.2	0.01	0.16	**0.85**	0.68	0.61	0.2	0.44	-0.06
PE2	0.57	0.26	0.18	0.48	0.17	0.21	0.08	0.17	**0.83**	0.54	0.49	0.19	0.36	-0.15
PE3	0.53	0.18	0.18	0.37	0.24	0.18	0.09	0.09	**0.82**	0.43	0.42	0.18	0.31	-0.13
PE4	0.34	0.04	0.02	0.28	0.21	0.14	0.14	0.01	**0.66**	0.26	0.34	0.19	0.12	-0.13
RE1	0.57	0.2	0.2	0.48	0.23	0.16	0.12	0.1	0.53	**0.78**	0.43	0.15	0.38	-0.07
RE2	0.58	0.28	0.23	0.57	0.19	0.13	0.04	0.15	0.5	**0.84**	0.36	0.13	0.35	0.01
RE3	0.53	0.33	0.29	0.52	0.15	0.12	0.02	0.13	0.49	**0.8**	0.36	0.16	0.35	-0.09
RE4	0.59	0.36	0.34	0.6	0.13	0.12	0.03	0.08	0.53	**0.81**	0.4	0.14	0.43	-0.07
RE5	0.56	0.24	0.23	0.56	0.17	0.22	0.1	0.13	0.55	**0.85**	0.4	0.18	0.39	-0.12
SI1	0.46	0.31	0.3	0.36	0.19	0.17	0.18	0.12	0.5	0.41	**0.85**	0.14	0.23	0
SI2	0.49	0.25	0.29	0.4	0.16	0.14	0.09	0.17	0.52	0.41	**0.88**	0.2	0.33	-0.05
SI3	0.57	0.26	0.29	0.39	0.19	0.16	0.03	0.11	0.58	0.43	**0.89**	0.12	0.34	-0.04
UA4	0.17	0.14	0.08	0.21	0.17	0.2	0.11	0.13	0.19	0.2	0.12	**0.83**	0.19	-0.01
UA6	0.08	-0.12	-0.14	-0.02	0.18	0.12	0.08	0.18	0.16	0.04	0.14	**0.62**	-0.02	-0.02
UB4	0.58	0.36	0.32	0.47	0.16	0.21	-0.05	0.05	0.39	0.45	0.33	0.13	**0.93**	-0.12
UB5	0.46	0.3	0.27	0.42	0.11	0.14	0.04	0.02	0.37	0.4	0.3	0.12	**0.9**	-0.14
UB10	-0.09	-0.05	-0.01	-0.16	0.03	-0.03	-0.13	-0.03	-0.14	-0.1	-0.05	-0.02	-0.14	**0.98**
UB12	0.05	0.04	0	0.01	0.01	-0.08	-0.03	0	-0.05	0.04	0.03	-0.04	-0.05	**0.54**

Table 2.5 PLS Confirmatory Factor Analysis (Main Study)



***significant at 0.01, **significant at 0.02, *significant at 0.05

Figure 2.3 PLS Results of Research Model of Main Test (n=379; Main Study)

	Hypothesis	Relationship Significant?
PC -> BI	H1a: Users' information privacy concerns are negatively related to their behavioral intention with use of IT.	Yes
PC -> UPB	H1b: Users' information privacy concerns are negatively related to their self-disclosure behavior with use of IT.	Yes
HM -> BI	H2: Users' hedonic motivation of IT is positively related to their behavioral intention with use of IT.	Yes
RE -> BI	H3: Users' relationships expectancy is positively related to their behavioral intention with use of IT.	Yes
IC -> SI	H4a: Individuals with higher espoused collectivistic cultural values will perceive higher levels of social influence.	Yes
IC -> RE	H4b: Individuals with higher espoused collectivistic cultural values will have higher levels of relationships expectancy.	Yes
PD -> SI	H5: Individuals with higher espoused power distance cultural values will perceive higher levels of social influence.	Yes
UA -> PC	H6: Individuals with higher espoused uncertainty avoidance cultural values will have higher levels of privacy concerns.	Yes
MF -> HM	H7a: Individuals with higher espoused feminine cultural values will have higher levels of hedonic motivation.	Yes
MF -> RE	H7b: Individuals with higher espoused feminine cultural values will have higher levels of relationships expectancy.	Yes

Table 2.6 Hypotheses Testing

2.5. Implications

2.5.1. Implications for Research

This study is expected to generate theoretical implications. It contributes to IS research by modeling online social network use through the established UTAUT (Venkatesh et al. 2003), and by adding the espoused national cultural values as individual differences. By doing so, we extend the generalizability of UTAUT to the hedonic social network context across cultures. Espoused national cultural values, named as espoused individualism/collectivism, espoused power distance, espoused uncertainty avoidance, and espoused masculinity/femininity were theorized as individual characteristics. While previous research has mainly focused on the value of utility, we added three additional variables which are hypothesized to impact behavioral intention: information privacy concerns, hedonic motivation, and relationship expectancy. Further, we incorporated the espoused national cultural values into the extended UTAUT model and described how they influenced the constructs of information privacy concerns, hedonic motivation, relationship expectancy, and social influence. This research was conducted in an online social network context.

2.5.2. Implications for Practice

The findings from the current proposed research are expected to also generate practical implications. For example, information privacy concerns are proposed to be

negatively associated with behavioral intention to use the technology, while relationship expectancy and hedonic motivation are proposed to positively influence behavior intention. Therefore, from a user's perspective, if the hedonic and relationship maintaining benefits are high enough to justify the privacy concerns, a user would be more likely to accept and use the technology. Our study suggests that to encourage more users in online social networks, online social networks should highlight their applications with respect to hedonic motivation, privacy concerns, and relationship expectancy. Considering the antecedent effects of espoused national cultural values on behavior intention to use the technology, we suggest that a marketing strategy of user segmentation would facilitate online social networks utilization.

Understanding the effect of espoused national cultural values on employees' perception and technology adoption behaviors is also important in today's global IT world. Considering that employees from different countries with various backgrounds might espouse diverse cultural values, managers should consider these variables and control their impacts.

2.6. Limitations and Future Directions

2.6.1. Limitations

There are two limitations in the study. First, we used a student sample answering self-administrated online survey items. Previous research has been critical of using student

samples. In addition, there might be common method biases if we collect data from a single source. More objective observation is needed beyond the existing self-administrated online survey. Second, gender, experience, and age were moderators which have been examined in the original UTAUT model (Venkatesh et al. 2003). They were not included in the current version of our model. However, we have collected the responses on these three constructs, and future research will investigate their impacts to the extended UTAUT model as control variables. Additionally, effect size could be a potential limitation and should be tested in the future.

2.6.2. Future Directions

In future, the mediating or moderating effect of espoused cultural dimensions on the model can be tested. Future research might also examine the overall effect of the espoused cultural dimensions, because there might be some interactions among these dimensions. This analysis will theoretically contribute to a better understanding of the influence of espoused national cultural values on technology acceptance and use. Furthermore, future research might comprehensively investigate the inclusion of additional constructs to the proposed model of social network acceptance and use. Finally, future research might test the proposed model in new contexts, such as technology support for education, knowledge management systems, and other IT diffusion subjects.

CHAPTER 3: Development and Testing of a Scale to Measure the Effect of IT Occupational Subculture on Knowledge Sharing within Organization Personnel

3.1. Introduction

Culture has been recognized as playing an important role in the adoption of new technologies (Leidner and Kayworth, 2006). Most cultural studies are conducted at the national level or through espoused national culture at the individual level (e.g. Hofstede, 1983; Srite and Karahanna, 2006). Notwithstanding the contribution of research up to now, our knowledge of how culture influences technology diffusion at the organizational level is limited. As organizations are becoming more and more reliant on IT, IT personnel who support the operations of business functions are essential to organizational technology diffusion (Kakabadse and Korac-Kakabadse, 2000). From a general perspective, IT personnel are regarded as those who make IT work; with respect to technology, business personnel are regarded as those who use IT to deal with everyday business at work (Nord, Nord, Cormack, and Cater-Steel 2006).

Guzman, Stam, and Stanton (2008) found that IT personnel have established a distinct occupational subculture within organizations. The concept of occupational subculture is different from both professional and organizational culture. Certain values, beliefs, and behaviors might be common across all IT workers regardless of their place of employment (professional culture). All employees of a certain company, including IT

personnel, might also have similar values (organizational culture). However, within an organization IT personnel can have a distinct occupational subculture that is influenced by both the organizational culture of the company and the professional culture of the IT profession. Generally, occupational subcultures within organizations arise from those people who share similar educational, personal, and work experiences, and are pursuing the same occupation and have a similar understanding on occupational and organizational ideologies in speech and behavior. Please see Figure 3.1 below.

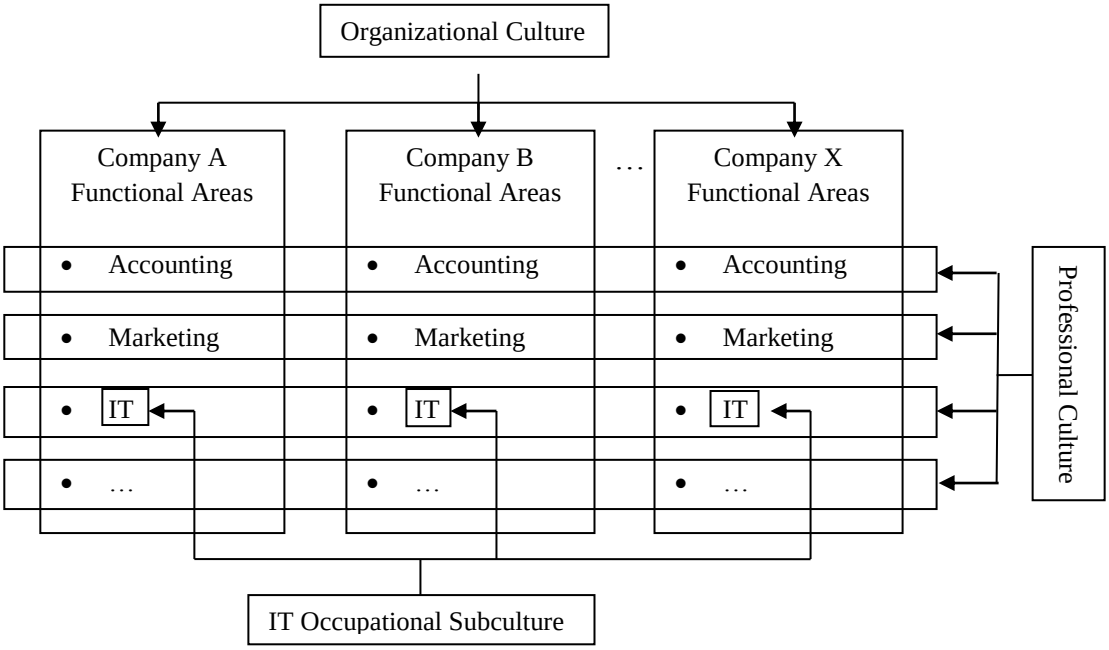


Figure 3.1 Organizational Culture, Professional Culture, and Occupational

When organizations implement a new information technology (IT), discrepancies often happen between IT personnel and non-IT employees. Differences in cultural

perspectives, such as cultural beliefs, often cause conflicts between interacting groups (Rao and Ramachandran, 2011). Intergroup discrepancies can affect the organizational technology diffusion curve (Cavusoglu, Hu, Li, and Ma, 2010). In particular, this study will focus on knowledge sharing, or lack of sharing, between business and IT personnel as one aspect of the diffusion process. This will be further developed after an explanation and overview of the classical diffusion theories. Previous studies have examined the factors which impact the rate of adoption of innovations; however, there is no research so far that considers the effect of sub-cultural conflict on the technology diffusion process at an organizational level. Although it is difficult to precisely measure culture (Weber and Camerer, 2003), it is important to open the black box and see how IT occupational subculture impacts knowledge sharing among organizational personnel. This leads to the following research question: *How does IT occupational subculture affect the knowledge sharing between IT personnel and business personnel within the IT diffusion context?*

Based on empirical research to date, classical IT diffusion variables by themselves are limited in their ability to predict the adoption of complex technologies at an organizational level. Based on a meta-analysis, Hameed, Counsell, and Swift (2012) found that studies of IT diffusion in organizations have produced inconsistent and contradictory outcomes and organizational readiness is the most significant attribute of IT innovation adoption in organizations. Additional factors should be included to better explain IT adoption behavior at the organizational level, given that a high

knowledge burden always exists among IT personnel and non-IT personnel (Fichman 1992). We propose that IT occupational subculture impacts the knowledge sharing between IT personnel and non-IT personnel within the IT diffusion context. We contribute to the technology diffusion and knowledge sharing literature by proposing a model that attempts to investigate the influence of IT occupational subculture on the knowledge sharing within organizational personnel. The proposed model is presented in Figure 3.2.

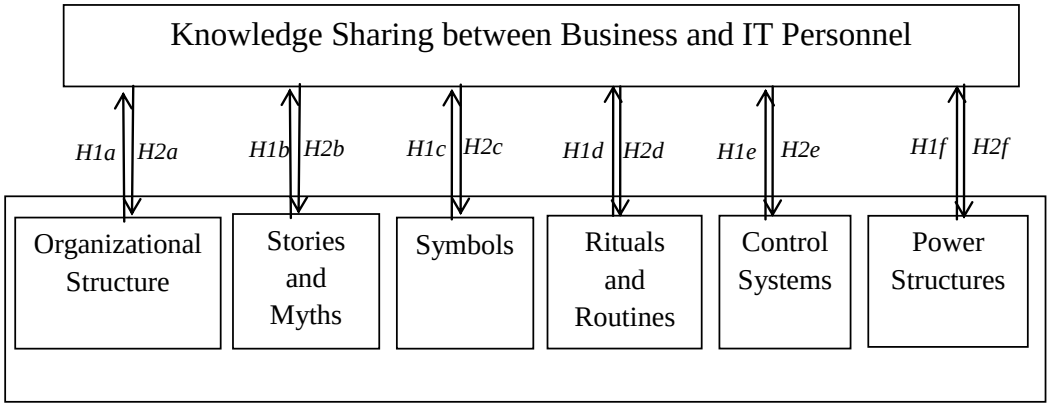


Figure 3.2 Research Model

3.2. Theory and Hypotheses

3.2.1. IT Diffusion and Knowledge Sharing in Organizations

> From the perspective of technology diffusion, IT implementation is defined as: "*an organizational effort directed toward diffusing appropriate information technology within a user community*".
>
> -- *Cooper and Zmud, p. 124*

To measure a technology adoption rate over time, research has found that it is influenced by two forces: a user's intrinsic tendency to adopt technology and social interaction (Cavusoglu, Hu, Li, and Ma, 2010). This indicates that individual adoption is impacted by environmental factors.

Cooper and Zmud (1990) and Kwon and Zmud (1987) developed the IT implementation stages model, in which a new IT diffusion process goes through six stages: initiation, adoption, adaption, acceptance, routinization, and infusion. In the model, contextual factors, such as task characteristics, community characteristics, organizational characteristics, and environmental factors impact the six stages of new IT diffusion within a user community (Kwon and Zmud 1987).

While diffusion, in the above classical model, is still able to explain partial patterns of organizational technology diffusion, more factors should be considered in different contexts of IT diffusion in organizations (Fichman 1992). Classical diffusion is limited to the individual level, without sufficient capability to map clearly to the organizational level of research. Also, organizational IT adoption is not a binary event, but a process that unfolds in stages over time. More importantly, there is an implicit assumption in classical diffusion theory that adopters make the adoption decision based on their own usage, instead of being part of a larger community of interdependent users. It also does not take into account the fact that many technology decisions are mandatory and made by organizations.

Beyond classical diffusion theory, new variables come into play in the IT diffusion process at the organizational level. While the organization as a whole makes a decision to adopt new technology, how cooperative individual adopters are in embracing the innovation could highly impact the IT diffusion process (Fichman 1992). Further, it is acknowledged that the level of skills and knowledge gained to operate technology are important determinants of adopter innovativeness for organizations. In all, it implies that cooperation between IT personnel (who support IT diffusion) and non-IT personnel (who actually adopt IT) affect the entire organizational technology adoption process.

A dysfunctional relationship between business and IT personnel hinders the IT diffusion process in an organization. Previous research already recognized the frustrations regarding repeated project failures and project delays, which resulted from a lack of cooperation between IT personnel and end users (Nord et al., 2006).

A considerable research effort has been applied in defining IT-business relationships. Among those studies, the Henderson (1990) model has often been cited to assess IT-business relationships in general. It was developed outlining two dimensions of partnership: partnership in context, which is necessary for a long term relationship; and partnership in action, which is necessary to create an effective day-to-day working relationship. For partnership in context, key factors included mutual benefits, commitment to the relationships, and predisposition. For partnership in action, key factors included shared knowledge, dependence on distinctive competencies and

resources, and organizational linkages (Henderson, 1990). Among these factors, knowledge sharing has been examined as a significant determinant of the IT-business relationship which was affected by IT professional culture (Nord et al., 2006).

More importantly, knowledge sharing impacted performance in the way that it had both direct and indirect effects on individual performance (Quigley, Teluk, Locke, and Bartol, 2007). Specifically, the positive norms for knowledge sharing enhanced the behavior of knowledge sharing among members. Besides, the knowledge recipient's self-efficacy had a strong relationship with performance goals when the recipient trusted the provider (Quigley, Teluk, Locke, and Bartol, 2007).

In the conceptual model developed by Ipe (2003), motivational factors that significantly impacted knowledge sharing between individuals in organizations were divided into internal and external factors. *Internal* factors included the power of knowledge and the reciprocity which came from knowledge sharing. *External* factors include relationship with the recipient, which was determined by trust and the power and status of the recipient; and the reward of knowledge sharing. And all the motivational factors were impacted by the organizational culture and the subunit of culture in their work environment (Ipe, 2003). From an integrative point of view, it was proved that attitudes toward and subjective norms with regard to knowledge sharing as well as organizational climate affected individuals' intentions to share knowledge (Bock, Zmud, Kim, and Lee, 2005). Lin (2007) integrated a motivational perspective on employee knowledge sharing intentions, and found that motivational

factors such as reciprocal benefits, knowledge self-efficacy, and enjoyment in helping others were significantly associated with employee knowledge sharing attitudes and intentions.

Researchers (Kim and Lee, 2006) examined the impact of organizational context and information technology on employee knowledge-sharing capabilities, and found that social networks, centralization, performance-based reward systems, employee usage of IT applications, and user-friendly IT systems significantly affected employee knowledge sharing capabilities in organizations in South Korean. Another study found that formal hierarchical structure, in the form of centralization, had a significant negative effect on knowledge sharing; and informal lateral relations, in the form of social interaction, had a significant positive effect on knowledge sharing among units that competed with each other for market share, but not among units that competed with each other for internal resources (Tsai, 2002). Hooff and Ridder (2004) investigated the influence of "organizational commitment", "organizational communication", and the use of computer-mediate communication on knowledge sharing. The results showed that commitment to the organization positively influenced knowledge donating; and was in turn positively influenced by computer-mediate communication (Hooff and Ridder, 2004).

Knowledge is essential to be shared within teams and communities, especially when fostering a virtual community. Individuals' knowledge sharing in virtual communities are proposed to be influenced by the facets of social capital, which are social

interaction ties, trust, norm of reciprocity, identification, shared version and shared language (Chiu, Hsu, and Wang, 2006). Research indicated that knowledge flows easily when employees view knowledge as a public good belonging to the whole organization (Ardichvili, Page, Wentling, 2003). However, there are still a variety of barriers that hinder individuals from contributing knowledge.

Several barriers, which are classified into three main domains, make it difficult to share knowledge: individual/personal, organizational, and technological barriers (Riege, 2005). There are more than a dozen barriers in each of these three domains. For example, the potential individual barriers include lack of time, concern of job security, low awareness of the value of knowledge sharing, lack of trust, and other differences. The potential organizational barriers include lack of the integration of knowledge management strategy and sharing initiatives into the company's goals and not having strategic approach, lack of leadership and managerial direction in terms of the benefits of knowledge sharing, lack of formal and informal spaces to share, an ability to reflect and generate new knowledge, restriction from the physical work environment and layout of work areas, lack of existing corporate culture which support the knowledge sharing, and etc. The potential technology barriers include lack of integration of IT systems and processes impedes on the way people operation, lack of technical support and immediate maintenance of integrated IT systems obstructs work routines and communication methods, lack of training, lack of communication, etc.

Attewell (1992) argued that the complex IT diffusion process is driven by decreasing knowledge barriers, in addition to being a process driven by communication and social influence. IT personnel, who support business through IT implementation in various functions, are closely linked to end users. It has been proposed that IT group characteristics play a role in the modified IT diffusion framework (Fichman 1992). Effective cooperation among IT groups and business employees is proposed to quickly bridge end-users' knowledge gap related to IT usage. Therefore, technology would be easier to implement in the whole organization.

3.2.2. IT Occupational Subculture

> *"Culture matters because it is a powerful, latent, and often unconscious set of forces that determine both our individual and collective behavior, ways of perceiving, thought patterns, and values."*
>
> *-- Edgar H. Schein, 1999, p.14*

The term culture is originally from anthropology, which is given to the rituals and customs that societies developed over time (Schein, 1992; Vecchio, Hearn, and Southery, 1996). Research has observed that not only do societies develop culture, but organizations, groups, communities, and occupations also develop their own culture at these particular levels (e.g. Schein, 1992; Nord et al., 2006; Guzman et al., 2008). In general, culture is defined as a general shared understanding, which results from

commonly held assumptions and views of the world among organizational, group, and occupational members (Weber and Camerer, 2003; Guzman et al., 2008).

In analyzing culture at group or organizational level, Schein (1990) found that culture manifests itself through three fundamental levels: observable artifacts, values, and basic underlying assumptions. According to Schein (2010), the basic underlying assumptions are the core of the culture, the level of espoused values reflect what is thought to be ideal (i.e. the underlying assumptions) and what is appropriate to present publicly, and the level of observable artifacts manifest culture through everyday behavior which determined by the complicated compromise among the espoused values, the core assumptions, and the specific situation at the moment. The observable artifacts include the visible and audible behavior patterns, myths and stories, languages, rituals, and symbols.

Information systems research has already noted the essential role played by culture in organizations, and called for more attention to the social and cultural factors of employees' workplace interactions with each other and with technology (Guzman et al., 2008). They found that IT personnel have established a distinct occupational subculture, such as the use of technical jargon, the primary value of technical knowledge, feelings of superiority, and a general lack of formal rules. When implementing a new IT in an organization, the dynamic IT diffusion process at the organizational level is inevitably affected by the cultural contexts of those who work with IT and the organization itself.

Culture impacts knowledge sharing in the way that it shapes assumptions that knowledge is important and that it creates the context for social interaction (De Long and Fahey, 2000). In order to overcome cultural barriers to share knowledge, McDermott and O'Dell (2001) found that companies did this by: linking sharing knowledge to solving practical business problems; tying sharing knowledge to a preexisting core value; introducing knowledge management in a way that matches the organization's style; building on existing networks; and encouraging peers and supervisors to exert pressure to share. Additionally, norms and practices that advocate sharing knowledge facilitate this process of knowledge sharing (Ipe, 2003). Additionly, Al-Alawi, Al-Marzooqi, and Mohammed (2007) investigated the role of organizational culture in the success of knowledge sharing, in which they found that trust, communication among staff, information systems, rewards and organization structure played a positive role to knowledge sharing in organizations.

Increased knowledge fragmentation is a result from various conceptualizations of culture, although it is hard to capture the complexity and interplay across culture, the IT diffusion process, and IT itself (Kappos and Rivard, 2008). After reviewing previous IS literature related to culture, Kappos and Rivard (2008) have conceptualized culture through three perspectives: integration, differentiation, and fragmentation. The integration perspective defines culture as the shared set of basic assumptions, value symbols, and meanings among members of a collective. The differentiation perspective indicates that manifestations which are clearly interpreted

exist only within subgroups of the collective and consensus occurs only within the subgroups, which are organizational subcultures. The fragmentation perspective presents that some manifestations are given to multiple meanings, which do not depend on organizational subcultures within the collective.

Based on this multi-faceted perspective, Gallivan and Srite (2005) regarded culture as a richly layered set of forces that shape personal beliefs and behaviors. Within a multicultural team, members are given multiple identities, such as national identity, organizational identity, group identity in team, and individual identity. Multiple level conflicts occur where different identity boundaries meet (Plessis 2012).

Researchers have already paid much attention to culture from organizational and geographical perspectives, while limited studies looked at groups of employees through the "occupational subculture" perspective. As a good starting point, Guzman, Stam, and Stanton (2008) identified common characteristics of IT personnel based on Trice's framework. They found that IT personnel have established a distinct occupational culture within organizations. Trice (1993) classified occupational culture as having two dimensions: group and grid. The "group dimension" refers to the extent to which a person's behavior is constrained between members as a result of their membership in a group; "grid dimension" refers the tangible structural features of an occupational culture through which members try to order the relations. There are three parts in the grid dimension (Sonnenstuhl and Trice, 1991): rankings and hierarchy within the culture; members' autonomy over their work and their control over other

workers; and the imposed, formal and tangible structure that execute these arrangements.

The model founded by Joshson and Scholes (1993) has already been utlized for assessing IT related occupational subculture in organizations (Nord et al., 2006). The model presents culture as a web, which is composed by central values and outer symbols. It is described as, "The center circle, the paradigm, represents a core set of values, beliefs, and assumptions common to the organization. These values, beliefs, and assumptions are reflected through the outer circles, which represent the cultural elements of stories, symbols, power structures, control systems, and rituals and routines" (Nord et al., 2006, p.6). Figure 3.3 shows the cultural web graph.

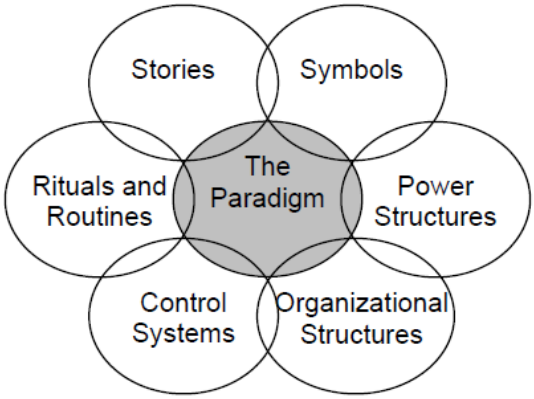


Figure 3.3 The Cultural Web (Source: Johnson and Scholes 1993, p.61)

Comparing the model developed by Trice (1993) and by Joshson and Scholes (1993), we preferred to select the latter one to measure IT personnel culture. There were several reasons. First, the model developed by Joshson and Scholes (1993) includes all essential elements of culture identified by other researchers, which is shown in

table 3.1. Second, given that culture in organizations is traditionally defined as comprised of three main factors: artifacts, espoused value, and basic underlying assumptions (Schein, 1992), this model links the visible artifacts to latent values and assumptions, making the concept of culture easier to understand and analyze. Third, the model has been employed by several previous researchers for assessing IT related culture in organizations. Additionally, Nord, Nord, Cormack, and Cater-Steel (2006) noticed the "cultural chasm" between business and IT personnel. Based on Joshson and Scholes (1993) model, they examined the effect of organizational IT culture on the IT-business relationship. Fourth and finally, the model captured the multiple layered set of forces nature of culture, which can be further analyzed through all perspectives of culture-integration, differentiation, and fragmentation.

Research Model	Elements of Culture		
Schein (1992)	Artifacts	Espoused Values	Underlying Values
National Cultures-Hofstede et al. (1990)	Power Distance Long Term Orientation	Uncertainty Avoidance Individualism vs. Collectivism	Masculinity vs. Femininity
Occupational Culture-Guzman et al. (2008)	Group	Grid: rankings and hierarchy, autonomy and control, imposed, formal and tangible structure	
Johnson and Scholes (1993)	Stories and Myths Rituals and Routines The Paradigm	Organizational Structure Control Systems	Symbols Power

Table 3.1 Summary of Selected Models for Assessing Culture at Various Levels

Thus, we propose that IT occupational subculture play a role in the knowledge sharing process among IT personnel and business end-users. Effective cooperation among IT

groups and business employees is proposed to quickly bridge end-users' knowledge gap related to IT usage. And this relationship is dynamic and reversible, in which knowledge sharing can shape people's mind. Over time, the general shared understanding among IT personnel would be changed through the knowledge sharing process with business end-users. In this case, knowledge sharing among IT personnel and business end-users is positively related to the elements of IT occupational subculture.

Thus, we hypothesize:

H1. Knowledge sharing among IT personnel and business end-users is positively affected by IT occupational subculture.

H2. IT occupational subculture is positively affected by knowledge sharing among IT personnel and business end-users.

3.2.3. The Effect of IT Occupational Subculture on Knowledge Sharing

> *"An individual's coworkers can be important sources of help in overcoming knowledge barriers constraining use of a complex system, and such interactions with others can determine an employee's ability to influence eventual system configuration and features."*
>
> *--Sykes, Venkatesh, and Gosain, 2009, p. 371*

IT occupational subculture is represented by six elements: organizational structure, stories and myths, symbols, rituals and routines, control systems, and power structures (Joshson and Scholes 1993), which are described in Table 3.2. Organizational structure guides the way in which an organization works. Stories and myths are tales told by organizational members. Symbols reflect the type of language used, logos, and office layout. Rituals and routines characterize the way work is done. Control systems highlight what is important in the organization. And power structures reveal the powerful managerial groupings in the organization.

Elements of Occupational Subcultural of IT Personnel	Description
Organizational Structure	Refers to the way in which an organization works, and is specified in two themes: role of IT and position of IT.
Stories and Myths	Refers to reputation of the occupation, and related stories are told by members of an organization
Symbols	Symbols of occupational subculture include the type of language used, logos, and office layouts.
Rituals and Routines	Characters the way work is the done, and manifests through systems development process.
Control systems	It deals with the question: which one is more important in organization, IT or business? Both strategic control and project control are included.
Power Structures	Reflect the powerful managerial group in an organization, and is specified through how power IT can control business. There are four kinds of power: interdependence power, expert power, position power, and information power.

Table 3.2 Occupational Subcultural Themes of IT Personnel within Organizations

Based on previous literature, Nord et al., (2006) developed themes of IT culture for the six elements of IT culture. The first element, organizational structure, was specified in two themes: role of IT and positioning of IT. IT occupational subculture would contribute to a healthy IT-business relationship, if it reflected a structure where IT played a strategic role and the IT director was a senior executive of the organization. Furthermore, Nord et al. (2006) found that shared knowledge among IT and business professionals was positively affected by the strategic role played by IT

personnel; and was negatively affected by the organizational structure where the IT director was not a senior executive.

Drawing from social network theory and previous individual-level technology adoption research, the Model of Acceptance with Peer Support (MAPS) proposes that an individual's embeddedness in the social network of the organizational unit impacts new technology implementation in the organization (Sykes, Venkatesh, and Gosain, 2009). As key predictors of system use, valued network density and valued network centrality together influence pathways by which they impact the organizational technology diffusion process. Valued network density describe the connectedness of a focal employee to others, weighted by the perceived strength of the tie and the adjacent node's control of system-related information, knowledge, and other tangible resources which are necessary for effective IT adoption. Valued network centrality refers to peers' perceptions of the level of system-related resources controlled by a focal employee. This implies that the extent of how IT personnel influence other employees' IT adoption in the organization is determined by their network density and centrality. If the IT director is a senior executive of the organization, the system resources would be more likely to be controlled by IT personnel. Therefore, IT personnel would be better able to facilitate the organizational IT diffusion process by overcoming knowledge barriers constraining the use of a complex system. Thus, we hypothesize:

H1a. Knowledge sharing among IT personnel and business end-users is positively affected by IT occupational subculture, such that the relationship is stronger when IT occupational subculture reflects a structure where IT people play a strategic role in the organization.

As one of the "soft" issues of culture, stories and myths are told by organizational members. Nord et al., (2006) found that: IT professional culture had a positive effect on the IT-business relationship if success stories were told about the IT personnel. They further indicated that success stories and myths about IT are positively related to trust between IT personnel and other employees in organization. If good stories are told about IT personnel in the organization, business end-users are more likely to trust personnels' capability, gain mutual benefits with them, and believe in the integrity of what they are doing and what they will do. In this case, business end-users might be more cooperative to use IT in the organization.

According to trust theory, there are three kinds of trusting beliefs: competence, benevolence, and integrity (McKnight, Choudhury, and Kacmar 2002). Competence beliefs refer to the confident truster perception that the trustee has the ability to do what the truster needs. Benevolence beliefs refer to the confident truster perception that the trustee cares and is motivated to act in the truster's interests. Finally, integrity beliefs refer to the confident truster perception that the trustee maintains honesty and keeps promises. A good reputation of IT personnel in the organization is positive to trusting beliefs formation process.

Gefen, Karahanna, and Straub (2003) integrate the Technology Acceptance Model (TAM) and trust theory, and link trust with intent to use technology. Obviously, trust will facilitate knowledge sharing among IT personnel and other employees in an organization. Thus, we hypothesize:

H1b. Knowledge sharing among IT personnel and business end-users is positively affected by IT occupational subculture, such that the relationship is stronger if organizational members are told about the success stories and myths of IT.

Symbols of IT occupational subculture include the type of language used, logos, and office layouts. Nord et al., (2006) found that a decentralized IT structure where IT professionals were physically located with their business colleagues had a positive effect on the IT-business relationship, while extensive use of IT jargon had a negative effect.

Media richness theory proposes that organizations process information to reduce uncertainty and equivocality (Daft and Lengel 1986). Uncertainty refers to the lack of information while equivocality refers to the ambiguity of information (Robert and Dennis, 2005). It is proposed that organizational structure and internal systems determine both the amount and richness of information provided to managers. In a decentralized IT structure, IT professionals are physically located with their business colleagues. Therefore, business and IT professionals would have more opportunity to communicate and integrate with each group's subculture, which can reduce

uncertainty and equivocality. One of the most common barriers to effective communication is the use of jargon. If IT professionals can get rid of using IT jargon, the communication with their business colleagues would be easier and more understandable. Thus, we hypothesize:

H1c. Knowledge sharing among IT personnel and business end-users is positively affected by IT occupational subculture, such that the relationship is stronger if IT occupational subculture reflects symbols that a) IT professionals are physically located with their business colleagues and b) to avoid use of IT jargon.

Rituals and routines characterize the way work is done and normally manifest through the system development process. Nord et al., (2006) found that a system development process that was not adhered to by both business and IT had a negative effect on the IT-business relationship. Generally, the software development process is comprised of eight phases: determination of long-term organizational requirements; identification of projects and user requirements; system requirements; system analysis and design; programming; installation and training; system operation and maintenance; and system review and change (Carayannis and Sagi, 2001). It is implied that IT personnel should understand organizational and user requirements first, and then analyze how to employ IT to achieve business goals. The system development process should be adhered to by both business and IT. Therefore, the information processing process would be facilitated. Thus, we hypothesize:

H1d. Knowledge sharing among IT personnel and business end-users is positively affected by IT occupational subculture, such that the relationship is stronger if IT occupational subculture reflects rituals/routines that system development process is adhered to by both business and IT.

Different from rituals and routines, the culture theme of a control system deals with the question: what is more important in an organization: IT or business? Guzman et al., (2008) found that IT personnel have a significant occupational culture which was characterized by the feeling of superiority and the primary value of technical knowledge. Nord et al., (2006) found that if IT controls the strategic direction in the organization and IT people manage projects, the IT-business relationship will be more interdependent. However, if there is a lack of involvement by business people in project management, and the responsibility of project management is left to IT people, the IT-business relationship will be harmed. It is reasonable to propose that when business people are more actively participating in the IT diffusion process and the greater dependence by business units on the IT group, the easier IT related knowledge can be shared with business units. Thus, we hypothesize:

H1e. Knowledge sharing among IT personnel and business end-users is positively affected by IT occupational subculture, such that the relationship is stronger if IT occupational subculture reflects a control system that both IT and business control the strategic direction within the organization and IT people co-manage projects with business people.

Similar to the cultural theme of a control system, power structures reflect the influence of the managerial group in an organization. There are various kinds of powers: interdependence power, expert power, position power, and information power (Nord et al., 2006). While a business highly dependent on IT is positively related to IT-business relationship, high levels of expert power and information power are negatively associated with it.

Furthermore, power structures shed light on how a powerful IT group can control business units. Nord et al., (2006) found that if the IT group uses their expert power and information power to their own advantage, and the business group has little control over this, the IT-business relationship would be harmed. Therefore, the power structures of IT group should be reasonably constrained. Thus, we hypothesize:

H1f. Knowledge sharing among IT personnel and business end-users is positively affected by IT occupational subculture, such that the relationship is weaker if IT occupational subculture reflects power structures that IT group has an extremely high level of expert power.

3.3. Research Methodology

3.3.1. Instrument Development

The construct of occupational subculture is measured with items developed by the authors based on the literature, due to a lack of a previously validated scale. The instrument has been developed by authors. The items are shown in Appendix B.

3.3.2. Data Collection

The responses from users of organizational information systems were collected through an online survey. Data was collected using both MBA and master of IT management student subjects at a large university in the Midwest of the US. A total of 94 usable responses were received. Almost all respondents were local employees, while about half respondents were business employees and half were IT employee. The study was used to establish the reliability (measured by Cronbach's alpha) and validity (both convergent and discriminant validity) of the constructs. Partial least squares (PLS) analysis was used to test the research model and the psychometric properties of the scales.

Survey design is often chosen by researchers to investigate organizational behavior. Since culture evolves over time, experiment design cannot easily be employed to assess IT occupational subculture in an organization. Previous researchers already conducted several qualitative researches (i.e. semi-structured interviews) to understand the occupational culture of IT personnel (e.g. Nord, Nord, Cormack, and Cater-Stell, 2006; Ramachandran and Rao, 2006; Guzman, Stam, and Stanton, 2008). Grounded by this qualitative research, this quantitative research attempts to explain what has been observed on culture and how does culture impact the IT diffusion process in organizations. We believe that findings will be able to generalize to a greater population of organizations by applying the quantitative research.

In order to minimize the threats to internal validity, control variables are included in the model. Consistent with prior research, these variables are tested to see if either of them has a significant effect on participants' perception of knowledge sharing among business and IT personnel as well as that of stages in IT adoption. Control variables include: participant's gender and age, the IT group's work experience with business employees, organizational size, IT group size, IT diffusion project size, and organization's previous IT diffusion experience. In order to test the effect of control variables, the research model runs with all the control variables included. Thus, the threat of confounding variables which might affect the hypothesized relationships is minimized. The control variables are removed after testing their effect on the research model.

3.4. Data Analysis

Because there were no suitable validated items to measure IT occupational subculture, we tested the reliability and validity of the construct which was developed by the authors, before we go to interview/survey employees. The testing was conducted using SmartPLS Version 2.0. The Partial Least Squares (PLS) approach, like other SEM techniques such as LISREL and AMOS, allowed researchers to simultaneously assess the measurement model parameters and structural path coefficients. Component-based PLS uses a least squares estimation procedure. PLS avoids many of the restrictive assumptions underlying covariance-based SEM techniques. Furthermore, it allows both formative and reflective constructs to be tested together.

According to the often-citied 10 times rule (Barclay, Higgins, and Thompson 1995), the sample size should be equal to the larger of: 1) 10 times the largest number of formative indicators used to measure a single construct, or 2) 10 times the largest number of structural paths directed at a particular construct in the structural model. In our model, all items were modeled as reflective indicators because they were viewed as effects (not causes) of latent variables. The largest number of independent variables estimated for a dependent variable or formative factors was six. Thus, our sample size of 94 was more than adequate for the PLS estimation procedures. The measurement model in SmartPLS was assessed by examining reliability, convergent validity, and discriminant validity (Hair, Hult, Ringle, and Sarstedt 2013).

3.4.1. Reliability

Reliability was assessed through a two-step process. 1) Internal consistencies reliability (ICR): composite reliability should be higher than of 0.708 (in exploratory research, 0.6 to 0.7 is considered acceptable). ICR is considered more robust than Cronbach's alpha because it weights items differently depending on factor loading considerations. 2) Indicator’s reliability: the indicator’s outer loadings should be higher than 0.708. Indicators with outer loadings between 0.4 and 0.7 should be considered for removal only if the deletion leads to an increase in composite reliability and Average Variance Extracted (AVE; a measure of convergent validity, which is the degree to which a latent construct explains the variance of its indicators) above the suggested threshold value.

3.4.2. Validity

Convergent and discriminant validity were assessed by applying two criteria: (1) the square root of the average variance extracted (AVE) by a construct from its indicators was at least 0.707 (i.e., AVE > 0.50) and was greater than that construct's correlation with other constructs, and (2) item loadings were at least 0.707, and that item loaded more highly on the construct it was intended to measure than on any other construct.

Table 3.3 shows the internal consistency reliabilities and correlations among constructs. Table 3.4 shows the structured factor matrix of the study variables, demonstrating strong convergent and discriminant validity, as all items exhibited high loadings (>0.707) on their respective constructs, and no item loaded higher on other constructs. Collectively, the psychometric properties of the constructs were excellent.

Constructs	AVE	Composite Reliability (ICR)	Inter- construct correlations							
			Contr Sys	Know_Sharing	Orga Struct	Power Struc	Ritu&Rout	Stor&Myths	Symb-lang	Symb-office
Contr Sys	0.67	0.89	**0.82**							
Know_Sharing	0.64	0.92	0.36	**0.80**						
Orga Struct	0.63	0.89	0.35	0.23	**0.79**					
Power Struc	0.81	0.90	-0.47	-0.13	-0.43	**0.90**				
Ritu&Rout	0.62	0.83	0.62	0.33	0.37	-0.34	**0.79**			
Stor&Myths	0.71	0.93	0.46	0.29	0.43	-0.46	0.56	**0.84**		
Symb-lang	0.68	0.81	0.24	0.26	0.17	-0.14	0.20	0.45	**0.82**	
Symb-office	0.75	0.86	0.02	-0.13	0.22	-0.05	0.14	0.33	0.25	**0.87**

Table 3.3 Inter-Construct Correlations

	Contr Sys	Know_Sharing	Orga Struct	Power Struc	Ritu&Rout	Stor&Myths	Symb-lang	Symb-office
CS1	0.85	0.4	0.37	-0.38	0.58	0.46	0.23	0.11
CS2	0.81	0.22	0.18	-0.36	0.48	0.33	0.16	-0.08
CS3	0.87	0.28	0.3	-0.39	0.52	0.4	0.23	0
CS4	0.73	0.17	0.2	-0.41	0.39	0.25	0.12	-0.08
KS10	0.32	0.85	0.28	-0.07	0.33	0.29	0.31	-0.1
KS3	0.27	0.7	0.07	-0.16	0.21	0.17	0.08	-0.15
KS4	0.22	0.81	0.16	-0.1	0.19	0.2	0.17	-0.05
KS5	0.23	0.7	0.05	-0.1	0.19	0.13	0.11	-0.14
KS6	0.19	0.86	0.16	-0.04	0.21	0.19	0.18	-0.08
KS9	0.41	0.87	0.25	-0.15	0.35	0.32	0.27	-0.1
OS1	0.32	0.24	0.9	-0.38	0.37	0.36	0.18	0.16
OS2	0.29	0.25	0.92	-0.33	0.28	0.42	0.18	0.27
OS3	0.27	0.08	0.66	-0.39	0.25	0.25	0.06	0.08
OS4	0.29	0.09	0.77	-0.35	0.38	0.3	0.05	0.15
OS5	0.23	0.06	0.69	-0.38	0.2	0.35	0.07	0.15
Re_PS1	-0.5	-0.11	-0.35	0.9	-0.33	-0.43	-0.13	-0.02
Re_PS2	-0.34	-0.12	-0.42	0.9	-0.27	-0.41	-0.13	-0.07
RR1	0.46	0.22	0.42	-0.26	0.83	0.43	0.2	0.17
RR3	0.47	0.21	0.35	-0.4	0.71	0.58	0.2	0.2
RR4	0.53	0.32	0.16	-0.18	0.81	0.36	0.1	0.01
SM1	0.37	0.28	0.37	-0.41	0.46	0.86	0.42	0.33
SM2	0.42	0.28	0.33	-0.38	0.43	0.86	0.34	0.25
SM3	0.35	0.22	0.39	-0.39	0.45	0.82	0.34	0.31
SM4	0.35	0.18	0.4	-0.42	0.5	0.75	0.37	0.24
SM5	0.46	0.23	0.33	-0.38	0.58	0.91	0.44	0.28
Re_SY2	0.01	0.19	0.08	-0.02	-0.02	0.21	0.79	0.23
SY4	0.36	0.23	0.18	-0.2	0.31	0.51	0.86	0.18
Re_SY3	-0.14	-0.08	0.11	0.14	0	0.15	0.25	0.81
SY1	0.11	-0.13	0.24	-0.16	0.2	0.39	0.19	0.93

Table 3.4 PLS Confirmatory Factor Analysis

*CS1, CS2, CS3, and CS4 are items refer to the construct *Control Systems*; KS3, KS4, KS5, KS6, KS9, and KS10 are items refer to the construct *Knowledge Sharing*; OS1, OS2, OS3, OS4, and OS5 are items refer to the construct *Organizational Structure*; Re_PS1 and Re_PS2 are items refer to the construct Power Structure; RR1, RR3, and RR4 are items refer to the construct *Rituals and Routines*; SM1, SM2, SM3, SM4, and SM5 are items refer to the construct *Stories and Myths*; Re_SY2 and SY4 are items refer to the construct *Symbols (Language)*; Re_SY3 and SY1 are items refer to the construct *Symbols (Office Layout)*.

3.4.3. Hypotheses Testing

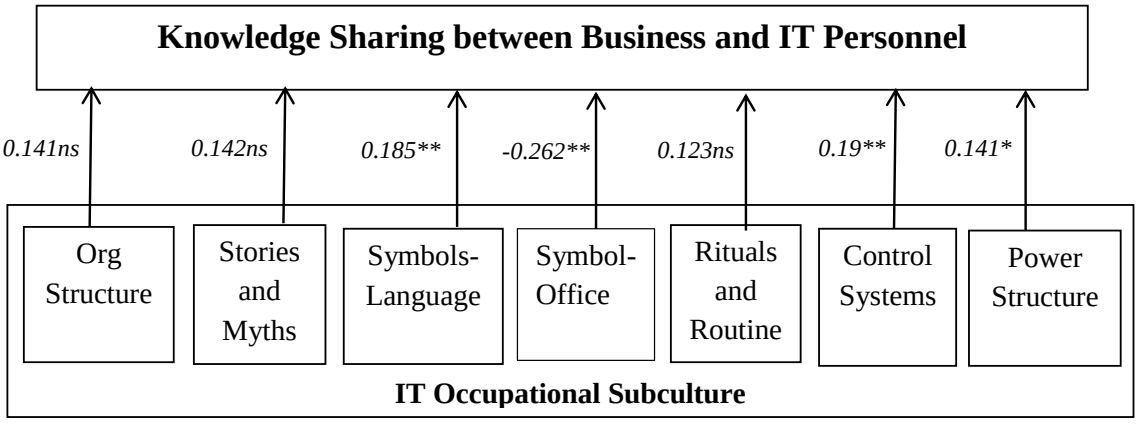
The structural model and hypotheses were assessed by examining the significance of the path coefficients and the variance accounted for by the antecedent constructs. In the following two parts, we examined the direct relationship between IT occupational subculture to knowledge sharing (where the dimensions of IT occupational subculture directly impacted knowledge sharing) and as a secondary analysis we looked at the relationship in the opposite direction (where knowledge sharing impacted the dimensions of IT occupational subculture).

Primary Analysis - From IT occupational subculture to knowledge sharing:

Figure 3.4 provides the results of hypothesis testing. Bootstrapping (with 94 cases and 5000 samples) was performed to test the statistical significance of each path coefficient using t-tests.

The model explained about 24% of the variance of the dependent variable, behavioral intention ($R^2 = 0.243$). Overall, 4 out of 7 hypotheses are well supported by the empirical test results. Results of the study are presented in Table3.5. The model explains about 24 percent of the variation in knowledge sharing behavior in the pilot study. Control systems, language related symbols and symbols in office layout significantly impact knowledge sharing between business people and IT employees. Control systems measure the extent to which the organizational direction and IT projects are controlled by sole part (IT or business) or both parts. Symbols of IT

occupational culture include the type of language used and office layouts. The commons among these three variables are they facilitate communication channel, thus there are more opportunities to share knowledge. Power Structure measures the extent to which the business units dependent on IT technical knowledge, which is marginal significant to knowledge sharing. Organizational structure, rituals and routines, and stories and myths are not significant to knowledge sharing. Organizational structure measures the role IT people play in the organization; rituals and routines measures each party's (IT professionals and business colleagues) participation and know-how in system development process; and stories and myths are related to the reputation of IT personnel. It means that without effective communication facility, knowledge is hard to be shared between IT professionals and business colleagues, even though they are both important to each other in organizations.



** significant at 0.05, * marginally significant at 0.10

Figure 3.4 PLS Results of Research Model (Culture to Knowledge Sharing; n=94)

Relationship	Significant Relationship?
Contr Sys -> Know_Sharing	Yes
Orga Struct -> Know_Sharing	No
Power Struc -> Know_Sharing	Marginal
Ritu&Rout -> Know_Sharing	No
Stor&Myths -> Know_Sharing	No
Symb-lang -> Know_Sharing	Yes
Symb-office -> Know_Sharing	Yes

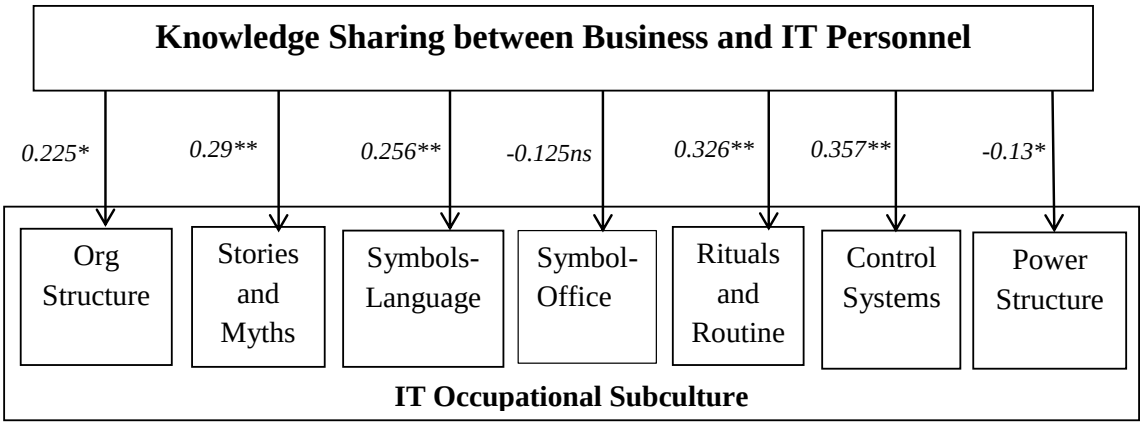
Table 3.5 Hypotheses Testing Results (Culture to Knowledge Sharing)

Secondary Analysis - From knowledge sharing to IT occupational subculture:

Figure 3.5 provides the results of hypothesis testing in the opposite direction. Bootstrapping (with 94 cases and 5000 samples) was performed to test the statistical significance of each path coefficient using t-tests.

Overall, all hypotheses were well supported by the empirical test results except for the relationship from knowledge sharing to symbols in office layout. Results of the study are presented in Table3.6. As expected, the relationships from knowledge sharing to control systems, to rituals and routines, to stories and myths, and to symbols in language were significant at the 0.01 level. The relationships from knowledge sharing to organizational structure and to power structure were significant at the 0.10 level. The only non-significant relationship is from knowledge sharing to symbols in office layout, which is also anticipated.

This means that knowledge sharing shape almost all variables of IT occupational subculture and organizations should provide more communication channels and opportunities to facilitate the knowledge sharing process.



** significant at 0.01, * significant at 0.10, *ns* means not significant

Figure 3.5 PLS Results of Research Model (Knowledge Sharing to Culture; n=94)

	Significant Relationship?
Know_Sharing -> Contr Sys	Yes
Know_Sharing -> Orga Struct	Yes
Know_Sharing -> Power Struc	Yes
Know_Sharing -> Ritu&Rout	Yes
Know_Sharing -> Stor&Myths	Yes
Know_Sharing -> Symb-lang	Yes
Know_Sharing -> Symb-office	No

Table 3.6 Hypotheses Testing Results (Knowledge Sharing to Culture)

3.5. Implications

3.5.1. Implications for Research

This study makes academic contributions to IT diffusion and knowledge sharing research by investigating the relationship among IT occupational subculture and knowledge sharing within IT diffusion framework. Although researchers have already explored some cultural characteristics of IT personnel which are distinct from other employees, there is no prior study that has investigated the effect of IT occupational subculture in organizations. Also, knowledge sharing (among IT personnel who support IT implementation and business employees who use IT) as an important determinant of IT diffusion in organization has been taken into consideration, which allows us to better understand the process by which IT is diffused in organizations.

Classical IT diffusion theory is not adequate at the organizational level if all employees are required to adopt a complex IT (Nord et al., 2006). Knowledge sharing among IT personnel and business employees is able to bridge the knowledge gap between groups and will facilitate the diffusion process. Thus, the occupational subculture of IT personnel plays an important role when both groups cooperate in IT diffusion, particularly in mandated adoption decisions.

Drawing upon cross-cultural psychology, the study presents one possible approach through which occupational subculture manifests at the organizational level of analysis and impacts the knowledge sharing process. Additionally, the study develops

a series of hypotheses as to how IT occupational subculture influences knowledge sharing among business and IT personnel in an organization. In doing so, behaviors related to knowledge sharing and IT diffusion at the organizational level will be better understood beyond the limitations of previous IT diffusion studies.

3.5.2. Implications for Practice

This study also has direct managerial implications. While previous studies highlight the need for paying attention to cultural impacts, they do not go further to suggest how knowledge sharing can be impacted by occupational subculture. This study proposes various factors that can be considered to facilitate the knowledge sharing process in organizations. For example, given the prevalence for extensive use of IT jargon in an IT group, it may be important for management to develop jargon reduction mechanisms to facilitate knowledge sharing across different occupations. As such, the IT diffusion process in the organization may be accelerated.

Another implication is that organizations should provide more facilities to share knowledge. Knowledge sharing significantly impact the IT occupational subculture and both might be essential to the IT diffusion process in organizations. Informal control of culture and knowledge sharing control are important tools to regulate and adjust behaviors in the organization.

3.6. Limitations and Future Directions

3.6.1. Limitations

The data in this research is not as rich as it could have been if a longitudinal study been conducted. Additionally, the results of this study were from data collected from organizations in one geographic area of the US, which limits the generalizability of this study to a larger world population.

Another limitation might be derived from the information providers. In this study, both IT and business employees were asked to take the survey and to measure knowledge sharing among IT personnel and business employees. However, the construct of knowledge sharing is measured by perception from our respondents' points of view. It would have been preferable to ask the opinions from both IT personnel and business employees to assess the two-way knowledge sharing process and utilize matched pairs between IT and business people in the same organization. Unfortunately the response rate is often very low in such situations, including this study, and a trade-off between richness of data and response rate was deemed a necessity in this research. Additionally, effect size will be tested in the future.

3.6.2. Future Directions

There were some contingencies and non-significant findings in this research. The study may be replicated with a mix of different technologies and/or across various

geographic areas. A future study may test the model in other regions/countries and at multiple time points.

Furthermore, a future study may examine the interplay between multiple levels of culture and develop hypotheses linking the different levels together. For example, the interaction of national and occupational subculture might be a new interesting research area, given that IT outsourcing is a prevalent business model and international cooperation is very common in organizations.

Finally, we could not measure the stage of IT diffusion without contacting with IT directors (e.g. CIO) in organizations, who are supposed to have sufficient experience to work with IT diffusion project. Thus, future research might examine the relationship among IT occupational subculture, knowledge sharing, and IT diffusion stage if researchers can reach more corporate participants.

CHAPTER 4: Differentiating Eustress from Distress: An Examination of Stress Associated with HIS Use across Organizational Culture

4.1. Introduction

Hospital Information Systems (HIS) can be defined as an integrated system that supports the comprehensive information requirements of hospitals, patients, clinical services, ancillary services, and financial management. Forty years ago, Wennberg and Gittelsohn (1973) believed that a population-based HIS could guide planning and regulatory decision-making in healthcare. With the rapid advancement of information technology, HIS have been popularized in medical institutions with the presumption to enhance productivity. However, the unintended consequences of HIS implementation on employees could be counterproductive. Strain might happen when employees are forced to speed up their rate of work or take on additional duties but don't have the needed knowledge/abilities to perform various tasks using HIS. On the other hand, there are also users who are able to cope with new computer technologies in a healthy manner and are motivated to actively participate in using HIS. Thus, the main purpose of this research is to explore the influence of HIS implementation on stress (both distress and eustress) and the associated consequences and antecedents. This study contributes to the research by providing insights into the impact of HIS use on distress and eustress and further developing and improving the job resources demand (JD-R) model.

There are many extensions of the JD-R model, such as the inclusion of personal resources (Demerouti and Bakker, 2011) and examining the effect of organizational climate (Bakker et al., 2010). In this study, we extend the JD-R model by adding personal resources and organizational culture. We examine the extended JD-R model in the context of using HIS for several reasons. First, previous stress models which have been applied in the IS area only examined the negative side of stress - distress (e.g. Ayyagari et al., 2011; Galluch et al., 2015; and Ragu-Nathan et al., 2008). One cannot ignore the positive side of stress - eustress. The JD-R model considers both the health impairment process (which leads to distress) and the motivational process (which leads to eustress). Second, the state of the art summary of the JD-R model (Demerouti and Bakker, 2011) indicates that personal resources may be the key to understanding the variation in perceived symptoms of stress and future research should examine the complex interaction between job demands, job resources, and personal resources. Third, although the effect of organizational culture on stress is modest and inconclusive, results of the research conducted by Lansisalmi et al. (2000) indicate that culture not only seems to impact the appraisal of stress, but also contains collective coping responses to stressors. Additionally, Joiner (2001) suggests that the alignment between organizational culture and societal culture is associated with lower reported job stress. Thus, it is necessary to examine stress from a cultural perspective. Although job-related stress has a variety of causes, the concentration of this study is the two forms of stress (distress and eustress) associated with the use of HIS. Basically, this model is focused on the relationships among distress as the negative

form of stress, eustress as the positive form of stress, HIS-enabled use demands, HIS-enabled use resources, personal resources, and organizational culture.

The rest of the paper is organized as follows. In section 2, we review theories and relevant research about the JD-R model and the person-environment (P-E) fit perspective. We then develop the research model and propose the research hypotheses in section 3. Section 4 discusses the research methodology used to test the hypotheses. Section 5 presents the results. Finally, the paper concludes with the discussion of findings, implications for theory and practice along with limitations of the study and opportunities for future research.

4.2. Literature Review

4.2.1. The Job Demands-Resources Model View of Stress

The job demands-resources (JD-R) model has been applied to examine the relationship between job characteristics, stress, and performance (Bakker et al., 2004). The underlying assumption of JD-R model is that whereas every occupation may have its own specific causes of employee well-being, these factors can be classified in two general categories: job demands and job resources (Demerouti et al., 2001). Thus, no matter what particular demands and resources involved, JD-R model is an overarching model that may be applied to various occupational settings. Job demands refer to "those physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological (cognitive and emotional) effort or skills and

are therefore associated with certain physiological and/or psychological costs" (Bakker and Demerouti, 2007, p. 312). Examples are a high work pressure, emotionally demanding interactions with clients. Although job demands are not always negative, they may turn into job stressors when the employee cannot recover from the high effort spent in meeting these demands (Meijman and Mulder, 1998). On the other hand, job resources refer to "those physical, psychological, social, or organizational aspects of the job that are either/or: functional in achieving work goals; reduce job demands and the associated physiological and psychological costs; stimulate personal growth, learning, and development"(Bakker and Demerouti, 2007, p. 312). Job resources may be located at the following levels: the organization (e.g., reward, career opportunities), interpersonal and social relations (e.g., supervisor and colleague support), the organization of work (e.g., role clarity, participation in decision making), and the task (e.g., performance feedback, skill variety) (Bakker et al., 2007).

Different from other well-known stress models, such as the demand-control model (Karasek, 1979, 1998) and the effort-reward imbalance model (Siegrist, 1996), the JD-R model indicates that there are two simultaneous psychological processes that play a role in the development of job strain and motivation (Bakker and Demerouti, 2007). In the first, the health impairment process, high job demands exhaust employees' mental and physical resources and therefore lead to the depletion of energy and to health problems, such as strain (Demerouti and Bakker, 2011). It

suggests that strain is a response to an imbalance between demands on the individual and the resources he or she has to deal with those demands. While the vast majority of stress models have concentrated on various negative outcome variables related to employee wellbeing, the JD-R model focuses on both negative and positive indicators. Contrast from the health impairment process, the second process proposed by the JD-R model is motivational in nature. It indicates that job resources motivate employee work engagement and can lead to improved performance. Moreover, the interaction between job resources and job demands plays an important role in the JD-R model, in that job resources are most beneficial in motivating or maintaining work engagement under conditions of high job demands (Bakker et al., 2007). This is in line with the coping hypothesis that under stressful conditions resources are more likely to be used as a coping mechanism or stress-reducing action (Bakker et al., 2010). Hence, job resources not only buffer the effect of job demands on stress, but also are valued in their own right. Figure 4.1 depicts the two different processes in the development of job-related strain and motivation of the JD-R model.

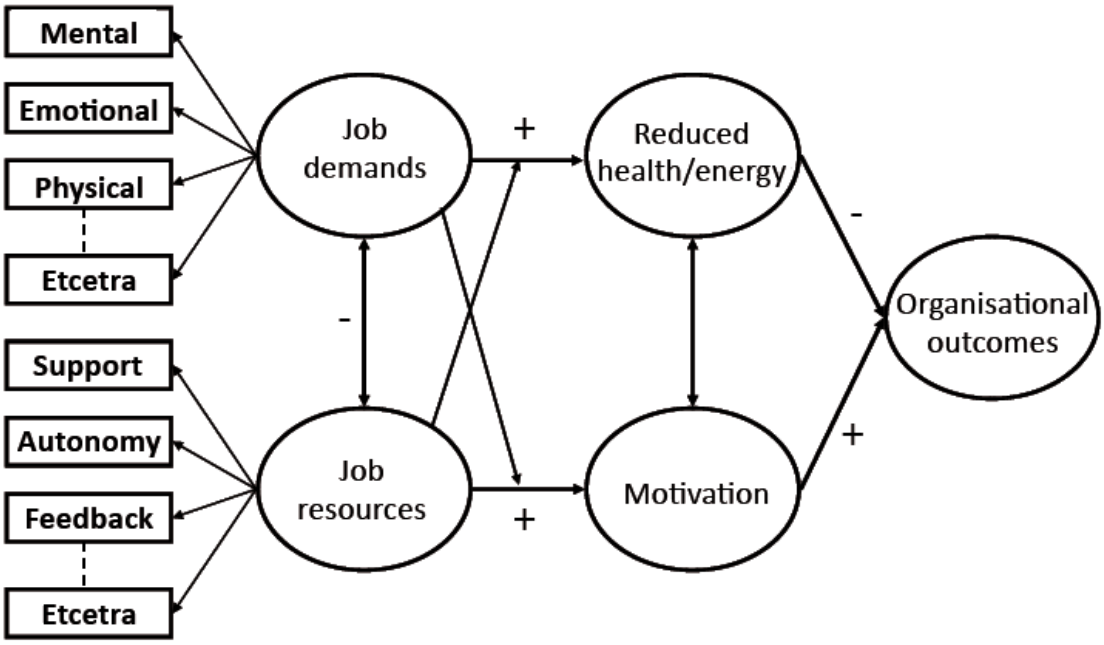


Figure 4.1 Job Demands-Resources Model (Source: Demerouti and Bakker (2011), p. 3)

4.2.2. Person–Environment Fit Model

The person-environment (P-E) fit model of stress is a widely accepted approach among organizational stress researchers (e.g. Edwards, Caplan, and Harrison, 1998; Edwards and Rothbard, 1999). It's based on the transactional perspective of stress, which suggests that stress is not a factor of the individual nor the environment, but rather an embedded ongoing process that involves individuals transacting with their environment, making judgments, and coping with issues that arise (Cooper et al., 2001). If the environment is appraised as taxing, people cope (Galluch et al., 2015).

The core premise of P-E fit theory is that strain arises not from the person (e.g. abilities, values) or environment (the context around the individual, e.g. demands,

supplies) separately, but rather by their fit or congruence with one another (Edwards et al., 1998). Specifically, if the relationship between people and their environment is out of equilibrium, individual needs or job demands cannot be satisfied, which leads to strain (Cooper, et al., 2001). Edwards and Cooper (1990) summarized the reasons for the widespread acceptance of P-E fit approach to stress and indicated that: first, the other available alternative models, such as the stimulus and response approach, have serious shortcomings; second, the general framework of P-E fit is rooted in psychology, tracing back to the influential writers as Lewin (1951) and Murray (1938); third, it makes sense that the person and the environment should be treated as joint determinants of stress-related outcomes, considering that one man's meat is another man's poison.

French et al., (1982) provides a comprehensive treatment of the P-E fit approach, which involves two distinct versions of P-E fit. The first one emphasizes the correspondence between environmental supplies and personal motives, goals, and values (i.e. S-V fit). It characterizes needs in general terms, encompassing innate biological and psychological requirements, values acquired through learning and socialization, and motives to achieve desired ends; and supplies refer to extrinsic and intrinsic resources and rewards that may fulfill the person's needs (Edwards, et al., 1998). The other one emphasizes the correspondence between environmental demands and personal skills and abilities (i.e. D-A fit). Demands include quantitative and qualitative job requirements, role expectations, and group and organizational

norms, while abilities include aptitudes, skills, training, time, and energy the person has to meet demands. Further, French et al., (1982) indicate that P and E can be described both objectively and subjectively. While objective P and E refers to the variables that exist independently of people's perception, subjective P and E refers to the variables that are perceived by the individual. Thus, subjective S-V or D-A misfit leads to negative psychological, physiological, and behavioral outcomes of stress, called as "strain" (Edwards and Cooper, 1990).

4.2.3. Distress and Eustress

The JD–R model indicates that there are two different underlying psychological processes that play a role in the development of job-related strain and motivation: health impairment and motivation (Bakker and Demerouti, 2007). In the first, the health impairment process, chronic job demands exhaust employees' mental and physical resources and may therefore lead to the depletion of energy (i.e. a state of distress) and to health problems (e.g. Demerouti et al., 2001; Demerouti and Bakker, 2011). According to the cognitive-energetical framework for the analysis of effects of stress and high workload on human performance (Robert and Hockey, 1997), performance may be protected under stress by the recruitment of further resources, but only at the expense of increased subjective effort, and behavioral and physiological costs. Thus, the greater the effort spent in protecting performance, the greater the physiological costs for the individual. Over time, latent detrimental under performance protection may be indicated through the disruption of subsidiary

activities or the use of less efficient strategies, as well as increased strain and fatigue after-effects. The second process is motivational in nature in that job resources may play either an intrinsic motivational role because they foster employees' growth, learning, and development, or they may play an extrinsic motivational role because they are instrumental in achieving work goals (Bakker and Demerouti, 2007). Job resources may play an intrinsic motivational role, because learning new skills can improve work competence. In the latter case, the extrinsic motivational factors of job resources, such as encouragement, feedback, and rewards as well as a supportive work environment increase the likelihood of being successful in achieving one's work goals.

"Stress" was first termed by Selye (1964) and defined as "...the non-specific response of the body to any demand placed upon it." (Selye, 1987, p. 17). Selye differentiated between distress and eustress that were originally both part of the larger definition of stress but were regarded as distinct from each other. Distress occurs when the demands placed on the individual exceed his or her capacity to expend energy in maintaining homeostasis (Le Fevre et al., 2003). Contrasting the negative or distressful responses that are the frequent sole topic of previous research about stress, eustress represents positive responses to external stressors. Le Fevre et al., (2006) reviewed the relevant literature and concluded that whether stressors lead to distress or eustress is determined not only by the perception of the amount of demand, but also by the perception of other characteristics such as source, timing, the degree to which

people have control over stressors, and the degree to which people consider stressors desirable. According to Selye, eustress is motivational in nature, which is illustrated by problem-focused coping, involvement, and work achievement. Distress, in contrast, might elicit avoidance behaviors and withdrawal from the task at hand (Van den Broeck, et al., 2010).

The concept of eustress is also supported by Cavanaugh et al. (2000) who differentiated self-reported stress into challenge stress and hindrance stress. Challenge stress was defined as ". . . self-reported work stress associated with positive work outcomes" (Cavanaugh et al., 2000, p. 66), and likened to eustress. Hindrance stress was defined as ". . . job demands or work circumstances that involve excessive or undesirable constraints that interfere with or hinder an individual's ability to achieve valued goals" (Cavanaugh et al., 2000, p. 67), and likened to distress. Their study indicated that challenge-related self-reported stress is positively related to job satisfaction and negatively related to job search (which includes behavioral search activities such as revising a resume or going to a job interview). In contrast, hindrance-related self-reported stress is negatively related to job satisfaction and positively related to job search and turnover. Further, Van den Broeck, et al. (2010) found that job hindrances were positively associated with exhaustion (i.e., the main component of burnout) and negatively associated with vigor (i.e., the main component of work engagement), while job challenges were positively related to vigor but unrelated to exhaustion.

Eustress can be characterized by work engagement. Since the implementation of an organizational information system is likely to produce widespread organizational changes,such as the redesign of business processes and patterns of work flow (Ke and Wei, 2008), how actively employees embrace the new information system into their daily job is a big concern among organizational managers and executives. There is widespread interest in employee engagement, which generally refers to the behaviors by which employees bring in or leave out their personal selves during work role performance (such as Goffman, 1961). It was originally defined by Kahn (1990, p. 694) as "harnessing of organization members' selves to their work roles by which they employ and express themselves physically, cognitively, and emotionally during role performances", and later defined by Schaufeli, et al. (2002, p. 74) as "a positive, fulfilling, work related state of mind characterized by vigor, dedication, and absorption".

Previous studies have indicated that eustress has positive consequences at both the individual and organizational levels. Eustress, illustrated by work engagement, is considered to be the antipode of burnout. Engaged employees have a sense of an energetic and effective connection with their work activities, and they believe that they can deal well with the demands of their jobs (Schaufeli, et al., 2006). Schaufeli and Bakker (2004) tested the different roles (predictors and consequences) of burnout and engagement and found that burnout was mainly predicted by job demands but also by lack of job resources, whereas engagement was solely predicted by available

job resources; burnout was related to both health problems and to turnover intention, while engagement was related only to the turnover intention; burnout mediated the relationship between job demands and health problems, while engagement mediated the relationship between job resources and turnover intention.

4.2.4. Personal Resources

According to Selye (1964), eustress was dependent not on the amount of stimulus, but primarily on how people interpreted the stressors that they were experiencing and how they chose to react to it. Thus, personal resources were added into the JD–R model as an important extension. Personal resources are aspects of self that are linked to resiliency and refer to individuals' sense of their ability to successfully control and impact their environment (Hobfoll, et al., 2003). Xanthopoulou, Bakker, Demerouti and Schaufeli (2007) examined the role of three personal resources (self-efficacy, organizational-based self-esteem and optimism) in predicting exhaustion and work engagement and found that personal resources did not offset the relationship between job demands and exhaustion, while personal resources mediated the relationship between job resources and engagement and influenced the perception of job resources. Based on the conservation of resources theory, a longitudinal research study examining relationships between job resources, personal resources, and work engagement indicated that job and personal resources related positively to the following work engagement, and reciprocally, work engagement related positively to job and personal resources (Xanthopoulou et al., 2009a). Luthans and Youssef (2007)

illustrated that personal resources were strongly related to various aspects of work related well-being because they were positively associated with individuals' self-regard, which inherently motivated individuals to accomplish the goals they set, thus leading to satisfaction.

Luthans and Youssef (2007) defined that there are four resources of positive psychological capacities (i.e. efficacy, optimism, hope, and resiliency). Based on Bandura's (1986, 1997, 2001) social cognitive theory and extensive empirical studies, Stajkovic and Luthans (1998) defined self-efficacy in the workplace as "one's conviction (or confidence) about his or her abilities to mobilize the motivation, cognitive resources, and courses of action needed to successfully execute a specific task within a given context" (p. 66). Often associated with confidence, self-efficacy can motivate people by influencing the challenges they pursue, the effort they spend, and their perseverance when faced with obstacles (Bandura, 1989). Self-efficacious individuals have been found to better accomplish their goals by employing cognitive capacities such as symbolizing, forethought, observation, self-regulation, and self-reflection (Bandura, 1997), which can facilitate preparation for critical and challenging encounters, enhance self-motivation, and promote learning from others and past experience (Luthans and Youssef, 2007).

Similar to self-efficacy, optimism is also related to higher well-being levels (Scheier et al., 2001). Optimism is defined in terms of generalized outcome expectations that

optimists have the tendency to believe that one will generally experience good outcomes in life (Scheier et al., 1994). As an attribution, optimism explains positive events through personal, permanent, and pervasive causes and negative events through external, temporary, and situation-specific ones. In contrast, pessimism explains positive events through external, temporary, and situation-specific causes and negative events through internal, permanent, and pervasive ones (Peterson and Steen, 2002; Seligman, 1998). Thus, optimists are motivated by their positive expectations that they can solve difficult problems and conduct coping behavior, while pessimists are hindered by self-doubt and negative expectancies (Carver and Scheier, 2002).

Besides efficacy and optimism, hope and resiliency are also the state-like psychological resource capacities (Luthans and Youssef, 2007). Hope is defined as "a positive motivational state that is based on an interactively derived sense of successful (1) agency (goal directed energy) and (2) pathways (planning to meet goals)" (Snyder, et al., 1991, p. 287). Luthans (2002, p.702) defines resiliency as "the capacity to rebound or bounce back from adversity, conflict, failure, or even positive events, progress, and increased responsibility".

Comparing with the four sources of positive psychological capacities, positive framing is a more general concept which refers to the imposition of cognitive self-control or self-management to reframe a potential difficult or negative situation as a positive gain rather than a loss (Ashford and Black, 1996; Cox and Klinger, 2004).

Folkman (1984) labeled positive framing as primary appraisal and indicated its influence on subsequent coping responses under stress. Taylor and Brown (1988) also noted the beneficial effects of positive framing on stress, recovery from illness, depression, and capability of creative and productive work.

4.2.5. Organizational Culture

In general, culture is defined as a general shared understanding, which results from commonly held assumptions and views of the world among organizational, group, and occupational members (Weber and Camerer, 2003; Guzman et al., 2008). In analyzing culture at the organizational level, Schein (1990) found that culture manifests itself through three fundamental levels: observable artifacts, values, and basic underlying assumptions. According to Schein (2010), the basic underlying assumptions are the core of the culture, the level of espoused values reflect what is thought to be ideal (i.e. the underlying assumptions) and what is appropriate to present publicly, and the level of observable artifacts manifest culture through everyday behavior which is determined by the complicated compromise among the espoused values, the core assumptions, and the specific situation at the moment. Based on the Schein's three-level culture framework, a majority of studies qualitatively conceptualized organizational culture from the level of values and quantitatively divided organizational culture into different typologies. Schein (1992, p. 12) defined organizational culture as "A pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that

has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way you perceive, think, and feel in relation to those problems".

Conceptually based on the Competing Values Framework (CVF), Quinn and Spreitzer (1991) divided organizational culture into four typologies - development culture, group culture, hierarchical culture, and rational culture from internal vs. external value orientation as well as stability vs. flexibility value orientation. The development culture emphasizes flexibility, change, and the external environment, in which the core values include growth, stimulation, creativity, and resource acquisition. The group culture emphasizes flexibility and the internal organization, in which the core values include belonging, attachment, cohesiveness, trust and participation. The hierarchical culture emphasizes stability and the logic of the internal organization, in which the core values include uniformity, security, order, rules, control, coordination, regulations and efficiency. Rational culture emphasizes internal stability and external environment, in which the core values include planning, productivity, efficiency and the successful achievement of predetermined goals (Denison and Mishra, 1995; Quinn and Spreitzer, 1991). Following Quinn and Spreitzer (1991), Shao et al. (2012) developed a theoretical model to explore the mediating effect of organizational culture and knowledge sharing on transformational leadership and Enterprise Resource Planning (ERP) system success. They suggested that development culture

has direct impact on ERP success, while hierarchical, group, and rational culture are indirectly related to ERP success, mediated by explicit and tacit knowledge sharing.

Based on Hurley and Hult's (1998) organizational cultural characteristics, Ke and Wei (2007) classified organizational culture into five dimensions — learning and development, participative decision making, support and collaboration, power sharing, and tolerance for conflicts and risk. They indicated that these traits are needed in ERP implementations and defined them as follows: "learning and development refers to an emphasis on individual learning and development; participative decision-making culture encourages employees to participate in the firm's decision-making process; a culture of collegial support and collaboration helps employees cooperate with each other and makes them ready to offer needed help; power sharing reduces focus on turf, politics, and status; communication refers to the organization's internal and external information exchange and interaction; tolerance for conflicts and risk taking measures the degree to which the organization accepts conflicts and risk" (Ke and Wei, 2007, p. 211). Ke and Wei (2007) theorized how leadership affects ERP implementations by fostering the desired organizational culture and propose that ERP implementation success is positively related to organizational culture along the dimensions of learning and development, participative decision making, power sharing, support and collaboration, and tolerance for risk and conflicts.

4.3. Hypotheses Development

Using both JD-R model and P-E fit model of stress as overarching research framework, Figure 4.2 presents the research model and Table 4.1 presents construct definitions. Through the interaction with HIS, individuals perceive objective characteristics of HIS and generate subjective feelings toward the HIS. The model represents stressors created by the use of HIS as three variables: HIS-complexity, HIS-overload, and HIS-uncertainty. These variables represent the HIS-enabled use demands. In the health impairment process, HIS-enabled use demands lead to distress. Dealing with the demands created by the use of HIS, as well as facilitating better use of HIS, HIS-enabled organizational resources are operationalized in this study as literacy support, technical support provision, technology involvement facilitation, and innovation support. We argue that, by embracing relevant resources, the distress caused by the demands of using HIS would be buffered and individuals are motivated to overcome challenges associated with the use of HIS. Moreover, we evaluate the impact of individual resources (i.e. general perceived self-efficacy and positive framing) and organizational culture on the overall process leading to distress and eustress.

Construct	Definition
Perceived HIS-enabled use demands	The perceived factors that are enabled by the use of HIS and stress individuals.
Perceived HIS-complexity	The perceived situations that the complexity associated with HIS leads users to feel inadequate with regard to their computer skills and forces them to spend time and effort in learning and understanding HIS.
Perceived HIS-overload	The perceived situations that users are forced by HIS to work more and work faster.
Perceived HIS-uncertainty	The perceived situations that continuing changes and upgrades to HIS do not give users a chance to develop a base of experience for the features of HIS.
Perceived HIS-enabled use resources	The perceived organizational mechanisms that are triggered by the use of HIS and are either/or: 1. functional in achieving work goals of using HIS 2. reduce HIS-enabled use demands and the associated physiological and psychological costs 3. stimulate personal growth, learning, and development in using HIS.
Perceived literacy support	The perceived mechanisms to help HIS users cope with the demands of learning about HIS.
Perceived technical support provision	The perceived mechanisms to address HIS users' anxiety about potentially disruptive mistakes and technical problems.
Perceived technology involvement facilitation	The perceived mechanisms to encourage users to explore and familiar with HIS.
Perceived innovation support	The perceived mechanisms to help HIS users learn about and accept HIS-driven changes in their routines and tasks.
Personal resources	The aspects of self that are linked to resiliency and sense of capability to successfully control and impact environment.
The general perceived self-efficacy	An optimistic self-belief that one can perform a novel or difficult tasks, or cope with adversity.
Positive framing	The imposition of cognitive self-control to reframe a potential difficult or negative situation as positive gains rather than losses.
Distress	The negative responses to external stressors.
Eustress	The positive responses to external stressors.
Espoused organizational culture	The degree to which an individual embraces the values of his or her organizational culture.
Espoused innovativeness	An employee's perception about the organization's orientation toward openness to new ideas.
Espoused participative decision making	An employee's perception about the degree to which employees are encouraged to participate in the organization's decision-making process.
Espoused power sharing	An employee's perception about the degree to which the organization facilitates collaboration and sharing of information and resources
Espoused support and collaboration	An employee's perception about the degree to which employees within the organization are willing to cooperate with each other and ready to offer needed help.
Espoused learning and development	An employee's perception about the degree to which the organization emphasizes on individual learning and development.

Table 4.1 Construct Definitions

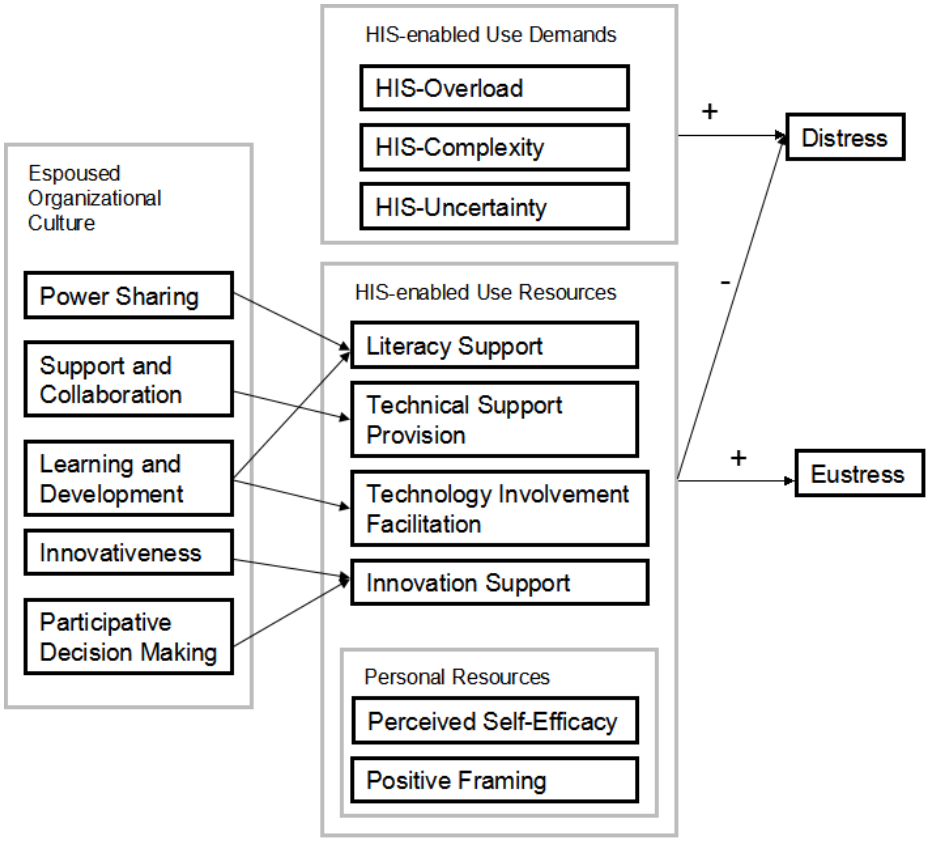


Figure 4.2 Research Model

4.3.1. The Effect of HIS-Enabled Use Demands

The transactional perspective of stress suggests that stress is an embedded ongoing process that involves individuals transacting with their environment, making judgments, and coping with raised issues (Cooper et al., 2001). As the first pioneers examined the phenomenon of technostress — stress experienced by end users of Information and Communication Technologies (ICTs), Ragu-Nathan et al. (2008) added to the transaction-based approach by identifying and validating stressors associated with the use of ICTs: techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty. Drawing from the theoretical lens of the

person–environment fit model Edwards, (1996) found that strain is caused from the lack of fit between the characteristics of people and their environment (the context around the individual), Ayyagari et al. (2011) examined certain characteristics of ICTs — like usability (usefulness, complexity, and reliability), intrusiveness (presenteeism, anonymity), and dynamism (pace of change) — that were related to stressors (work overload, role ambiguity, invasion of privacy, work–home conflict, and job insecurity). Rooted in both the person–environment fit model and the transactional perspective of stress, Galluch et al. (2015) identified two types of stressors: chronic and episodic. While a chronic stressor is a long-term, consistent, or reoccurring pressure in one's life, an episodic stressor is a transitory negative event that occurs periodically but is not ongoing (Cooper et al., 2001). Galluch et al. (2015) focused on episodic stressors as reflected in ICT-enabled interruptions: quantity demand and content of ICT-enabled interruptions (message profile).

In terms of technology characteristics, a HIS is a specialized ICT that is useful, sophisticated, always updated but not intrusive. *HIS-enabled use demands* represent the factors that are supported by the use of HIS and stress individuals. It refers to aspects of HIS usage that require effort and therefore are associated with costs. HIS-enabled use demands are different from occupational demands in the way that stressors are the use of HIS, not the occupation itself. Further, job related stressors can be classified into physical stressors and task related stressors (Ayyagari et al., 2011). While physical stressors (such as noise, temperature, and vibration) are not relevant to

the use of HIS, task related stressors can be counted as HIS-enabled use demands when the task is associated with the use of HIS.

Although demands may not necessarily be bad, within the JD–R model the main role of demands is seen in the health impairment process (Demerouti and Bakker, 2011). Healthcare professionals experience technostress when they cannot adapt to, or cope with, information technologies in a healthy manner (Tarafdar et al., 2011). HIS can create stress in a variety of ways. First of all, although the purpose of HIS is to manage all the information to allow health care providers to do their jobs effectively, it might be too complex for them to adapt to this complicated system. The development of HIS is associated with the shift from paper-based to computer-based processing and storage, as well as the increase in the amount of data in health care settings (Haux, 2006). Thus, HIS users might find it intimidating to learn and use this system. Complexity refers to the degree to which the use of technology is free of effort and is perceived as relatively difficult to understand and use (Venkatesh et al., 2003). Following the definition developed by Ragu-Nathan et al. (2008), *HIS-complexity* describes situations where the complexity associated with HIS leads users to feel inadequate with regard to their computer skills and forces them to spend time and effort in learning and understanding HIS.

HIS have a number of features. Furthermore, users have to learn how to use these features. The high complexity of HIS creates a knowledge barrier that requires users to spend more effort to bridge the gap. The implementation of HIS leads to an

increased speed of workflow and heightened expectations for productivity. Thus, users of HIS have to work under time pressures and strict deadlines. HIS users who are persuaded to work such pressures and deadlines would perceive a higher degree of work overload. *HIS-overload* refers to the situations that users are forced by HIS to work more and work faster (Tarafdar, et al., 2011). While employees with time-flexible work policies reported less stress, higher levels of commitment to their employer, and reduced costs to the organization because of fewer absences, fewer days late, and fewer missed deadlines (Halpern, 2005), pressures of perceived tech-overload resulted from use of HIS create stress.

Last but not the least, HIS always need to be updated and users might feel unsettled by continual upgrades and accompanying software and hardware changes. There has been a steady increase of new technologies added into HIS, including ubiquitous computing environments and sensor-based technologies for health monitoring (Haux, 2006). *HIS-uncertainty* emerges in situations where continuing changes and upgrades to HIS do not give users a chance to develop a base of experience for the features of the HIS (Tarafdar, et al., 2011). Constant requirements for learning new features and updating knowledge make users feel unsettled and create stress. Since the HIS implementation processes is a careful balancing act between initiating organizational change, and drawing upon IS as a change agent (Berg, 2001), HIS-uncertainty hampers HIS implementation processes and makes it an even harder task.

Since the relationship between the identified stressors (i.e. job demands created by the use of HIS) and distress has been well established in the extensive technostress literature (e.g., Ayyagari et al., 2011; Ragu-Nathan et al., 2008; Tarafdar et al., 2011), we hypothesize

H1a: Perceived job demand created by the use of HIS (HIS-complexity) is positively related to distress.

H1b: Perceived job demand created by the use of HIS (HIS-overload) is positively related to distress.

H1c: Perceived job demand created by the use of HIS (HIS-uncertainty) is positively related to distress.

4.3.2. The Effect of HIS-Enabled Use Resources

Following the definition of job resources (Demerouti and Bakker, 2011), *HIS-enabled use resources* refer to those organizational mechanisms that are triggered by the use of HIS and are:

1. Functional in achieving work goals of using HIS,

2. Reduce HIS-enabled use demands and the associated physiological and psychological costs, or

3. Stimulate personal growth, learning, and development in using HIS.

Thus, HIS-enabled use resources not only can buffer the intensity and outcomes of HIS-enabled use demands, but also can motivate HIS users to perform their jobs well, which plays into the role of both technostress inhibitors and work motivation. The first mechanism of HIS-enabled use resources is *literacy support*, which refers to mechanisms to help HIS users cope with the demands of learning about HIS (Ragu-Nathan et al., 2008; Tarafdar et al., 2011), such as training, teamwork and knowledge sharing. Sykes (2015) reviewed studies published in two leading information systems journals—namely, *MIS Quarterly* and *Information Systems Research*—since 2006 and identified six relevant organizational support structures that help employees in coping with new enterprise systems implementations (namely, training, online support, help desk support, change management support, top management support, and expert users). Further, she selected four traditional support structures (TSS - training, online support, help desk support, and change management support) and compared their impact on employee outcomes (system satisfaction, job stress, job satisfaction, and job performance) in the context of the shakedown phase of an enterprise system implementation with that of peer advice ties, which are self-organizing entities among fellow employees. She found that while TSS indeed can predict the various outcomes, peer advice ties are a much stronger predictor. Venkatesh et al., 2011 found that a key barrier to success of E-healthcare systems is the availability of adequate training and support. Typically e-healthcare systems are inflicted on healthcare professionals with little or no training or process change support, thus resulting in adoption taking much longer than expected and benefits not being realized for a long time. Literacy support

is related to two traditional support structures (training and online support) and also to peer advice ties. Literacy support plays not only an intrinsic motivational role because it fosters employees' learning and satisfies their need to belong, thereby increasing their job competence, but also an extrinsic motivational role because training is instrumental in achieving work goals.

The second mechanism that can alleviate anxiety of using HIS is providing technical support when users need help. *Technical support provision* is the mechanisms to address HIS users' anxiety about potentially disruptive mistakes and technical problems (Ragu-Nathan et al., 2008; Tarafdar et al., 2011). Help desk workers possess technical knowledge about the launched information system and are typically able to help users faced with software-related problems (Sykes, 2015). Technical support is provided by the help desk service, which is a dedicated team that attends to the queries and requests of the HIS users, thus trying to make this initiative more reachable and useful (Ravishankar et al., 2011). Similar to literacy support, technical support plays an intrinsic motivational role because it satisfies employees' needs to belong, as well as psychological and job safety needs. Technical support also plays an extrinsic motivational role, because, according to the effort-recovery model (Meijman and Mulder, 1998), work environments that offer many resources can foster employees' willingness to dedicate their efforts and abilities to the work task. Thus the task can be completed successfully and the work goal will be more likely to be attained.

The third mechanism that can promote the use of HIS is to motivate users to explore HIS. *Technology involvement facilitation* refers to mechanisms to encourage users to explore and familiarize themselves with the HIS. Bhattacherjee (2011) argues that value of IT investments is only realized by organizations when users engage in ongoing behaviors at the post-adoption stage. Technology involvement facilitation are motivational drivers enabled by the organization and may stimulate individual exploration of a technology. Monitoring and feedback have been examined as the organizational strategy to encourage the development of new system habits and to make users more aware of their behavior (Polites and Karahanna, 2013). People who know that they are being monitored while at work tend to become much more aware of what they are doing (Wood et al., 2002) and are more likely to follow the actions (such as using HIS) that are preferred by the organization. Meanwhile, proper feedback and rewards foster learning, thereby increasing employees' job competitiveness and relieving the pressure associated with using the new system. This mechanism and context manipulation helps users become familiar with HIS from the beginning, thus decreasing the impact of stressful situations during use (Clark and Kalin, 1996; Ragu-Nathan et al., 2008)

Besides technology involvement facilitation, research on post-adoption use of technology suggests that the true gains from IT investments are realized when users attempt to incorporate IT into their work practices (Maruping and Magni, 2015). *Innovation support* refers to mechanisms to help HIS users learn about and accept

HIS-driven changes in their routines and tasks (Tarafdar et al., 2011). The change management literature suggests that managerial strategies can release employee stress by providing the employee with empathy, support, and slack resources (Polites and Karahanna, 2013). Kim and Kankanhalli (2009) found that the perceived facilitation provided by the organization makes users' adaptation to the new IS related change easier, which can be termed organizational support for change. Organizational support for change is likely to reduce the perceived difficulty of adapting to the new IS and to lower the required effort of learning the new way of working, and therefore can reduce the impact of technostress. With innovation support, employees are motivated to use and adapt HIS and try out new features without worrying about the potential consequences associated with risk taking.

Thus, we hypothesize

H2a: Perceived job resource associated with the use of HIS (literacy support) is positively related to eustress.

H2b: Perceived job resource associated with the use of HIS (technical support provision) is positively related to eustress.

H2c: Perceived job resource associated with the use of HIS (technology involvement facilitation) is positively related to eustress.

H2d: Perceived job resource associated with the use of HIS (innovation support) is positively related to eustress.

H3a: Perceived job resource associated with the use of HIS (literacy support) is negatively related to distress.

H3b: Perceived job resource associated with the use of HIS (technical support provision) is negatively related to distress.

H3c: Perceived job resource associated with the use of HIS (technology involvement facilitation) is negatively related to distress.

H3d: Perceived job resource associated with the use of HIS (innovation support) is negatively related to distress.

4.3.3. The Effect of Personal Resources

In this study, general perceived self-efficacy and positive framing are examined as two components of personal resources. Similar to but different from effort expectancy, which is defined as the degree of ease associated with the use of the systems and has been widely investigated in the IT acceptance and diffusion studies (e.g. Davis, 1989; Venkatesh, 2000; Venkatesh, et al., 2003), general perceived self-efficacy is used to predict coping with daily hassles as well as adaptation after experiencing all kinds of stressful life events (Schwarzer and Jerusalem, 1995). According to Schwarzer (1992), *general perceived self-efficacy* reflects an optimistic self-belief that one can perform novel or difficult tasks, or cope with adversity - in various domains of human functioning. It can be treated as a positive resistance resource factor which facilitates goal-setting, effort investment, persistence in face of barriers, and recovery from

setbacks. Thus, with general perceived self-efficacy, individuals are self-motivated to deal with obstacles and challenges and are less likely to become hassled or distressed.

The other personal resource is *positive framing*, which is the imposition of cognitive self-control to reframe a potentially difficult or negative situation as positive gains rather than losses (Ashford and Black, 1996; Cox and Klinger, 2004). Positive framing explains positive events through personal, permanent, and pervasive causes and negative events through external, temporary, and situation-specific ones; while negative attitude explains positive events through external, temporary, and situation-specific causes and negative events through internal, permanent, and pervasive ones (Peterson and Steen, 2002; Seligman, 1998). Lazarus and Folkman (1984) proposed that distress happened when people believe that they lack the resources to deal with difficult events. Following the same logic, we argue that people with positive framing would experience eustress when they look on the bright side of challenges and believe that they can solve difficult problems.

We hypothesize

H4a: Personal resource (the general perceived self-efficacy) is positively related to eustress.

H4b: Personal resource (positive framing) is positively related to eustress.

H5a: Personal resource (the general perceived self-efficacy) is negatively related to distress.

H5b: Personal resource (positive framing) is negatively related to distress.

4.3.4. The Effect of Espoused Organizational Culture

Organizational culture is defined as a general shared understanding within an organization, which arises from commonly held values, beliefs and assumptions and influences employees' perceptions and behavior (Schein, 1992). Organizational culture is important for the success of implementing HIS when associated with organizational changes. According to Hofstede (1991, p. 5), culture is "learned, not inherited. It derived from one's social environment, not from one's genes. The collective programming of the mind distinguishes the members of one group or category of people from another".

Contrary to much of the prior research that investigated how national culture impacts individual behavior (e.g. Cardon and Marshall 2008; Veiga et al. 2001), Srite and Karahanna (2006) formulated culture at the individual level through their use of espoused cultural values. Espoused national cultural values refer to "the degree to which an individual embraces the values of his or her national culture" (Srite and Karahanna 2006, p. 681). In this study, embracing the concept of "espoused", the *espoused organizational culture* is defined as the degree to which an individual embraces the values of his or her organizational culture. Building on Hurley and Hult's (1998) organizational cultural characteristics, five dimensions of espoused organizational cultural values: innovativeness, participative decision making, power

sharing, support and collaboration, and learning and development, are used to examine how culture impact employee's perceived job resources to deal with stress in the context of HIS implementation.

According to the person-environment (P-E) fit model of stress, P and E can be described both objectively and subjectively while only the subjective environment is perceived by the individual (French et al., 1982). Moreover, distress arises from the misfit between a person's values and the resources or supplies around the individual (Edwards et al., 1998). Since espoused organizational culture is a set of commonly-held values, beliefs, and assumptions owned by an employee, it influences the employee's perception and behavior. Thus, we propose that espoused organizational cultural values determine employees' perception towards HIS-enabled job resources, and that they therefore influence how employees deal with stress and their work engagement.

Specifically, the first dimension of espoused organizational cultural values is espoused innovativeness. Innovativeness, as an aspect of organizational culture, is the notion of openness to new ideas, which measures the organization's orientation toward innovation. It has been found that the receptivity to new ideas and invention affects the group's capacity to innovate (Hurley and Hult, 1998). In this study, *espoused innovativeness* is an employee's perception about the organization's orientation toward openness to new *ideas.* As mentioned before, innovation support (as a HIS-enabled job resource) refers to the mechanisms to help IS users learn about

and accept IS-driven changes in their routines and tasks. Objectively speaking, when the organizational culture is equipped for innovation, the organization is more likely to support specific innovations (e.g. HIS implementation and usage). Through a subjective point of view, if an employee can perceive a high degree of innovativeness within the organization, it would be more likely that the employee would perceive an innovation support resource. Following this logic, we hypothesize:

H6a: An Espoused organizational innovativeness culture is positively related to perceived innovation support.

The second dimension of espoused organizational cultural values is espoused participative decision making. Participative decision making is a culture that encourages employees to participate in the organization's decision-making process (Ke and Wei, 2008). In this study, *espoused participative decision making* is an employee's perception about the degree to which employees are encouraged to participate in the organization's decision-making process. Different from other one-step suite software package, HIS implementation needs employees from different department with different job titles (e.g. doctors, nurses, front desk staff, etc) to set up the system packages and participate in the business process redesign, and HIS system configuration and adaptation. According to the summary of Hurley and Hult (1998), a culture of participative decision making increases employees' involvement and commitment to innovation, perceived freedom to act, and innovation, as well as information flow and communication both up and down the firm. This participation

provides employees a sense of ownership and facilitates their learning about, and accepting, HIS-driven changes in their routines and tasks. Thus, we hypothesize:

H6b: An espoused organizational participative decision making culture is positively related to perceived innovation support.

The third dimension of espoused organizational cultural values is espoused power sharing. Power sharing is a culture that facilitates collaboration and sharing of information and resources necessary for implementation (Hurley and Hult, 1998). In this study, *espoused power sharing* is an employee's perception about the degree to which the organization facilitates collaboration and sharing of information and resources. Literacy support, as a HIS-enabled job resource, refers to the mechanisms to help HIS users cope with the demands of learning about new HIS through training, knowledge sharing, and teamwork. Thus, we hypothesize that the organizational power sharing culture, as a behavior guideline, can positively facilitate the development of an employee's perception about literacy support. Thus, we hypothesize:

H6c: An espoused organizational power sharing culture is positively related to perceived literacy support.

The fourth cultural dimension is espoused support and collaboration. Support and collaboration is a culture employees where are willing to cooperate with each other and are ready to offer needed help (Ke and Wei, 2008). In this study, *espoused*

support and collaboration is an employee's perception about the degree to which employees within the organization are willing to cooperate with each other and ready to offer needed help. A culture of support and collaboration helps employees in reducing fear and increasing cross-fertilization and cross-functional support (Hurley and Hult, 1998). As a HIS-enabled job resource, the technical support provision refers to the mechanisms to address HIS users' anxiety about potentially disruptive mistakes and technical problems. Thus, we hypothesize that an organizational support and collaboration culture, as a behavior guideline, can positively facilitate the development of an employee's perception about technical support provision. Thus, we hypothesize:

H6d: An espoused organizational support and collaboration culture is positively related to the perceived technical support provision.

The last dimension of espoused organizational cultural values is espoused learning and development. Learning and development is a culture that places an emphasis on individual learning and development (Ke and Wei, 2008). In this study, *espoused learning and development* is an employee's perception about the degree to which the organization emphasizes individual learning and development. As mentioned before, technology involvement facilitation (as a HIS-enabled job resource) refers to the mechanisms to keep HIS users informed and familiar with a new HIS. Another HIS-enabled job resource, literacy support, refers to the mechanisms to help HIS users cope with the demands of learning about new HIS through training, knowledge

sharing, and teamwork. Thus, we hypothesize that an organizational learning and development culture, as a behavior guideline, can positively facilitate the development of an employee's perception about technology involvement facilitation and literature support. Thus, we hypothesize:

H6e: An espoused organizational learning and development culture is positively related to perceived technology involvement facilitation.

H6f: An espoused organizational learning and development culture is positively related to perceived literature support.

4.4. Research Methodology

4.4.1 Instrument Development

Most of the measurement items were adapted and/or revised from previous research. HIS-enabled use demands (HIS-Overload, HIS-Complexity, and HIS-Uncertainty) and HIS-enabled use resources (literacy support, technical support provision, technology involvement facilitation, and innovation support) were assessed using scales derived from Tarafdar et al. (2011). In terms of individual resources, we used the scale developed by Schwarzer and Jerusalem (1993) to measure the general perceived self-efficacy; and positive framing was measured by survey items created by Ashford and Black (1996). The construct of eustress was measured using survey items adapted from O'Sullivan (2011). Finally, the validated scales from Hurley and Hult (1998) were used to measure espoused organizational culture, namely

innovativeness, participative decision-making, power sharing, support and collaboration, and learning and development. All of these constructs were measured by respondents' perception and their subjective feelings. They were all measured using 7-point Likert-type scales with "1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Neither agree or disagree, 5 = Somewhat agree, 6 = Agree, and 7 = Strongly agree". The control variables (age, gender, computer confidence, previous training, and the HIS use duration and frequency), specific module usage, and demographics were assessed as background information.

A draft survey was developed mainly based on measures identified in the literature. After compiling the English version of the questionnaire, the draft survey items were first translated into Chinese by a bilingual research associate and then verified, refined, and back translated for translation accuracy by one MIS professor and one senior doctoral student. Content validity of all scales (both formative and reflective) was established through both literature review and a content validity expert panel comprised of eight Chinese faculty and doctoral students skilled in quantitative analysis and quantitative research methods.

4.4.2. Data Collection

To test the above research model a survey was conducted at multiple hospitals in China, where HIS had been recently implemented. The questionnaires were randomly distributed to employees in the hospital by one of the research assistants. The research

assistant waited in the hospital for employees to complete the questionnaire. A small gift was provided to the respondent for completing and returning the questionnaire. The study lasted for two weeks. A total of 288 usable responses were received. Table 4.2 presents the demographic characteristics of the respondents in this study.

Respondents	Category	Frequency	Percentage (%)
Gender	Male	74	25.7
	Female	211	73.3
	Missing	3	1
Age	Under 26	8	2.8
	26-35	73	25.3
	36-45	139	48.3
	46-55	41	14.2
	56-65	1	0.3
	Over 65	4	1.4
	Missing	22	7.6
Educational background	High school	65	22.6
	Associate degree	139	48.3
	Bachelor's degree	51	17.7
	Master degree	29	10.1
	PhD degree	2	0.7
	Other	0	0
	Missing	2	0.7
Occupation	Doctor	73	25.3
	Nurse	105	36.5
	Pharmacist	14	4.9
	Medical staff	21	7.3
	IT staff	11	3.8
	Manager	61	21.2
	Missing	3	1

Table 4.2 Sample Demographics

4.5. Results

Our data analysis included measurement validation and hypothesis testing. Validation efforts assessed the reliability and validity of the measures, while hypothesis testing analyzed the hypotheses we proposed. Structural equation modeling with partial least squares (PLS) was used to perform a simultaneous evaluation of both measurement quality (measurement model) and construct interrelationship (structural model). The component-based PLS avoids many of the restrictive assumptions underlying covariance-based structural equation modeling (SEM) techniques. By using ordinary least squares as the estimation technique, PLS performs an iterative set of factor analysis and applies a bootstrap approach to estimate the significance (t-values) of the paths (Ringle et al., 2012; Hair et al., 2012). Prior studies indicate that PLS-SEM overcomes problematic model identification issues and that it is a powerful method to analyze complex models using smaller samples (Reinartz et al. 2009) and PLS-SEM is primarily used for exploratory work and for prediction. Thus, in this study, we used SmartPLS 2.0 to evaluate the measurement properties and test hypotheses.

According to the often-citied 10 times rule (Barclay, Higgins, and Thompson, 1995), the sample size should be greater than or equal to the larger of: 1) 10 times the largest number of formative indicators used to measure a single construct, or 2) 10 times the largest number of structural paths directed at a particular construct in the structural model. In our model, all items were modeled as reflective indicators because they were viewed as effects (not causes) of the latent variables. The largest number of

independent variables estimated for a dependent variable or formative factors was six. Thus, our sample size of 288 was more than adequate for the PLS estimation procedures. The measurement model in SmartPLS was assessed by examining reliability, convergent validity, and discriminant validity (Hair, et al., 2013).

4.5.1. Reliability

When determining reliability, two things need to be achieved. 1) Internal consistencies reliability (ICR): composite reliability should be higher than of 0.708 (in exploratory research, 0.6 to 0.7 is considered acceptable). ICR is considered more robust than Cronbach's alpha because it weights items differently depending on factor loading considerations. 2) Indicator's reliability: the indicator's outer loadings should be higher than 0.708. Indicators with outer loadings between 0.4 and 0.7 should be considered for removal only if the deletion leads to an increase in composite reliability and average variance extracted (AVE; a measure of convergent validity, which is the degree to which a latent construct explains the variance of its indicators) above the suggested threshold value. Table 4.3 shows the internal consistency reliabilities and correlations among constructs. All constructs' composite reliabilities were higher than 0.708.

4.5.2. Validity

Convergent and discriminant validity were assessed by applying two criteria: (1) the square root of the average variance extracted (AVE) by a construct from its indicators

was at least 0.707 (i.e., AVE > 0.50) and was greater than that construct's correlation with other constructs, and (2) item loadings were at least 0.707, and that an item loaded more highly on the construct it was intended to measure than on any other construct. Table 4.4 shows the factor structure matrix of the study variables, demonstrating strong convergent and discriminant validity, as all items exhibited high loadings (>0.707) on their respective constructs, and no item loaded higher on other constructs.

4.5.3. Common Methods Variance

To test for common methods variance (CMV), we conducted Harman's single factor test. According to Podsakoff, MacKenzie, Lee, and Podsakoff (2003), if a detrimental level of common method bias exits, "(a) a single factor will emerge from exploratory factor analysis (unrotated) or (b) one general factor will account for the majority of the covariance among the measures" (p.889). In the exploratory factor analysis of this study, more than one factor emerged to explain the variance; and one general factor cannot account for the majority of the covariance among the measure. Thus, the common methods bias in this study is low.

4.5.4. Hypotheses Testing

The structural model and hypotheses were assessed by examining the significance of the path coefficients and the variance accounted for by the antecedent constructs. Figure 4.3 provides the results of hypothesis testing. Bootstrapping (with 288 cases

and 500 samples) was performed to test the statistical significance of each path coefficient using t-tests.

The model explained 67.3 percent of the variance of distress ($R^2 = 0.673$), and 68.8 percent of the variance of eustress ($R^2 = 0.688$). 56 percent of the variance of perceived literature support is explained by the espoused organizational cultural variables: power sharing and learning and development ($R^2 = 0.56$). 53.3 percent of the variance of perceived technical support provision is explained by the espoused organizational cultural variable: support and collaboration ($R^2 = 0.533$). 46.4 percent of the variance of perceived technical involvement facilitation is explained by the espoused organizational cultural variable: learning and development ($R^2 = 0.464$). 69 percent of the variance of perceived innovation support is explained by the espoused organizational cultural variables: innovativeness and participative decision making ($R^2 = 0.69$).

Overall, 14 out of 21 hypotheses are well supported by the empirical test results. Results of the study are presented in Table 4.5. All the supported relationships of our research model were significant at the .05 level.

In this study, age, gender, computer confidence, previous training, and the HIS use duration and frequency were used as control variables. We included the control variables in the model, with direct links pointing at the dependent variables. After the analysis was conducted, we found that the path coefficients between existing

independent variables and dependent variables remained statistically significant, with the control variables included in the model as described above. Thus, we conclude that the hypothesized relationships in the proposed research model are significant, when the effects of age, gender, computer confidence, previous training, the HIS use duration and frequency are controlled for (we only included control variables in testing their impact on the model, and we did not include the control variables in analyzing the relationships among constructs in the model, nor for the R square reporting).

Constructs	AVE	Composite Reliabilit	Inter- construct correlations															
			DS	ES	IN	IS	LD	LS	PDM	PF	PS	SC	SE	TC	TIF	TO	TSP	TU
DS	0.68	0.89	**0.83**															
ES	0.67	0.91	0.06	**0.82**														
IN	0.73	0.89	-0.01	0.68	**0.86**													
IS	0.70	0.87	0.03	0.74	0.76	**0.84**												
LD	0.76	0.87	0.00	0.63	0.77	0.82	**0.87**											
LS	0.73	0.89	-0.02	0.72	0.77	0.76	0.71	**0.86**										
PDM	0.76	0.90	0.03	0.70	0.69	0.76	0.78	0.64	**0.87**									
PF	0.71	0.88	-0.06	0.64	0.72	0.63	0.58	0.71	0.55	**0.84**								
PS	0.68	0.80	0.10	0.68	0.75	0.77	0.76	0.70	0.69	0.61	**0.82**							
SC	0.74	0.90	0.03	0.65	0.74	0.83	0.78	0.76	0.71	0.58	0.75	**0.86**						
SE	0.62	0.92	0.04	0.75	0.74	0.72	0.64	0.74	0.62	0.84	0.67	0.67	**0.79**					
TC	0.61	0.86	0.73	0.26	0.17	0.21	0.18	0.23	0.25	0.07	0.29	0.24	0.14	**0.78**				
TIF	0.69	0.82	0.10	0.65	0.63	0.69	0.68	0.72	0.60	0.59	0.67	0.69	0.64	0.30	**0.83**			
TO	0.75	0.86	0.66	0.26	0.18	0.19	0.12	0.21	0.20	0.15	0.24	0.15	0.24	0.59	0.20	**0.87**		
TSP	0.64	0.88	-0.01	0.77	0.74	0.75	0.69	0.83	0.64	0.73	0.68	0.73	0.78	0.16	0.68	0.19	**0.80**	
TU	0.75	0.86	0.42	0.43	0.34	0.36	0.30	0.37	0.31	0.33	0.43	0.35	0.38	0.47	0.48	0.42	0.40	**0.87**

Table 4.3 Internal Consistency Reliabilities and Correlations among Constructs

***DS: distress, ES: eustress, IN: innovativeness (espoused organizational cultural variable), IS: innovation support (HIS-enabled job resources variable), LD: learning and development (espoused organizational cultural variable), LS: literature support (HIS-enabled job resources variable), PDM: participative decision making (espoused organizational cultural variable), PF: positive framing (personal resources variable), PS: power sharing (espoused organizational cultural variable), SC: support and collaboration (espoused organizational cultural variable), SE: perceived self-efficacy (personal resources variable), TC: HIS-complexity (HIS-enabled job demands variable), TIF: technology involvement facilitation (HIS-enabled job resources variable), TO: HIS-overload (HIS-enabled job demands variable), TSP: technical support provision (HIS-enabled job resources variable), TU: HIS-uncertainty (HIS-enabled job demands variable).**

	DS	ES	IN	IS	LD	LS	PDM	PF	PS	SC	SE	TC	TIF	TO	TSP	TU
DS1	0.86	0.07	0.01	0.05	0.01	0.03	0.06	-0.02	0.13	0.04	0.09	0.67	0.13	0.59	0.03	0.43
DS2	0.88	0.06	-0.02	0.03	-0.01	-0.04	0.04	-0.03	0.07	0.04	0.05	0.62	0.07	0.59	-0.03	0.33
DS3	0.70	-0.02	-0.05	-0.03	-0.05	-0.05	-0.07	-0.09	0.00	0.01	-0.03	0.46	0.05	0.37	-0.04	0.24
DS4	0.85	0.06	0.01	0.04	0.03	-0.01	0.05	-0.06	0.10	0.03	0.00	0.64	0.08	0.58	0.01	0.38
ES1	0.06	0.77	0.67	0.63	0.58	0.67	0.53	0.62	0.63	0.60	0.72	0.21	0.62	0.22	0.69	0.42
ES10	0.08	0.87	0.55	0.59	0.52	0.59	0.61	0.55	0.58	0.51	0.61	0.26	0.56	0.25	0.64	0.37
ES2	0.03	0.82	0.53	0.53	0.44	0.55	0.52	0.48	0.52	0.43	0.62	0.13	0.47	0.23	0.62	0.29
ES8	0.03	0.83	0.55	0.64	0.52	0.59	0.62	0.52	0.54	0.55	0.55	0.24	0.51	0.19	0.61	0.33
ES9	0.03	0.83	0.49	0.61	0.49	0.55	0.58	0.45	0.49	0.57	0.54	0.21	0.49	0.19	0.59	0.34
IN1	-0.02	0.61	0.88	0.62	0.63	0.68	0.55	0.67	0.59	0.60	0.66	0.13	0.53	0.19	0.65	0.32
IN2	-0.02	0.57	0.82	0.73	0.74	0.68	0.63	0.57	0.74	0.75	0.61	0.19	0.58	0.12	0.62	0.28
IN3	0.02	0.57	0.87	0.59	0.59	0.60	0.58	0.62	0.56	0.54	0.64	0.11	0.50	0.17	0.64	0.28
IS1	-0.02	0.64	0.70	0.87	0.69	0.73	0.59	0.58	0.71	0.79	0.68	0.19	0.63	0.14	0.72	0.31
IS2	-0.02	0.61	0.53	0.82	0.64	0.56	0.69	0.51	0.55	0.63	0.57	0.09	0.47	0.11	0.60	0.21
IS4	0.11	0.59	0.69	0.82	0.74	0.62	0.63	0.48	0.66	0.66	0.54	0.25	0.63	0.22	0.57	0.39
LD1	0.09	0.55	0.69	0.78	0.89	0.62	0.64	0.49	0.73	0.73	0.53	0.23	0.66	0.11	0.62	0.35
LD2	-0.10	0.54	0.66	0.65	0.86	0.61	0.73	0.52	0.59	0.63	0.58	0.08	0.52	0.10	0.58	0.17
LS1	0.04	0.56	0.62	0.67	0.60	0.84	0.52	0.58	0.61	0.65	0.60	0.20	0.58	0.20	0.66	0.30
LS2	0.00	0.61	0.67	0.64	0.61	0.88	0.53	0.58	0.60	0.69	0.63	0.20	0.68	0.19	0.65	0.32
LS4	-0.08	0.68	0.68	0.65	0.60	0.85	0.60	0.65	0.58	0.61	0.67	0.18	0.57	0.15	0.81	0.32
PDM3	0.02	0.58	0.62	0.68	0.72	0.57	0.87	0.45	0.63	0.65	0.54	0.24	0.54	0.15	0.53	0.27
PDM4	0.10	0.66	0.56	0.67	0.62	0.53	0.86	0.45	0.61	0.60	0.51	0.25	0.52	0.20	0.59	0.32
PDM5	-0.03	0.59	0.63	0.65	0.71	0.57	0.88	0.54	0.56	0.61	0.58	0.17	0.50	0.16	0.57	0.22
PF1	-0.10	0.48	0.58	0.50	0.49	0.60	0.44	0.80	0.50	0.49	0.66	0.00	0.49	0.11	0.56	0.26
PF2	-0.04	0.59	0.63	0.59	0.53	0.61	0.51	0.86	0.56	0.55	0.75	0.08	0.52	0.09	0.66	0.27
PF3	-0.01	0.54	0.62	0.50	0.44	0.58	0.43	0.86	0.46	0.43	0.69	0.09	0.49	0.17	0.60	0.30
PS1	0.02	0.64	0.75	0.77	0.75	0.69	0.68	0.58	0.91	0.77	0.62	0.24	0.64	0.14	0.66	0.37
PS2	0.18	0.45	0.43	0.44	0.45	0.42	0.42	0.40	0.73	0.40	0.46	0.25	0.43	0.29	0.43	0.35
SC1	-0.03	0.56	0.69	0.76	0.69	0.67	0.62	0.52	0.70	0.88	0.58	0.18	0.57	0.09	0.67	0.32
SC2	0.16	0.56	0.59	0.65	0.62	0.62	0.62	0.42	0.54	0.81	0.55	0.27	0.57	0.18	0.58	0.26
SC3	-0.03	0.56	0.64	0.73	0.72	0.68	0.60	0.56	0.68	0.89	0.60	0.18	0.64	0.13	0.63	0.32
SE10	0.05	0.63	0.55	0.54	0.49	0.56	0.53	0.63	0.47	0.50	0.82	0.12	0.46	0.17	0.60	0.29
SE2	0.08	0.65	0.68	0.66	0.56	0.65	0.55	0.68	0.60	0.63	0.83	0.19	0.57	0.22	0.68	0.34
SE4	0.01	0.61	0.61	0.61	0.53	0.58	0.48	0.61	0.59	0.59	0.80	0.10	0.51	0.13	0.62	0.32
SE6	-0.03	0.62	0.61	0.55	0.49	0.64	0.51	0.69	0.52	0.49	0.78	0.07	0.49	0.22	0.58	0.21
SE7	0.04	0.59	0.62	0.55	0.49	0.63	0.44	0.79	0.51	0.51	0.83	0.10	0.52	0.20	0.66	0.32
SE8	0.10	0.54	0.53	0.54	0.49	0.55	0.41	0.59	0.53	0.50	0.76	0.14	0.54	0.23	0.62	0.36
SE9	-0.04	0.48	0.49	0.49	0.46	0.49	0.51	0.62	0.45	0.47	0.72	0.03	0.42	0.13	0.53	0.24
TC2	0.57	0.20	0.15	0.17	0.14	0.23	0.20	0.10	0.24	0.22	0.14	0.83	0.25	0.52	0.17	0.42
TC3	0.51	0.21	0.10	0.12	0.13	0.18	0.19	0.05	0.17	0.12	0.08	0.73	0.22	0.39	0.09	0.27
TC4	0.49	0.25	0.18	0.22	0.16	0.20	0.20	0.08	0.29	0.28	0.14	0.74	0.28	0.40	0.19	0.42
TC5	0.68	0.17	0.11	0.17	0.14	0.12	0.20	0.01	0.21	0.15	0.09	0.83	0.21	0.53	0.07	0.38
TIF1	0.00	0.57	0.56	0.53	0.48	0.62	0.43	0.57	0.52	0.53	0.60	0.13	0.81	0.13	0.60	0.42
TIF4	0.16	0.52	0.50	0.62	0.64	0.58	0.56	0.43	0.60	0.62	0.47	0.36	0.86	0.19	0.55	0.38
TO2	0.49	0.36	0.25	0.25	0.22	0.28	0.28	0.22	0.32	0.25	0.30	0.45	0.27	0.83	0.27	0.32
TO5	0.64	0.13	0.09	0.09	0.02	0.11	0.09	0.06	0.13	0.05	0.13	0.57	0.09	0.90	0.08	0.40
TSP1	0.13	0.55	0.45	0.54	0.44	0.63	0.44	0.54	0.48	0.54	0.58	0.24	0.57	0.22	0.77	0.35
TSP2	-0.05	0.64	0.52	0.55	0.48	0.56	0.47	0.48	0.51	0.47	0.58	0.06	0.48	0.12	0.75	0.26
TSP3	-0.13	0.69	0.71	0.68	0.65	0.75	0.60	0.65	0.60	0.69	0.69	0.09	0.59	0.10	0.85	0.33
TSP4	0.05	0.59	0.67	0.63	0.61	0.70	0.53	0.63	0.60	0.62	0.64	0.14	0.54	0.18	0.83	0.33
TU2	0.33	0.36	0.34	0.35	0.33	0.37	0.30	0.33	0.38	0.37	0.37	0.34	0.46	0.32	0.39	0.84
TU3	0.40	0.39	0.26	0.29	0.20	0.28	0.24	0.25	0.37	0.25	0.29	0.47	0.38	0.40	0.31	0.89

Table 4.4 PLS Confirmatory Factor Analysis

	Hypotheses Testing	Relationship Significant?
TC -> DS	H1a: Perceived HIS-complexity is positively related to distress.	Yes
TO -> DS	H1b: Perceived HIS-overload is positively related to distress.	Yes
TU -> DS	H1c: Perceived HIS-uncertainty is positively related to distress.	Yes
LS -> ES	H2a: Perceived literacy support is positively related to eustress.	No
TSP -> ES	H2b: Perceived technical support provision is positively related to eustress.	Yes
TIF -> ES	H2c: Perceived technology involvement facilitation is positively related to eustress.	Yes
IS -> ES	H2d: Perceived innovation support is positively related to eustress.	Yes
LS -> DS	H3a: Perceived literacy support is negatively related to distress.	Yes
TSP -> DS	H3b: Perceived technical support provision is negatively related to distress.	No
TIF -> DS	H3c: Perceived technology involvement facilitation is negatively related to distress.	No
IS -> DS	H3d: Perceived innovation support is negatively related to distress.	No
SE -> ES	H4a: The general perceived self-efficacy is positively related to eustress.	Yes
PF -> ES	H4b: Positive framing is positively related to eustress.	No
SE -> DS	H5a: The general perceived self-efficacy is negatively related to distress.	No
PF -> DS	H5b: Positive framing is negatively related to distress.	No
IN -> IS	H6a: Espoused organizational innovativeness culture is positively related with perceived innovation support.	Yes
PDM -> IS	H6b: Espoused organizational participative decision making culture is positively related with perceived innovation support.	Yes
PS -> LS	H6c: Espoused organizational power sharing culture is positively related with perceived literacy support.	Yes
SC -> TSP	H6d: Espoused organizational support and collaboration culture is positively related with perceived technical support provision.	Yes
LD -> TIF	H6e: Espoused organizational learning and development culture is positively related with perceived technology involvement facilitation.	Yes
LD -> LS	H6f: Espoused organizational learning and development culture is positively related with perceived literature support.	Yes

Table 4.5 Hypotheses Results

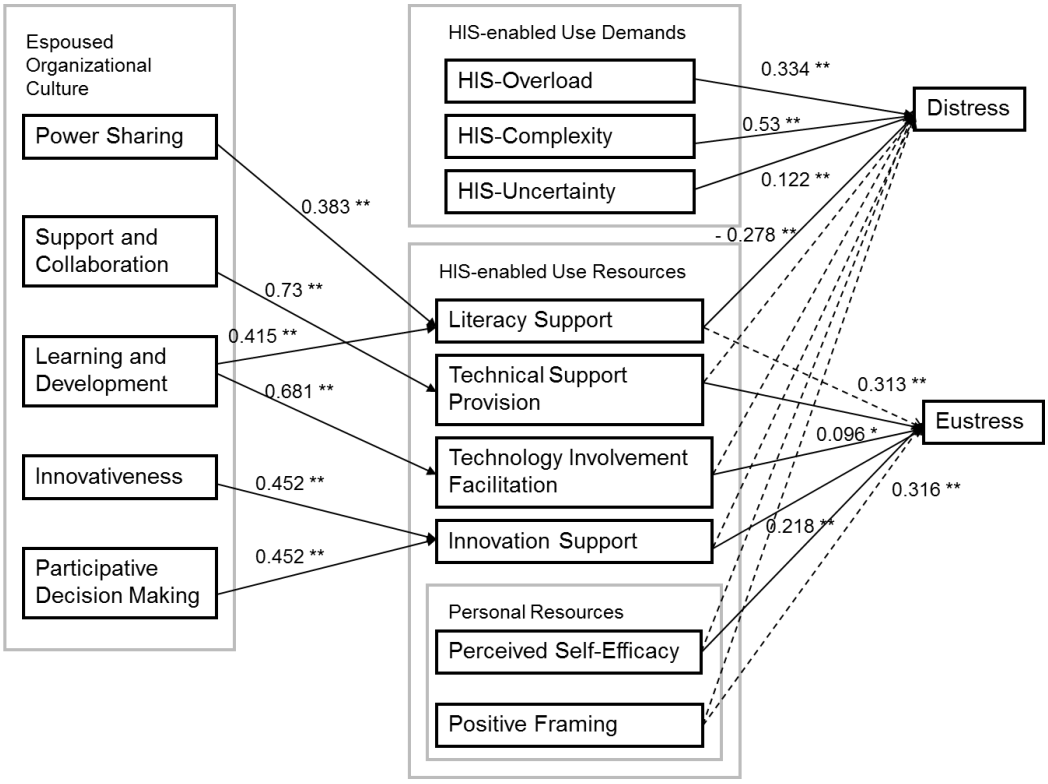


Figure 4.3 PLS Results of Research Model (n=288)

4.6. Implications

4.6.1. Discussion about the Results

The results indicated that all the perceived job demands created by the use of HIS (HIS-complexity, HIS-overload, and HIS-uncertainty) were positively related to distress. All of the proposed relationships between espoused organizational cultural variables and perceived HIS-enabled use resources were supported, which showed that espoused organizational cultural values could be antecedents of perceived HIS-enabled use resources. Except for literacy support, the remaining perceived job

resources associated with the use of HIS (technical support provision, technology involvement facilitation, and innovation support) were found to be positively related to eustress. Additionally, literacy support was found to be negatively related to distress, while the remaining perceived job resources associated with the use of HIS (technical support provision, technology involvement facilitation, and innovation support) were found to be not significantly related to distress. A possible explanation is that literacy support refers to mechanisms to help HIS users cope with the demands of learning about HIS, which can alleviate the strain associated with HIS-enabled use demands. Equipped with training, knowledge sharing and teamwork, literacy support helps users to get used to HIS but there is no inherent motivation mechanism. In contrast, the rest of the HIS-enabled use resources can stimulate personal growth, learning, and development in using the HIS, and can motivate employees to deal with the inherent challenges. In terms of personal resources, only perceived general self-efficacy positively related to eustress, while there was no significant relationship among positive framing, eustress, and distress. This indicated that personal resources cannot buffer the effect of job demands on stress.

4.6.2. Implications for Research

This study generates a number of theoretical implications. It contributes to IS research by modeling the antecedents of stress associated with using HIS through the established JD-R model, and by adding espoused organizational cultural values as antecedents of perception toward the HIS-enabled job resources. By doing so, we

extend the generalizability of JD-R model to the IT diffusion context across cultures. This study extends past stress and JD-R research by showing that predictors of eustress due to using HIS (job resources like literacy support, technical support provision, technology involvement facilitation, and innovation support, etc.) have their own determinants (i.e. espoused organizational cultural values).

We articulated and tested a new model of stress after explicitly differentiating eustress from distress and identifying their relation to HIS-enabled use demands and HIS-enabled use resources, thereby significantly extending the present understanding on technostress (e.g. Ayyagari et al. 2011; Galluch et al. 2015; Ragu-Nathan et al. 2008). We incorporated components of both the JD-R model and the PE fit theory in our integrated model of distress and eustress. The JD-R model allowed us to categorize eustress through the motivational process toward job demands and resources. Through the perspective of the PE model, the fit between a person and the individual's perceptions about technologies in work settings was examined, when the person received stressors and was given a certain level of supplies. Additionally, organizational cultural values were conceptualized at the individual level as espoused organizational culture variables, which played the role as antecedents of perception about organizational job resources. In doing so, we combined and integrated theory from a variety of areas that were able to shed insight into the model from a unique point of view.

To our knowledge, we are among the first behavioral science researchers to examine the mechanism of eustress in the area of IT adoption and diffusion. Rather than only examining the negative side of stress (i.e. distress), we can now understand eustress alongside distress and their varying impact on job performance. The proposed model also provides researchers with the ability to prescribe solutions to channel distress into eustress. Rather than just asking "How could we deal with distress?" it is also important to ask "How could we stimulate the positive side of stress?" and "Can we change organizational culture to better assist employees?".

Since we integrated theory from referent fields, this study generates implications to the other areas besides IS, such as the psychology realm and organizational behavior. We expanded the application of the job demands and resources model by adapting it to a new context of HIS usage at the individual perception level and by studying specific HIS-enabled job demands, HIS-enabled job resources, and personal resources that affected the link between HIS usage and stress. In doing so, we directly assessed how the use of technology impacted stress, an aspect rarely examined in the psychology literature. The espoused organizational cultural values measured at the individual perception level provided a roadmap into how organizational culture can be integrated into management studies.

4.6.3. Implications for Practice

The findings from the current research also generated practical implications. For example, distress is proposed to be negatively associated with performance at both individual and organizational level, while eustress is proposed as the positive response to dealing with stress. There are two different underlying psychological processes playing a role in the development of job-related strain and motivation: health impairment, which leads to distress; and motivation, which leads to eustress (Bakker and Demerouti, 2007). Distress is generated when the perceived external job resources and internal personal resources cannot buffer the depletion of energy associated with job demands, while eustress is generated when the perceived external job resources and internal personal resources motivate and reenergize the employee. Therefore, from a user's perspective, if the perceived resources are high enough to overcome the demands, a user would be more likely to go through the motivational process and generate positive responses toward stress. From an organization's view, if the organization can configure its organizational culture settings and adjust their resources to supplement IT users, employees in the organization would be more likely to be satisfied with IT and engaged with using the technology. Our study suggests that to motivate users in using HIS, HIS-enabled resources, such as literacy support, technical support provision, technology involvement facilitation, and innovation support should be highlighted. Moreover, organizational cultural values (such as innovativeness, participative decision making, power sharing, support and

collaboration, and learning and development) should be emphasized to better assist employees in their use of the new technology.

The results from this study provided support for the phenomenon of technology enabled distress and eustress. When considering to launch a new information technology or information system with the purpose to improve employees' job performance, it is important that organizations be aware of the side effects associated with the technology usage. The distressed employees are shown to have lower technology use engagement, which could hurt their job performance. Additionally, the health impairment process leads not only to distress, but also many health ailments, so organizations should proactively make strategies to motivate employees and reduce their stress to limit potential health issues. Therefore, organizations could use the model developed in this study as a tool to assess the potential consequences of stress associated with using organizational information systems. Although the model is focused on the context of HIS usage, it can be customized to fit the needs of different technologies. Understanding the specific antecedents of distress and eustress would be valuable in developing effective organizational mechanisms to help employees actively utilize the new technology.

4.7. Limitations and Future Directions

4.7.1. Limitations

No study is without limitations. First, we used a self-administrated survey. Previous research has been critical of using subjective perceptions to measure constructs. In addition, although the results showed that common method bias was not an issue in this study, our collection of data was, however, from a single source. Thus, a more objective observation is needed beyond the existing self-administrated online survey. Second, we conceptualized espoused organizational cultural variables as antecedents of perceived job resources; however, there may be other variables that we did not examine, such as personal traits. Meanwhile, we selected perceived self-efficacy and positive framing as the personal resources; however, there may be other variables that we did not examine, such as optimism, hope, and resiliency. Further, although we believe that critical HIS-enabled job demands and resources are considered, the proposed variables might not be exhaustive.

Moreover, although we asked respondents about their use frequency about each sub-system of HIS, the present study also didn't control for the variety of HIS use at the level of feature usage. It is possible that individuals who use specific features of a particular HIS could be more likely to get distressed compared to individuals who use other features of that HIS. Consequently, a user might perceive different levels of HIS-enabled job demands with respect to the use of varying HIS features. However,

only one unified measure of HIS-enabled job demands was collected concerning their overall HIS use perception. Additionally, effect size will be tested in the future.

4.7.2. Future Directions

Future research should try to resolve the limitations of this study and then stronger results could be expected. For example, future research might comprehensively investigate the inclusion of additional constructs to the research model, or measure the relevant constructs through an objective point of view. Additionally, future research might examine the overall effect of the espoused cultural dimensions, because there might be some interactions among these dimensions; or test the mediating or moderating effect of espoused cultural dimensions. This analysis could theoretically contribute to a better understanding of the influence of espoused organizational cultural values on stress associated with using information systems. Furthermore, future research might explore more specific questions toward the use of information systems at the feature level, such as, is the use of a specific feature stressful? Or is the use of a specific feature by a specific group stressful? Moreover, future research can examine the critical degree of different job resources toward eustress and distress and pay more attention to the corresponding variables of job resources. Finally, future research might test the proposed model in new contexts, such as the use of distance learning systems, knowledge management systems, and other IT diffusion subjects.

4.8. Conclusions

While previous research has mainly focused on the antecedents and mechanisms of negative response of stress (i.e distress), we examined both distress and eustress (a positive response of stress) through two psychological processes: the health impairment process and the motivational process. Additionally, we added the variables of personal resources (perceived self-efficacy and positive framing) which are hypothesized to impact the development of eustress and distress. Furthermore, we conceptualized espoused organizational cultural values, namely espoused innovativeness, espoused participative decision making, espoused power sharing, espoused support and collaboration, and espoused learning and development to be antecedents of perception of HIS-enabled job resources. Finally, we incorporated these espoused organizational cultural values into our extended JD-R model and described their impact mechanism. Given the pervasiveness of organizational information systems in firms, it is imperative to understand the impact of using these systems. In summary, the research model we extended from JD-R can be used to better explain the consequences of using new organizational systems and the associated responses about stress.

CHAPTER5: Conclusion

This dissertation indicates that culture plays a significant role in the IT diffusion process. Findings from all the three essays support that cultural variables are the antecedents of various behaviors associated with IT diffusion. Previous research has observed that not only do nations/societies develop culture, but organizations, groups, communities, and occupations also develop their own culture at these particular levels (e.g. Schein, 1992; Nord et al., 2006; Guzman et al., 2008). This dissertation examines culture through three points of view: espoused national culture, IT occupational subculture, and espoused organizational culture, with each in a separate IT diffusion context. The first essay examines the effect of espoused national culture values on social network usage. The second essay investigates the effect of IT occupational subculture on knowledge sharing between IT personnel and business personnel within the general organizational IT adoption context. The third essay specifies the organizational IT adoption context into the use of hospital information systems, and explores the effect of espoused organizational culture values on stress associated with using hospital information systems. Each of these cultural levels will be discussed below followed by an explanation of their relationship to their respective essays.

Espoused national cultural values refer to "the degree to which an individual embraces the values of his or her national culture" (Srite and Karahanna 2006, p. 681). Building on Hofstede's (1991) five dimensions of national culture, four espoused

national cultural values: espoused individualism/collectivism, espoused power distance, espoused uncertainty avoidance, and espoused masculinity/femininity, were examined in this dissertation (the dimension of long-term orientation was excluded because it was formulated based on the Asian culture).

Occupational subculture is influenced by both the organizational culture of the company and the professional culture of the IT profession. The model founded by Joshson and Scholes (1993) was utilized for assessing IT related occupational subculture in this dissertation, which was represented by cultural elements such as stories, symbols, power structures, control systems, and rituals and routines (Nord et al., 2006). Organizational structure guides the way in which an organization works. Stories and myths are tales told by organizational members. Symbols reflect the type of language used, logos, and office layout. Rituals and routines characterize the way work is done. Control systems highlight what is important in the organization. And power structures reveal the powerful managerial groupings in the organization.

Organizational culture is defined as a general shared understanding within an organization, which arises from commonly held values, beliefs, and assumptions and influences employees' perceptions and behavior (Schein, 1992). In this dissertation, embracing the concept of "espoused", the espoused organizational culture is defined as the degree to which an individual embraces the values of his or her organizational culture. Building on Hurley and Hult's (1998) organizational cultural characteristics, five dimensions of espoused organizational cultural values: innovativeness,

participative decision making, power sharing, support and collaboration, and learning and development, were used to examine how culture impacts employee's perceived job resources to deal with stress in the context of HIS implementation.

As a whole, the dissertation contributes both to theory and practice. First, it extends the established UTAUT (Venkatesh et al. 2003) model by adding three additional variables to the context of personal hedonic social network use, and the espoused national cultural values are incorporated as individual differences. Second, it develops a scale used to measure the IT occupational subculture and examines its relationship with knowledge sharing within the organizational IT diffusion process. It shows the importance of knowledge sharing relating to the IT occupational subculture and the effect of the IT occupational subculture relating to knowledge sharing. Finally, it contributes to the IT diffusion research by providing insights into the impact of HIS use on distress and eustress and further developing and improving the job resources demand (JD-R) model by incorporating espoused organizational cultural variables as antecedents. In depth contributions and directions for future research from each essay are detailed in the paragraphs below.

The first essay contributes to IS research by modeling online social network use through the established UTAUT (Venkatesh et al., 2003), and by adding espoused national cultural values as individual differences. By doing so, we extend the generalizability of UTAUT to the hedonic social network context across cultures. While previous research has mainly focused on the value of utility, we added three

additional variables which are hypothesized to impact behavioral intention: information privacy concerns, hedonic motivation, and relationship expectancy. Information privacy concerns are critical determinants of behavioral intention to disclose information and/or to engage in social networking activities. Users are able to protect their privacy and reveal less information by adjusting the privacy settings on their social networking sites. Thus, while people indicate their concerns about information privacy, they are still able to be active on social networking sites. While information privacy concerns are negatively associated with behavioral intention to use IT in a social networks context, hedonic motivation plays an important role in predicting intentions to use hedonic IS (Venkatesh et al., 2012), such as social networking sites. According to self-determination theory, hedonic motivation belongs to the larger construct of intrinsic motivation, which is a key user belief. Our empirical results demonstrate that in the general context of social network use, both hedonic motivation and use value are important drivers of intention to use the technology. In addition to hedonic motivation, relationship expectancy (based on social identity theory and Maslow's hierarchy of needs) is incorporated into the research model of this study. We defined the concept of relationship expectancy and highlighted its significance in online social activities regarding IT use. While we have examined the role of relationship expectancy in online social networks users' adoption of IT, future research can extend it to continued use.

Espoused national cultural values, particularly espoused individualism/collectivism, espoused power distance, espoused uncertainty avoidance, and espoused masculinity/femininity were theorized as individual characteristics. Further, we incorporated these espoused national cultural values into our extended UTAUT model and described how they influenced the constructs of information privacy concerns, hedonic motivation, relationship expectancy, and social influence. While previous UTAUT research examined the moderating effect of gender and age in organizational and consumer contexts, we found that the espoused national cultural values had a significant effect on the new added predictors of behavioral intention to use IT: relationship expectancy, hedonic motivation, and information privacy concern; as well as on social influence, which was the original predictor in UTAUT. Additionally, we found empirical support for the paths in the original UTAUT performing as expected in the context of online social networks.

Future research might also examine the overall effect of the espoused cultural dimensions, because there might be some interactions among these dimensions. This analysis would theoretically contribute to a better understanding of the influence of espoused national cultural values on technology acceptance and use. Furthermore, future research might comprehensively investigate the inclusion of additional constructs to the proposed model of social network acceptance and use, such as habit. Finally, future research might test the proposed model in new contexts, such as

technology support for education, knowledge management systems, and other IT diffusion subjects.

The second essay makes academic contributions to IT diffusion and knowledge sharing research by investigating the relationship among IT occupational subculture and knowledge sharing within IT diffusion framework. Although researchers have already explored some cultural characteristics of IT personnel which are distinct from other employees, there is no prior study that has investigated the effect of IT occupational subculture in organizations. Also, knowledge sharing (among IT personnel who support IT implementation and business employees who use IT) as an important determinant of IT diffusion in organizations has been taken into consideration, which allows us to better understand the process by which IT is diffused throughout organizations.

Classical IT diffusion theory is not adequate at the organizational level if all employees are required to adopt a complex IT (Nord et al., 2006). Knowledge sharing among IT personnel and business employees is able to bridge the knowledge gap between groups and will facilitate the diffusion process. Thus, the occupational subculture of IT personnel plays an important role when both groups cooperate in IT diffusion, particularly in mandated adoption decisions.

Drawing upon cross-cultural psychology, the second essay indicates one possible approach through which occupational subculture manifests at the organizational level

of analysis and impacts the knowledge sharing process. Additionally, the study develops a series of hypotheses as to how IT occupational subculture influences knowledge sharing among business and IT personnel in an organization. In doing so, behaviors related to knowledge sharing and IT diffusion at the organizational level will be better understood beyond the limitations of previous IT diffusion studies.

Future research may be replicated with a mix of different technologies and/or across various geographic areas, such as a study to test the model in other regions/countries and at multiple time points. Alternatively, researchers may examine the interplay between multiple levels of culture and develop hypotheses linking the different levels together. For example, the interaction of national and occupational subculture might be a new and interesting research area, given that IT outsourcing is a prevalent business model and international cooperation is very common among organizations.

The third essay contributes to IS research by modeling the antecedents of stress associated with using HIS through the established JD-R model, and by adding espoused organizational cultural values as antecedents of perception toward the HIS-enabled job resources. By doing so, we extend the generalizability of JD-R model to the IT diffusion context across cultures. The third essay goes beyond stress and JD-R research by showing that predictors of eustress due to using HIS (job resources like literacy support, technical support provision, technology involvement facilitation, and innovation support, etc.) have their own determinants (i.e. espoused organizational cultural values).

We articulated and tested a new model of stress after explicitly differentiating eustress from distress and identifying their relationships to HIS-enabled use demands and HIS-enabled use resources, thereby significantly extending the present understanding on technostress (e.g. Ayyagari et al. 2011; Galluch et al. 2015; Ragu-Nathan et al. 2008). We incorporated components of both the JD-R model and the PE fit theory into our integrated model of distress and eustress. The JD-R model allowed us to categorize eustress through the motivational process toward job demands and resources. Through the perspective of the PE model, the fit between a person and the individual's perceptions about technologies in work settings was examined, when the person received stressors and was given a certain level of supplies. Additionally, organizational cultural values were conceptualized at the individual level as espoused organizational culture variables, which played the role as antecedents of perception about organizational job resources. In doing so, we combined and integrated theory from a variety of areas that were able to shed insight into the model from a unique point of view.

To our knowledge, we are among the first behavioral science researchers to examine the mechanism of eustress in the area of IT adoption and diffusion. Rather than only examining the negative side of stress (i.e. distress), we can now understand eustress alongside distress and their varying impacts on job performance. The proposed model also provides researchers with the ability to prescribe solutions to channel distress into eustress. Rather than just asking "How could we deal with distress?" it is also

important to ask “How could we stimulate the positive side of stress?” and “Can we change organizational culture to better assist employees?”

Since we integrated theory from referent fields, this study generates implications to the other areas besides IS, such as the psychology realm and organizational behavior. We expanded the application of the job demands and resources model by adapting it to a new context of HIS usage at the individual perception level and by studying specific HIS-enabled job demands, HIS-enabled job resources, and personal resources that affected the link between HIS usage and stress. In doing so, we directly assessed how the use of technology impacted stress, an aspect rarely examined in the psychology literature. The espoused organizational cultural values measured at the individual perception level provided a roadmap into how organizational culture can be integrated into management studies.

Future research might comprehensively investigate the inclusion of additional constructs to the research model, or measure the relevant constructs through an objective point of view. Additionally, future research might examine the overall effect of the espoused cultural dimensions, because there might be some interactions among these dimensions. This analysis will theoretically contribute to a better understanding of the influence of espoused organizational cultural values on stress associated with using information systems. Furthermore, future research might explore more specific questions related to the use of information systems at the feature level, such as, is the use of a specific feature stressful? Or is the use of a specific feature by a specific

group stressful? Moreover, future research can examine the critical degree of different job resources toward eustress and distress and pay more attention to the corresponding variables of job resources. Finally, future research might test the proposed model in new contexts, such as the use of distance learning systems, knowledge management systems, and other IT diffusion subjects.

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Appendix A (Essay1_survey items)

All scales use 7 point likert scales from strongly disagree to strongly agree, except for demographics.

Privacy Concerns

PC1. I am concerned that the information I submit on the social networks could be misused.

PC2.When I am online using social networks, I have the feeling of being watched.

PC3. I am concerned about online identity theft.

PC4. I am concerned about people online not being who they say they are.

PC5. I am concerned about people I do not know obtaining personal information about me from my online activities.

PC6. In general, I am concerned about my privacy while I am using social networks.

Hedonic Motivation

HM1. Using social networks is fun.

HM2. Using social networks is enjoyable.

HM3. Using social networks is very entertaining.

HM4. Using social networks relieves my stress.

Relationship Expectancy

RE1. I found social networks important to my social relationships.

RE2. Using social networks helps me maintain social relationships.

RE3. Using social networks increases my interaction with others.

RE4. Using social networks helps me contact with others more frequently.

RE5. Using social networks helps me establish social relationships.

Espoused National Cultural Values

Masculinity/Femininity

MF6. Having challenging work to do is a more important work goal than having a friendly work atmosphere.

MF7. Getting the recognition you deserve when you do a good job is a more important work goal than employment security.

MF8. Prestige is a more important goal to me than having less stress at work.

MF9. Having challenging work to do is a more important work goal than having a good working relationship with your manager.

MF10. Having challenging work to do is a more important work goal than working with people who cooperate well with each other.

Individualism/Collectivism

IC1. Being accepted as a member of a group is more important than having autonomy and independence.

IC2. Being accepted as a member of a group is more important than being independent.

IC3. Group success is more important than individual success.

IC4. Being loyal to a group is more important than individual gain.

IC5. Individual rewards are not as important as group welfare.

IC6. It is more important for a manager to encourage loyalty and a sense of duty in subordinates than it is to encourage individual initiative.

Power Distance

PD1. Managers should make most decisions without consulting subordinates.

PD2. Managers should not ask subordinates for advice, because they might appear less powerful.

PD3. Decision making power should stay with top management in the organization and not be delegated to lower level employees.

PD4. Employees should not question their manager's decisions.

PD5. A manager should perform work which is difficult and important and delegate tasks which are repetitive and mundane to subordinates.

PD6. Higher level managers should receive more benefits and privileges than lower level managers and professional staff.

PD7. Managers should be careful not to ask the opinions of subordinates too frequently, otherwise the manager might appear to be weak and incompetent.

Uncertainty Avoidance

UA1. Rules and regulations are important because they inform workers what the organization expects of them.

UA2. Order and structure are very important in a work environment.

UA3. It is important to have job requirements and instructions spelled out in detail so that people always know what they are expected to do.

UA4. It is better to have a bad situation that you know about, than to have an uncertain situation which might be better.

UA5. Providing opportunities to be innovative is more important than requiring standardized work procedures.

UA6. People should avoid making changes because things could get worse.

Use Behavior

UB1. Have you ever created your own profile online that others can see on a social networking site? (1=Yes; 2=NO)

UB2. Which social networks do you use? Please list all answers as check boxes from top to bottom. (Facebook; Twitter; LinkedIn; Google+; Instagram; Foursquare; Others, please specify)

UB3. For how many years have you had your profile(s) displayed? (Qualtrics Default Answers)

UB4.How often do you use social networks?

UB5. How long do you use social networks daily?

User Privacy Behavior

UB6. Do you allow anyone to view your profile (s)?

UB7. Do you post your personal stories/news on your profile page (s)?

UB8. Do you use your real name on your profile page (s)?

UB9. Do you include a picture of yourself on your profile (s)?

UB10. Do you include your Email address on your profile (s)?

UB11. Do you include your instant messenger on your profile (s)?

UB12. Do you include your phone number on your profile (s)?

UB13. Approximately how many "friends" do you have on all your profile (s)?

Behavioral Intention

BI1. I intend to continue using social networks in the future.

BI2. I will always try to use social networks in my daily life.

BI3. I plan to continue to use social networks frequently.

Performance Expectancy

PE1. I find social networks useful in my daily life.

PE2. Using social networks increases my chances of achieving things that are important to me.

PE3. Using social networks helps me accomplish things more quickly.

PE4. Using social networks increases my productivity.

Effort Expectancy

EE1. Learning how to use social networks is easy for me.

EE2. My interaction with social networks is clear and understandable.

EE3. I find social networks easy to use.

EE4. It is easy for me to become skillful at using social networks.

Social Influence

SI1. People who are important to me think that I should use social networks.

SI2. People who influence my behavior think that I should use social networks.

SI3. People whose opinions that I value prefer that I use social networks.

Facilitating Conditions

FC1. I have the resources necessary to use social networks.

FC2. I have the knowledge necessary to use social networks.

FC3. Social networks are compatible with other technologies I use.

FC4. I can get help from others when I have difficulties using social networks.

Demographics

What's your gender? (1=male; 2=female).

How old are you? _____ years old

What's your country of origin? (Qualtrics Default Answers)

How many years have you lived in the United States? _____years

Appendix B (Essay2_survey items)

Demographic Controls

1. Gender

   Male
   Female

2. Age

   16-20
   21-25
   26-30
   31-35
   36-40
   41-45
   46-50
   51-55
   56-60
   >60

3. Highest Educational Level Attained
   Doctorate
   Master's
   Bachelor's Degree
   High School
4. If you are working in IT department, what's your present position/job title?
   CIO
   Information systems manager
   Project manager
   Strategic planning
   Systems Design
   Systems analysis
   Database administrator
   Other, please specify_____

5. Length of tenure with current company
   <1 year
   1-3 years
   4-6 years
   7-9 years

10-12 years
13-15 years
16-18 years
>18 years

6. What kind of technology is diffusing now in your organization?
   Enterprise resource planning (ERP)
   Material requirements planning (MRP)
   other software_____

7. How long has the organization been working on the IT diffusion project?
   <1 year
   1-3 years
   4-6 years
   7-9 years
   10-12 years
   13-15 years
   16-18 years
   >18 years

8. Which industry are you currently working in?

   Agriculture / Farming/ Forestry
   Armed forces
   Automotive
   Community Service
   Architecture / Construction
   Distribution
   Education
   Electricity / Gas / Water
   Mechanical / Engineering
   Financial and Banking Services
   Insurance
   Pharmaceutical / Healthcare
   Hospitality
   IT industry
   Legal
   Logistics
   Manufacturing
   Media
   Mining
   Retail

Real estate
Restaurant and catering
Telecommunications
Transport
Petroleum
Other_____

9. How many employees are in your organization?
   <100
   100-249
   250-499
   500-999
   1000-2499
   >2499

10. How many IT employees are in your organization?
   <10
   10-49
   49-99
   100-199
   200-499
   >499

11. How many employees are involved in the IT diffusion project in your organization?
   <100
   100-249
   250-499
   500-999
   1000-2499
   >2499

12. Which of the following best describes you?
   White
   Black or African American
   American Indian or Alaska Native
   Asian, Native Hawaiian or other Pacific Islander
   Latino/Latina or Hispanic
   Multi-racial (more than one race)

13. How many coworkers do you interact with regularly?
   <5
   5-9
   10-14

15-19
20-24
>25

Knowledge Sharing between Business and IT Personnel

Scale:

1	2	3	4	5	6	7
Strongly Disagree	**Disagree**	**Somewhat Disagree**	**Neutral**	**Somewhat Agree**	**Agree**	**Strongly Agree**

1. You share your work reports and official documents with members of divisions/units outside your own in the organization.
2. Your colleagues from divisions outside your own in the organization share business proposals and reports with you.
3. You share your success and failure stories with members of divisions/units outside your own in the organization.
4. Your colleagues from divisions outside your own in the organization share success and failure stories with you.
5. You share your experience or know-how from work with members of divisions/units outside your own in the organization.
6. Your colleagues from divisions outside your own in the organization share know-how from work with you.
7. You share knowledge at the request of members of divisions/units outside your own in the organization.
8. Your colleagues from divisions outside your own in the organization share knowledge at your request.

9. You share your expertise from your education or training with members of divisions/units outside your own in the organization.
10. Your colleagues from divisions outside your own in the organization share their expertise from their education or training with you.

Organizational Structure

Definition: Organizational structure is specified in two themes: role of IT and positioning of IT. What role IT people play in the organization reflects its specific organizational structure.

Scale:

1	2	3	4	5	6	7
Strongly Disagree	**Disagree**	**Somewhat Disagree**	**Neutral**	**Somewhat Agree**	**Agree**	**Strongly Agree**

Please rate the extent you agree to the following statements.
There is no right or wrong answer.

1. IT plays a strategic role in your organization.
2. IT employees play a strategic role in your organization.
3. The IT director is a senior executive in the organization.
4. The IT director participates in making strategic decisions on the organization.
5. System-related resources are controlled by the IT director.

Stories and Myths

Definition: Stories and myths are told by organizational members. Further, good stories are positively related to trust and reputation.

Scale:

1	2	3	4	5	6	7
Strongly Disagree	**Disagree**	**Somewhat Disagree**	**Neutral**	**Somewhat Agree**	**Agree**	**Strongly Agree**

Please rate the extent you agree to the following statements.
There is no right or wrong answer.

1. Good stories are told about the IT personnel in the organization by non-IT employees.
2. IT personnel are admired by other departments in the organization.
3. IT personnel are trusted by other departments in the organization.
4. IT personnel are a competent group in the organization.
5. IT personnel have a good reputation in the organization.

Symbols

Definition: Symbols of IT occupational culture include the type of language used, logos, and office layouts.

Scale:

1	2	3	4	5	6	7
Strongly Disagree	**Disagree**	**Somewhat Disagree**	**Neutral**	**Somewhat Agree**	**Agree**	**Strongly Agree**

1. IT professionals are physically located with the business colleagues in the organization.
2. IT professionals use IT jargon when talking with their business colleagues in the organization.
3. IT professionals' offices are far away from their business colleagues' offices.
4. IT professionals and the business colleagues share information through commonly understood languages and terms.
5. IT professionals and business colleagues communicated smoothly, without confusion.

Rituals and Routines

Definition: Rituals and routines characterize the way work is the done, normally manifests through system development process.

Scale:

1	2	3	4	5	6	7
Strongly Disagree	**Disagree**	**Somewhat Disagree**	**Neutral**	**Somewhat Agree**	**Agree**	**Strongly Agree**

- The system development process is adhered to by both business and IT.
- IT professionals understand organizational and user requirements.
- IT professionals know how to employ IT to achieve business goals.
- Business colleagues participate in the system development process.
- Business colleagues understand the system development process.

Control Systems

Definition: The culture theme of control system deals with the question: which one is more important in organization, IT or business?

Scale:

1	2	3	4	5	6	7
Strongly Disagree	**Disagree**	**Somewhat Disagree**	**Neutral**	**Somewhat Agree**	**Agree**	**Strongly Agree**

- IT people co-manage IT implementation projects with business people in the organization.
- The IT diffusion project in the organization is managed only by IT department.
- The IT diffusion project in the organization is managed only by non-IT department.
- Both IT and business control the strategic direction in the organization.
- The strategic direction in the organization is only controlled by business people.

Power Structures

Definition: Power structures reflect the powerful managerial group in an organization.

Scale:

1	2	3	4	5	6	7
Strongly Disagree	**Disagree**	**Somewhat Disagree**	**Neutral**	**Somewhat Agree**	**Agree**	**Strongly Agree**

- The IT group has an extremely high level of expert power in the organization.
- The business units are extremely dependent on IT technical knowledge.
- The business units have control over the expert power of the IT group.
- The IT group has an extremely high level of information power to control over the business units in the organization.
- IT professionals are a powerful managerial group in the organization.

Appendix C (Essay3_survey items)

Background Information

Gender:	☐Male ☐Female
Age:	☐Under 26 ☐26-35 ☐36-45 ☐46-55 ☐56-65 ☐ Over 65
Education:	☐High school ☐Associate degree ☐Bachelor's degree ☐Master degree ☐PhD degree ☐Other
Your confidence in using computers 10-point scale: 1: no confidence at all, 10: complete confidence	1 2 3 4 5 6 7 8 9 10
How long have you used the HIS?	☐Less than half a year ☐More than half a year but less than one year ☐More than one year but less than two years ☐More than two years but less than three years ☐More than three years but less than four years

	☐More than four years but less than five years ☐More than five years
The amount of training you have got for using the hospital information system:	☐Very little ☐Little ☐Some ☐Much ☐Very much
The frequency you use the hospital information system in your work:	☐Very little ☐Little ☐Some ☐Much ☐Very much
The amount of time you use the hospital information system in	☐None ☐Less than one hour per day ☐one to three hours per day

your work:	☐three to five hours per day ☐More than five hours per day
Please check all the relevant modules of HIS you use and write down the number representing the frequency you use towards each module: 1-Very little, 2-Little, 3-Some, 4- Much, 5-Very much	Module: Use frequency: ☐Out-patient doctor workstation subsystem _____ ☐Hospital all-in-one-card subsystem _____ ☐Out-patient appointment subsystem _____ ☐Out-patient infusion subsystem _____ ☐Remote diagnosis and treatment subsystem _____ ☐Blood management subsystem _____ ☐Others, please specify: _____ _____ _____
Your occupation:	

Job title:	
If you are interested in the results from this survey, please write down your email here:	

For the following statement, the categories are: 1 – Never True, 2 – Rarely True, 3 – Infrequently True, 4 – Occasionally True, 5 – Sometimes True, 6 – Usually True, 7 – Always True.

HIS-Overload: HIS users face information overload and HIS-enabled multitasking

TO1. I am forced by HIS to work much faster.

TO2. I am forced by HIS to do more work than I can handle.

TO3. I am forced by HIS to work with very tight time schedules.

TO4. I am forced to change my work habits to adapt to HIS.

TO5. I have a higher workload because of increased HIS complexity.

HIS-Complexity: HIS users find it intimidating to learn and use HIS

TC1. I do not know enough about HIS to handle my job satisfactorily.

TC2. I need a long time to understand and use HIS.

TC3. I do not find enough time to study and upgrade my technology skills to use HIS.

TC4. I find new recruits to this organization know more about HIS than I do.

TC5. I often find it too complex for me to understand and use HIS.

HIS-Uncertainty: HIS users feel unsettled by continual upgrades and accompanying software and hardware changes

TU1. There are always new developments in the HIS we use in our organization.

TU2. There are constant changes in HIS related software in our organization.

TU3. There are constant changes in HIS related hardware in our organization.

TU4. There are frequent upgrades to HIS related networks in our organization.

Literacy Support: Mechanisms to help HIS users cope with the demands of learning about new HIS

LS1. Our organization encourages knowledge sharing to help deal with the use of HIS.

LS2. Our organization emphasizes teamwork in dealing with HIS-related problems.

LS3. Our organization provides end-user training before the introduction of HIS.

LS4. Our organization fosters a good relationship between the IT department and the end users of HIS.

LS5. Our organization provides clear documentation to end users on using HIS.

Technical Support Provision: Mechanisms to address HIS users' anxiety about potentially disruptive mistakes and technical problems

TSP1. Our end-user help desk does a good job of answering questions about HIS.

TSP2. Our end-user help desk is well staffed by knowledgeable individuals.

TSP3. Our end-user help desk is easily accessible.

TSP4. Our end-user help desk is responsive to my requests.

Technology Involvement Facilitation: Mechanisms to encourage users to explore and familiar with HIS

TIF1. I am encouraged to try out HIS.

TIF2. I am rewarded for using HIS.

TIF3. I am monitored for using HIS.

TIF4. I get feedback about my performance of using HIS.

Innovation Support: Mechanisms to help HIS users learn about and accept HIS-driven changes in their routines and tasks.

IS1. We have a very open communications environment.

IS2. Employees and functional managers are supportive of each other.

IS3. Employees at all levels are rewarded for learning new skills.

IS4. Management encourages an experimental mind-set and risk-taking.

Organizational culture scale

Innovativeness

IN1. Technical innovation, based on research results, is readily accepted.

IN2. Management actively seeks innovative ideas.

IN3. Innovation is readily accepted in program/project management.

IN4. People are penalized for new ideas that don't work (R).

IN5. Innovation perceived as too risky and is resisted (R).

Participative Decision-Making

PDM1. Decision making is delegated to the lowest possible level of authority.

PDM2. Individuals involved in implementing decisions have a say in making the decisions.

PDM3. Decisions are made on the basis of research, data, and technical criteria, as opposed to political concerns.

PDM4. Decisions are based on open discussion and debate of facts.

PDM5. Once a decision is made, management communicates the results and rationale to employees.

Power Sharing

PS1. People are willing to share their power-there is an atmosphere of working together.

PS2. We do teamwork and sharing.

PS3. Authority is highly centralized; only a handful at the top has it (R).

Support and Collaboration

SC1. People throughout this organization are supportive and helpful.

SC2. There is a willingness to accept responsibility for failure.

SC3. There is a willingness to collaborate across organizational units.

Learning and Development

LD1. My organization provides opportunities for individual development other than formal training (e.g., work assignments and job rotation).

LD2. My organization encourages managers to attend formal developmental activities such as training, professional seminars, symposia, etc.

LD3. There are people at my organization who provide guidance and counsel regarding one's career.

LD4. Career management is a shared responsibility of both employee and the manager.

The General Perceived Self-Efficacy Scale

SE1. I can always manage to solve difficult problems if I try hard enough.

SE2. If someone opposes me, I can find means and ways to get what I want.

SE3. It is easy for me to stick to my aims and accomplish my goals.

SE4. I am confident that I could deal efficiently with unexpected events.

SE5. Thanks to my resourcefulness, I know how to handle unforeseen situations.

SE6. I can solve most problems if I invest the necessary effort.

SE7. I can remain calm when facing difficulties because I can rely on my coping abilities.

SE8. When I am confronted with a problem, I can usually find several solutions.

SE9. If I am in trouble, I can usually think of something to do.

SE10. No matter what comes my way, I am usually able to handle it.

Positive Framing

PF1. I try to look on the bright side of things.

PF2. I try to see my situation as an opportunity rather than a threat.

PF3. I try to see my situation as a challenge rather than a problem.

Eustress scale

ES1. I can effectively cope with stressful changes that occur in my work when using the HIS.

ES2. I can successfully deal with irritating hassles when using the HIS.

ES3. I feel that stress positively contributes to my ability to handle my use of HIS problems.

ES4. In general, I feel motivated by my stress.

ES5. In general, I am able to successfully control the irritations in use of the HIS.

ES6. In general, I cannot perform well in using the HIS when under pressure. (R)

ES7. In general, I am unable to control the way I spend my time in using the HIS. (R)

ES8. When faced with work stress in using the HIS, I find that the pressure makes me more productive.

ES9. I feel that I perform better in using the HIS when under pressure.

ES10. I feel that stress for using the HIS has a positive effect on the results of my use of the HIS.

Distress scale

DS1. I feel drained from activities that require me to use HIS.

DS2. I feel tired from my HIS activities.

DS3. Working all day with HIS is a strain for me.

DS4. I feel burned out from my HIS activities.

CURRICULUM VITAE

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Publications

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