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A CULTURAL CONTINGENCY MODEL OF KNOWLEDGE SHARING AND JOB PERFORMANCE

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ABSTRACT

Drawing from the knowledge management literature, we developed and tested a nomological network related to knowledge sharing—i.e., knowledge seeking and knowledge providing using knowledge management systems. We investigated the effect of cultural contingencies on the prediction of both knowledge seeking and knowledge providing. In addition, we examined the effect of knowledge sharing using a KMS on employee job performance. We conducted a study using a field survey of 224 employees in an organization in the People's Republic of China and United States. We found that sensitivity to image and sensitivity to organizational incentives influenced both knowledge seeking and knowledge providing, and the effect was varied across individuals with different cultural values. For example, our findings suggested that the negative relationship between sensitivity to image and knowledge seeking was stronger for individuals with collectivistic values than for those with individualistic values. We also found that both knowledge seeking and knowledge providing led to better job performance.

Keywords: cultural contingencies; job performance; knowledge management; sensitivity to image; sensitivity to organizational incentives

1. INTRODUCTION

To gain competitive advantage in the global market, knowledge management systems (KMSs), generally classified as an instance of collaborative systems that incorporate various information and communication technologies (e.g., David, Chand, Newell, & Resende-Santos, 2008; Leidner, 2010; Tsui, 2005), play an important role in facilitating knowledge exchange in a distributed or virtual environment to fulfill different strategic objectives such as new product development and information systems (IS) development (e.g., Griffith, Cavusgil, & Xu, 2008; Friedrich, Becker, Kramer, Wirth, & Schneider, 2020; Mithas, Tafti, Bardhan, & Goh, 2012; Morris, Hammond, & Snell, 2014). However, implementations of KMSs do not guarantee that organizations will reap benefits from them (Boughzala & De Vreede, 2015; Handzic, 2009; Kankanhalli, Lee, & Lim, 2011). Similar to many other large-scale project implementations, such as ERP implementations and e-healthcare system implementations (e.g., Avgar, Tambe, & Hitt, 2018; Bardhan, Krishnan, & Lin, 2013; Peng, Dey, & Lahiri, 2014), researchers and practitioners must understand the process by which an individual adopts and uses KMSs in the workplace (Sun, 2012). A fundamental assumption is that employees will use the system to share knowledge (Kang, Lee, & Kim, 2017), i.e., *knowledge providing* and *knowledge seeking*. However, prior studies indicate knowledge sharing using a KMS, defined as “a class of information systems applied to managing organizational knowledge” (Alavi & Leidner, 2001: 114), is rare and the lack of use has been identified as a key reason for the failure of KMS implementations (e.g., Bordia, Irmer, & Abusah, 2006; Friedrich et al., 2020; Kankanhalli, Tan, & Wei, 2005a; Kankanhalli, Tan, & Wei, 2005b; Wasko & Faraj, 2005; Young, Kuo, & Myers, 2012). As project implementations increasingly span regions or involve people with diverse cultural backgrounds to support distributed and virtual environments (Cleveland & Laroche, 2007; Oliveira, Thomas, Baptista, & Campos, 2016), failure rates increase significantly due to coordination problems caused by cultural differences (Leung, Bhagat, Buchan, Erez, & Gibson, 2005; Lücke, Kostova, & Roth, 2014). The importance of this issue is further underscored by the fact that more than 45% of project teams are cross-cultural (Schell,

2016). A recent survey of 1,620 managers from 90 countries indicates that over 60% of the managers work on teams with employees from more than three cultures (CultureWizard, 2018). In light of this, it is important to understand the underlying motivational mechanisms that affect knowledge sharing using KMSs in a cross-cultural setting (Haas & Cummings, 2015; Hsu, Lin, & Wang, 2015; Morris et al., 2014).

Prior literature indicates two important motivational mechanisms influence knowledge sharing, one is concern for one's public image or reputation, e.g., worries about face-loss in revealing one's unfamiliarity in certain knowledge domains (Ramasamy, Goh, & Yeung, 2006) or gains recognition in certain knowledge domains (Huang, Davison, & Gu, 2011), and the other is organizational incentives, e.g., monetary rewards (Chang, Hsu, Shiau, & Tsai, 2015; Kankanhalli et al., 2005a; Zhang, Ordóñez De Pablos, & Zhou, 2013). Organizational stimulus can convey monetary or symbolic values. In our work, organizational incentives capture monetary values (i.e., financial incentives that emphasize the direct value of money given to employees in the form of extra pay or other material benefits). Interestingly, our review of prior literature indicated that the effects of concern for image and organizational incentives on knowledge sharing were inconsistent. For example, concern for image was found to negatively affect knowledge sharing in some studies (e.g., Bordia et al., 2006; Borgatti & Cross, 2003) but the effect was positive or not significant in other studies (e.g., Kankanhalli et al., 2005a; Wasko & Faraj, 2005). Similarly, prior studies found that the effects of organizational incentives were positive (Kankanhalli et al., 2005a), negative (Bock, Zmud, Kim, & Lee, 2005; Bock & Kim, 2002), or not significant (He & Wei, 2009; Lin, 2007). These inconsistent findings are the primary motivation for the current research—i.e., to develop a better understanding of how these two motivational mechanisms affect knowledge sharing. An important approach to understand why a relationship is not significant or is inconsistent across studies is to go beyond the simple bivariate relations between a predictor and a criterion by examining the boundary conditions or how contextual factors may mediate and/or moderate the original relationships (Alvesson & Kärreman, 2007; Hutzschenreuter & Voll, 2008; Johns, 2006; Sarala & Vaara, 2010; for an example, see Zhang, 2017).

In this work, we examine *sensitivity to image*, defined as the extent to which an individual is concerned about his or her own public or social image shaped by participating in knowledge sharing using KMSs and *sensitivity to organizational incentives*, defined as the extent to which an organizational stimulus that conveys monetary values for participating in knowledge sharing using KMSs is appealing to individuals (Jiacheng, Lu, & Francesco, 2010). Sensitivity to image captures symbolic values (i.e., social incentives) with regard to obtaining social approval and social recognition. We argue that knowledge seekers and providers will be different regarding their sensitivity to image and organizational incentives considering that favor givers and receivers would calculate the value of a social exchange relationship differently when exposed to various stimuli (e.g., Zhang & Epley, 2009). To get a better understanding of the roles of image and organizational incentives in affecting knowledge sharing, we distinguish knowledge seeking and knowledge providing using KMSs in our theory development.

Knowledge sharing using KMSs in a culturally diverse context may be different from knowledge sharing in a culturally homogeneous context because of variations in culture, languages, and knowledge management practices (e.g., Barner-Rasmussen, Ehrnrooth, Koveshnikov, & Mäkelä, 2014; Haas & Cummings, 2015; Sarala & Vaara, 2010). The role of culture has not been adequately examined in the knowledge sharing literature. Although prior research has shown a direct effect of culture on knowledge sharing (e.g., Müller, Spiliopoulou, & Lenz, 2005), the role of culture as a contingency factor that shapes the effects of sensitivity to image and sensitivity to organizational incentives on knowledge sharing using KMSs has not been adequately understood. However, prior research has indicated the importance of incorporating norms, such as collaborative norms and pro-sharing norms, as key contingency factors to understand knowledge sharing (e.g., Gould & Grein, 2009; Lücke et al., 2014). Culture and norms are similar in that they both refer to values and beliefs that represent a degree of consensus in the social system and they both often regulate the direction and strength of knowledge sharing (Sarala & Vaara, 2010; Rai, Maruping, & Venkatesh, 2009). Therefore, it is theoretically important to incorporate cultural

values as key contingency factors to enhance our understanding of the effects of sensitivity to image and organizational incentives on knowledge sharing using KMSs. To investigate the effect of cultural values on knowledge sharing among employees, we use Hofstede's five cultural dimensions, i.e., individualism/collectivism, power distance, masculinity/femininity, uncertainty avoidance, and long-term orientation (Hofstede, 1980, 1983; Hofstede & Bond, 1988). Although Hofstede's cultural dimensions were originally developed for country level studies (e.g., Griffith, Myers, & Harvey, 2006; Chen, Hsieh, Van De Vliert, & Huang, 2015), they have been used to investigate the role of culture at the individual level (e.g., Chang et al. 2015; Kirkman, Chen, Farth, Chen, & Lowe, 2009; Kirkman & Shapiro, 2001).

We also examine a key consequence of knowledge sharing using KMSs, i.e., job performance (e.g., Hutzschenreuter & Voll, 2008; Ko & Dennis, 2011), given that understanding the effect of knowledge sharing using a KMS on job performance has been critical both to research and practice (Bordia et al., 2006; Kim, Mukhopadhyay, & Kraut, 2016). Especially in a distributed working environment, competitive advantage depends on how effectively knowledge is shared among individuals and groups using KMSs (Alavi & Leidner, 2001). Like other factors in this literature base, knowledge sharing has been found to have positive effects on key job outcomes, e.g., job performance (e.g., Kankanhalli et al., 2011; Ko & Dennis, 2011), and negative or non-significant effects (e.g., Cheung, Chau, & Au, 2008; Gallivan, Eynon, & Rai, 2003). Therefore, we examine employee job performance as a key outcome in our model.

Taken together, our work aims to answer the following research questions: (1) what is the influence of motivational mechanisms on knowledge sharing and job performance? and (2) how do cultural values leverage motivational mechanisms to improve knowledge sharing? In doing so, our work makes key theoretical contributions. First, the incorporation of cultural values extends the knowledge management literature by offering a new perspective to understand knowledge sharing in a distributed context. Second, we develop a better understanding of how to facilitate the implementation and use of collaborative systems

in general, KMSs in particular, for knowledge sharing. Third, we extend prior research by theorizing and empirically validating the relationship between knowledge seeking and providing and job performance.

We organize the rest of the paper as follows: our literature review is followed by a discussion of our research model and hypotheses; next, the method section describes the contextual setting, data collection, and empirical analysis; we then discuss our findings and their implications, followed by a conclusion.

2. LITERATURE REVIEW

2.1. Cultural values

Culture is “the collective programming of the mind that distinguishes the members of one group or category of people from another” (Hofstede, 1980: 3). Hofstede (1980) developed a taxonomy of cultural values to measure people’s “basic values and beliefs” (Chang et al. 2015: 264). These values and beliefs affect human behaviors and shape human social relationships (Leidner & Kayworth, 2006). Hofstede’s taxonomy of cultural values includes five dimensions and has been widely employed in prior research (Cleveland & Laroche, 2007; Goncalves, Oliveira, & Cruz-Jesus, 2018; Gould & Grein, 2009; Hofstede, 1980; Leung et al., 2005). Individualism/collectivism refers to an individual’s preference for a social framework where individuals take care of themselves (individualism), as opposed to where individuals expect the group to take care of them in exchange for their loyalty (collectivism). Power distance refers to the extent to which people with less power accept differentials of power and inequality.

Masculinity/femininity refers to an individual’s degree of preference for achievement, assertiveness, and material success. Uncertainty avoidance refers to the extent to which individuals feel vulnerable to unpredictable and unknown situations. Long-term orientation refers to people’s consideration for the future. Although Hofstede’s taxonomy of cultural values was initially conceptualized at the national level, more recent work has examined these values at the individual level both in organizational behavior and information systems literatures (e.g., Ameen, Tarhini, Hussain Shah, & Madichie, 2020; Chang et al., 2015; Eisend, 2019; Kirkman et al., 2009; Kirkman & Shapiro, 2001; Martins, Oliveira, & Thomas, 2016; Rai et al.,

2009), conceptualizing them as the extent to which an individual embraces specific cultural values, i.e., espoused cultural values.

2.2. Motivation and knowledge sharing

Knowledge is recognized as a strategic resource for organizations and is considered more important than traditional resources such as capital and land (e.g., Hansen, Nohria, & Tierney, 1999). Understanding how to facilitate knowledge sharing has been a particular focus of researchers and practitioners (Bordia et al., 2006; Kim et al., 2016). Especially in a distributed working environment, competitive advantage depends on how efficiently knowledge is shared among individuals and groups (Alavi & Leidner, 2001; Quigley, Tesluk, Locke, & Bartol, 2007). Our literature review indicates that two types of motivations impact employees' knowledge sharing: financial incentives and social incentives. Table 1 presents example studies that have examined the effects of motivational factors on knowledge sharing.

Existing literature proposes that motivations exert direct effects on individuals' knowledge sharing. Most studies draw on social exchange theory and explain that employees could be motivated to share knowledge for two types of benefits, i.e., financial rewards and social incentives (e.g., Chang et al., 2015; Friedrich et al., 2020; Hung, Lai, & Chang, 2011; Zhang & Epley, 2009). Organizational incentives include financial rewards such as bonuses, promotions, and job security (Lin, 2007). They are associated with individuals' material well-being (Brock & Kim, 2002). Therefore, organizations can introduce reward systems to encourage employees to share knowledge (Huang et al., 2011). For example, Quigley et al. (2007) found that knowledge providers are motivated to engage in knowledge sharing for greater rewards and higher performance. Social incentives include social approval, others' recognition of competence or ability, and reputation (Huang et al., 2011). We use sensitivity to image to capture social incentives. Thus, sensitivity to image is defined as the extent to which an individual is concerned about his/her public or social image shaped by participating in knowledge sharing.

Our literature review suggests that most studies have examined the effect of motivations on knowledge sharing generally (e.g., Ba, Stallaert, & Whinston, 2001; Hung et al., 2011; Zhang et al., 2013), with a few exceptions. For example, Kankanhalli et al. (2005a) and Quigley et al. (2007) specifically examined employees' knowledge contribution by providers, and Ozer and Vogel (2015) investigated the effectiveness of knowledge seeking. We propose that the effects of motivations on knowledge seeking and knowledge providing may be nuanced (Ozer & Vogel, 2015). Therefore, in this work, we break down knowledge sharing into seeking and providing, and examine how they are related to sensitivity to organizational incentives and sensitivity to image.

2.3. Knowledge sharing in a cross-cultural context

Cultural differences have been found particularly useful in understanding how social groups and individuals interact with technology in organizational contexts (Leidner & Kayworth, 2006; Ma, Yang, & Yoo, 2020). Hofstede's taxonomy of cultural values has been widely employed to examine knowledge sharing in a cross-cultural context (Chang et al. 2015). For example, Chow, Deng, and Ho (2000) examined the effect of individualism/collectivism on knowledge sharing by analyzing questionnaires completed by managers in China and the United States (US). They found that managers in China (collectivism) shared more than managers in the US (individualism) when involving a self vs. collective interest conflict. Drawing on resource-based view, Griffith et al. (2006) investigated the relationship between knowledge resources and relationship resources in Japanese and the US. Chen et al. (2015) examined the moderating effect of cultural values on the effect of perceived usefulness on knowledge seeking intention. They collected data from knowledge workers across 30 nations and found that cultural values moderated the relationship between perceived usefulness and intention to continue knowledge seeking. Chang et al. (2015) conducted a study in the US and China to compare motivations on knowledge sharing in the cross-cultural context, and found that individualism/collectivism and uncertainty avoidance moderated the effect of motivations on

knowledge sharing intention. In the current study, we incorporated Hofstede's five cultural values and examined their effects on knowledge seeking and knowledge providing in a cross-cultural context.

3. MODEL DEVELOPMENT

Figure 1 presents our research model. Specifically, we examine the effects of sensitivity to image and sensitivity to organizational incentives on knowledge sharing, and the moderation of these effects by cultural values; and finally, we relate knowledge sharing to job performance.

3.1. Sensitivity to image

Most employees care about their image in the eyes of their colleagues and tend to engage in activities that would improve their image or reputation (Dhillon, Oliveira, & Syed, 2018), and tend to disengage themselves from activities that may tarnish their image or reputation (e.g., Borgatti & Cross, 2003; Gattiker, Carter, Huang, & Tate, 2014). Knowledge sharing is likely to be a double-edged sword in that it could either jeopardize or improve employees' image or reputation. On the one hand, participating in knowledge seeking and knowledge providing could tarnish one's image by revealing one's incompetence, such as asking stupid questions or providing incorrect answers (Borgatti & Cross, 2003; Ngwenyama & Lee, 1997; Tynan, 2005). On the other hand, seeking knowledge shows an employee's modest attitude and desire to learn and such personal attributes are perceived favorably among employees (e.g., Anand, Walsh, & Moffett, 2019; Morrison & Bies, 1991). In contrast, providing knowledge is a good way to demonstrate employees' expertise and their citizenship behaviors (Ozer & Vogel, 2015), thus enhancing their image and reputation (e.g., Kankanhalli et al., 2005a; Wasko & Faraj, 2005).

According to the egocentric social judgment perspective (e.g., Ross & Ward, 1995; Zhang & Epley, 2009), people's egocentric biases reflect their self-centered basis of social judgment (e.g., Barner-Rasmussen et al., 2014). When it comes to knowledge sharing using a KMS, knowledge seekers and providers are likely to assign different weights to the factors that would enhance their image and those that would tarnish their image. Thus, we discuss the nuanced effects of sensitivity to image on knowledge

providing and knowledge seeking.

Knowledge providing. Employees can use a KMS to provide knowledge by answering questions posted by specific employees or posting knowledge, such as technical know-how and best practices, that are targeted to a general audience (Bardhan et al., 2013; Wasko & Faraj, 2005). Driven by the desire for professional development and career advancement, employees are more likely to provide knowledge using a KMS due to its capability of making more people view and access the knowledge posted (Friedrich et al., 2020), and develop favorable perceptions of the knowledge providers (Majchrzak, Wagner, & Yates, 2013; Ramasamy et al., 2006). Employees who establish a positive image or reputation, such as being viewed as good citizen or domain experts, will be deemed to be valuable assets to the organizations and more likely advance faster in their careers (Wasko & Faraj, 2005). Thus, we hypothesize:

H1a. Sensitivity to image will have a positive effect on knowledge providing using a KMS.

Knowledge seeking. Admitting unfamiliarity on a work-related task might harm one's reputation such that one might be perceived as being less knowledgeable or sometimes ill-suited for the job, particularly if the knowledge provider is the supervisor. When employees post questions using a KMS, they reveal their lack of knowledge in a certain area¹. DePaulo and Fisher (1980) indicated that the costs that are perceived as potential threats to the knowledge seeker's feelings of competence and self-respect are often difficult to overcome. The incompetence and face-loss issues related to knowledge seeking become particularly stronger in a KMS context (e.g., Bardhan et al., 2013), as posted questions (solicitation for knowledge) become archived and can be seen by all users of a KMS. This is in contrast this to a one-on-one face-to-face (FTF) knowledge request that could well be forgotten and/or not known to many others. Bordia et al. (2006) found that evaluation apprehension—i.e., the fear that one's work may be critiqued—

¹ In this work, employees shared knowledge in a virtual setting. Unlike other virtual settings where employees can choose not to reveal their true identities and thus minimize the impacts of interpersonal risks, we study an organization, like many organizations, where employees must use their true identities when using the KMS.

negatively influenced knowledge seeking using a KMS. Sensitivity to image may become a trigger that affects how an employee will adapt the use of a KMS for knowledge seeking (Sun, 2012). Thus, we hypothesize:

H1b. Sensitivity to image will have a negative effect on knowledge seeking using a KMS.

3.2. Sensitivity to organizational incentives

When it comes to knowledge sharing using a KMS, knowledge seekers and providers are likely to be different in their sensitivity to organizational incentives (Quigley et al., 2007; Zhang et al., 2013). Generally, it is important for employees to seek knowledge to resolve work-related problems (Ozer & Vogel, 2015). If they cannot solve the problems, they may not be able to accomplish job tasks and as a result, they are likely to receive poor performance ratings and in the worst case, lose their jobs. To avoid such negative consequences, employees are likely to seek knowledge using a KMS to accomplish their job tasks (Kang et al., 2017). In the context of knowledge seeking, it is less likely that organizations will allocate a large budget to incentivize knowledge seeking behaviors.

Providing knowledge to others will take away time of knowledge providers from working on their own tasks. Answering questions may be disruptive, as knowledge providers may need to spend significant amount of time switching between tasks, i.e., their own tasks and the tasks of addressing their colleagues' questions, and vice versa (Anand et al., 2019). In addition, providing answers online may demand more time than answering questions in a FTF setting because the lack of contextual cues to clarify misunderstandings in an online setting (e.g., Zhang & Venkatesh, 2013). Moreover, sharing expertise with others may empower knowledge seekers, making them more capable of competing with knowledge providers. This could make the knowledge providers uncomfortable due to the loss of power and status (Kankanhalli et al., 2005a; Li, Liu, & Liu, 2016). Under such circumstances, organizational incentives will likely be highly valued as a return for the time and effort spent by employees to provide knowledge.

Therefore, organizational incentives will be effective in motivating employees to provide knowledge using a KMS. Thus, we hypothesize:

H2. Sensitivity to organizational incentives will have a positive effect on knowledge providing using a KMS.

3.3. Moderating effect of cultural values

3.3.1. Individualism/collectivism

Knowledge providing. In the context of knowledge providing using a KMS, employees high in collectivism will be likely to engage in activities that will boost their public image or reputation, due to their greater concern for image and social status in a group (Davison, Ou, & Martinsons, 2013; Wei, Ang, & Liou, 2020). The behavior of providing knowledge in a FTF setting is only seen by or known to the knowledge providers and the knowledge seekers, whereas the behavior of using a KMS to provide knowledge can be seen and known by more people if the questions and answers are posted publicly. Driven by the desire to create a good public image, employees high in collectivism will be likely to engage more in knowledge providing using a KMS (Jia & Zsidisin, 2014). Consequently, the effect of sensitivity to image on knowledge providing using a KMS will be strengthened. Thus, we hypothesize:

H3a. Individualism/collectivism will moderate the effect of sensitivity to image on knowledge providing using a KMS such that the positive effect will be stronger for employees with collectivistic values than it will be for those with individualistic values.

Knowledge seeking. Individuals high in collectivism place great emphasis on social acceptance, social identity and smooth interpersonal relations (Wei et al., 2020; Zhang & Maruping, 2008), and they are motivated to establish and maintain a positive image that is needed for social acceptance (Gangestad & Snyder, 2000). As hypothesized earlier, knowledge seekers are more sensitive to the factors that would tarnish their image, e.g., acknowledgement of ignorance and incompetence and choose not to engage in knowledge seeking using a KMS (Chang et al., 2015). For employees high in collectivism, they will avoid situations that can potentially damage their images to “save face” (Huang et al., 2011: 564). For this reason, their concern for image will likely be stronger due to their greater sensitivity to their reputation and

status they are strongly motivated to maintain in a group (Oliveira, Alinho, Rita, & Dhillon, 2017).

Consequently, the negative effect of sensitivity to image on knowledge seeking using a KMS will be strengthened. Thus, we hypothesize:

H3b. Individualism/collectivism will moderate the effect of sensitivity to image on knowledge seeking using a KMS such that the negative effect will be stronger for employees with collectivistic values than it will be for those with individualistic values.

3.3.2. Power distance

Knowledge providing. The positive relationship between sensitivity to image and knowledge providing using a KMS is likely to be reinforced by power distance. Employees who espouse high power distance tend to be more sensitive to their public image or authority (Huang et al. 2011; Jia & Zsidisin, 2014). They will be likely to have strong orientation toward the preservation of the organizational hierarchy that defines their power and status, and they will try to create and maintain a good image that will reinforce their power and status (McCoy, Galletta, & King, 2007; Wiener, Remus, Heumann, & Mahring, 2015). From their perspective, providing knowledge using a KMS can enhance their image by maintaining their authority in certain domain of knowledge (Chang et al., 2015; Majchrzak et al., 2013). Under such circumstances, employees will be more likely to engage in the behavior of providing knowledge (Kang et al., 2017). Consequently, the effect of sensitivity to self-image on knowledge providing using a KMS will be strengthened. Thus, we hypothesize:

H4a. Power distance will moderate the effect of sensitivity to self-image on knowledge providing using a KMS such that the positive effect will be stronger for employees high in power distance than it will be for those low in power distance.

Knowledge seeking. The negative relationship between sensitivity to image and knowledge seeking is likely to be reinforced by power distance. Along the same line of reasoning as H4a, employees who espouse high power distance conform to a hierarchy and respect the structure of a hierarchy (Hofstede, 1980). They are likely to maintain or protect their status or positions in organizations (Chang et al., 2015) such as levels of authority defined by power accrued through the acquisition of specialized

knowledge and skills (e.g., Srite & Karahanna, 2006). Such status or authority is closely related employees' public image because a good public image is likely to reinforce status or authority. For these employees, they will be likely to be more sensitive to the factors that would jeopardize their public image that they have greater tendency to endorse and protect (Li et al., 2016; Wiener et al., 2015). In addition, they tend to comply with the hierarchy and avoid situations that create disharmony or conflict (Huang et al., 2011). Under these circumstances, employees will likely disengage from the behavior of seeking knowledge using a KMS (Li et al., 2016). Consequently, the effect of sensitivity to self-image on knowledge seeking using a KMS will be strengthened. Thus, we hypothesize:

H4b. Power distance will moderate the effect of sensitivity to self-image on knowledge seeking using a KMS such that the negative effect will be stronger for employees high in power distance than it will be for those low in power distance.

3.3.3. Masculinity/femininity

Employees who espouse high femininity desire a comfortable life, whereas employees who espouse high masculinity desire work achievement and material success (Hofstede, 1998). Therefore, employees who espouse high masculinity will be more likely to embrace and endorse the value conveyed by organizational incentives (Chen et al., 2015), i.e., achieving career advancement or material success by providing knowledge using a KMS. Additional incentives, such as monetary rewards, will be important in facilitating knowledge providing for employees who espouse high masculinity. Under such circumstances, employees will be more likely to use a KMS to answer questions or make comments on certain discussion topics (e.g., Niemiec & Ryan, 2009). Thus, we hypothesize:

H5. Masculinity/femininity will moderate the effect of sensitivity to incentives on knowledge providing using a KMS such that the positive effect will be stronger for employees with masculine values than it will be for those with feminine values.

3.3.4. Uncertainty avoidance

Using asynchronous features of a KMS to provide knowledge would make it more difficult to deal with the ambiguity and uncertainty arising from using the KMS. For example, the lack of immediate

feedback, visual cues, and body language create barriers for knowledge transfer using a KMS (Dennis, Fuller, & Valacich, 2008). Given that employees who espouse high uncertainty avoidance have a low tolerance for uncertainty and ambiguity (Hofstede, 1980), they will feel uncomfortable, e.g., anxious, using asynchronous communication (Hwang, 2005; Kim, 2008). They will avoid ambiguous and uncertain situations by disengaging themselves from providing knowledge using a KMS (Chang et al., 2015). Under such circumstances, monetary incentives will likely be effective in motivating these employees given that monetary incentives have a stronger effect in changing people's non-volitional behaviors than in changing their volitional behaviors (e.g., Ryan & Deci, 2000; Vallerand, 1997). Thus, we hypothesize:

H6. Uncertainty avoidance will moderate the effect of sensitivity to incentives on knowledge providing using a KMS such that the positive effect will be stronger for employees high in uncertainty avoidance than it will be for those low in uncertainty avoidance.

3.3.5. Long-term orientation

Given that employees who espouse high long-term orientation respect long-term commitments (Hofstede & Bond, 1988), they will be more likely to provide knowledge using a KMS because using a KMS to provide knowledge, such as answering questions or participating in the discussion of certain topics, is a way to show organizational citizenship behaviors that signals employees' willingness to make long-time commitments (Fang, Benamati, & Lederer, 2011; Maruping, Venkatesh, Thong, & Zhang, 2019). Under such circumstances, the effect of monetary incentives will likely be stronger among employees who espouse low long-term orientation because these employees will be less motivated to provide knowledge using a KMS. Thus, we hypothesize:

H7. Long-term orientation will moderate the effect of sensitivity to incentives on knowledge providing using a KMS such that the positive effect will be stronger for employees low in long-term orientation than it will be for those high in long-term orientation.

3.4. Job performance

Knowledge providing. Knowledge providers can leverage various KMS features, such as "multiple editing" (e.g., Majchrzak et al., 2013) and "entry of experimental knowledge" (e.g., Majchrzak, Malhotra, &

John, 2005), to provide knowledge. The “multiple editing” feature allows many users to jointly edit, modify or refine a piece of knowledge (Majchrzak et al., 2013). When providers use this feature to contribute knowledge, they can also study others’ knowledge entries to facilitate their own knowledge growth that contributes positively to job performance. Using the “recipient profile” feature helps knowledge providers get to know more about knowledge seekers (Alavi & Leidner, 2001), such as seekers’ job tasks or job requirements, and thereby gain a better understanding of knowledge seekers’ questions before providing solutions. When employees use the “entry of experimental knowledge” feature to provide knowledge, they can enter incomplete information into the system and continue to add or refine previous entries. Such an evolutionary process of providing knowledge may advance a knowledge provider’s understanding of a problem and enhance the provider’s absorptive capacity that is critical for knowledge growth and job performance (Scott & Sarker, 2010). In addition, knowledge providing may be noticed by supervisors and seen to be a positive at the time of performance assessment. Thus, we hypothesize:

H8a. Knowledge providing using a KMS will have a positive effect on providers’ job performance.

Knowledge seeking. We expect that employees will be likely to seek knowledge from experienced colleagues using various features, such as “expert profile” (e.g., Baloh, 2007) and “structured discussion pages”. Use of these features familiarizes seekers with providers’ areas of expertise, accelerate seekers’ trust in providers (Aparicio, Bacao, & Oliveira, 2017; Zolotov, Oliveira, & Casteleyn, 2018), and thereby facilitates knowledge transfer and reuse, thus saving seekers enormous amount of time and effort in searching for the knowledge or coming up with their own solutions (e.g., Kankanhalli et al., 2005b). Experienced colleagues can provide complementary expertise or analogous experiences that knowledge seekers can draw on to identify and generate viable solutions (Haas & Hansen, 2007). The two-way discussions between knowledge providers and seekers help the knowledge providers gain insight into problems and tailor their answers to the situations. Consequently, knowledge seekers will likely receive high-quality inputs to enhance their job performance. Thus, we hypothesize:

H8b. Knowledge seeking using a KMS will have a positive effect on seekers' job performance.

4. METHOD

4.1. Participants and data collection

To test our hypotheses, we used a multi-wave survey design, with multiple sources of data. The participants in our study were knowledge workers in a Fortune 500 telecommunications company. Specifically, they were software engineers, analysts, and technical leads from similar business units located in the People's Republic of China (P.R.C.) and the US. Prior to our study, the organization intended to create an open environment for discussion, and employees were encouraged to propose and share new, innovative ideas for products and services. Interacting across geographies and time zones for knowledge and expertise sharing was critical for employees. The main reasons for implementing the KMS were to improve telecommunication product services, respond quickly to market change, and reduce costs. The KMS could facilitate communication in multiple ways and enable continued conversations and follow-ups for knowledge sharing. Organizational incentives, mainly in the form of *financial incentives*, such as cash award and all-expenses-paid trip, were used as a way to recognize the value of sharing knowledge, appreciate the contributions people have made, and increase awareness of the importance of sharing knowledge. Out of 230 questionnaires distributed in the US, 100 were returned. Out of 198 questionnaires distributed in P.R.C., 124 were returned. Therefore, 224 people out of 428 responded to the survey for a response rate of 52%, with the response rate for the US sample being 43% and for the P.R.C. sample being 63%. Of the 224 respondents, 85 (around 37.9%) were women, with the age ranging from 21 to 61. We compared the demographic profile of our respondents with the profile of those non-respondents² and found them to be comparable, thus minimizing concerns of non-response bias.

Data were collected before and after the implementation of the KMS. We collected individuals'

² The profile of non-respondents was provided by the organization.

demographic variables, e.g., age and gender, organizational position, organization tenure and other control variables, e.g., computer experience, computer self-efficacy, expertise, and pre-implementation job performance, two weeks before the implementation of the KMS. After the system was used for about 6 months, we collected Hofstede's five cultural dimensions, knowledge seeking and providing using the KMS, and job performance data. We also collected the use data about 6 months after the implementation of the KMS, like in prior literature that notes organizations are likely to go through a shakedown phase after implementing large information systems, such as an enterprise resource planning system, or a large scale collaborative system, such as a KMS (e.g., Markus & Tanis, 2000; Morris & Venkatesh, 2010; Sykes, 2015). During the shakedown phase, employees struggle to use the system, and there will be a steep learning curve that prevents them from leveraging the system effectively and efficiently. About 6 months after the implementation, employees typically get more familiar with the system and they feel more comfortable using the system to seek knowledge or provide knowledge.

Data were collected using a web-based survey from both countries in the same general timeframe during normal business hours, with the participants being asked to return the completed survey within a week. Employees received an email with a link directing them to the website where they could fill out the survey and employees could fill out the survey during normal business hours. Reminders to complete the survey were sent to all participants everyday throughout the week. Surveys in the P.R.C. were administered in Chinese. To minimize translation errors, the survey items, written in English, were first translated to Chinese by a professional translator and then back translated to English by a different professional translator, and the few discrepancies found were discussed and resolved. Finally, items were randomized to eliminate the effect of ordering, and reverse-coded items and attention check questions (e.g., addition of numbers) were used to catch inconsistent answers and/or inattentive respondents. Supervisor-rated job performance of the respondents was obtained from organizational archives. Pre-implementation job performance data were also obtained from organizational archives.

4.2. Measurement

The measurement items are included in the Appendix.

4.2.1. New scale development

We developed the scales for the sensitivity to image and sensitivity to organizational incentives by following DeVellis' (2003) guidelines. Specifically, we developed the scale for sensitivity to image by incorporating the two main factors that could tarnish (e.g., Borgatti & Cross, 2003) or enhance image (Kankanhalli et al., 2005a). Given that these two factors do not have to co-vary, sensitivity to image was modeled as a formative construct, with face-loss and enhancement of image as the first-order formative dimensions, each of which was measured using second-order reflective scales (Petter, Straub, & Rai, 2007). For sensitivity to organizational incentives, we focused on the financial incentives that emphasize the direct value of money given to employees in the form of extra pay or other material benefits, such as paid leave and sponsored training.

4.2.2. Cultural values

There are a few existing measures of cultural values (e.g., Hofstede, 2007; Rai et al., 2009; Srite & Karahanna, 2006). As Hofstede's measure (the VSM 94 manual, see Hofstede, 2007) is an index measure and is not designed for cultural values at the individual-level, Srite and Karahanna (2006) modified them such that these scales were measured at the individual level with reflective indicators. Consistent with Srite and Karahanna (2006), we modified Hofstede's VSM measure of long-term orientation such that it was an individual-level measure with reflective indicators. Similarly, we modified the other measures, with the high-end of the scales denoting greater endorsement of collectivist values and masculine values.

4.2.3. Job performance

The measurement of job performance was adapted from existing literature (e.g., Kraimer, Wayne, Liden, & Sparrowe, 2005; Welbourne, Johnson, & Erez, 1998). The supervisor ratings on these five items

were reported as a final rating ranging from excellent (7), very good (6), good (5), acceptable (4), needs improvement (3) to varying levels of probation (2, 1). Job performance ratings for each employee were obtained by aggregating supervisor ratings on the different items, which was consistent with the approach used by the organization. This scale has been used extensively in the IS literature (e.g., Sykes, 2015, 2020; Sykes, Venkatesh, & Johnson, 2014; Zhang, 2017; Zhang & Venkatesh, 2017).

4.2.4. Control variables

We controlled for variables that have been found to predict knowledge sharing and performance. In particular, we controlled for the demographic variables of age, gender (men=0), computer experience, expertise, organizational position, sharing norms, and organizational tenure. Prior research has found these variables to be significant predictors of knowledge sharing and job performance (e.g., Cross & Cummings, 2004; Faraj & Sproull, 2000; Mehra, Kilduff, & Brass, 2001; Quigley et al, 2007).

4.3. Results

4.3.1. Measurement model testing

The measurement model was assessed for convergent validity and discriminant validity. Convergent validity was assessed by examining factor loadings, composite reliability, and average variance extracted (AVE). Table 2 provides the descriptive statistics, reliabilities, and inter-construct correlations. Table 3 presents loadings and cross-loadings. All items loaded highly on the respective factors ($>.70$), with cross-loadings being lower than $.42$, thus supporting convergent and discriminant validity. Cronbach's Alpha values exceeded the recommended value of 0.70 . Average variance extracted exceeded the recommended value of 0.50 (Fornell & Larcker, 1981). The results suggested good convergent validity. The discriminant validity of the scales was further supported as the square root of AVE of each construct was greater than its corresponding correlation coefficient. Correlations among the variables were in the expected range and direction. A potential threat to the validity of surveys is common method bias

(Podsakoff, Scott, Lee, & Podsakoff, 2003). We conducted Harmon's one-factor test to assess common method bias. Our findings suggested that no factor accounted for more than 30% of the variance, indicating that common method bias is not a concern in this study (Podsakoff et al., 2003).

4.3.2. Regression analysis

The hypotheses were tested using ordinary least squares (OLS) regression. Table 4 presents the regression results. Model 1 included control variables. Model 2 incorporated sensitivity to image and sensitivity to organizational incentives. Finally, Model 3 added the interaction effects. We standardized the variables included in interaction terms to reduce collinearity between the main effects and interaction terms (Aiken & West, 1991).

The control variables only models (Model 1) explained 10% of the variance in knowledge providing, 7% of the variance in knowledge seeking, and 15% of the variance in job performance. Adding sensitivity to image and sensitivity to organizational incentives explained 20% and 15% of variance in knowledge providing and knowledge seeking, respectively (Model 2). Adding sensitivity to image and sensitivity to organizational incentives explained 34% of variance in job performance (Model 2). The model explained 19% more variance in job performance than did the model with control variables only (Model 1). The increased variance was 10% for knowledge providing and 8% for knowledge seeking. Adding the interaction terms of espoused cultural values explained 28% of variance in knowledge providing and 25% of variance in knowledge seeking (Model 3). The increased variance was 8% for knowledge providing and 10% for knowledge seeking.

Sensitivity to image had a positive and significant effect on knowledge providing (Model 2: $\beta = .20$, $p < .01$). Sensitivity to image had a negative and significant effect on knowledge seeking (Model 2: $\beta = -.37$, $p < .001$). Therefore, the findings supported hypothesis 1a and 1b. Sensitivity to organizational incentives had a positive and significant effect on knowledge providing (Model 2: $\beta = .48$, $p < .001$), thus supporting hypothesis 2.

Hypotheses 3, 4, 5, 6, and 7 examined the moderating effects, i.e., interactions of sensitivity to image and individualism/collectivism (H3a and H3b), interactions of sensitivity to image and power distance (H4a and H4b), interactions of sensitivity to organizational incentives and masculinity/femininity (H5), interaction of sensitivity to organizational incentives and uncertainty avoidance (H6), and interactions of sensitivity to organizational incentives and long-term orientation (H7). The positive effect of sensitivity to image on knowledge providing was stronger for individuals with collectivistic values than it was for those with individualistic values (Model 3: $\beta = .15$, $p < .05$), thus supporting hypothesis 3a. The interaction effect of sensitivity to image and individualism/collectivism on knowledge seeking (Model 3: $\beta = -.24$, $p < .01$) was significant. The negative effect of sensitivity to image on knowledge seeking was stronger for employees with collectivistic values than it was for those with individualistic values. Thus, hypothesis 3b was supported. The interaction effect of sensitivity to image and power distance on knowledge providing was not significant (Model 3: $\beta = .10$, $p > .05$). Thus, hypothesis 4a was not supported. The negative effect of sensitivity to image on knowledge seeking was stronger for individuals with high power distance than it was for those with low power distance (Model 3: $\beta = -.28$, $p < .001$), thus supporting hypothesis 4b. The positive effect of sensitivity to organizational incentives on knowledge providing was stronger for individuals with masculine values than it was for those with feminine values (Model 3: $\beta = .31$, $p < .001$), thus supporting hypothesis 5. The interaction effect of sensitivity to organizational incentives and uncertainty avoidance on knowledge providing was significant (Model 3: $\beta = .20$, $p < .01$). The positive effect of sensitivity to organizational incentives on knowledge providing was stronger for individuals with high uncertainty avoidance than it was for those with low uncertainty avoidance. Thus, hypothesis 6 was supported. The interaction effect of sensitivity to organizational incentives and long-term orientation on knowledge providing was not significant ($\beta = .10$, $p > .05$). Thus, hypothesis 7 was not supported.

To understand the interactions, we plotted the significant interactions (Aiken & West, 1991). Figures 2(a) through 2(e) visually depict how motivational mechanisms interact with cultural values. For

example, as shown in Figure 2a, the positive relationship between sensitivity to image was stronger for employees with high collectivism than those with low collectivism. As shown in Figure 2b, the negative relationship between sensitivity to image and knowledge seeking was stronger for employees with high collectivism than for those with low collectivism. As shown in Figure 2c, the negative relationship between sensitivity to image and knowledge seeking was stronger for employees with high power distance than for those with low power distance.

Hypothesis 8 examined the impact of knowledge providing and knowledge seeking using a KMS on job performance and the results indicated that the relationships between knowledge providing and job performance (Model 2: $\beta = .32$, $p < .001$) and between knowledge seeking and job performance (Model 2: $\beta = .55$, $p < .001$) were positive and significant, thus supporting hypothesis 8a and 8b. In Table 5, we summarize the support for our hypotheses.

5. DISCUSSION

Based on samples from the P.R.C. and the US, our proposed nomological network for knowledge sharing using a KMS was supported. Integrating espoused cultural values into sensitivity to image and sensitivity to organizational incentives explained 28% of variance in knowledge providing and 25% of variance in knowledge seeking, and knowledge sharing explained 34% of variance in job performance. Most of the hypotheses were supported and our model explained significantly more variance in knowledge seeking and knowledge providing using a KMS compared to a main-effects only model.

5.1. Theoretical implications

Our work makes several important theoretical contributions. First, we contribute to the knowledge management literature by breaking down knowledge sharing into seeking and providing, and by theorizing how they are related to sensitivity to image and sensitivity to organizational incentives. Deconstructing the concept of knowledge sharing into knowledge seeking and knowledge providing offers a more nuanced understanding of the effects of its antecedents and moderators (Quigley et al., 2007). Specifically, we gain

a better understanding of how and why the effects of sensitivity to image and sensitivity to organizational incentives differ across knowledge seeking and providing using a KMS. Most importantly, we have a better understanding of how and why the moderating effects of cultural values differ across knowledge seeking and knowledge providing (e.g., Hutzschenreuter & Voll, 2008; Sarala & Vaara, 2010), thus shedding light on our understanding of the mixed findings on the effects of images/incentives on knowledge sharing using a KMS in prior studies. The theorization about how motivational mechanisms, i.e., sensitivity to image and sensitivity to organizational incentives, and cultural values operate in conjunction with each other in affecting individuals' knowledge sharing using a KMS also shed light on our understanding of how to improve the design of KMS to facilitate knowledge sharing and enhance job performance (e.g., Hutzschenreuter & Voll, 2008).

Prior literature has widely employed social exchange theory to investigate employees' knowledge-sharing behavior (e.g., Chang et al. 2015; Huang et al. 2008). We extend the social exchange theory by examining the effects of cultural values on knowledge sharing. We modify the empirical assessment of cultural values from national level to individual level (see Appendix A) and conduct an empirical study in a cross-cultural context. Our findings confirm that individual cultural values moderated the effects of motivational mechanisms on knowledge sharing. In particular, individualism/collectivism moderated the effect of sensitivity to image on knowledge sharing; power distance moderated the effect of sensitivity to image on knowledge seeking; masculinity/femininity moderated the effect of sensitivity to organizational incentives on knowledge providing; and uncertainty avoidance moderated the effect of sensitivity to organizational incentives on knowledge providing.

Finally, this research extends management literature by developing a better understanding of the role of knowledge sharing using a KMS in affecting job performance. Although prior research indicates that knowledge sharing plays an important role in affecting the success of knowledge management (Argote, McEvily, & Reagans, 2003), empirical evidence has provided mixed results. Our study is among the few

studies that theorized and empirically validated the relationship between knowledge sharing using a KMS and job performance.

5.2. Practical implications

Our study informs practice in several ways. A big challenge of implementing a KMS in a cross-cultural context is to motivate employees to use the KMS to share knowledge. Our study reveals knowledge seeking and providing are complex social processes. Understanding the processes helps organizations and employees better cope with and manage the challenges and difficulties during the implementation of a KMS, thus increasing the chance of KMS implementation success. Whereas prior research indicates the role of sensitivity to image in affecting FTF knowledge sharing (e.g., Borgatti & Cross, 2003), our research extends this by showing sensitivity to image also affects knowledge sharing using a KMS. Our study also indicated cultural values related to socio-relational characteristics might be invoked in situations involving social interactions and collaborations (Baptista & Oliveira, 2019), and employees who espouse high collectivism and high power distance had greater concern for their image associated with knowledge sharing using a KMS. It urges organizations to improve the design of a KMS to facilitate knowledge sharing. For example, to reduce the concern that seeking knowledge will tarnish one's image, the system can be designed to make knowledge seekers develop more favorable perceptions of knowledge providers. If knowledge seekers have more favorable perceptions of knowledge providers, they are likely to have a higher level of trust in knowledge providers that would reduce their concern for face-loss and increase their willingness to seek knowledge.

Another important implication for managers is that knowledge sharing includes both knowledge seeking and knowledge providing. They should understand the differences between knowledge seeking and knowledge providing, and develop knowledge management practices accordingly. Our study indicated employees, especially those who embrace collectivistic values, had greater concern for their image associated with knowledge seeking using a KMS than those who embrace individualistic values. This

suggests managers should pay more attention to the social barriers, e.g., concern for face-loss, and develop effective approaches to reduce such barriers when their main objective is to facilitate knowledge seeking. They should consider different strategies to minimize the negative impact of social barriers such as designing and implementing features that could help knowledge seekers develop favorable perceptions of knowledge providers. For example, when the main objective is to facilitate knowledge providing to a KMS, organizations should give employees recognition for providing knowledge because such recognition will enhance their public image.

Many studies have suggested the use of incentives to overcome the barriers to knowledge sharing using a KMS and top management should consider leveraging incentives in formulating strategies (e.g., Kankanhalli et al., 2005a, 2005b). We examined the effect of sensitivity to organizational incentives in this study but not the actual effect of incentives available in the organization. We found that organizational incentives were effective in facilitating knowledge providing, and different cultural values are likely to shape an individual's perceptions and interpretations of such incentives. Consequently, understanding the cultural values of different employees could help in establishing an effective incentive structure that motivates employees to share knowledge using a KMS (e.g., Lisak, Erez, Sui, & Lee, 2016; Stahl & Tung, 2015). For example, given that the effect of sensitivity to organizational incentives on knowledge sharing using a KMS is more salient for employees high on masculinity than it was for those high on femininity, organizations should emphasize organizational incentives accordingly (Hung et al., 2011).

5.3. Limitations and future research

This study has some limitations that should be noted. Our first limitation relates to the design of the study. We conducted a field survey of employees in an organization in China and the US. As this study aimed to examine the impact of individual-level cultural values and due to space constraints, we did not compare the differences of cultural values between the two groups. Second, we only tested our model in the context of one KMS, which may limit the generalizability of the results. Future studies are necessary

across diverse organizational contexts and KMS instantiations to establish the generalizability of our findings. Our third limitation is the sample and timeframe. External validity threats cannot be eliminated, as our sample includes only members from two business units in a single organization over a relatively short period of time when compared to the lifecycle of an implementation. However, by using participants from only one organization, we rule out organizational factors, such as norms and incentives, that could vary across organizations and affect the study outcomes. Nevertheless, future research should examine our model using a larger sample size from different organizations. In terms of time, future research should study this phenomenon over longer periods of time, with particular attention to rich conceptualizations relative to time and its impacts (Venkatesh et al., 2006; Venkatesh et al., 2021). Our fourth limitation is also related to our sample. The participants were software engineers, analysts, and technical leads. Therefore, they all had certain degree of experience and skill in using technologies. Future research should study those with less computer experience/skill. Finally, our model contains only a small number of predictors that increases the chances for model misspecifications. Predictors of technology-related outcomes has a rich tradition, especially in the information systems literature, and incorporating such predictors will increase the richness and comprehensiveness of our understanding of the phenomenon (see Venkatesh et al., 2003; Venkatesh et al., 2012; Venkatesh et al., 2016). The threat of model misspecification is greatly reduced because we included key control variables. As the main goal of our work was to predict, rather than explain, omitting some factors from the model has limited adverse effects. In future research, examining different KMSs can be taken into account studying knowledge sharing using KMSs.

6. CONCLUSIONS

Our work contributes to the growing body of research on how to facilitate knowledge sharing using a KMS in a cross-cultural setting. We discuss two important motivational mechanisms, i.e., sensitivity to image and sensitivity to organizational incentives, within the context of knowledge seeking and providing using a KMS. Further, we argued that cultural values will play important roles in moderating the effects of

sensitivity to image and sensitivity to organizational incentives on knowledge seeking and knowledge providing using a KMS. We found support for our predictions, thus contributing to the literature on knowledge sharing and culture. Based on our findings, we provided suggestions on how managers can facilitate knowledge sharing using a KMS in a cross-cultural setting.

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Table 1

Knowledge sharing motivation

Paper	Motivational factors	Impact on:	Theory	Category
Ozer & Vogel (2015)	Social identity	Knowledge receiving (seeking)	Social identity theory	Public image
Chang, Hsu, Shiau, & Tsai, (2015)	Reputation	Knowledge sharing	Social exchange theory	Public image
	Reward			Organizational incentives
Casimir, Ng, & Cheng (2012)	Rewards	Knowledge sharing	Theory of reasoned action	Organizational incentives
	Social recognition			Public image
Hung, Lai, & Chang (2011)	Reputation	Knowledge sharing	Social exchange theory, TAM	Public image
Hsu & Lin (2008)	Benefit	Knowledge sharing	Theory of reasoned action, theory of planned behavior	Organizational incentives
	Reputation			Public image
Huang, Davison, & Gu (2008)	Extrinsic reward	Knowledge sharing	Theory of reasoned action, social exchange theory	Organizational incentives
	Image			Public image
Quigley, Tesluk, Locke, & Bartol (2007)	Financial reward	Knowledge provider	Social motivation theory	Organizational incentives
	Norms			Public image
Lin (2007)	Rewards	Knowledge sharing	Theory of reasoned action, expectancy theory	Organizational incentives
	Recognition of ability/competence			Public image
Kankanhalli, Tan, & Wei (2005)	Reward	Knowledge contributors (providers)	Social exchange theory, social capital theory	Organizational incentives
	Norms			Public image
Wasko & Faraj (2005)	Reputation	Knowledge contribution (providing)	Social exchange theory, social capital theory	Public image
	Social status/approval			
Bock, Zmud, & Kim (2005)	Extrinsic rewards	Knowledge sharing	Theory of reasoned action	Organizational incentives
	Norms			Public image
Bock & Kim (2002)	Rewards	Knowledge sharing	Economic exchange theory, social exchange theory, social cognitive theory, theory of reasoned action	Organizational incentives
Ba, Stallaert, & Whinston (2001)	Tangible incentive	Knowledge sharing	Social exchange perspective	Organizational incentives

Table 2
Descriptive statistics, reliabilities, and correlations

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
1. Age	43.20	9.89	NA																	
2. Gender (men = 0)	.38	.49	.14*	NA																
3. Organizational position	6.22	2.88	.23***	-.22**	NA															
4. Organizational tenure	7.34	4.22	.28***	-.18**	.22***	NA														
5. Computer experience (years)	12.25	1.55	.08	-.14*	.05	.10	NA													
6. Expertise	4.99	1.30	.10	.10	.07	.09	.04	.NA												
7. Sharing norms	4.12	1.26	.12*	.06	.13*	.13*	.08	.24***	.77											
8. Sensitivity to image	4.15	1.27	.15*	.17**	.05	.06	.06	.09	.21***	.71										
9. Sensitivity to organizational incentives	3.89	1.01	.24***	-.29***	.09	.05	.12*	.13*	.30***	.20**	.73									
10. Individualism/collectivism	3.20	1.06	.16**	.21***	-.16**	.16*	.08	.10	.13*	.29***	.26***	.84								
11. Power distance	4.46	1.58	.13*	.19**	.14*	.12*	.08	.09	.05	.21***	.24***	.10	.79							
12. Masculinity/femininity	4.02	0.96	.14*	-.23***	-.14*	.08	.07	.07	.13*	-.29***	-.26***	.08	.14*	.79						
13. Uncertainty avoidance	4.58	1.34	.10	.14*	.16**	-.12*	.04	.06	.03	.28***	.24***	.13*	.14*	.16**	.75					
14. Long-term orientation	4.20	1.64	.17**	.20**	.13*	.07	.10	.20**	.19**	.25***	.23***	.15*	.08	.13*	.16**	.74				
15. Knowledge seeking using a KMS	5.21	1.05	-.11*	.11*	.14*	.10	.09	.15*	.20**	-.37***	.08	.28***	.20**	.24***	.21***	.22***	.82			
16. Knowledge providing using a KMS	5.35	1.02	-.08	.15*	.25***	.11*	.11*	.13*	.15*	.31***	.57***	.19**	.21***	.21***	.15*	.23***	.58***	.86		
17. Job performance	4.67	1.41	.11*	-.19**	.19**	.19**	.11*	.24***	.19**	-.19**	.19**	.13*	.15*	.10	.12*	.15*	.56***	.50***	.75	

Notes:

1. n = 224.

2. Diagonal elements are Cronbach's Alpha; off-diagonal elements are correlations between constructs.

3. * p < .05, ** p < .01, *** p < .001.

Table 3

Loadings and cross-loadings

	STOI	IC	MF	PD	UA	LTO	KS	KP	CSE	SNM	IMG	POR
STOI1	.83	.27	.23	.21	.39	.20	.13	.26	.29	.22	.16	.31
STOI2	.75	.30	.25	.22	.21	.38	.26	.33	.31	.12	.24	.13
STOI3	.82	.29	.35	.34	.22	.35	.24	.15	.20	.36	.36	.23
IC1	.38	.84	.32	.15	.36	.32	.36	.27	.25	.15	.29	.15
IC 2	.27	.75	.15	.18	.24	.37	.27	.21	.22	.17	.25	.23
IC 3	.24	.81	.28	.16	.22	.36	.32	.31	.19	.19	.29	.25
MF1	.35	.32	.77	.15	.33	.28	.18	.26	.19	.21	.24	.38
MF2	.38	.28	.78	.19	.29	.22	.35	.25	.33	.36	.37	.26
MF3	.38	.14	.81	.25	.35	.21	.28	.26	.37	.12	.15	.39
PD1	.22	.23	.19	.76	.23	.33	.22	.24	.17	.21	.15	.29
PD2	.34	.34	.22	.82	.22	.29	.13	.31	.35	.28	.15	.27
PD3	.35	.31	.11	.75	.31	.21	.26	.27	.15	.31	.21	.14
UA1	.19	.27	.29	.30	.84	.29	.31	.25	.27	.19	.29	.15
UA2	.34	.28	.22	.30	.83	.22	.24	.23	.34	.24	.16	.16
UA3	.30	.31	.34	.25	.81	.36	.31	.14	.34	.25	.19	.11
LTO1	.27	.29	.33	.17	.28	.77	.17	.13	.36	.17	.21	.15
LTO2	.26	.32	.20	.26	.29	.76	.19	.24	.26	.25	.29	.34
LTO3	.25	.18	.21	.27	.22	.78	.32	.23	.26	.28	.35	.26
KS1	.25	.32	.24	.31	.24	.26	.82	.29	.25	.33	.34	.15
KS2	.30	.19	.29	.11	.25	.27	.79	.24	.29	.14	.31	.24
KS3	.31	.15	.27	.22	.23	.27	.76	.15	.29	.25	.22	.28
KS4	.30	.22	.22	.17	.21	.27	.79	.24	.24	.20	.25	.15
KP1	.29	.34	.20	.27	.25	.28	.33	.75	.22	.29	.24	.23
KP2	.35	.17	.24	.27	.31	.27	.14	.85	.24	.29	.37	.21
KP3	.37	.33	.17	.24	.27	.19	.15	.78	.19	.19	.23	.13
KP4	.22	.29	.14	.30	.32	.18	.33	.77	.12	.35	.25	.34
CSE1	.42	.27	.23	.28	.21	.20	.12	.22	.76	.27	.16	.29
CSE2	.21	.16	.31	.31	.19	.14	.14	.27	.81	.29	.15	.31
CSE3	.30	.33	.30	.24	.22	.26	.15	.23	.78	.15	.22	.22
CSE4	.24	.17	.32	.24	.23	.26	.25	.29	.75	.19	.15	.22
SNM1	.34	.28	.23	.24	.27	.12	.23	.18	.27	.84	.15	.25
SNM2	.38	.25	.19	.25	.25	.17	.34	.21	.12	.83	.25	.21
SNM3	.24	.25	.24	.25	.22	.26	.28	.27	.27	.82	.28	.37
SNM4	.26	.24	.23	.24	.23	.13	.17	.29	.17	.79	.21	.13
IMG1	.27	.20	.31	.18	.28	.26	.21	.24	.26	.35	.80	.15
IMG2	.28	.22	.26	.24	.23	.19	.25	.22	.17	.16	.76	.21
IMG3	.15	.31	.31	.24	.22	.15	.15	.15	.15	.15	.75	.35
IMG4	.35	.19	.31	.29	.16	.13	.20	.17	.22	.14	.77	.20
POR1	.37	.22	.26	.18	.22	.15	.16	.34	.22	.26	.25	.82
POR2	.35	.33	.24	.19	.24	.13	.31	.19	.13	.27	.35	.83
POR3	.36	.34	.35	.25	.26	.17	.18	.26	.22	.15	.35	.87
POR4	.32	.29	.22	.25	.16	.12	.33	.18	.16	.28	.15	.85

Note: STOI = sensitivity to organizational incentives, IC = individualism/collectivism, MF = masculinity/femininity, PD = power distance, UA = uncertainty avoidance, LTO = long-term orientation, KS = knowledge seeking using a KMS, KP = knowledge providing using a KMS, CSE = computer self-efficacy, SNM = sharing norms, IMG = enhancement of image, POR = performance orientation

Table 4
Predicting KMS use and job performance

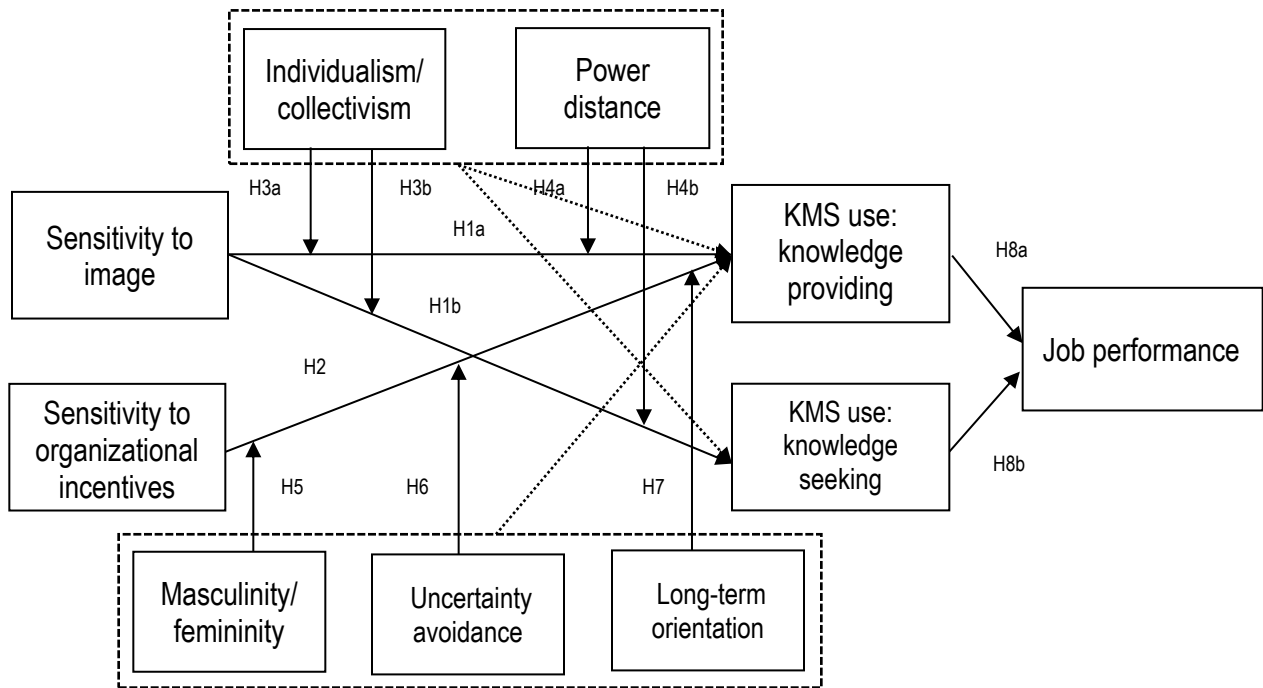
	Model 1			Model 2			Model 3	
	Knowledge providing	Knowledge seeking	Job performance	Knowledge providing	Knowledge seeking	Job performance	Knowledge providing	Knowledge seeking
<i>R</i> ²	.10	.07	.15	.20	.15	.34	.28	.25
Control variables								
Age	-.06	-.07	.07	-.10	-.07	.04	-.07	-.05
Gender	.12	.06	-.20**	.10	.04	-.14*	.08	.06
Organizational position	.07	.08	.16**	.05	.07	.12*	.04	.05
Organizational tenure	.05	.05	.19**	.08	.09	.10	.06	.07
Computer experience	.10	.10	.05	.07	.08	.04	.05	.04
Expertise	.14*	.13*	.30***	.12*	.11*	.21***	.10	.09
Sharing norms	.19**	.13*		.11*	.11*		.07	.08
Main effects								
Sensitivity to image (STI)				.20**	-.37***		.15*	.17**
Sensitivity to organizational incentives (STOI)				.48***			.30***	
Knowledge providing using a KMS						.32***		
Knowledge seeking using a KMS						.55***		
Interaction effects								
Individualism/collectivism (IC)							.10	.21***
Power distance (PD)							.07	.10
Masculinity/femininity (MF)							.10	
Uncertainty avoidance (UA)							.08	
Long-term orientation (LTO)							.15*	
STI x IC							.15*	-.24**
STI x PD							.10	-.28***
STOI x MF							.31***	
STOI x UA							.20**	
STOI x LTO							.10	

Note: * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 5
Summary of hypotheses and results

Hypothesis number	Independent variable	Moderator	Dependent variable	p-value	Result
H1a	Sensitivity to image	NA	Knowledge providing	<.01	Supported
H1b	Sensitivity to image	NA	Knowledge seeking	<.001	Supported
H2	Sensitivity to organizational incentives	NA	Knowledge providing	<.001	Supported
H3a	Sensitivity to image	Individualism/collectivism	Knowledge providing	<.05	Supported
H3b	Sensitivity to image	Individualism/collectivism	Knowledge seeking	<.01	Supported
H4a	Sensitivity to image	Power distance	Knowledge providing	>.05	Not supported
H4b	Sensitivity to image	Power distance	Knowledge seeking	<.001	Supported
H5	Sensitivity to organizational incentives	Masculinity/femininity	Knowledge providing	<.001	Supported
H6	Sensitivity to organizational incentives	Uncertainty avoidance	Knowledge providing	<.01	Supported
H7	Sensitivity to organizational incentives	Long-term orientation	Knowledge providing	>.05	Not supported
H8a	Knowledge seeking	NA	Job performance	<.001	Supported
H8b	Knowledge providing	NA	Job performance	<.001	Supported

Figure 1. Research model



Note: --> dashed lines present non-hypothesized direct effects

Figure 2(a-e) Interactions

Figure 2(a). Effects of sensitivity to image and individualism/collectivism on knowledge providing

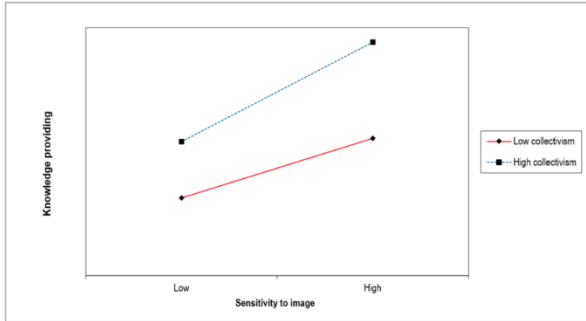


Figure 2(b). Effects of sensitivity to image and individualism/collectivism on knowledge seeking

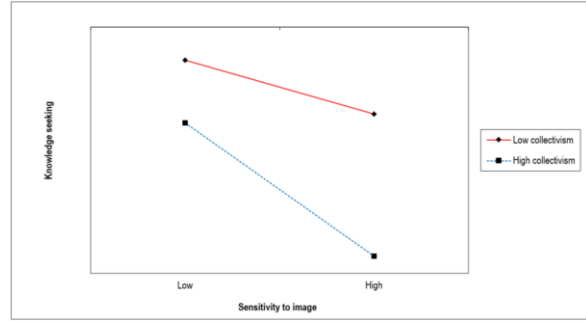


Figure 2(c). Effects of sensitivity to image and power distance on knowledge seeking

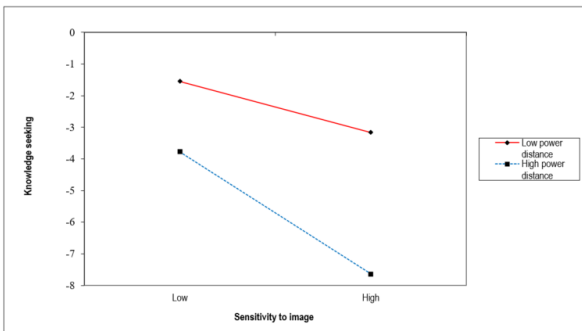


Figure 2(d). Effects of sensitivity to organizational incentives and masculinity/femininity on knowledge providing

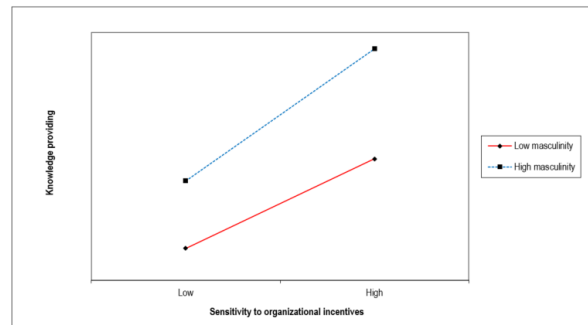
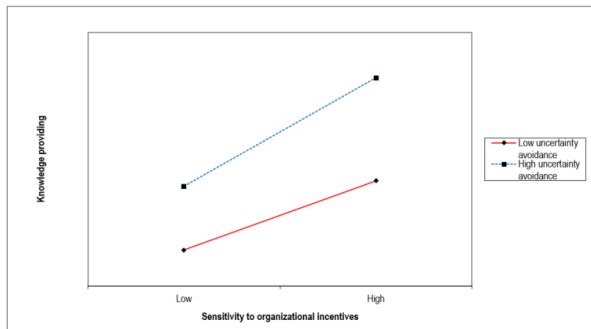


Figure 2(e). Effects of sensitivity to organizational incentives and uncertainty avoidance on knowledge providing



APPENDIX A. MEASURES

Gender Male/Female/prefer not to answer (Cross & Cummings, 2004; Mehra et al., 2001)

Organizational position (Mehra et al., 2001)

Which of the following best describes your position in this company:

1. junior manager
2. middle manager
3. senior manager
4. non-managerial employee

Tenure (Cross & Cummings, 2004; Mehra et al., 2001)

Please indicate the number of years you have been working for this company: _____

Computer self-efficacy (7-point Likert Scale) (Venkatesh et al., 2003)

I could complete a job or task using the system...

1. If there was no one around to tell me what to do as I go. (CSE1)
2. If I could call someone for help if I got stuck. (CSE2)
3. If I had a lot of time to complete the job for which the software was provided. (CSE3)
4. If I had just the built-in help facility for assistance. (CSE4)

Computer experience (Venkatesh et al., 2003)

Please indicate amount of computer experience you have in years: _____

Expertise (adapted from Faraj & Sproull, 2000; Shanteau, 1992)

Please rate your each of your subordinate's overall expertise on a 100-point scale, where 100 refers to the highest level of expertise: _____ (names provided)

Sharing norms (7-point Likert Scale) (adapted from Kankanhalli et al., 2005b)

1. There is a norm of cooperation in my organization. (SNM1)
2. There is a norm of collaboration in my organization. (SNM2)
3. There is a norm of teamwork in my organization. (SNM3)
4. There is a willingness to value and respond to diversity in my organization. (SNM4)

Sensitivity to image

Face-loss (7-point Likert Scale) (newly developed scale)

1. When I used the system to share knowledge, I feel uncomfortable revealing my lack of knowledge on a given topic.
2. When I used the system to share knowledge, I will not do things that could tarnish my reputation.
3. When I used the system to share knowledge, I will not do things that could harm my image.

Enhancement of image (7-point Likert Scale) (adapted from Kankanhalli et al., 2005a)

1. Sharing my knowledge through the system improves my image within the organization.
2. People in the organization who share their knowledge through the system have more prestige than those who do not.
3. Sharing my knowledge through the system improves others' recognition of me.
4. When I shared my knowledge through the system, the people I work with respect me.

Sensitivity to organizational incentives (7-point Likert Scale) (newly developed scale)

1. I think financial incentives are important for me to use the system to share knowledge. (STOI1)
2. I think additional bonus is important for me to use the system to share knowledge. (STOI2)
3. I think incentives such as providing extra credits that can be redeemed for other benefits (e.g., pay leave, sponsored training and etc.) are important for me to use the system to share knowledge. (STOI3)

Individualism/collectivism (7-point Likert Scale) (adapted from Hofstede, 2007; Srite & Karahanna, 2006)

1. Being accepted as a member of a group is more important than having autonomy and independence. (IC1)
2. Group success is more important than individual success. (IC2)
3. Being loyal to a group is more important than individual gain. (IC3)

Power distance (7-point Likert Scale) (adapted from Hofstede, 2007; Srite & Karahanna, 2006)

1. Managers should make most decisions without consulting subordinates. (PD1)
2. Managers should not ask subordinates for advice, because they might appear less powerful. (PD2)
3. Decision making power should stay with top management in the organization and not be delegated to lower level employees. (PD3)

Masculinity/femininity (7-point Likert Scale) (adapted from Hofstede, 2007; Srite & Karahanna, 2006)

1. It is preferable to have a man in a high level position rather than a woman. (MF1)
2. It is more important for men to have a professional career than it is for women to have a professional career. (MF2)
3. Solving organizational problems requires the active forcible approach which is typical of men. (MF3)

Uncertainty avoidance (7-point Likert Scale) (adapted from Hofstede, 2007; Srite & Karahanna, 2006)

1. Rules and Regulations are important because they inform workers what the organization expects of them. (UA1)
2. Order and structure are very important in a work environment. (UA2)
3. It is important to have job requirements and instructions spelled out in detail so that people always know what they are expected to do. (UA3)

Long-term orientation (7-point Likert Scale) (adapted from Hofstede, 2007)

1. In your private life, personal steadiness and stability is important. (LTO1)
2. In your private life, thrift is important. (LTO2)
3. In your private life, respect for tradition is important. (LTO3)

Knowledge seeking using a KMS (7-point Likert Scale) (newly developed scale)

1. I frequently search the system for best practices. (KS1)
2. I frequently use the system to seek advice from domain experts. (KS2)
3. When I am working on a challenging problem, I often look in the system to find solutions to similar problems. (KS3)
4. I generally use the system to ask for feedback from others. (KS4)

Knowledge providing using a KMS (7-point Likert Scale) (newly developed scale)

1. I generally use the system to offer advice if requested. (KP1)
2. I generally use the system to share my domain expertise. (KP2)
3. I often would use the system to share best practices. (KP3)
4. I often use the system to provide feedback if requested. (KP4)

Job performance (7-point Likert Scale) (adapted from Kraimer et al., 2005; Welbourne et al., 1998)

Please rate <<name>> along the following dimensions:

1. Quality of work.
2. Quantity of work.
3. Technical competence.
4. Working as part of a team or work group.
5. Help others when it is not part of his/her job.