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UNDERSTANDING CROSS NATIONAL DIFFERENCE IN KNOWLEDGE SEEKING BEHAVIORAL MODEL: A SURVIVAL PERSPECTIVE

Completed Research Paper

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Abstract

Electronic Knowledge Repository (EKR) is one of the most commonly deployed knowledge management technologies, yet its success is hindered by employees' underutilization and further complicated when implemented in the multinational context. To address these challenges, we propose a research model by conceptualizing employees' knowledge seeking via EKR as a survival-centric behavior, identifying the technology acceptance model as the individual-level explanation for EKR use, and drawing on the thermal demands-resources theory for explaining cross national behavioral differences. Using hierarchical linear modeling, we tested the model with data from 1352 randomly sampled knowledge workers across 30 nations. The results reveal interesting cross national behavioral patterns. Specifically, thermal climates and national wealth at the macro-level interactively moderate individual-level relationships between perceived ease of use and perceived usefulness and between perceived usefulness and behavioral intention.

Keywords: Cross National Differences, Knowledge-based Systems, Technology Acceptance Model, Thermal Demands-Resources Theory, Survival.

Introduction

Knowledge has been recognized as one of the most critical resources that help employees survive in their organizations (Gray and Durcikova 2005). This is one of the major reasons that drive 80% of the leading multinational firms to have their own knowledge management (KM) initiatives (Lawton 2001). Technology providers have also been offering various kinds of information technologies to support organizational KM processes (Kankanhalli et al. 2005). Among different forms of KM technologies, Electronic Knowledge Repository (EKR) is one of the most commonly deployed tools to integrate disparate knowledge resources, and to enable retrieval and reuse of codified knowledge (Markus 2001). Empirical evidences suggest that 80% of the KM initiatives involve EKR implementation (Davenport and Prusak 1998). While the value of EKR can only be realized through effective use by the employees (Tiwana and Bush 2005), a significant portion of these initiatives has experienced different levels of failure due to lack of attention toward various implementation issues (KPMG 2000). This challenge of EKR implementation is even more complicated in multinational firms where the technology needs to be deployed across different nations (Srite and Karahanna 2006).

As managers increasingly concern what motivates employees to seek knowledge from EKR, scholars are also paying more attention toward this research area (Bock et al. 2006; Gray and Durcikova 2005; He and Wei 2009; Kankanhalli et al. 2001; Kankanhalli et al. 2005). It is accepted that seeking knowledge from EKR, as an IS usage behavior, can be motivated by such factors as perceived usefulness (PU) and perceived ease of use (PEOU) (Bock et al. 2006; Desouza 2003; He and Wei 2009). This is consistent with the Technology Acceptance Model (TAM), in which individual IS use is determined by PU and PEOU. Yet, the issue of global EKR implementation is complicated by the findings of cross-national TAM studies, in that the model and the predictive power of PU and PEOU may vary across countries (e.g., Rose and Straub 1998; Straub 1994; Straub et al. 1997).

Toward this end, scholars have proposed different explanations to account for cross national differences in technology acceptance. One popular view is to explain such differences by national cultures (Keil et al. 1995; Rose and Straub 1998; Straub 1994; Straub et al. 1997). Recently, a thermal demands-resources theory was proposed by Van de Vliert (2007b), who argues that, instead of culture, living environment (e.g., thermal climates) and human development status (e.g., national wealth) are more fundamental factors that jointly cause cross national behavioral differences. On the one hand, livability of thermal environment determines the survival needs in terms of comfort, nutrition and health. On the other hand, national wealth can be considered as available resources for individuals within a country to cope with survival needs set by the thermal environment. This theory submits that a society may adapt its survival values and practices to its climatic and economic environment. Specifically, harsh climates make monetary or equivalent resources more useful to fulfill survival needs, whereas monetary or equivalent resources make harsher climates less threatening.

Inspired by the thermal demands-resources theory, we conceptualize employees' seeking knowledge from EKR as a survival-driven behavior. In the workplace settings, knowledge enables employees to solve problems, make decisions, and perform tasks, thereby justifying their value to the organizations and satisfying the needs of economic security (Gray and Meister 2004). This utilitarian nature of knowledge seeking behavior (Gray and Meister 2004) is consistent with the instrumentality orientation of TAM (Davis et al. 1989) and the survival focus of the thermal demands-resources theory (Van de Vliert 2007b). Therefore, this research synthesizes these three concepts, viewing knowledge seeking from EKR as a behavior for survival in organizations, TAM as the framework explaining individuals' seeking knowledge from EKR, and thermal climates and national wealth as the theoretical accounts for cross national behavioral differences. This study thus aims to achieve the following two primary objectives:

1. Investigate employees' knowledge seeking from EKR through the technology acceptance perspective with particular emphasis on survival.
2. Explain cross national differences in the EKR knowledge seeking behavioral model through the lens of the thermal demands-resources theory.

The remainder of this paper is organized as follows. We first discuss the theoretical foundations and propose a research model and related hypotheses for cross national differences in the EKR knowledge seeking behavioral model. We then delineate the field study conducted in a multinational firm, from which we gathered survey data from 1352 randomly sampled subjects across 30 nations. Next, we report the procedures and results of confirmatory factor analysis (CFA), measurement invariance analysis, and hypothesis testing using hierarchical linear modeling (HLM). We conclude this study with implications for research, practice, limitations and future research.

Theoretical Backgrounds

Knowledge Seeking Behavior via Enterprise Knowledge Repositories – A Survival Behavior

In the workplace context, knowledge seeking is a need-driven behavior (He and Wei 2009). Knowledge enables employees to cope with problems, assists their decision-making, and helps them fulfill their assigned responsibilities, thereby proving their value to the organizations (Gray and Durcikova 2005; Gray and Meister 2004). In other words, knowledge seeking essentially reflects individuals' need for survival in the organizational context (Gray and Durcikova 2005; Gray and Meister 2004). When encountering task problems that are beyond the scope of personal knowledge, employees tend to seek knowledge from external resources (Gray and Meister 2004). They intentionally access others' expertise and experience for addressing the challenges encountered (Gray and Meister 2004). They can reuse the knowledge directly, adapt the knowledge for particular situations, and even innovate, based on the newly acquired knowledge (Levitt and March 1988). Thus, the main purpose of EKR is to support this solution-centered characteristic of employees' knowledge seeking behavior (Gray and Durcikova 2005). EKR stores knowledge in a coifed and searchable format and enables employees to quickly locate useful knowledge for problem solving, decision making, and task performance (Gray and Meister 2004; Levitt and March 1988). With this backdrop, this paper studies employees' knowledge seeking behavior via EKR with an emphasis on survival.

Technology Acceptance Model

Among various models that explain IS usage behavior, TAM has a strong focus on utilitarian outcomes of information systems (Davis 1989; Davis et al. 1989). While TAM can be applied across various settings (Venkatesh et al. 2003), the instrumental underpinning of TAM renders it an ideal framework for understanding knowledge seeking behavior from EKR.

In the original TAM, perceived ease of use (PEOU) directly affects perceived usefulness (PU). Behavioral intention (BI) is determined by attitude towards technology use, as well as by the direct and indirect effects of PU and PEOU. BI, in turn, directly influences technology use. Some have argued and demonstrated that BI is a reasonable predictor of actual use, especially in the voluntary context (Davis et al. 1989; Davis et al. 1992; Hartwick and Barki 1994; Mathieson 1991; Pavlou and Fygenson 2006; Taylor and Todd 1995). To be parsimonious, Davis et al. (1989) advised dropping attitude and focusing on only three constructs: PU, PEOU, and BI. Following the recommendation by Davis et al., we apply this simplified TAM as the theoretical framework for investigation, and define behavioral intention, in our investigative context, as employees' intention to seek knowledge from EKR.

The concept of perceived usefulness originally describes whether one believes that using a particular system would enhance his or her job performance (Davis 1989). PU captures the notion of extrinsic motivation and the associated instrumentality, suggesting that IS use is driven by such economic considerations as maintaining job position, obtaining promotion, getting rewards, etc. Such utility-oriented motivation is noted, explained and supported by numerous empirical studies (Davis et al. 1992; Venkatesh and Davis 2000; Venkatesh and Speier 1999). In the context of EKR, employees may seek knowledge via the system when they perceive the knowledge to be useful for their task performance. We thus define perceived usefulness as the extent to which the employees believe that using EKR can enhance their job performance.

Another antecedent of behavioral intention in TAM is perceived ease of use (Davis et al. 1989), which is defined as the extent to which the employees believe that using EKR is free of effort. PEOU concerns individual evaluation regarding the cognitive effort required for operating a system (Davis et al. 1989). An easy-to-use IS removes the cognitive barriers for using the system and makes the users believe the system is under their control, thereby encouraging them to engage with the technology (Pavlou and Fygenson 2006). This effort consideration reflects the instrumental aspect of the PEOU construct (Davis et al. 1989; Pavlou and Fygenson 2006). According to the resource allocation theory, effort is a finite cognitive resource (Kanfer et al. 1994); efforts saved due to improved ease of use may be redeployed for accomplishing more work (Kanfer et al. 1994). As increased PEOU may contribute to elevating performance expectation, perceived ease of use is justified to have a direct effect on perceived usefulness (Bandura 1982; Barrett et al. 1968; Davis 1989; Davis et al. 1989; Swanson 1987; Todd and Benbasat 1991; Venkatesh 2000).

Cross National Studies

Prior studies have examined TAM across different settings, including user groups, technologies, organizations, and countries (e.g., Legris et al. 2003). It is noted that the technology acceptance model may vary across nations. For instance, empirical results for TAM are similar in United States and Switzerland, but they are significantly different in Japan (Rose and Straub 1998; Straub 1994; Straub et al. 1997). Scholars usually attribute such cross-national differences to different national cultures. Indeed, culture may impact effectiveness and efficiency of IS deployment (Ho et al. 1989; Robey and Rodriguez-Diaz 1989; Straub et al. 1997), as well as employees' response to IS (Straub et al. 1997). For example, individuals in nations with high power distance (PD), high uncertainty avoidance (UA), or low individualism (IDV) tend to have lower intention to use a lean IS-based medium like email (Straub et al. 1997). In addition, the relationship between perceived usefulness and IS usage intention is stronger in high masculinity (low femininity) cultures, while the relationship between perceived ease of use and IS usage intention is stronger in low masculinity (high femininity) cultures (Srite 1999).

A majority of these studies collected data only from three to four countries and then compare the models across nations (e.g., Keil et al. 2000; Straub et al. 1997). As the sampled countries represent only a small portion of the world, generalizability of their findings deserves further scrutiny. In addition, while these studies examine the impact of culture on individual IS behavior in an aggregate manner, some have investigated how cultures measured at the individual level (e.g., espoused national culture values) affects IS acceptance (McCoy et al. 2007; Srite and Karahanna 2006). Srite and Karahannna (2006) commented that these two approaches provide distinct yet complementary perspectives toward cross-national or cross-cultural studies.[1] With this backdrop in mind, this study follows the former approach, investigating how macro-level factors affect individual IS response, while aiming at gathering data from more nations.

There are two limitations that constrain cross national studies in general. First, most of the extant cross national studies applied culture value scores from either Hofstede and his associates (Hofstede 1984; Hofstede 2001; Hofstede and Bond 1988) or the GLOBE project by House et al. (2004). However, cultural values provided by these two groups are confined within a certain number of countries, preventing future research from studying countries beyond their scopes. More importantly, these studies have, implicitly or explicitly, taken these cultural values for granted, without a deeper consideration of the origins of culture. As a result, we still have little understanding about why and how a certain culture has evolved in a particular country.

Thermal Demands-Resources Theory

Toward this end, the thermal demands–resources theory (Van de Vliert 2008; Van de Vliert et al. 2004) was recently proposed as a solution to the aforementioned limitations, as it (1) provides a more fundamental explanation to cross national differences in individual behaviors; and (2) does not require culture value scores and can thus be applied to a broader range of countries. This theory posits that culture evolves from two macro level conditions: physical environment and available resources. These two factors jointly predict the extent to which individual residents go beyond their survival needs. It is important to note that the survival needs in the thermal demands-resources theory specifically refer to the pressure derived from natural environment for individuals to survive (Van de Vliert 2008) rather than business market competitiveness that affect organizational survival.

To begin with, thermal climates set survival demands in terms of comfort, nutrition, and health for human beings (Van de Vliert 2007b). Temperate climates offer thermal comfort, abundant food resources (owing to the rich flora and fauna), and negligible risks of unhealthy weather conditions (Van de Vliert 2007a). Demanding climates, however, require increasing investments of time and effort to cope with the environmental demands, in order to meet survival needs. In psychology, the survival needs aroused by climates can be interpreted as a hierarchical chain, including primary homeostatic needs for thermal comfort, nutrition, and health; secondary needs for homeostatic goods to satisfy the primary homeostatic needs for thermal comfort, nutrition, and health; and tertiary needs for

[1] We would like to distinguish cross national from cross cultural studies. While cross national studies typically compare behavioral differences across national boundaries, cross cultural studies may compare different cultural groups within one nation (Srite and Karahanna 2006) or across several nations (McKoy et al. 2007). Srite and Karahanna (2006), for instance, examine the impact of espoused cultural value with respondents within a single country. McKoy et al. (2007), though obtained data from subjects across 24 nations, compared behavioral differences between individuals with high or low cultural values (i.e., high/low power distance, high/low uncertainty avoidance, individualism/collectivism, masculinity/femininity) rather than across national boundaries. Our focus here is cross national behavioral differences.

monetary equivalent resources to satisfy the secondary needs for homeostatic goods. Accordingly, survival pressure would be more salient in poorer countries where homeostatic goods are more desirable and where stable work status enables employees to buy these goods to support their life (Ven de Vliert et al. 2008). In other words, different living conditions outside the organizations influence organizational regulations and work circumstances (Van de Vliert 2007a) and shape employees' values and work practices in organizations (Van de Vliert 2008; Van de Vliert et al. 2008). Meanwhile, national wealth can be considered as a country's available resources that the residents can access to cope with thermal demands. It has been shown that members of poor nations endorse strong materialistic values, whereas members of rich nations emphasize less materialistic values (Van de Vliert 2007b).

The interaction between thermal demands and economic resources forms the circumstances in which people adapt their values and practices, which constitute the syndromes of culture (Van de Vliert 2006; Van de Vliert 2007a; Van de Vliert 2007b). To be more specific, adaptation to a particular climatic-economic niche has distinctive impacts on employees' psychological functions in life and work related activities in general. For example, in harsh climates, people in rich countries tend to be happier at the expense of being more altruistic, whereas people in poor countries tend to be more altruistic at the expense of being happier (Van de Vliert et al. 2004). Also, in demanding climates, autocratic leadership, as the opposite of democratic leadership, is seen as less effective in rich countries but more effective in poor countries (Van de Vliert 2006). Moreover, wages are perceived as more important in poor countries with harsh climates than in rich countries with harsh climates and in both poor and rich countries with temperate climates (Van de Vliert et al. 2008). This argument is also consistent with Maslow's need theory (Maslow 1954), which contrasts lower-order needs for nutrition and health against higher-order needs for expression of capacities and talents, suggesting that national cultures differ in the extent to which they go beyond gratification of survival needs toward gratification of self-fulfilling needs. Three situations are illustrated in details herein below.

First, harsh thermal demands mismatched by inadequate economic resources impair individuals' sense of control over threatening and stressful situations set by the challenging climates. Therefore, residents in poor countries with harsh climates give higher priority to physical and economic security. They are less happy, more reluctant to sign petitions, and working more for money (Van de Vliert et al. 2004). These values are thought to reflect and represent broader survival-related values (Van de Vliert 2007b).

Second, harsh thermal demands matched by adequate economic resources enable individuals to turn threats into opportunities and experience relief and pleasure. Residents in rich countries with harsh climates encounter less survival stress and tend to lead a happy and healthy life (Van de Vliert et al. 2004). Economic resources like money support their tendency to obsessively work for themselves, for fun, and for improvement against the continuous counteractions of the demanding climates. Consequently, residents in this environment show least concerns about survival needs and embrace self-expression values (Van de Vliert 2007b).

Third, survival demands set by temperate climates, in relation to harsh climates, can be more easily matched with economic resources. Compared with the tight cultures evolved in demanding climates in response to the burden of climatic survival (and self-expression as a sublimation of it), an easygoing atmosphere evolves in temperate climates (Van de Vliert 2007b). In relation to nations with harsh climates, residents of countries with temperate climates, regardless of their economic development status, are in a position to lead a relatively more relaxed and easy life. Poverty or wealth does not make much difference in this environment for individual feelings of life satisfaction and work motivations (Van de Vliert et al. 2008).

Research Model and Hypotheses

Given the above discussion, we propose a framework to explain the differential pattern in employees' knowledge seeking from EKR across nations (Figure 1). To begin with, seeking knowledge from EKR helps employees solve their task related challenges, which is beneficial for employees to survive in organizations. Specifically, EKR offers the relevant, accurate, and timely knowledge that enables employees to find and exploit diverse information and knowledge to accomplish their task activities. Leveraging useful experiences, advice, insights, and ideas from EKR in their own decisions-making and problem-solving processes would enhance their performance (Tiwana and Bush 2005). Hence seeking knowledge through using EKR in workplace can possibly satisfy employees' survival needs. TAM, as a model that explains IT adoption behavior, is adopted because of its focus on instrumental nature of IT application. The thermal demands-resources theory is integrated as the theoretical perspective that accounts for cross national differences in the survival centric behavioral model.

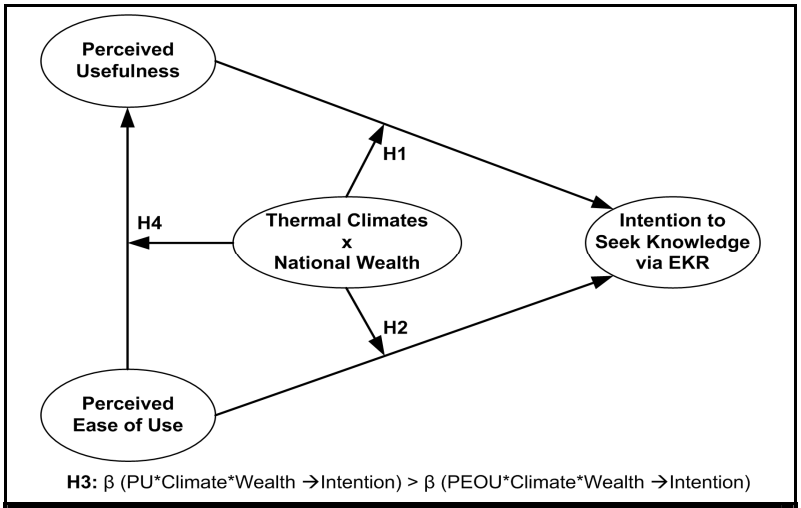


Figure 1. Research Model

Perceived Usefulness and Intention to Use

As aforementioned, within workplace settings, employees form intentions toward seeking knowledge from EKR based largely on their appraisal of the extent to which using the system can improve their task performance (Davis et al. 1989). This is because enhanced performance brings extrinsic benefits like job security, pay increases, and promotion (Davis et al. 1992). In other words, usefulness belief affects knowledge seeking intention through an instrumental mechanism that is survival laden. Therefore, we predict the effect of perceived usefulness on intention to seek knowledge via EKR will be stronger in an environment that emphasizes survival more strongly.

Specifically, harsh climates set a strong survival orientation. In this context, employees in rich countries are fortunate to take survival for granted because they are exposed to abundant resources (Van de Vliert 2007b). Indeed, resources available to human beings tend to correlate with a variety of life-related factors, including human capital (e.g., knowledge and education), social resources (e.g., support from personal and social networks), and physical condition (e.g., health status), such that resources are distributed in a manner that is more favorable to people in better positions (Bornstein and Bradley 2003; Inglehart and Welzel 2005; Williams 1990). For instance, people in richer nations typically have higher education attainment (Inglehart and Welzel 2005), which also brings about higher levels of confidence and competence in technology use (Hsieh et al. 2008). They are usually endowed with social networks characterized by high quality support from family members, friends, colleagues, and other acquaintances who too have received good education and are knowledgeable and resourceful (Payton 2003; Warschauer 2002). They also have better access to (relatively speaking) superior public resources like libraries. Thus, given the availability of alternative knowledge sources (e.g., social networks and public libraries), the role of EKR for survival may not be very critical for people in rich nations with harsh climates.

In contrast, the inadequate resource availability makes survival a rather serious concern for employees in poor countries with harsh climates (Van de Vliert 2007b). Their resources are inferior to those in rich countries in terms of access to different knowledge sources (Warschauer 2002); unfortunately, they are also more vulnerable to the lack of resources (Williams 1990). Hence, their strong survival orientation, limited access to alternative knowledge sources, and high sensitivity to insufficient resources would make EKR a more valuable tool for employees in poor than in rich nations. The above reasoning suggests that, in harsh climates, perceived usefulness may affect intention to seek knowledge via EKR more strongly for employees in poor than in rich countries.

On the other hand, the difference between rich and poor countries, in terms of knowledge seeking behaviors, may not be as pronounced in case of nations with temperate climates. Since survival needs are not so strong in climatically temperate regions, the difference in economic or equivalent resources between rich and poor countries may exert little behavioral impact (Van de Vliert 2007b). The above discussions lead to our first hypothesis:

H_1: Thermal climates and national wealth interactively moderate the relationship between perceived usefulness and intention to seek knowledge from EKR, such that in harsh climates, the relationship is stronger for employees in poor than in rich countries, whereas in temperate climates, such a difference between rich and poor countries is not salient.

Perceived Ease of Use and Intention to Use

The underlying objective for employees to use EKR is to complete their tasks by applying the knowledge in the system (Gray and Durcikova 2005). This utilitarian consideration of EKR use is tightly related with employees' survival needs. Thus, a user-friendly system can avoid users' suffering from lack of such resources as operating skills and learning time (Bandura 1982; Pavlou and Fygenson 2006). When viewed as a control related factor that facilitates a behavior with lower personal effort (Lepper 1985), PEOU reveals its instrumental aspect (Pavlou and Fygenson 2006).

In harsh climates, which cause a survival-centric outlook, employees in poor countries, relative to those in rich countries, put more emphasis on the instrumental purpose of work (Van de Vliert 2007b). Unfortunately, their intention to seek knowledge from EKR is more likely to be hurdled by their lower competence in operating the system due to their lesser technology experience and inferior knowledge bases (Hsieh et al. 2008; Warschauer 2002). Compared to those in rich nations with harsh climates, the poors' strong survival values (Van de Vliert 2007b) and high sensitivity to resource availability (Williams 1990) will make PEOU a more important consideration for seeking knowledge via EKR. Again, since nations in temperate regions do not emphasize survival as much, such a difference between rich and poor countries in harsh climates is not expected to be salient in areas with temperate climates (Van de Vliert 2007b). We, therefore, arrive at the second hypothesis:

H_2: Thermal climates and national wealth interactively moderate the relationship between perceived ease of use and intention to seek knowledge from EKR, such that in harsh climates, the relationship is stronger for employees in poor than in rich countries, whereas in temperate climates, such a difference between rich and poor countries is not salient.

Perceived Usefulness versus Perceived Ease of Use

When considering the interactive moderation effect of climates and national wealth, the relative impacts of PU and PEOU on behavioral intention deserve further elaboration. While PU can be seen as a function of task-technology fit and emphasizes more on extrinsic outcomes of technology application (Davis et al. 1992), PEOU, in addition to its instrumental aspect, may be viewed as a task-independent construct that is not necessarily related to utilitarian concerns. For instance, Keil et al. (1995) argued that PEOU may reflect interface characteristics that are relevant to technology design but not task performance. Davis (1989) offered a complementary view by demonstrating that employees are often willing to cope with difficulty in using a system as long as the system provides critically needed functionality. In other words, PU surpasses PEOU in terms of utility for survival purpose. Thus the aforementioned moderation effect, if any, should be stronger for PU than for PEOU.

H_3: The interactive moderation effect of thermal climates and national wealth will be stronger for the relationship between perceived usefulness and knowledge seeking intention than for the relationship between perceived ease of use and knowledge seeking intention.

Perceived Ease of Use and Perceived Usefulness

Most cross national studies, while focusing on examining the impacts of PU and PEOU on technology use, have overlooked the effect of PEOU on PU. The thermal demands-resources theory, however, implies that the strength of relationship between these two beliefs may vary significantly across nations.

On closer consideration, perceived ease of use of a certain system is related to employee users' work efficiency (Todd and Benbasat 1991). According to the resource allocation theory (Kanfer et al. 1994), when a system is perceived as easy to use, it would be considered valuable because it enables employees to redeploy their finite resources (e.g., time and cognitive effort) to accomplish more tasks or achieve better performance, which reflects the essence of perceived usefulness (Davis et al. 1989). In other words, perceived ease of use affects employees' expectations of achieving survival goals. Thus, since both PU and PEOU are survival-centric, and the effect of PEOU on PU represents a utilitarian mechanism, we predict a similar interactive moderation effect by thermal climates and national wealth on the relationship between PU and PEOU.

H_4: Thermal climates and national wealth interactively moderate the relationship between perceived ease of use and perceived usefulness, such that in harsh climates, the relationship is stronger for employees in poor than in rich countries, whereas in temperate climates, such a difference between rich and poor countries is not salient.

Methodology

Research Site

A leading multinational shipping company that implanted a global enterprise knowledge repository (EKR) system was chosen as the site for investigation. The company has branches over 58 countries and annual revenue of US$ 5.65 billion (2007). Given the high intensity of competition in this industry, the firm's competitiveness and quality of service are contingent upon its employees' abilities to access and apply the latest and the most relevant knowledge. The knowledge-centric characteristic of the shipping industry, together with the firm's global presence and EKR implementation, makes the site an ideal test bed for the proposed model and hypotheses.

By the time of data collection in spring 2008, the target firm had implemented its EKR for two years. The available knowledge in the system covered useful intelligence across various geographical and functional areas. The firm assigns a few dedicated personnel to be responsible for maintaining and updating the content in the system. On the other hand, the firm authorizes most of its employees to access this repository. Unlike frontline operators, these employees are knowledge workers whose performance is contingent upon their professional knowledge. The EKR was designed to help these employees access professional knowledge when needed, thereby facilitating their task performance. Our investigation thus focuses on employees whose EKR use is knowledge seeking, instead of knowledge contribution. Importantly, the employees are encouraged, but not mandated, to search knowledge via the EKR. Thus, their EKR use is voluntary in nature.

Measures

Established scales were used to measure the constructs in this study. Perceived usefulness, perceived ease of use, and intention to seek knowledge via EKR were all measured with multi-item seven-point Likert scales ranging from strongly disagree (1) to strongly agree (7). Four items for PU and four items for PEOU were adapted from Davis (1989) and Davis et al. (1989). Three items for behavioral intention were adapted from Taylor and Todd (1995) and Karahanna et al. (1999). Following the recommendation by Fishbein and Ajzen (1975), all these items were adapted to reflect the specific context of knowledge seeking from EKR.

Thermal climates, generally expressed in average degrees Celsius across a country's major cities, are harsher to the extent that winters are colder, or summers are hotter, or both. Following Van de Vliert et al. (2008), harsh climates was operationalized as the sum of absolute deviations from 22^{o}C for the average lowest and highest temperatures in the coldest winter month, and for the average lowest and highest temperatures in the hottest summer month, over a 30-year period (Parker 1997). National wealth was operationalized as the per capita gross domestic product (GDP) (unit of currency: international dollar). GDP per capita estimates were derived from purchasing power parity (PPP) calculations for 2007, published by the International Monetary Fund (IMF).[2]

To rule out possible alternative explanations, several variables were controlled in the analysis, including gender, age (years old), use history, education (secondary/high school, post-secondary, university graduate, post-graduate, or others), and years in the current position. In addition, Hofstede's (2001) four culture values (uncertainty avoidance (UA), power distance (PD), individualism/collectivism (IDV) and masculinity/femininity (MS)) were also controlled for their potential cross national moderation effect on the relationships between PU, PEOU, and behavioral intention. Specifically, Hofstede's culture value indices (ranging from 1 to 112 on each culture value dimension) were employed (Hofstede 2001).

Data Collection

The survey instrument was developed in English, which is the official language of the firm. The instrument was first pretested with 24 employees. Minor modifications were made based on their feedback. The official data collection was conducted through an online survey. We invited 3027 randomly sampled employees across 30 countries for participation. Reminding letters were sent one week after the initial survey to increase the response rate. After excluding incomplete responses, 1352 responses (see Table 1 for demographics) across 30 countries were usable for

[2] Data was accessed on October 8, 2008 from World Economic Outlook Database-October 2008, International Monetary Fund. http://www.imf.org/external/pubs/ft/weo/2008/02/weodata/index.aspx

analysis, yielding a 44.7% response rate. The sample size for each nation ranges from 7 to 129 (mean= 45.07; standard deviation= 26.93), which is appropriate for multi-level analysis (Kreft and De Leeuw 1998; Raudenbush and Bryk 2002). Although this sample is far from comprehensive with respect to all countries in the world, it representatively covers countries with high and low national wealth and harsh and temperate climates (see Table 2 for country information).

Table 1. Sample Demographics

	Category	**Percentage**
Education	Secondary/High School	18.3%
	Post-secondary	13.4%
	University Graduate	53.9%
	Post-graduate	11.5%
	Others	2.9%
Gender	Male	50%
	Female	50%
Use History	Less than 6 months	21.1%
	More than 6 months but less than 12 months	16.6%
	More than 12 months	62.4%
	Mean	**Std. Deviation**
Age (years)	36.45	9.73
Years in current position (years)	6.37	6.77

Table 2. Country Information

Country	**Sample Size**	**National Wealth** (a)	**Harsh Climates** (°C)	**Uncertainty Avoidance** (b)	**Power Distance** (b)	**Individualism/ Collectivism** (b)	**Masculinity/ Femininity** (b)
Australia	43	36,226	76	51	36	90	61
Bangladesh	31	1,311	44	80	60	20	55
Belgium	29	35,388	79	94	65	75	54
Canada	57	38,614	105	48	39	80	52
China	129	5,325	82	80	30	20	66
Denmark	14	37,265	83	23	18	74	16
France	36	33,509	75	86	68	71	43
Germany	103	34,212	84	65	35	67	54
Hong Kong	42	42,124	40	29	68	25	57
India	63	2,563	53	40	77	48	56
Indonesia	40	3,728	30	48	78	14	46
Italy	15	30,365	59	75	50	76	70
Japan	57	33,596	52	92	54	46	95
Korea	36	24,803	79	85	60	18	39
Malaysia	62	13,385	33	36	104	26	50
Netherlands	34	38,995	77	53	38	80	14
New Zealand	12	26,611	53	49	22	79	58
Pakistan	26	2,594	59	70	55	14	50
Philippines	60	3,383	36	44	94	32	64
Russia	38	14,705	101	93	95	39	36
Singapore	61	49,754	29	8	74	20	48
Spain	21	30,118	69	86	57	51	42
Sri Lanka	19	4,265	30	40	77	48	56
Sweden	7	36,578	89	29	31	71	5
Taiwan	81	30,322	49	69	58	17	45
Thailand	52	7,907	45	64	64	20	34
UAE	26	37,941	53	68	80	38	53
UK	36	35,634	67	35	35	89	66
USA	68	45,725	79	46	40	91	62
Vietnam	54	2,589	48	70	30	20	40

(a) unit of currency: international dollar

(b) adopted from Hofstede (2001)'s Cultural Value Score. Accessible from http://www.geert-hofstede.com/hofstede_dimensions.php

Analysis

Measurement Model Evaluation

CFA was first performed using AMOS 7.0 to assess the measurement properties of the three multi-item constructs (Anderson and Gerbing 1988). The three-factor model yielded an adequate model fit (CFI=0.97, TLI=0.96, NFI=0.96 GFI=0.94, AGFI=0.90, and SRMR=0.065) (Hair et al. 1998). The factor loading for each indicator on its corresponding construct was significant at 0.05 significance level or higher, supporting convergent validity. As shown in Table 3, the average variance extracted (AVE) are all above 0.5, suggesting that explained variance is higher than unexplained (Segars 1997). The square root of AVE of each construct is also higher than all inter-construct correlations, thereby establishing discriminant validity (Fornell and Larcker 1981). To assess reliability, Cronbach's alpha and composite reliability were both above the recommended 0.707 (Nunnally 1978). The above results suggest that the measurement scales exhibit adequate psychometric properties.

Table 3. Descriptive Statistics, Reliabilities, Average Variance Extracted, and Correlations

	Mean(S.D.)	**α** (a)	**C.R.**(b)	**AVE**(c)	**1.**	**2.**	**3.**	**4.**	**5.**
1.Intention to seek knowledge via EKR	5.30 (1.29)	0.91	0.92	0.79	0.89				
2.Perceived usefulness	5.34 (1.03)	0.92	0.93	0.76	0.45**	0.87			
3.Perceived ease of use	4.96 (1.16)	0.93	0.93	0.77	0.34**	0.58**	0.88		
4.Harsh climates	--	--	--	--	0.05	-0.12*	-0.20**	N.A.	
5.National wealth	--	--	--	--	0.07*	-0.16**	-0.24**	0.25*	N.A.

1. (a) Cronbach's Alpha; (b) Composite Reliability; (c) Average Variance Extracted
2. Diagonals represent the square root of average variance extracted. Off diagonal elements are inter-construct correlations.
3. *p<0.05, **p<0.01

To evaluate the appropriateness to compare path coefficients across nations, we conducted measurement invariance (MI) analysis (Doll et al. 1998; Steenkamp and Baumgartner 1998). As structural equation modeling (SEM) based analysis typically requires at least 200 to 250 data points in one single group (Hair et al. 1998), we split the entire sample (1352) into two groups, one at a time, based on the following six categorizations: high/low national wealth, temperate/harsh climates, high/low power distance, high/low uncertainty avoidance, individualism/collectivism, and masculinity/femininity groups. Also using AMOS 7.0, we performed configural and metric invariance analyses to evaluate if the three-factor multi-item measurement models are invariant across the split groups (two groups for every dimension). Following the procedures by Steenkamp and Baumgartner (1998) and the evaluation criteria by Cheung and Rensvold (2002), the results reveal strong support for measurement invariance between groups along the above six categorizations.

Hypothesis Testing – Hierarchical Linear Modeling

The research model and the proposed hypotheses demand multi-level analyses across both national and individual levels. Statistically, integration of the two levels of analysis can be achieved by using hierarchical linear modeling (HLM). Hierarchical linear modeling or multilevel modeling is a statistical technique designed to analyze data with a nested structure, such as individuals nested within nations. In such a nested data structure, individual units are not randomly distributed across nations. As a result, bias may occur when the number and the characteristics of individuals differ from nation to nation (Goldstein et al. 1998). Moreover, individuals in a particular nation, sharing the same climates and national wealth, are more likely to demonstrate similar behavioral patterns than individuals across different nations. Simple one-level multiple regression techniques would lump all individuals together and ignore the fact that, as a result of the potential statistical dependence among observations, the standard errors will be underestimated, leading to overestimation of the level of significance. HLM can better assure that the findings will not simply be the result of distribution of individuals across nations, statistical dependence in the data, and varying sample sizes across nations, as these factors are less likely to affect HLM coefficients (Goldstein et al. 1998).

Data analyses were performed using MLwiN, which is a software package for HLM (Goldstein et al. 1998). MLwiN produces an estimate for each predictor variable, along with the associated standard error. These estimates are comparable to the unstandardized regression coefficients in an ordinary regression analysis, and their level of significance can be tested using T-tests. Moreover, MLwiN produces a statistic called the deviance, which indicates

how well a given model fits the data. If two models are nested, the difference in deviances of the two models has a chi-square distribution with degrees of freedom equal to the difference in the number of parameters estimated. A chi-square test can then be performed to examine whether the more general model fits significantly better than the simpler model. Before testing the hypotheses, harsh climates, national wealth, and four of Hofstede's cultural values (i.e., UA, PD, IDV, and MS) were standardized at country level to facilitate analysis and interpretation of the interaction effect (Aiken and West 1991). We also standardized individual-level PU and PEOU within each country, so as to disentangle individual differences and country differences (Kreft and De Leeuw 1998). These standardized measures were then used for creating interaction terms for analysis.

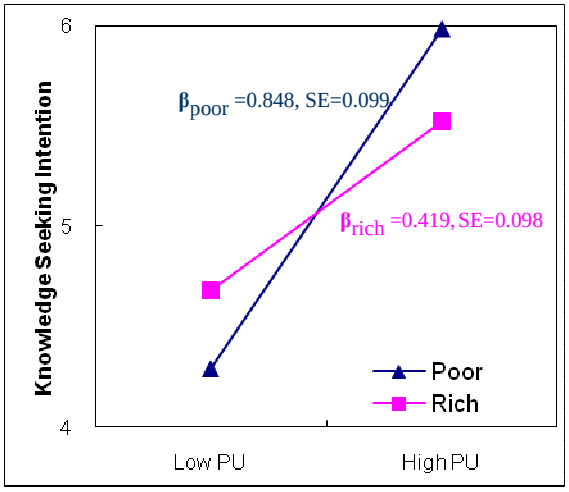
H_1: Table 4 lists the results of the multi-level analysis with improvement of model fit statistics for each step. We now delineate the detailed procedures for Hypothesis 1. In the first step, gender, age, use history, education, years in the current position, and Hofstede's four dimensions of culture values were entered into the model as control variables. Among these control variables, only prior use history significantly affected (β=0.278, $p<0.01$) intention to seek knowledge via EKR. In step 2, the main predictor (PU) and the two moderators (harsh climates and national wealth) were entered into the model. A significant positive coefficient (β=0.524, $p<0.01$), along with a significant improvement of model fit ($\Delta\chi^2$ (3) =256.469, $p<0.01$) indicates that PU was positively related to intention to seek knowledge from EKR at the individual level. In step 3, we conducted a random slope test to examine if this relationship between PU and behavioral intention had significant variance at the national level. A significant improvement in model fit ($\Delta\chi^2$ (2) =10.503, $p<0.01$) suggests the slope was significantly different from one nation to another. In step 4, all possible two-way interaction terms were added. To be conservative, we even controlled the moderating effect of Hofstede's four culture dimensions on the relationship of interest. None of these two-way interaction terms were found to be salient. In step 5, we tested whether three-way cross-level interaction (i.e., climates and national wealth at the macro level and PU at the individual level) had any influence on individual level knowledge seeking intention. As can been seen in column A of Table 4, the results reveal a significant three-way interaction effect (β= -0.166, $p<0.01$) together with a significant improvement in model fit ($\Delta\chi^2$ (1) =9.581, $p<0.01$).

Table 4. Results of Hierarchical Linear Modeling

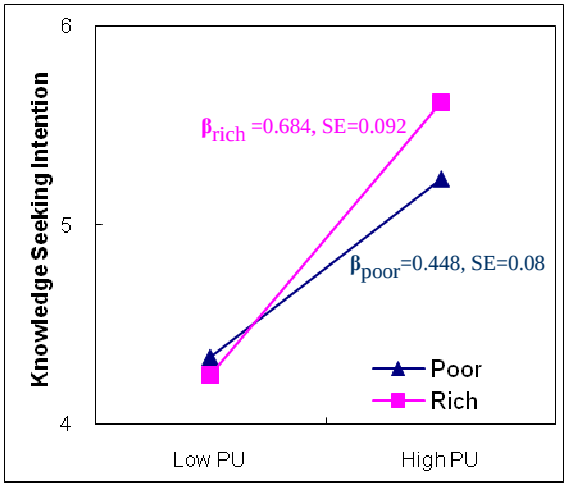
Relationship	**A. PU→ Intention**		**B. PEOU→Intention**		**C. PEOU→PU**	
	Beta	**Increase in Model Fit**	**Beta**	**Increase in Model Fit**	**Beta**	**Increase in Model Fit**
Constant	5.283		5.283		5.338	
Step 1: Control Variables						
Age	-0.007		-0.007		0.003	
Gender	0.115		0.115		0.047	
Use history	0.278**		0.278**		0.176**	
Education	0.063		0.063		0.061**	
Years of position	0.008		0.008		0.004	
Uncertainty Avoidance (UA)	-0.008		-0.008		-0.015	
Power distance (PD)	-0.007		-0.007		0.015	
Individualism/Collectivism (IDV)	0.033		0.033		-0.191**	
Masculinity/Femininity (MS)	-0.007	ΔX^2(9)# =50.730**	-0.007	ΔX^2 (9) =50.730**	0.097	ΔX^2 (9) =48.328**
Step 2: Main Effect						
Harsh Climates (C)	0.147		0.142		-0.048	
National Wealth (W)	0.063		0.052		-0.205**	
Main Predictor (MP)	0.524**	ΔX^2 (3)=256.469**	0.407**	ΔX^2 (3)=152.719**	0.501**	ΔX^2 (3)=423.482**
Step 3: Testing the Slope						
MP	0.504**	ΔX^2 (2)=10.503**	0.394**	ΔX^2 (2)=3.314 (n.s.)	0.489**	ΔX^2 (2)=13.362**
Step 4: Two-Way Interactions						
UA*MP	0.019				0.020	
PD*MP	0.068				0.029	
IDV*MP	0.012				-0.065	
MS*MP	-0.035				-0.017	
C*W	-0.072				-0.075	
C*MP	0.094				0.085	
W*MP	0.083	ΔX^2 (7)=10.294			0.044	ΔX^2 (7)=6.816
Step 5: Three-Way Interaction						
C*W*MP	-0.166**	ΔX^2 (1)=9.581**			-0.123**	ΔX^2 (1)=8.896**

Numbers within the brackets indicate the degree of freedom per step
*p<0.05; **p<0.01

To have a more nuanced understanding, we plotted the interaction effect in Figure 2a (harsh climates) and Figure 2b (temperate climates). As can be seen in Figure 2a, in countries with harsh climates, the effect of PU on intention to seek knowledge via EKR was significantly stronger for employees in poor (β=0.848, p<0.01) than in rich countries (β=0.419, p<0.01), which is consistent with our anticipation. On the other hand, while we expected no difference between rich and poor nations in temperate climates, we observe in Figure 2b that the impact of PU on knowledge seeking intention was stronger for employees in rich (β=0.684, p<0.01) than in poor countries (β=0.448, p<0.01). In a post-hoc analysis that contained only data from temperate areas, we further confirmed that the slope of this relationship varied significantly between rich and poor nations. The above evidences, as a whole, suggest that H_1 is only partially supported.



2a. For Harsh Climates



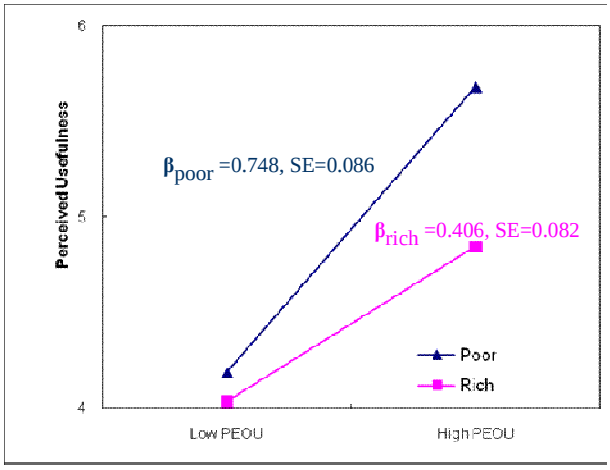
2b. For Temperate Climates

Figures 2a & 2b: Interaction Diagrams –From Perceived Usefulness to Intention to Seek Knowledge via EKR

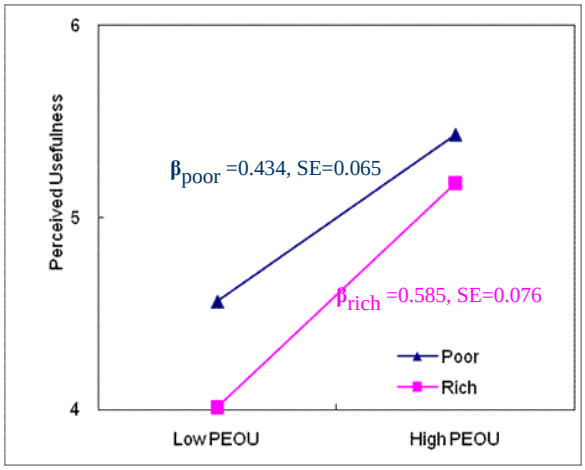
H_2: A similar procedure was performed for testing H_2. The results are presented in column B of Table 4. The results of the random slope test (step 3) reveal no improvement in model fit ($\Delta\chi^2$ (2) =3.314, p>0.05), suggesting that the link between PEOU and intention to seek knowledge via EKR did not vary significantly across nations. Hypothesis 2 is, therefore, not supported.

H_3: Hypothesis 3 states that the interactive moderating effect of thermal climates and national wealth will be stronger for the relationship between perceived usefulness and knowledge seeking intention, than for the relationship between perceived ease of use and knowledge seeking intention. Based on the results of H_1 and H_2, thermal climates and national wealth exerted salient interactive moderating effect on the former relationship (PU to behavioral intention) but not on the latter one (PEOU to behavioral intention). H_3 is thus supported.

H_4: We tested H_4 using a procedure similar to that for H_1. The results are shown in column C of Table 4. The results of the random slope test (step 3) reveal significant improvement in model fit ($\Delta\chi^2$ (3) =423.482, p<0.01), suggesting that the link between PEOU and PU had significant variance at the national level. Next, after controlling all the two-way interaction terms, we further detected a significant three-way interaction effect (β= -0.123, p<0.01), together with a significant improvement in model fit ($\Delta\chi^2$ (1) = 8.896, p<0.01). The interaction plots are illustrated in Figures 3a and 3b. Consistent with our conjecture, in countries with harsh climates, PEOU had a stronger impact on PU for employees in poor than in rich countries (Figure 3a). Also as expected, the effect of PEOU on PU did not vary significantly between rich and poor nations in temperate climates (Figure 3b). We further analyzed the data that contained subjects only from temperate areas and confirmed that this link between PEOU and PU did not vary significantly across rich and poor countries. H_4 is fully supported.



3a. For Harsh Climates



3b. For Temperate Climates

Figures 3a and 3b: Interaction Diagrams – From Perceived Ease of Use to Perceived Usefulness

Discussion

The results reveal interesting cross national differences in the behavioral model. We summarize our findings with regard to each of the four hypotheses in Table 5, and now discuss these results in detail. To begin with, the results reveal that the strength of relationship between perceived usefulness and intention to seek knowledge from EKR was subject to interaction effect of thermal climates and national wealth. In harsh climates, perceived usefulness was more important in shaping EKR use intention for employees in poor than in rich countries. One interesting finding is that in temperate climates, this relationship was stronger in rich than in poor countries, which is not exactly the same as our conjecture. Here we provide one possible explanation that might account for this unexpected outcome. As temperate climates demand fewer resources, people in both rich and poor countries do not have to worry much about survival. Nevertheless, people in rich countries tend to receive higher education and have more technology usage experience in general (Inglehart and Welzel 2005; Rogers 2003; Warschauer 2002). This may enable them to better appreciate the instrumental value that can be realized through EKR (Hilgard and Bower 1975; Hsieh et al. 2008), thereby making them more responsive to the usefulness of EKR (Hsieh et al. 2008; Venkatraman and Price 1990). Consequently, in temperate climates, the effect of perceived usefulness on intention to seek knowledge via EKR appeared slightly stronger for employees in rich than in poor countries. Meanwhile, when combining Figures 2a and 2b, in relation to any possible comparison among the four lines in the two figures, the biggest contrast occurred between poor-harsh and poor-temperate nations. Employees in poor nations seem to fall back on an easy-going template once the ecological alert is gone, which is not in conflict with the thermal demands-resource theory.

Table 5. Hypothesis Testing Results

Link	Hypothesis	Results	Supported?
PU→Intention	H_1: $\beta_{poor, harsh} > \beta_{rich, harsh}$	$\beta_{poor, harsh} > \beta_{rich, harsh}$	Partially Supported
	$\beta_{poor, temperate} = \beta_{rich, temperate}$	$\beta_{poor, temperate} < \beta_{rich, temperate}$	
PEOU→Intention	H_2: $\beta_{poor, harsh} > \beta_{rich, harsh}$	No Cross National Variation in Slope	Not Supported
	$\beta_{poor, temperate} = \beta_{rich, temperate}$		
	H_3: $\beta_{pu*climate*wealth \rightarrow intention} > \beta_{peou*climate*wealth \rightarrow intention}$	$\beta_{pu*climate*wealth \rightarrow intention} > \beta_{peou*climate*wealth \rightarrow intention}$	Supported
PEOU→PU	H_4: $\beta_{poor, harsh} > \beta_{rich, harsh}$	$\beta_{poor, harsh} > \beta_{rich, harsh}$	Supported
	$\beta_{poor, temperate} = \beta_{rich, temperate}$	$\beta_{poor, temperate} = \beta_{rich, temperate}$	

Next, the interactive moderating effect of thermal climates and national wealth on the relationship between PEOU and behavioral intention was not supported. While the results show that PEOU directly influenced intention to seek knowledge from EKR, this relationship did not vary across nations. In addition to its instrumental mechanism, PEOU may also affect individual IS use via an intrinsic mechanism through self-efficacy (Davis et al. 1989; Pavlou and Fygenson 2006). In other words, the effect of PEOU on intention to search knowledge via EKR may not be a purely utilitarian concern. On the one hand, this might be the reason leading to rejection of H_2. On the other, this lends further support to our expectation that perceived ease of use, relative to perceived usefulness, is less instrumental in nature, thereby supporting H_3.

Finally, prior studies seem to have underestimated cross national differences in the relationship between perceived ease of use and perceived usefulness. Our findings illustrate that this link indeed varied significantly across nations. Specifically, in harsh climates, the relationship was stronger in poor than in rich countries, whereas such a difference was not observed between rich and poor countries with temperate climates. The results not only highlight the instrumental influence of PEOU on PU (Davis et al. 1989) but also offer additional empirical evidences to support the thermal demands-resources theory.

Contributions and Implications

Implications for Research

This study makes integrative contributions to such research areas as knowledge management systems, technology acceptance, and cross cultural studies. By conceptualizing knowledge seeking through EKR as a survival-centric behavior, we are able to identify and, more importantly, synthesize two theoretical perspectives that are compatible with the survival concept, i.e., the technology acceptance model and the thermal demands-resources theory. While TAM offers an individual level account of employees' intention to seek knowledge via EKR, the thermal demands-resources theory provides a novel explanation to the observed cross national behavioral differences.

For knowledge management systems literature in general and EKR studies in specific, researchers have offered to understand knowledge seeking from various theoretical perspectives, including social capital, social exchange, and knowledge sourcing theories (Gray and Durcikova 2005; Gray and Meister 2004; Kankanhalli et al. 2005). We enrich this research stream by justifying the value of investigating knowledge seeking behavior from the survival perspective. For technology acceptance literature, this study makes a contribution by examining TAM with a focus on survival. Although previous studies have discussed the utilitarian nature of TAM, none has explicitly tested the model with a survival emphasis. Toward this end, this is one of the first studies that attempts to approach TAM from the survival point of view.

In addition, this research contributes to cross national IS studies by applying the thermal demands-resources theory as the theoretical account of cross national differences in employees' knowledge seeking behavioral model. Our results offer insights into the interactive moderating effect of macro-level climatic and economic factors on individual-level behavioral patterns. One noteworthy advantage of this theory over the cultural dimensions by Hofstede and associates (Hofstede 1984; Hofstede 2001; Hofstede and Bond 1988) or by the GLOBE project (House et al. 2004) is that thermal climates and national wealth can be easily operationalized using publicly available data. Hence it permits investigation of a wider range of nations, thereby attaining a more faithful understanding of cross national differences in human activities. While most prior national studies rely on Hofstedes' cultural dimensions as the dominant theoretical perspective for explaining cross national differences, future research should seriously consider incorporating the survival angle for achieving a more fundamental and more holistic understanding about cross national IS management.

Methodologically, this is perhaps one of the few IS studies that include as many as 30 countries in a single study. This research design has important implications for methodology in cross national IS research. Previous studies in this area have encountered several methodological challenges that are difficult to address. In theory, national culture is a macro-level phenomenon, while technology acceptance by end-users is an individual-level one. In this vein, hierarchical learning modeling (HLM) is an ideal statistical technique for analysis. However, HLM requires the dataset to cover at least 25 units at the higher level (e.g., national level) (Kreft and De Leeuw 1998). Since it is difficult in practice to collect data from this many countries, most cross national IS studies, if not all, have been restricted to data from only three to four countries (e.g., Keil et al. 1995; Keil et al. 2000; Straub et al. 1997). As a result, these studies typically rely on cross-group comparison technique for analysis. As indicated by Aiken and West

(1991), relative to the interaction approach, the cross-group comparison technique is weaker in its power to detect between group differences, if any. In addition, having data from just three to four countries may also underestimate cross national effects, as this research design could not representatively include most countries that are major players in the global economy. Toward this end, the multinational design of this research addresses the above concerns by collecting data from a wider array of countries, which also allows for analyzing the data with advanced multi-level techniques like HLM, thereby achieving more faithful understanding of the phenomenon of interest.

Implications for Practice

Our findings also hold important implications for practice. To deploy EKR successfully, organizations should understand the core needs that stimulate employees to seek knowledge from the system. The results of this study reveal that employees' survival needs could be a powerful driver in this regard. More importantly, our findings suggest that multinational firms should carefully tailor their EKR implementation strategies according to the survival needs shaped by climatic and economic environments. Specifically, in poor countries with harsh climates, knowledge seeking through EKR is predominantly stimulated by employees' survival needs, and thus employees' utilitarian evaluations with regard to the system are extremely critical for their EKR use. In this vein, managers can include interventions that enhance the instrumental value of EKR, such as providing high quality knowledge via EKR to support employees' tasks and designing easy-to-use interfaces that facilitate employees' work efficiency. In addition, companies should create mechanisms to encourage the use of EKR, including proactively communicating with employees about the practical benefits of using EKR and offering incentives for frequent knowledge seeking via EKR. In contrast, in rich countries with harsh climates, as well as in countries with temperate climates, regardless of their national wealth, survival needs for using EKR to seek knowledge are not as strong as in poor countries with harsh climates. Thus, instrumental focus of EKR may not be the dominant reason driving employees' knowledge seeking behavior. In this case, managerial interventions may consider other drivers for knowledge seeking. Such factors may include, but not limited to, collaborative norms, self-efficacy, and personal knowledge growth (Bock et al. 2006).

Limitations & Future Research

Like most empirical studies, this research too bears some limitations, besides shedding light into a number of directions for future studies. First, although management of global enterprise knowledge repositories is an important issue, research on this subject in a global scale remains limited. While our findings offer insights into cross national differences in employees' knowledge seeking behavioral patterns, the data was only gathered from one multinational firm in the shipping industry. Caution should be exercised when generalizing the findings to other contexts. Interested scholars are encouraged to examine the model and the hypotheses by collecting data from multiple global firms from the same industry, more industries, and/or a broader range of nations.

In addition, individual perceptions with regard to an EKR are not necessarily static. Similarly, temperature and national economic status may also change over time. A longitudinal research design that collects individual-level and macro-level data at different points of time will permit insights into how changes in thermal climates and national wealth affect individual technology acceptance at different innovation stages. As human beings are increasingly challenged by issues like global warming and financial crisis, this can be a timely and interesting research area.

Finally, while our emphasis on survival has guided our identification of two relevant and useful theoretical lens, i.e., TAM and the thermal demands-resources theory, for investigating cross national differences in the knowledge seeking behavioral model, there are other factors related to survival considerations, such as perceived behavioral control (Pavlou and Fygenson 2006), perceived output quality, resource availability, incentive availability (Kankanhalli et al. 2005) and competitiveness of business environments. Future research should include these survival related factors and examine if their behavioral consequences demonstrate similar cross national differences.

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