Knowledge Sharing in Virtual Communities: A Comparison of Three Different Cultures

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***Abstract*-The paper identifies relationships between Hofstede's cultural dimensions and knowledge sharing in the context of virtual communities. A quantitative research design was applied. Data were collected from U.K. Lenovo, Slovakia Lenovo and China Lenovo. Research accessed national samples from identical jobs based in three different countries, all within a single corporation. The societal cultural factors demonstrate significant relationships with knowledge sharing in VCs. Results also indicated that these factors differ among employees in the three participating countries. The findings were based on only three cultures: British, Chinese and Slovakian. The conclusion of this research project will benefit those who are directly or indirectly involved in the development of knowledge sharing plans and strategies. This study provides empirical evidence of the relationship between Hofstede's cultural model and knowledge sharing in a virtual community context.**

Keywords- Knowledge Management; Knowledge Sharing; Virtual Community; Hofstede's Cultural Dimensions

I. INTRODUCTION

A. Background and Motivations of Knowledge Management

Knowledge management provides a key contribution to the competitiveness and survival of an organisation [1, 2]. Approximately 30% of Fortune 1000 organisations have implemented knowledge management programmes [3]. Knowledge management can greatly affect successful performance of company functions. Therefore, some companies have developed their entire business strategies around knowledge management solutions [4]. Knowledge management provides the answers to certain key organisational questions, for example, how to collaborate with remote staff and how content and knowledge can be shared within an organisation [4]. Many leading companies (e.g., NHS Scotland, NASA, IBM, HP, Shell Ltd and Accenture) have directly benefited from knowledge management.

Hofstede's [5] culture model is an important model to analyse comparisons between different societies, cultures and nations. His cultural dimensions were used as a research paradigm in the field of intercultural communication, cross-cultural psychology, and international management. He collected data worldwide, and performed a comprehensive study. Hofstede's cultural model is widely accepted and has been used to study cross-cultural influences in many different fields, such as cross-cultural psychology [6], cross cultural management [7], information technology [8] and intercultural communication [9].

Over the past three decades, organisations have paid increasing attention to profits, expenses, production, human resources and similar issues. However, many companies are currently focusing on knowledge, networks, intangible contributions, and emotional intelligence [10]. Bashir [11] cites two authors [12, 13] who argue that in the contemporary knowledge economy, the success of an organisation depends heavily on knowledge: an intangible asset that must be organised and properly managed.

Knowledge management is the creation of, capture of, organisation of, access to and use of knowledge [14]. Knowledge management tools include policies, knowhow, practices and technologies which enable knowledge sharing and transfer [15]. The most important organisational benefits of knowledge management are the connections between individual members in order to increase, expand and share their knowledge. Hoof and Ridder [16] describe knowledge sharing as a process wherein new knowledge is created when individuals mutually exchange their ideas and acquired information. Knowledge sharing provides a business with a competitive advantage [17], enhances innovative performance and reduces redundant learning efforts [18].

Virtual communities are one of the most recognised tools of knowledge sharing. A virtual community is "a group of people who may or may not meet one another face-to-face, and who exchange words and ideas through the mediation of computer bulletin boards and networks" [19]. A participant can be the giver or the receiver of information from a particular cultural background. Virtual communities enable knowledge sharing on a global level [20, 21]. The increasing use of virtual communities for knowledge sharing in large organisations continues to grow. Organisations may develop such communities for the use of their staff. Wei Li [22] cites many authors [23-25] who argue that global organizations intentionally recruit members from different societies, nations and cultures. These members bring different types of values, principles, and morals to the workplace. Their organisations expect them to share knowledge productively but the cultural mix does not always allow this to happen. For example, one of the seven main costs to British Petroleum (oil spillage in Gulf Mexico) is identified as knowledge sharing challenges between different societal cultural members [26].

Ardichvili [27] cites many authors who argue that knowledge sharing (a component of knowledge management) and

learning within organisations are deeply influenced by the cultural values of individual employees [28-31]. While cultural interchange is exciting, it can be difficult to study because of its inherent complexity.

Researchers use national culture models, such as Hofstede's model, to propose theoretical frameworks describing the ways in which national culture might influence knowledge sharing between people from different cultures [23], but many of these hypotheses are yet to be tested [22]. This study investigates the societal cultural aspect of knowledge sharing in a virtual community context, with the future aim of testing the hypotheses developed by the current research project.

II. CASE STUDY

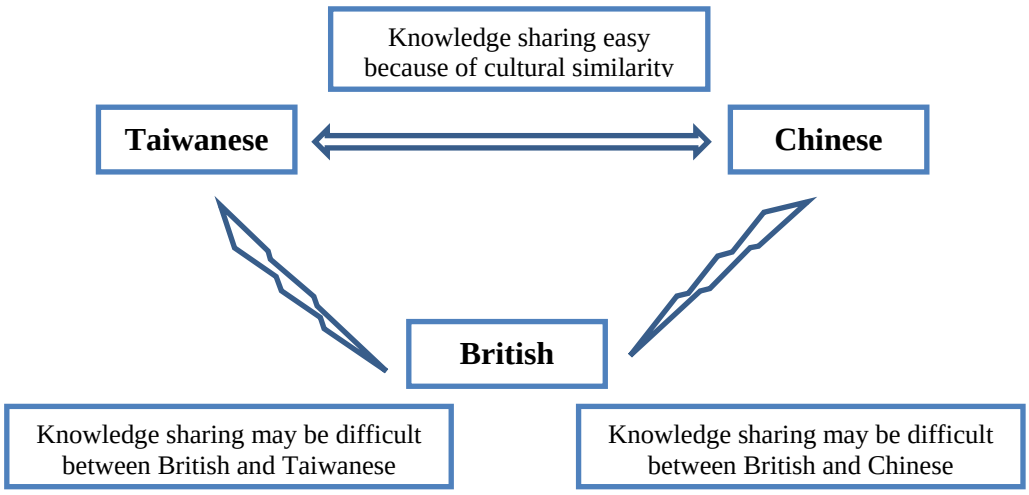

Fig. 1 Example of knowledge sharing scenario

For example, suppose that an organisation includes members from three different cultures: Taiwan, the U.K., and China (see Fig. 1). It is relatively easy for a Chinese manager to share knowledge with Taiwanese managers, because their cultures share many similarities. Alternatively, it is considerably more difficult for Chinese managers to share their knowledge with British managers, because their cultures greatly differ from each other. Hofstede [32] describes culture as "shared and transferable perceptions, values or practices." It is often passed on from generation to generation. Culture therefore must be better understood as a concept, because "creating knowledge is a human process, not a technological one" [33].

A. Research Focus

As members from different cultural backgrounds become involved in a single organisation, what societal cultural factors affect knowledge sharing in a virtual community context? Additionally, what are the relationships between societal culture factors within knowledge sharing in virtual communities? The following literature review illustrates various aspects of the research focus.

III. LITERATURE REVIEW

A. Knowledge Sharing

Many studies define knowledge sharing differently. For instance, Davenport and Prusak [34] define knowledge sharing as the process that exchanges knowledge between individuals and groups. Hoof and Ridder [16] on the other hand, define knowledge sharing as the process in which individuals mutually exchange their tacit and explicit knowledge, and thus create new knowledge. Lin [35] pointed out that knowledge sharing can occur at an individual and at an organisational level. In either case, knowledge sharing conveys "knowledge from one place, person or ownership to another" [36]. It is the exchange of task-related information, knowhow, and feedback regarding a product or procedure [22]. Knowledge sharing can also be defined as "a social interaction culture, involving the exchange of employee knowledge, experiences, and skills through the whole department or organization" [37]. Communities of practice represent a recognised knowledge management approach for connecting people [38].

B. Virtual Communities

A virtual community is "a network of people with common interests communicating with each other electronically" [39], or "a set of relationships where people interact socially for mutual benefit" [40]. Hsu et al. explains that a virtual community is "a cyberspace supported by information technology … and centred upon the communications and interactions of participants to generate specific domain knowledge that enables the participants to perform common functions and to learn from, contribute to, and collectively build upon that knowledge" [41]. Rheingold [42] defines it as "a group of people who may or may not meet one another face to face, and who exchange words and ideas through the mediation of computer bulletin boards and networks".

Bashir [4] cites many authors who suggest that businesses perceive virtual communities as opportunities to provide and share knowledge with people separated by distance, to whom physical access is not feasible. As a result, research regarding virtual communities is growing ([43-48]). One of the important areas requiring further research is culture [27, 49, 50].

C. Societal Culture

According to Hofstede, the word "culture" stems from a Latin root which refers to the tilling of the soil, as in agricultural practices. In many modern languages, the word is used in a figurative sense, with two common meanings:

1: The first, most common meaning, is "civilization", including education, manners, arts and crafts and their products. This definition falls into the "ministry of culture" domain.

2: The second meaning derives from social anthropology, but in recent decades has entered common parlance. This definition refers to the way people think, feel, and act. Hofstede [51] described culture as a "collective programing of the mind which distinguishes the members of one group or category of people from another". The "category" can refer to nations, or to regions within or across nations (http://www.geerthofstede.com/culture).

Minkov and Hofstede [52] discussed several empirical studies of societal culture, explained in greater detail in Table 1, below.

TABLE 1 MAJOR CROSS-CULTURAL STUDIES

Authors	Study
Geert Hofstede (1980-2001)	A study of values, beliefs, and norms across IBM corporation.
Geert Hofstede (1987)	A study of national values based on a Chinese questionnaire.
Shalom Schwartz (1994)	A study of the values of school teachers and university students.
Peter Smith, Fons Trompenaars, and Shaun Dugan (1995)	A study of locus of control.
Peter smith, Shaun Dugan, and Fons Trompenaars (1996)	A study of the values and beliefs of organizational employees.
Robert Levine and Ara Norenzayan (1999)	A study of the pace of life.
Robert Levine, Ara Norenzayan, and Karen Philbrick (2001)	A study of helping strangers.
Ashleigh Merritt (2000)	An attempt to replicate Hofstede's four dimensions.
Ronald Inglehart and Wayne Baker (2000)	An analysis of the world values survey.
Ulrich Schimmack, Shigeiro Oishi, and Ed Diener (2000)	A study of personal emotional dialecticism and frequencies of pleasant and unpleasant emotions.
Peter Smith, Mark Peterson and Shalom Schwartz (2002)	A study of managers' sources of guidance.
Evert van de Vliert and Onne Janssen (2002)	A study of performance motives.
Robert McCrae (2002)	A comparison of mean national and ethnic personality traits (self-reports).
Robert McCrae and Antonio Terracciano (2005)	A study of mean national or ethnic personality traits (peer reports).
David Schmitt, Juri Allik, Robert McCrae, and Veronica Benet-Martinez (2007)	A study of the geographic distribution of the major five personality traits (self-reports).
Michael Bond, Kwok Leung, and Associates (2004)	A study of social axioms.
Project GLOBE (2004)	A study of national stereotypes and ideologies.
Project GLOBE (2004)	A study of culturally-endorsed leadership profiles.
Eva Green, Jean-Claude Deschamps, and Dario Paez (2005)	A study of beliefs and values.
David Schmitt (2005)	A study of socio-sexuality.
Peter Kuppens, Eva Ceulemans, Marieke Timmeran, Ed Diener, and Chu Kim-Prieto (2006)	A study of positive and negative emotions.
Christians Welzwl (2010)	An analysis of the world values survey.
Michael Minkov (2009a)	A study of social polarization in social opinions and life-quality judgments.
Michael Minkov (2011)	A study of values related to national economic growth and educational achievement.
Michael Minkov (2011)	A study of national homicide rates and their correlations.
Michael Minkov and Geert Hofstede (2012a)	An analysis of the world values survey replicating two dimensions of the Chinese values survey.
Geert Hofstede, Bram Neuijen, Denise Daval Ohayv, and Geert Sanders (1990)	A study of organizational cultures across 20 Danish and Dutch organization units.

Michael Minkov and Geert Hofstede, 2013: 199-397)

The research studies of Chong [53] as well as Davenport and Prusak [34] examine how organisational issues such as reward systems, work practices and organisational culture impact knowledge sharing, why people share knowledge to different extents in organisational environments and why different cultural groups within the same organisation share knowledge

differently [22]. Chan and Ford produced case studies of knowledge sharing situations in multicultural settings [24], and Li [22] argued that the common factor among all these efforts is the attempt of researchers to use societal culture to explain differences among people from different countries. Very little research has been conducted in the field of cross-cultural knowledge sharing among societal cultural members in organisational environments through online system [27]. Knowledge sharing between team members in virtual environments has been studied by Soule [54] and Zakaria [55] but these studies did not integrate cross-cultural factors [22]. Bhagat [23] used the Hofstede culture model with results indicating that national culture might influence knowledge sharing between people from different cultures. However, the reported hypotheses are yet to be tested [22]. Hofstede's work-related study is undoubtedly the most significant cross-cultural values study [56]. It is the most widely cited ([57, 58]). Hofstede collected data worldwide and performed a comprehensive study. His societal cultural model is an important model with which to study culture. In face-to-face communities, his model has been tested by Okoro [59] and Shi [60], both of whom have reported that the factors of this model play a significant role. Thus, it is important to study its relationship with knowledge sharing in virtual communities.

IV. HOFSTEDE'S CULTURAL MODEL AND SOCIETAL CULTURE FACTORS

Hofstede's work is considered a hallmark of cross-cultural study. It has been used extensively in various fields such as education and information technology [61]. Hofstede's five cultural dimensions were analysed in an organisational context in the field of cross cultural communication [9]. Hofstede explored cultural consequences in international organizations [62]. He collected data from a large multinational corporation, IBM and concluded from his analysis that "organisations are cultural-bounded [62]".

Hofstede is most well-known for his work [5, 63] which concluded the five dimensions of culture: power distance, uncertainty avoidance, individualism, masculinity and long-term orientation.

- ***Power distance*** is the extent to which the less powerful members of an organisation within a country feel that power is unequally distributed.
- ***Uncertainty avoidance*** is the extent to which members of a society feel unsafe in unknown situations.
- ***Individualism*** refers to the degree to which people from a society look after themselves and their close family members and neglect the greater society.
- ***Masculinity*** refers to a society's emphasis on traditional gender roles.
- ***Long-term orientation*** refers to the placing of priority on long term goals, values and achievements.

Hofstede [51] described culture as a "collective programming of the mind that distinguishes one group or category from another."

Thus, the central research question of this analysis is: what are the relationships between societal cultures and knowledge sharing in virtual communities?

V. METHODOLOGY

Questionnaires are one of the most common methods of collecting data from members of VCs [64]. Li and Hsieh [65] designed a questionnaire for the purpose of their research. These questionnaires were sent to companies listed in "The Foreign Enterprises in Taiwan" and published by Chinese Business Window. Contributors included knowledge management executives, managers and staff of American, Japanese, European and Korean companies based in Taiwan and China. Respondents provided answers about knowledge sharing problems, as well as some important information about themselves and their firms. This study is important in that it supports the use of questionnaires in a multinational and a multi-cultural environment. Thus, the questionnaire survey approach was selected for this study as the method by which to evaluate knowledge sharing relationships with societal culture within VCs.

This research paper concentrates on societal cultures and knowledge sharing in VCs. The author developed a 28-item English questionnaire for British and Slovakian participants, and translated the questionnaire into the Chinese language for Chinese participants. This study was performed in three different societal cultural environments. The author accessed national samples from the United Kingdom, China and Slovakia within the Lenovo Corporation, a Chinese multinational computer hardware and electronics company whose products include personal computers, tablet computers, mobile phones, workstations, servers, electronic storage devices, IT management software and smart televisions. Lenovo operates in more than 60 countries, and sells its products in approximately 160 countries.

The questionnaire is divided into four sections. The first section is the introduction; the second section consists of questions regarding societal culture factors; the third section asks questions about knowledge sharing in VCs from giver and receiver perspectives; and the final section asks demographic questions.

VI. ANALYSIS

Data were collected through a Survey Monkey link. A total of 159 respondents completed the online questionnaire: n=30

from Lenovo U.K., n=92 from Lenovo China and n=37 from Lenovo Slovakia. The nationality question within the demographic section of the questionnaire was used to identify participants from each country. Statistical Package for the Social Sciences (SPSS) software was used to analyse the data relating to the three cultures addressed in the study. The relationship between knowledge sharing and societal culture was statistically examined. In examining the relationship between the variables, the first step was to determine whether a parametric (Pearson) or a non-parametric (Spearman rho) test must be used, which was determined by examining the sample for normality [66]. The normality of the data can be determined by plotting a histogram of the sample and running a Kolmogorov-Smirnov test [66]; a non-significant result indicates normality [66]. The results indicated that the sample data was not normally distributed; thus, a non-parametric correlation test (Spearman rho) was employed.

Bashir [11] cites authors [66] who suggest that a correlation of 0 indicates no relationship at all, a correlation of 1.0 indicates a perfect positive correlation, and a value of -1.0 indicates a perfect negative correlation. Correlations of between 0.10 and 0.2 are regarded as small, between 0.30 and 0.49 as medium and between 0.50 and 1.0 as large.

A. U.K. Results

The relationships between knowledge sharing and societal cultural factors were investigated using Spearman correlation coefficients. The results indicate that power distance has a small negative correlation with knowledge sharing ($r=-0.252$, $n=30$, $p<0.05$), and that uncertainty avoidance also has a small negative relationship to knowledge sharing ($r=-0.217$, $n=30$, $p<0.05$). The remaining three factors of societal culture demonstrated positive relationships to knowledge sharing. Individualism demonstrates a large positive relationship ($r=0.650$, $n=30$, $p<0.05$); masculinity demonstrates a very small positive relationship ($r=0.013$, $n=30$, $p<0.05$); and long-term orientation demonstrates a medium positive relationship ($r=0.320$, $n=30$, $p<0.05$). The results are summarized in Table 2.

TABLE 2 SOCIETAL CULTURAL FACTORS AND THEIR CORRELATION TO KNOWLEDGE SHARING IN VCS (U.K.)

			Power Distance	Uncertainty Avoidance	Individualism	Masculinity	Long-term Orientation	Knowledge Sharing
Spearman's rho	Power Distance	Correlation Coefficient	1.000	.139	-.051	.126	-.131	-.252
		Sig. (1-tailed)	.	.241	.399	.262	.253	.098
		N	28	28	28	28	28	28
	Uncertainty Avoidance	Correlation Coefficient	.139	1.000	-.371*	.022	-.196	-.217
		Sig. (1-tailed)	.241	.	.026	.456	.159	.134
		N	28	28	28	28	28	28
	Individualism	Correlation Coefficient	-.051	-.371*	1.000	-.072	.331*	.650**
		Sig. (1-tailed)	.399	.026	.	.357	.043	.000
		N	28	28	28	28	28	28
	Masculinity	Correlation Coefficient	.126	.022	-.072	1.000	.253	.013
		Sig. (1-tailed)	.262	.456	.357	.	.097	.474
		N	28	28	28	28	28	28
	Long-term Orientation	Correlation Coefficient	-.131	-.196	.331*	.253	1.000	.320*
		Sig. (1-tailed)	.253	.159	.043	.097	.	.049
		N	28	28	28	28	28	28
	Knowledge Sharing	Correlation Coefficient	-.252	-.217	.650**	.013	.320*	1.000
		Sig. (1-tailed)	.098	.134	.000	.474	.049	.
		N	28	28	28	28	28	29

*Correlation is significant at the 0.05 level (1-tailed).

B. Chinese Results

All relationships were investigated using the Spearman correlation coefficients (see Table 3). The result indicates that only power distance has a negative and very small correlation with knowledge sharing ($r=-0.050$, $n=92$, $p<0.05$). The other four factors of societal culture have positive relationships with knowledge sharing. Individualism demonstrates a large positive relationship ($r=0.521$, $n=92$, $p<0.05$); uncertainty avoidance demonstrates a small positive relationship ($r=0.108$, $n=92$, $p<0.05$); masculinity demonstrates a small positive relationship ($r=0.237$, $n=92$, $p<0.05$); and long-term orientation demonstrates a medium positive relationship ($r=0.319$, $n=92$, $p<0.05$).

TABLE 3 SOCIETAL CULTURAL FACTORS AND THEIR CORRELATION TO KNOWLEDGE SHARING IN VCS (CHINA)

			Power Distance	Uncertainty Avoidance	Individualism	Masculinity	Long-term Orientation	KnowledgeSharing
Spearman's rho	Power Distance	Correlation Coefficient	1.000	.057	.118	.089	.047	-.050
		Sig. (1-tailed)	.	.295	.136	.203	.331	.330
		N	91	91	89	90	89	81
	UncertaintyAvoidance	Correlation Coefficient	.057	1.000	.197*	.169	.122	.108
		Sig. (1-tailed)	.295	.	.032	.056	.127	.168
		N	91	91	89	90	89	81
	Individualism	Correlation Coefficient	.118	.197*	1.000	.292**	.204*	.521**
		Sig. (1-tailed)	.136	.032	.	.003	.029	.000
		N	89	89	89	89	87	80
	Masculinity	Correlation Coefficient	.089	.169	.292**	1.000	.422**	.237*
		Sig. (1-tailed)	.203	.056	.003	.	.000	.017
		N	90	90	89	90	88	80
	Long-term Orientation	Correlation Coefficient	.047	.122	.204*	.422**	1.000	.319**
		Sig. (1-tailed)	.331	.127	.029	.000	.	.002
		N	89	89	87	88	89	79
	KnowledgeSharing	Correlation Coefficient	-.050	.108	.521**	.237*	.319**	1.000
		Sig. (1-tailed)	.330	.168	.000	.017	.002	.
		N	81	81	80	80	79	81

*Correlation is significant at the 0.05 level (1-tailed).

C. Slovakia Results

The relationships between knowledge sharing and societal cultural factors were investigated using the Spearman correlation coefficients (see Table 4). Results indicate that only power distance has a small negative correlation with knowledge sharing ($r=-0.115$, $n=37$, $p<0.05$); the remaining four factors of societal culture have positive relationships. Individualism demonstrates a small positive relationship ($r=0.258$, $n=37$, $p<0.05$); uncertainty avoidance demonstrates a small positive relationship ($r=0.164$, $n=37$, $p<0.05$) masculinity demonstrates a very small positive relationship ($r=0.020$, $n=37$, $p<0.05$); and long-term orientation demonstrates a small positive relationship ($r=0.216$, $n=37$, $p<0.05$).

TABLE 4 SOCIETAL CULTURAL FACTORS AND THEIR CORRELATION TO KNOWLEDGE SHARING IN VCS (SLOVAKIA)

			Power Distance	Uncertainty Avoidance	Individualism	Masculinity	Long-term Orientation	Knowledge Sharing
Spearman's rho	Power Distance	Correlation Coefficient	1.000	.295*	-.145	-.068	.030	-.115
		Sig. (1-tailed)	.	.040	.204	.346	.432	.288
		N	36	36	35	36	36	26
	Uncertainty Avoidance	Correlation Coefficient	.295*	1.000	.180	-.195	.359*	.164
		Sig. (1-tailed)	.040	.	.146	.124	.015	.206
		N	36	37	36	37	37	27
	Individualism	Correlation Coefficient	-.145	.180	1.000	.231	.528**	.258
		Sig. (1-tailed)	.204	.146	.	.087	.000	.101
		N	35	36	36	36	36	26
	Masculinity	Correlation Coefficient	-.068	-.195	.231	1.000	.436**	.020
		Sig. (1-tailed)	.346	.124	.087	.	.004	.461
		N	36	37	36	37	37	27
	Long-term Orientation	Correlation Coefficient	.030	.359*	.528**	.436**	1.000	.216
		Sig. (1-tailed)	.432	.015	.000	.004	.	.139
		N	36	37	36	37	37	27
	Knowledge Sharing	Correlation Coefficient	-.115	.164	.258	.020	.216	1.000
		Sig. (1-tailed)	.288	.206	.101	.461	.139	.
		N	26	27	26	27	27	27

D. Societal Cultural Factors in Three Different Countries

Table 5 shows the relationship of societal cultural factors with three different countries; United Kingdom, China and Slovakia. As it can be seen from the table that Power distance is the same in China and Slovakia but in China very small negative. Uncertainty Avoidance is the same in China and Slovakia but totally different in U.K. Individualism is positive in all three countries but small in Slovakia. Masculinity is also positive in all three countries but a Chinese Lenovo result is different from two other countries. Long-term orientation is also positive but Slovakia Lenovo shows small positive and other two are medium positive.

TABLE 5 RELATIONSHIPS BETWEEN KNOWLEDGE SHARING AND SOCIETAL CULTURE FACTORS IN THREE DIFFERENT COUNTRIES

Societal cultural factors	United Kingdom	China	Slovakia
Power Distance	Small negative	Very small negative	Small negative
Uncertainty Avoidance	Small negative	Small positive	Small positive
Individualism	Large positive	Large positive	Small positive
Masculinity	Very small positive	Small positive	Very small positive
Long-term Orientation	Medium positive	Medium positive	Small positive

VII. DISCUSSION AND CONCLUSIONS

The U.K. results indicate that power distance and uncertainty avoidance have small negative relationships to knowledge sharing. Alternatively, in China and in Slovakia, only power distance demonstrates a negative relationship to knowledge sharing in a virtual community context. Individualism, masculinity and long-term orientation demonstrate significant results in China while in the U.K., only individualism and long-term orientation represent statistical significance at the 0.05 level. In Slovakia, masculinity is the only significant factor at the 0.05 level.

This paper represents an ongoing study, and a portion of the first author's PhD research. Investigating the societal culture factors and their relationships to knowledge sharing in virtual communities is a popular area among researchers. Further questionnaires have been distributed to additional related countries including Argentina, India, Peru, United Arab Emirates (UAE), Singapore, Spain, France and the U.S. for data collection process. After completion, this study will benefit those who are directly or indirectly involved in the development of knowledge sharing plans and strategies by allowing managers to assess such plans and strategies from societal cultural aspects.

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