Measuring National Culture Impact (NCI) At An Individual Level:

A Conceptual Model For Capturing The NCI On Knowledge Sharing Via Video-Conferencing

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ABSTRACT:

Knowledge is deemed necessary in giving competitive advantages. As globalization comes into view, technologies are unavoidable in enabling interactions between virtual teams, across cultures, in materialising the sharing of knowledge. This paper seeks to investigate the impact of national culture, by means of video conferencing, on knowledge sharing. Existing models that capture national cultural impact are lacking, in that they only focus on general information technology acceptance, without any particular medium other than measuring national culture at a national level. These authors were carried out a review on previous work; and examine cultural and technology acceptance theories before proposing a conceptual model. Studies on the cultural dimension yielded contradicting results. It is important to measure national cultural value at an individual level, as the results are more accurate than measuring at other levels, such as organizational or national. The proposed model will be able to address articulated views on the impact of national culture through video conferencing, on the endeavour of knowledge sharing.

Keywords: *Knowledge sharing, Technology acceptance model, National culture, Video-conferencing, Virtual teams.*

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1. Introduction

Cultural anthropologists argue that technology has a cultural component that impacts the adoption, use, and management, of the technology itself (Swigger et al, 2004). Until now, literature has been at its infancy stage with regard to the role of national culture differences on IT acceptance, whilst globalization has continued (Cardon & Marshall, 2008). Guo et al, (2009) investigated the impact of the dialogue technique, through video-conferencing technology, for sharing virtual team members in China. They rejected the importance of the national culture impact.

Although national culture was considered crucial in virtual teams, the impact of national culture on knowledge sharing is often ignored in literature and not well articulated. However, it is widely considered that cultural orientation might inhibit or motivate the sharing of knowledge, and these cultural factors could be more significant than the technical factors on knowledge sharing success (Hutchings & Michailova, 2006; Huang & Trauth, 2007). Cross-cultural differences show the most effective

impact on Computer Mediated Communications (CMC) (Law, 2007; Hutchings & Michailova, 2006). Since virtual teams are composed of members' cultural heterogeneity, it is therefore relevant to CMC studies (Guo et al, 2006).

The aim of this study is to synthesize the significance of national culture on CMC generally, but video-conferencing specifically.

2. Base Theories For The Proposed Conceptual Model

This study is based on two kinds of theories, namely cultural and technology acceptance. The following is a definition of the concepts and discussion of these theories.

2.1. Cultural Theories

This study utilizes Hofstede's cultural theory, including five dimensions and the context communication dimension from Hall's cultural communication theory, as bases to measure the impact of national culture. In order to recover the related cultural theories in this study, the primary cultural theories (with their dimensions) are reviewed as follows:

2.1.1. Hofstede's Cultural Theory

Culture, typically indicates the feasible perception, thoughts, and actions, of human behaviour. Culture is defined as 'a collective programming of the mind, which distinguishes one group from another' (Hofstede, 1980). It is also defined as 'a collective programming of the mind; it manifests itself, not only in values, but also in more superficial ways' (Hofstede, 2001). Wei (2007) argues that Hofstede's cultural theory, with the five dimensions, is identified as the most commonly used in information system researches. Hofstede (2001) identified the five independent dimensions of national culture. The following section will review the concepts and arguments of each dimension:

- Power Distance. The extent to which the less powerful members of organizations accept that power is distributed unequally (Wei et al, 2008). In technology usage, high-power distance users pay more attention to the community's reaction to the technology, and then alter their reaction, relying on their place within the hierarchical structure. However, low-power distance users are more self-governing in their technology use (Li et al, 2009).

- Individualism versus Collectivism. This refers to the degree to which individuals are supposed to look after themselves or remain integrated into groups and family (Wei et al, 2008). In high collectivist cultures, users have a tendency to focus more on the community to which they belong. They are more impacted by their peers and superiors, by satisfying their opinions; however, the opposite occurs in individualistic cultures. In technology adoption and use, high collectivism users care more about regarding how their community is possibly affected by their adoption behaviours (Li et al, 2009).

- Masculinity versus Femininity. The degree to which tough values, such as assertiveness, performance, success, and competition (which are associated with the role of men), prevail over tender values, such as quality of life, maintaining warm personal relationships, service, care for the weak, and solidarity (which are associated with women's roles) (Wei et al, 2008). In using technology, feminine users usually care more about building relationships with other users, than the technology itself. They focus on maintaining interdependency and accepting others' suggestions and desires. Users with feminine values are expected to conform to social pressures more than those with highly masculine values (Li et al, 2009).

- Uncertainty Avoidance. The extent to which a culture programs its members to feel either uncomfortable or comfortable, in unstructured situations. Unstructured situations are novel, unknown, surprising, or different from usual (Wei et al, 2008). In high uncertainty avoidance cultures, users have a low tolerance of the unknown and risk. When high uncertainty avoidance users do not avoid ambiguous situations, they will seek easy rules, in order to decrease the ambiguity. Generally, high uncertainty avoidance users are expected to comply with their community beliefs more in adopting technology; the opposite is true for low uncertainty avoidance culture users (Li et al, 2009).

- Long-term versus Short-term Time Orientation. Long-term time orientation, means focusing on the future. It implies a cultural trend towards delaying immediate gratification, by practicing persistence and thriftiness. In contrast, short-term time orientation, means focusing on the past and present, by respecting tradition and through a need to follow spending trends (Wei et al, 2008). The technology's usage nature shapes the users' perception, because they have different time orientations. As users with short-term orientation values are concerned with the difficulty of beginning to learn the usage technology, users with long-term orientation values look forward to the learning process and practicing, and how it would be easy to use the technology. Long-term users perceive the support of technology to improve their performance next time; they are also patient and enthusiastic in affording extra effort to accomplish in their future; whilst, the opposite is true for short-term oriented users (Li et al, 2009).

2.1.2. Hall's Cultural Communication Theory

Hall's effort on cultural communication is divided into three cultural dimensions, namely; context style; time (polychronism versus monochronism), and Space (high versus low territoriality). This study only involves the context style communication dimension, because the researcher found its suitability to be synthesized with the extended model constructs, in order to explore its effects. The definition for this dimension (Context Style Communication) is the degree to which users are aware of, and pay attention to, any situational and contextual cues, when interpreting messages. In quoting Hall (1976), Vatrapu & Suthers (2010) point out that the context style cultural dimension is relevant to the contexts involving intra- and inter-cultural computer supported collaboration groups. In quoting Hall (1976), Wang et al, (2009)

indicate that there is diversity between cultures, in the way that speakers ground their messages to make sure that the messages have been understood, and further quo Hall (1976) that low context is common in Western cultures, especially U.S. culture, in their desire for more direct communication forms, where they are relying mainly on words to express meaning. In contrast, high context is common in Asian cultures, especially among the Chinese and Japanese, where the desire is more for indirect communication forms, where they are relying on the situational context to make the meaning apparent (Setlock & Fussell, 2010; Wang et al, 2010) . Briefly, understanding messages could be easier for low context users through using textual technologies, such as e-mail or text chatting, than through using a rich technology, such as video-conferencing (Wang et al, 2009).

2.2. Technology Acceptance Model (TAM) Theory

TAM is 'an information system theory that models how users come to accept and use a technology'. It was developed by Davis (1989) to study an individual's acceptance and adoption of technology and information systems, and to explain computer usage behaviour. The main components of the TAM are the perceived usefulness and ease of use dimensions, which determine system use.

TAM is the most popular employed theory model for examining an individual's acceptance of technology (Lai & Li, 2010; Law, 2007; Yi et al, 2006). Researchers have used TAM on various fields of technology (Jan & Contreras, 2010). However, Durfee et al (2006) state that since TAM is an individual level adoption model, it should be applied at the individual level of culture measures. However, an investigative study suggests that TAM could only be valuable if it is extended to take in specific issues, such as cultural issues, as well in this study (Khasawneh & Ibrahim, 2008).

3. The Importance Of Measuring The National Culture At An Individual Level

In quoting Pawlowski & Robey (2004), Dulipovici (2009) mentions that, generalizing data at an individual level is fitting to social studies, which are related to knowledge sharing. In social cultural studies related to CMC, the impact of culture could be measured at either an individual, organizational, or a national level (Bagchi & Kirs, 2009; Leidner & Kayworth, 2006). Researchers in information system fields of study shall apply cultures in a dynamic view, culture should be investigated at the different levels of analysis (Gaspay et al, 2009). The measurement of national culture is one of the main challenges. Although measuring cultural values at an individual level is significant, the majority of cultural studies have measured the cultural values impact at the national level of their analysis. The problem with investigating the national culture impact at the national level is that it results in assuming that all users in a country support the same cultural values impact. Nevertheless, in case studies measuring the cultural constructs of individual level processes, the national cultural level is not required (Earley, 2006). Actually, the improvement of measures at the individual level of cultural values, support the studies investigating how these cultural values may interrelate to impact technology human behaviours (Li et al, 2009). (Law, 2007; Baker et al, 2009) argue that it is valuable to measure the impact of the national culture of any

country at an individual level of analysis. However, Bagchi and Kirs (2009) point out that those studies at the individual level of analysis, generally involved a single nation.

4. The Impact Of National Culture On Technology Acceptance And Adoption

Many researchers had extended the origin TAM; different types of information system were examined, such as e-mail, v-mail, fax, dial-up systems, and others (Lee et al, 2003; Chuttur, 2009). The following is an overview of cultural studies using TAM theory at an individual level of analysis.

4.1. Cultural Studies Using TAM Theory (At An Individual Level Of Analysis)

The following is a summary of several cultural studies, at an individual level of analysis:

- Durfee et al (2006) examined instance message adoption across cultures. The study, conducted in Mexico and the United States, relied on four of Hofstede's cultural dimensions. They found that cultural dimensions affected instance message usage within Mexico and the United States.

- Srite & Karahanna (2006) investigated IT adoption, and how four of Hofstede's cultural dimensions, affected the acceptance of IT in 30 countries. They found that social influence had a stronger influence of intention to adopt an IT than PU in high power distance, uncertainty avoidance, and masculine cultures.

- Akour et al, (2006) examined internet usage, and the impact of four of Hofstede's cultural dimensions, PEOU, and PU of managers' intentions in Jordan. They found that power distance and collectivism impacted significantly and positively, whilst, uncertainty avoidance and femininity had no impact at all. Furthermore, both PEOU and PU dimensions had significant positive impacts on managers' intentions, because of their moderation of the relationship between cultural dimensions and managers' intentions.

- Zakour (2007) explored IT adoption and reported that individualistic users are more concerned about their own opinion. However, the opposite is true for collectivists. Individuals from feminine cultures care more about other's opinions than those from masculine cultures. Those from high power distance cultures care less about their superiors' opinions; high uncertainty avoidance cultures are more respectful of regulations; high context cultures prefer unwritten messages, but the opposite is true in low context cultures. High power distance cultures are less accepting of IT than those from low power distance cultures. Masculine cultures are more established for IT usage, because the use of IT is associated with accomplishing their goals.

- Li et al, (2009) investigated how national culture affects the acceptance of global websites. Five national cultural dimensions were measured by integrating both the moderating and direct effects of cultural values, in the

scope of the USA and China; they found that individualism and time orientation influences PEOU and PU, directly. Four of Hofstede's dimensions had no significant moderating effect on the relationship between social influence and intention.

The studies reviewed generated contrary results, such as by (Zakour, 2007; Strite, 1999) examined IT adoption; resulting in the impact of cultural dimensions. Different results by (Li et al, 2009) found that four of Hofstede's dimensions had no effect. Therefore, examining video-conferencing technology will possibly promise different findings.

In addition, most previous works explored the CMC in general, without focusing on a particular medium, or a modern medium, such as video-conferencing. Video-conferencing is different to other mediums, in that it is the richest CMC tool, and offers further social presence (Setlock et al, 2004). Studies by (Tan et al, 1998a; Tan et al, 1998b; Setlock et al, 2004; Hewling, 2005; Zhang et al, 2007; Wei & Crowston, 2010; Wang et al, 2009; Vatrapu & Suthers, 2010), emphasized the CMC in general. Some researches mentioned a particular medium(s). For example, (Setlock et al, 2004) made a comparison between face-to-face and instance messages. Meanwhile, studies by (Kayan et al, 2006; Setlock et al, 2007; Wang et al, 2009), explored audio and video-conferencing in particular. As mentioned by (Ahmad et al, 2010) most researchers explored the adoption of a set of mediums. Undoubtedly, these measuring studies are considered only as approaches of understanding technology acceptance in general, and are not enough to represent the uses of a specific technology. However, there are a small number of researches exploring a particular aspect of CMC and culture, thus, a consistent body of research in this field, does not yet exist (Setlock & Fussell, 2010).

Setlock & Fussell (2010) described several constraints of research during the last decade, and how they assumed those communication goals; relationships belonging to communicators; and situation in context, are perceived to be the same across cultures. The challenge is that researchers have generated opposite findings. For instance, (Setlock et al, 2004) discovered that in face-to-face Chinese and Chinese, there is more talk than that of communication between American and American. This difference is because relationships are considered more important in Chinese society. Whilst, an American communicating with a Chinese through instance messages, is more similar due to the lower social presence; which reduces the building of a relationship in that context. In contrast, (Wang et al, 2009) found that Chinese generally talk less, as they converse more when they collaborate via text-based chatting, or over video-based chatting. Similarly, (Kayan et al, 2006) found that Asians come from high context cultures, as they prefer audio-video chatting more than North Americans do. Nevertheless, (Setlock et al, 2007) found no differences between Asian and American cultures, when communicating, via audio or video conferencing.

The above results reflect the important role of social influence, in addition to the role of communication context style. However, Hofstede's five cultural dimensions, which could affect social influence, directly impact the perception of accepting technology, as asserted by previous researchers, such as (Tan et al, 1998a; Strite, 1999; Guo &

D'ambra, 2002; Loch et al, 2003; Setlock et al, 2004; Guo et al, 2006; Al-Ghahtani et al, 2007; Zhang et al, 2007; Zakour, 2007; Li et al, 2009).

5. Existing Technology Acceptance Model (TAM)

There are two models related to this study.

(i) Model developed by Karahanna & Straub (1999).

Karahanna & Straub (1999) limit their study on the acceptance of e-mail. They measured the impact of social presence, social influence, training and support, and physical accessibility on the system usage of e-mail through PU and PEOU. The study revealed that the degree of social influence and social presence, exerted by supervisors of the medium, and the availability of training and support, had no impact on the perceptions of PEOU or PU of e-mail. The model developed by Karahanna & Straub (1999) is shown in Figure 1 below.

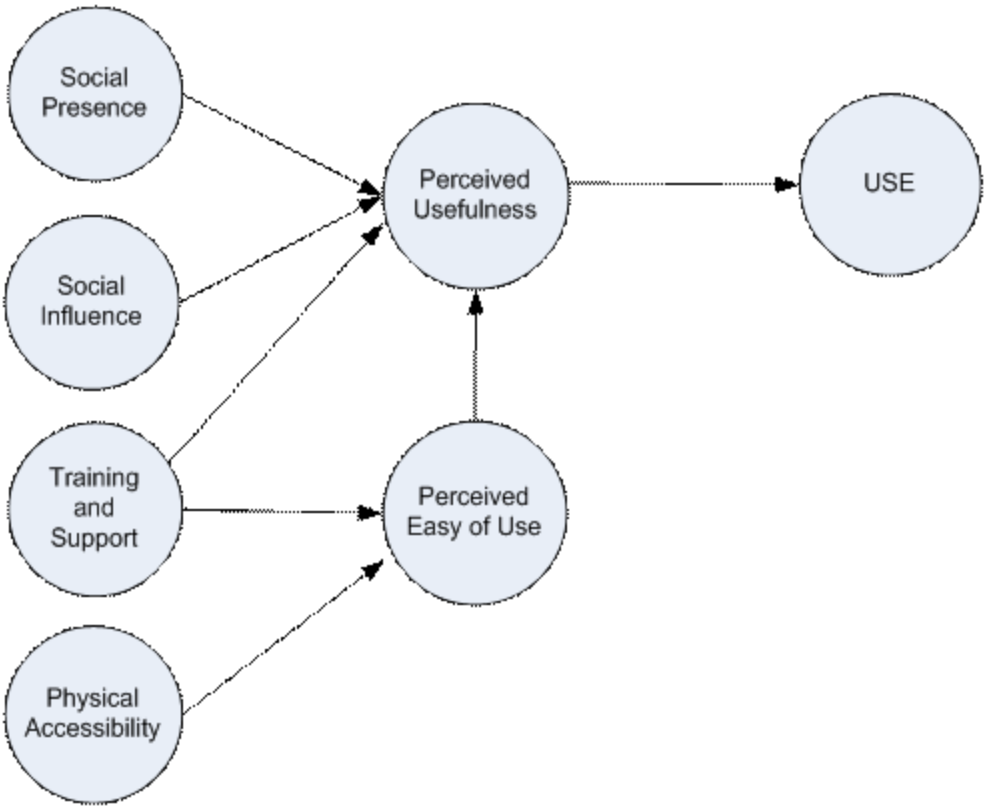

Figure 1: Model By Karahanna & Straub (1999)

(ii) Model developed by Karahanna & Limayem (2000).

Karahanna & Limayem (2000) extended the model previously developed Karahanna & Straub (1999) by asserting that e-mail and v-mail measures should include social presence, social influence, support and training, physical

accessibility, informational accessibility, and media style. They investigated the acceptance of e-mail and v-mail with the intention to distinguish between the perceptions to use both. Training and support are only a significant determinant of PU in the v-mail. Finally, the result was reversed in the case of v-mail. The model developed by Karahanna & Limayem (2000)is shown in Figure 2 below.

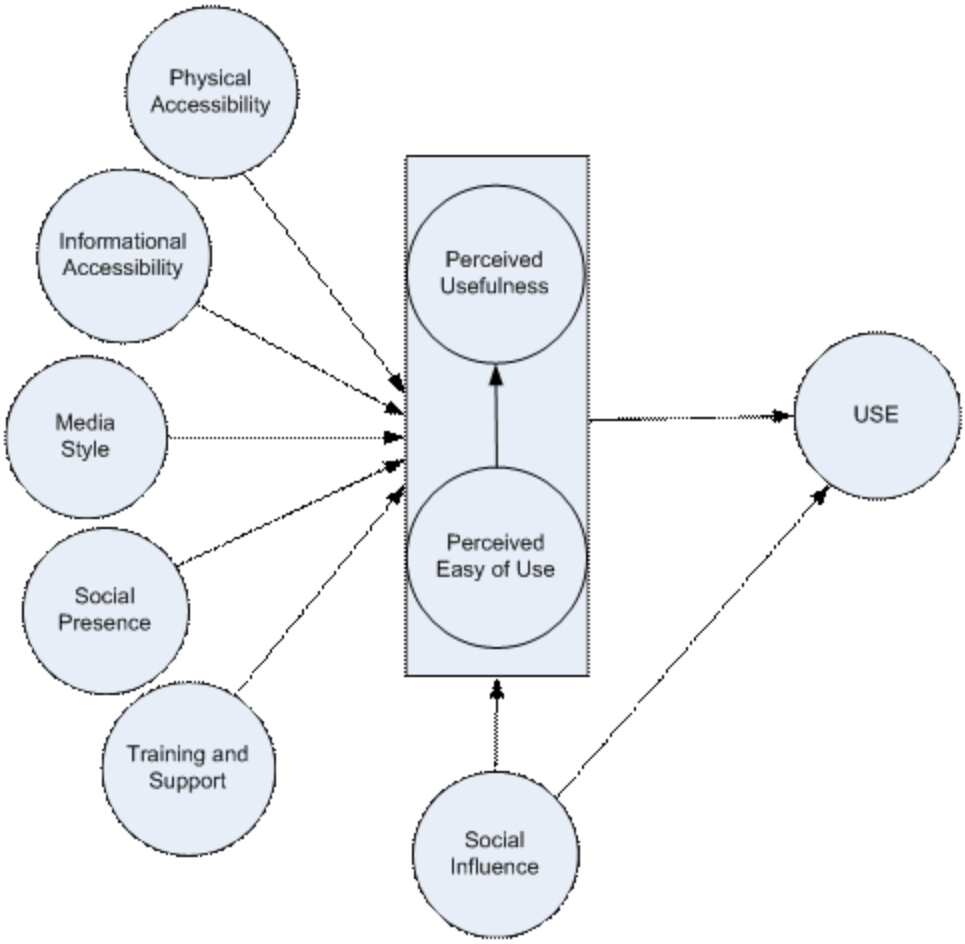

Figure 2: Model \By Karahanna & Limayem (2000)

It appears valuable to observe that the findings of (Karahanna & Straub, 1999; Karahanna & Limayem, 2000), reveals that e-mail and v-mail are different in adoption. Therefore, this encourages the intention of this study to extend (Karahanna & Limayem, 2000), with the aim to investigate video-conferencing usage, because different mediums might have different results, even in measuring the same dimensions, as they measure the effect of PU and PEOU on actual system use directly.

6.2. A Proposed Model By These Authors

The models by Karahana and Straub (1999) and Karahana and Limayem (2000) are modified and extended by these authors in order to produce a new model for capturing

the national culture impact on knowledge sharing. The same constructs proposed by (Karahanna & Limayem, 2000), that influenced user's beliefs are expected to play a role in affecting the user's perception of video-conferencing usage across a cultural environment. However, physical accessibility, informational accessibility, and media style are excluded because the researcher only synthesized the cultural construct with some constructs from (Karahanna & Limayem, 2000), with the intention of measuring what the moderating impact could be.

(Setlock et al., 2007) indicate that interaction styles across cultures possibly impacted in different ways by the use of various technology tools that could or could not provide cues such as intonation of voice or facial expressions. Video-conferencing technology tools provide a high social presence through the ability of these cues (Hills, 2005). Therefore, social presence is associated with the nature of video-conferencing collaborations and as such, could be moderated by context style dimension. On the other hand, due to the fact that video-conferencing technology is more complicated than both e-mail and v-mail thus, more training and support are needed to use video-conferencing technology. Therefore, it deserved to measure the effect of training and support with regard of the time orientation that could moderate the relationship as well.

Practical researchers have indicated how culture plays an important indirect effect or a moderating effect on technology acceptance (Guo et al, 2009; Twati, 2008). Some variables, such as culture would have indirect effects for TAM, which are essential to be examined (Lee et al, 2003). Consequently, there are further factors that could have an indirect effect on the user's perception to use video-conferencing technology. The proposed model is shown in **Figure 3** below.

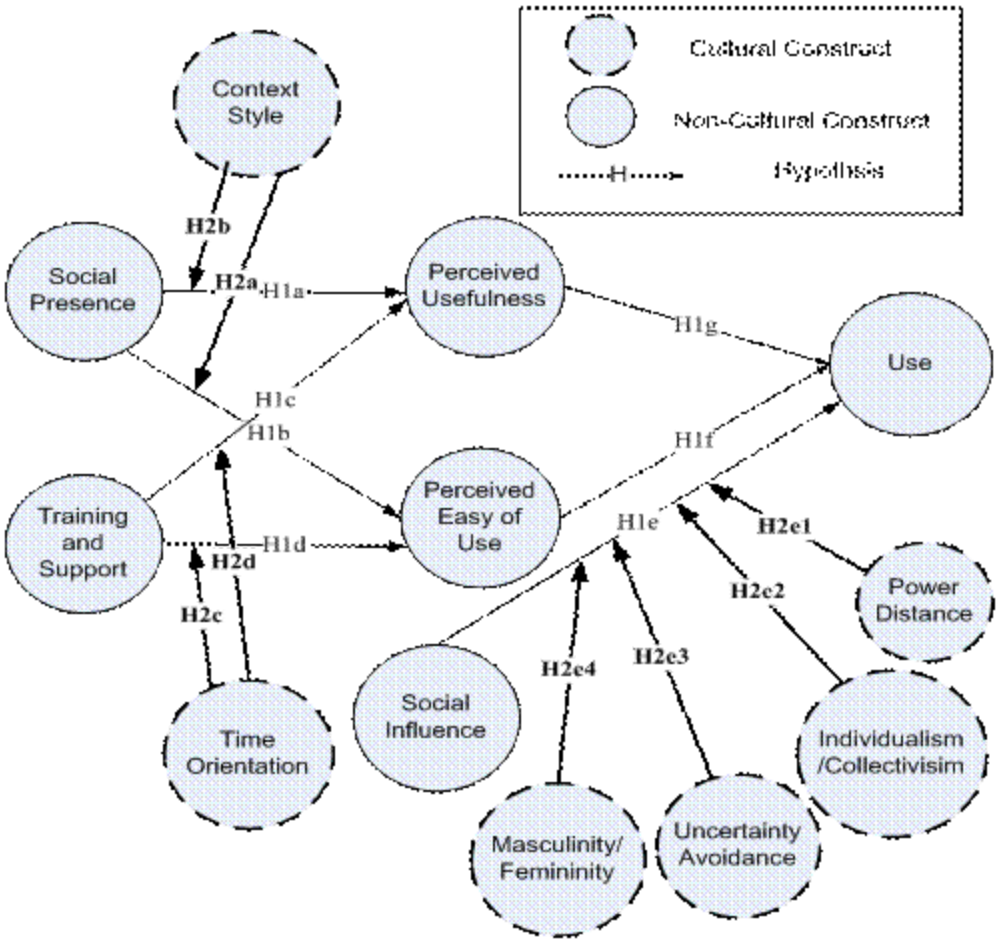

Figure 3: The Proposed Conceptual Model

7. Conclusion

The new proposed conceptual model provides relationships and an articulate view for future researchers to adopt conceptually in a different scope. This study provides a better understanding of the cross-cultural perspective, that there are differences between simple virtual teams and global virtual teams, due to globalization. This study will add to the existing limited available researches by specifically exploring the video-conferencing medium. Furthermore, measuring of cultural values at an individual level of analysis would lead to results that are more accurate. The proposed model will be able to address articulated views on the impact of national culture through video conferencing, on the endeavour of knowledge sharing. However, the proposed model is applicable for other mediums, not just video-conferencing medium. However, this study tests TAM's applicability across cultures.

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