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Cultural Model of Information Technology Usage (CMITU)

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Abstract

Since usage is a necessary condition for deriving benefit from information technology and the use by the end users is not guaranteed, one of the main streams of research in the field is the explanation of acceptance and use. Increasingly, it appears that researchers are shifting focus from Technology Acceptance Model (TAM) to Unified Theory of Acceptance and Use of Technology (UTAUT). The main contribution of the UTAUT to the TAM was the addition of demographic variables (such as age, gender, and experience with IT) and situational variable (voluntariness) as the main moderators of beliefs on technology usage. This paper extends this line of research beyond these moderator variables. Given recent trends in the globalization of business and the prominence of multinational team members, managers in multinational companies are now confronted with the need for increasing usage of information technology from a workforce comprised of different cultures. Furthermore, without understanding the role of cultural values in IT usage, it could be hard for developers to design and guide systems development in ways that are appropriate in different cultures. Since individuals are conditioned by their culture and the suggestion form prior research that UTAUT model do not universally hold across cultures, this paper extends the UTAUT model by espousing national cultural values as an important set of individual difference moderators. These espoused national cultural values of masculinity/femininity, individualism/collectivism, power distance and uncertainty avoidance are incorporated into an extended model of UTAUT as moderators. At this stage, the model was constructed and will be explained in this paper. The future work is the validation of the model in which a cross-sectional survey will be conducted in two countries varying in term of culture according to Hofstede's cultural dimensions' indexes. The findings may provide a useful lens for the successful implement of information technology in multinational and transnational organizations.

Keywords: Information Technology, user's acceptance, use of information technology, national culture, cultural change.

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1. Introduction

Benefits of information technology to end users and organizations will not be realized if the end users fail to use that technology (Mathieson, 1991). Since usage is a necessary condition for deriving benefit from information technology (Taylor and Todd, 1995) and the use of information technology by the end user is not guaranteed (Davis et al., 1980), one of the main streams of research in the field is the explanation of acceptance and use.

The major underlying disciplines of user's acceptance and use of information technology (e.g. Theory of Reasoned Action, Theory of Planed Behavior, Technology Acceptance Model and Unified Theory of Acceptance and Use of Technology) are basically dependent on North American research and have been deeply rooted in North American culture (Watson et al., 1994; Tan et al., 1998). Prior IT usage research primarily explains how IT is accepted and used by North America users. However, as IT transfer has become a global phenomenon and has diffused outside the boundary of the originating countries, it remains a puzzling question if the relevant IT acceptance theories are transferable across cultures. Given recent trends in the globalization of business and the prominence of multinational team members, managers in multinational companies are now confronted with the need for increasing usage of information technology from a workforce comprised of different cultures (Zakour, 2004). Without understanding the role of cultural values in user acceptance and usage, it could also be hard for IT developers to design and guide systems development in ways that are appropriate to, and acceptable in, different cultures (Linjun, 2003).

Prior research indicates that the cultural impact on technology usage is still at the early stage of research. This study is motivated by a lack of empirical support on how cultural values influence an individual user's behavior to use an information technology. The major of objective of this study is to establish a research model by incorporating the Unified Theory of Acceptance and Use of Technology (UTAUT) explicitly with cultural values in an attempt to better understand culture's role in IT usage. Cultural influence will be operationalized within the framework of Hofstede's (1980) four cultural dimensions: these are collectivism, power distance, uncertainty avoidance and masculinity. To be specific, this research attempts to investigate how these four cultural values are related to user acceptance of information technology.

Understanding the use of an information technology at its earlier stage is very important for its successful diffusion and implementation. At a practical level, this study would encourage IT organizations understand the key determinants of IT usage and help organizations diffuse information technology more effectively by taking the consequences of different cultural tendencies into consideration. Multinational corporations may make a priori predictions on the possible barriers to technology acceptance and usage based on new understandings of culture-IT relationships. The proposed model could also be used by IT designer and developer as guideline for making or improve compatibility system with the cultural tendency in organizations.

2. Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh and colleagues constructed the UTAUT model in 2003. The model asserted that there are four factors that directly affect an individual's use of new information technology: performance expectancy; effort expectancy; social influence and facilitating conditions see Figure 1.

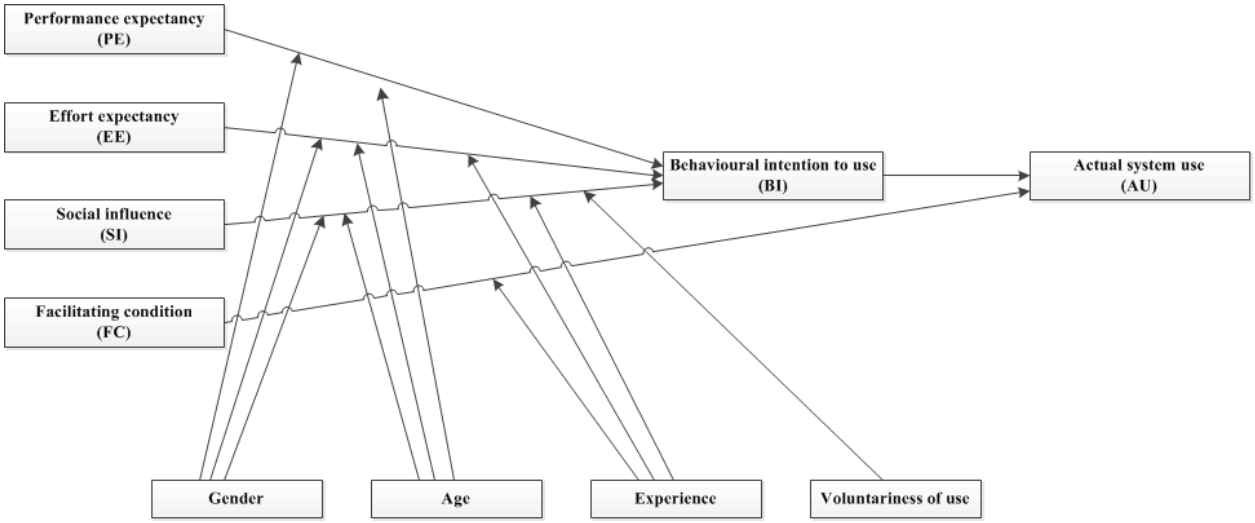

Figure 1. Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003)

Performance Expectancy (PE) refers to the degree to which an individual believes that the use of a new information technology enhances their job performance.

Effort Expectancy (EE) is defined as the degree to which an individual believes that the use of that information technology does not require an increase in effort.

Social Influence (SI) is defined as the degree to which an individual believes that their significant persons will approve and encourage the use of new information technology.

Facilitating condition (FC) refers to the degree to which individual users believe that an existing infrastructure can support the use of a new technology.

The UTAUT model proposed that performance expectancy, effort expectancy and social influence affect the intention towards use of information technology, while facilitating condition is a direct antecedent of the usage. Interestingly, the model also indicates that the influence of these factors on intention towards use and actual use can be moderated by individuals' background, such as gender, age, experience and how voluntary is their use.

3. Hofstede's Four Cultural Dimension

From the previous section, users' expectations (beliefs) of an information technology influence their use. Expectations are mainly determined by their pattern of thought, feeling, and behaving (Hofstede, 1986). As these patterns are mainly influenced by the environment in which one is brought up, there is little room to doubt how differences in cultural socialization leads to differences between user's expectation and use of new information system (Kluckhohn, 1951; Kroeber & Kluckhohn, 1952; Geertz, 1973).

Hofstede and his colleagues constructed four cultural dimensions by examining the results of a world-wide survey from IBM staff in forty countries between 1967 and 1973. The first dimension is power distance; it focuses on the extent that individuals in a culture accept the inequality between themselves and other parties who wield more power within their society, viewed as large or small (Hofstede, 1980; 2004). The second is uncertainty avoidance; it is the extent to which individuals in a culture feel discomfort from uncertainty and ambiguity, and how hard these individuals try to eliminate the discomfort; viewed as strong and weak. Individualism is the third dimension that describes the closeness of relationship an individual has with other people. An individualist society

would focus on themselves and their families, while a collectivist society would focus on a bigger social group that encompasses more than their immediate family and includes extended families, friends, and those with similar interest. The last dimension is masculinity, it is the degree to which assertiveness, material possessions, and lack of interest in others are high; its polar opposite is femininity. The reason that these characteristics are deemed as masculine is because these characteristics are found in men more than women.

4. Cultural Model of Information Technology Usage

The cultural model of information technology usage (CMITU) was constructed to explain the use of information technology in the different cultures, see Figure 2.

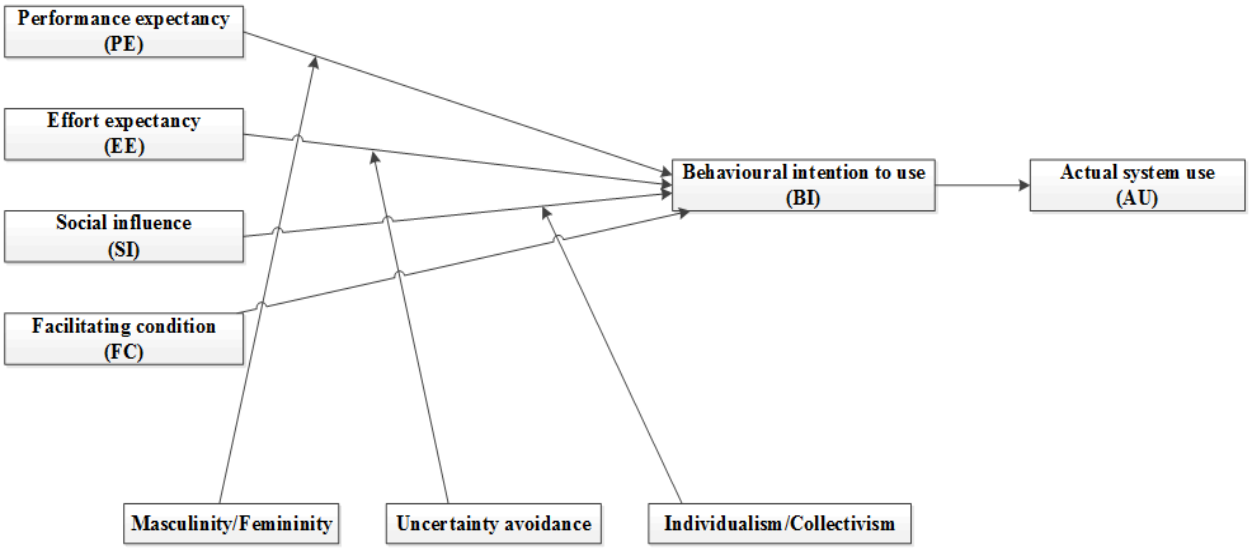

Figure 2. Cultural Model of Information Technology Usage (CMITU)

Similar to UTAUT, behavioural intention to use was adopted in the CMITU model to capture users' motivational level in order to predict their usage of information technology: they would use the system if they had high levels of intention (Fishbein and Ajzen, 1974). While the UTAUT model asserts that facilitating conditions directly impacts on use, other theories (e.g. Theory of planned behaviour and Decomposed Theory of planned behaviour) describe facilitating conditions as having an indirect impact on use through user's intention (Ajzen, 1991). In the CMITU model, there are four key factors that influence a user's intention to use technology, and these are performance expectancy, effort expectancy, social influence and facilitating conditions. Even though other factors may be relevant and the effect of the proposed four factors can be moderated by user individual's background (gender, age, how voluntary is their use, and experience with IT), these factors were not included into the model. A model is a simplified view of a complex domain (Aris, 1994), and so to begin with, this research focused on the major variables

Interestingly, the CMITU model extends this line of research beyond these moderator variables by proposing the moderate effect of culture. To begin with, the model suggests the moderate effect of masculinity on the relationship between performance expectancy and IT usage. In high masculinity culture (e.g. Japan, the United Kingdom, Germany and the United states) people are more task-oriented and heavily emphasize the quality of life than those holding lower masculine value (e.g. Thailand, Netherland, Denmark and Sweden) (Hofstede et al., 1991; Robinchaux & Cooper, 1998). Regardless of the system ease of use, people with high masculine values are more concerned with the

usefulness of a given technology (Srite, 2000). An individual with higher level of masculine value tends to be task oriented and therefore would concern more with the usefulness of a technology.

According to Hofstede (1984), people with high uncertainty avoidance (e.g. Greece, Portugal, Belgium and Slovenia) tend to feel threatened by unknown situations than those holding lower value (e.g. the United Kingdom, Sweden, and Denmark). The more ease of technology use is desired so as to reduce off-task anxiety (Kanfer et al., 1994; Srite, 2000). In high uncertainty avoidance, effort expectancy will therefore be more important than those with than lower value. . Thus, the CMITU model posits that the influence of effort expectancy on information technology usage is moderated by uncertainty avoidance culture.

Furthermore, people holding collectivist values (e.g. China, Mexico and Arab countries) will be more concerned about the maintenance of the group cohesiveness than those with individualism (e.g. the United states, Australia and the United Kingdom) (Hofstede, 2004). Since intrinsically they tend to place more emphasis on the opinions of social referents, users in high collectivist culture perceive a higher social pressure to use a technology (Watson et al., 1994). The moderate effect of collectivism on the relationship between social influence and IT usage is then proposed in the CMITU model.

The facilitating condition is positively correlated with the use of technology: if there are more conditions that support the use of a technology, then people would be more likely to adopt the technology regardless of the country they are in. The CMITU model therefore suggests that the impact of facilitating conditions on use behaviour is indifferent across culture.

5. The Application of Cultural Model of Information Technology Usage

By synthesizing research on culture and IT usage, the cultural model of information technology usage (CMITU) was constructed. As Hofstede's research yielded data on national culture from forty countries, and the CMITU was constructed by applying Hofstede's dimension, CMITU can be used to understand the usage of information technology in those forty countries. However, it does not mean that every users in the same country will have the same expectations towards the system; it gives a generalization of particular cultures.

The aim of this section is to show how the CMITU model can be applied to particular country for increasing the use of information system. Thailand will be used as a case for giving an example. According to Hofstede's research, Thailand as an eastern country has high-level uncertainty avoidance and is collectivist as a national culture, but has low-level of masculinity (Hofstede, 2004), see Figure 3.

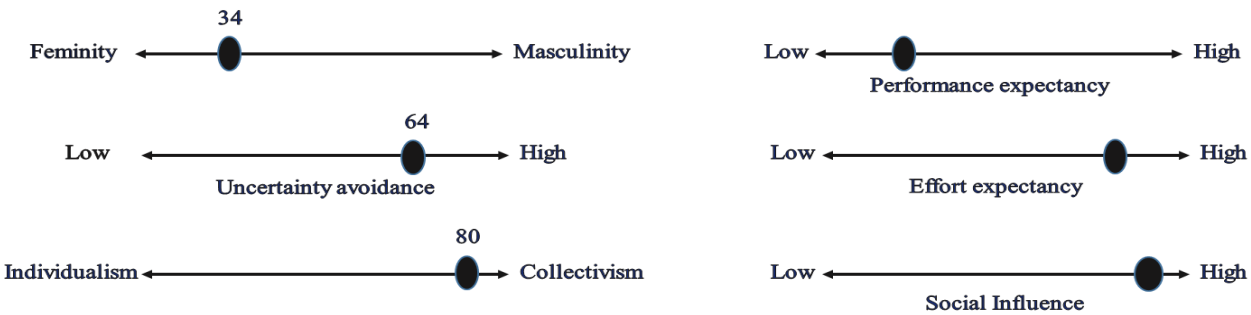

Figure 3. The application of Cultural Model of Information Technology Usage using Thailand as a case study

In these kinds of culture, the CMITU suggests that Thai users focus heavily on effort expectancy and social influence. Thus, this group of users will use information technology if their significant others (e.g. parents, teachers and peers) recommend usage and the use of that information technology does not require an increase in effort. In addition, similarly to any countries, Thai users would be more

likely to adopt the technology if there are more conditions that support the use of a technology. However, the effect of performance of the system on IT usage may be lower than other criteria.

Mangundjaya's research found that there is a difference in the stereotype of Indonesian people in 2013 and Hofstede's findings in 2005. This raises the question of whether there has been a cultural change. The cultural change is defined as reconstruction of the cultural concept (patterns of meaning, values, and behaviour) of a society (Meyerson & Martin, 1987). Because of the dynamic of culture, the recommendation is that Hofstede's questionnaire should be used at the first time use of CMITU model for checking the cultural change and adjusting the model.

6. Conclusion and Future work

The aim of this research is to investigate how cultural values are related to user acceptance and use of information technology. The research model was established by incorporating the Unified theory of acceptance and use of technology (UTAUT) and Hofstede's four cultural values. The CMITU model has practical value for IT stakeholders in each country in terms of suggesting stakeholders to take corrective action or devoting more targeted effort to increase usage. From the review of literature, it was found that, no study has yet theoretically combined factors affecting IT usage and cultural value into a single model. The theoretical contribution of this study is the integration of culture into the technology acceptance model. A cross-sectional survey will be conducted in two subsidiaries of a multinational organization in two countries expected to be different enough in national cultural values according to Hofstede's cultural dimensions indexes. The data collection will be conducted through interviews and questionnaires. Most of the questions in the survey will be based on previous well-validated instruments. Interviews will be helpful in interpreting results obtained from quantitative analysis.

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