THE CULTURAL PERSPECTIVE OF MOBILE GOVERNMENT TERMINAL ACCEPTANCE – AN EXPLORATORY STUDY IN CHINA

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Abstract

Based on accumulated literature on technology adoption research, it is widely accepted that the cultural perspective is an important direction for related studies, yet by far has not been systematically examined. This paper proposes a model for analyzing individuals’ mobile communication technology (MCT) acceptance from the cultural perspective. We also designed the method and process for validating this model and for analyzing the acceptance mechanism of a mobile government system with the model. As the studies on classic ICT adoption models, typically TAM, are increasingly challenged as lacking significant practical value, the proposed model may be helpful for investigating the ICT acceptance from a novel perspective.

Keywords: IT adoption, IT acceptance, Hofstede’s cultural dimensions, mobile government.

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1 INTRODUCTION

The rapid development of mobile communication networks has offered people a new and convenient way to acquire Internet information without desktop computers. Mobile communication devices, such as cell phones, laptops, PDAs, etc., provide the abilities to access emails, instant messaging, and other networking services, which can fully take the advantages of the mobility and timeliness of mobile communication technologies (MCT) and create new business opportunities in the market (Yuan et. al. 2006). With regard to the practice of governmental administration and services, the technologies also make it possible to improve the effectiveness and efficiency of municipal governance (Siau & Shen 2003, Song & Cormford 2006).

Similar to the case of traditional ICT, users’ adoption is regarded as one of the key issues in the diffusion process of MCT (Venkatesh & Ramesh 2006, Wu & Wang 2005). Although the population of cell phone users in China has kept growing dramatically since late 1990s and amounts to an amazing number of over 550 million in 2007, comparing to the number of 100 million Internet users in the same year (MII 2008), the adoption of high value-added services based on MCT is still on a preliminary stage. Unlike traditional Internet users, a large proportion of MCT users are characterized with a lack of technological knowledge (Zhang & Yuan 2002). Therefore, it would be meaningful to discuss the acceptance of MCT from some non-tech perspectives, among which the cultural perspective might be a promising one.

Study from the culture perspective is a very important branch in the information systems research area. For many years, scholars have been actively probing into this area and the efforts are fruitful (Davison & Martinson 2003, Gallivan & Srite 2005, Myers & Tan 2002). The cultural concepts thusly incorporated include not only organizational culture and societal culture, but also national culture and ethnic culture. In recent years, researches from the national culture perspective are gradually prevailing, especially in the studies of ICT adoption and implementation and/or use of specific systems or technology (Gallivan & Srite 2005). Hofstede’s well known model with five cultural dimensions has become the popular basic framework of most of those works (Ford et. al. 2003).

On these backgrounds, this paper proposes a model for individual’s MCT acceptance from the cultural perspective. We also designed the method and process for validating this model and for analyzing the acceptance mechanism of a mobile government system with the model. As the studies on classic ICT adoption models, typically TAM, are increasingly challenged as lacking significant practice value (Benbasat & Barki 2007), the proposed model may be helpful to investigate the ICT acceptance from a novel perspective.

2 THE CULTURAL MODEL FOR ACCEPTANCE

2.1 Literature Review

In the past 20 years, individual’s ICT adoption/acceptance studies have been very popular in the information systems research area around the world (Benbasat & Barki 2007, Venkatesh et. al. 2003, 2007). Since the results from different counties are often conflicting with each other, researchers also tried to explain the inconsistency by discussing the differences of national cultures (Straub 1994, Straub et. al. 1997). Consequently, Hofstede’s cultural dimensions were applied in the process of research design and model revision (Huang et. al. 2003, Lipert et. al. 2007, Zhang et. al. 2007). However, the efforts in this direction are yet to be strengthened, at least on the following two aspects. First, most of the target systems in the studies were simple technologies such as E-mail (Huang et. al. 2003, Mao & Palvia 2006, Straub 1994, Straub et. al. 1997), while the attention on new emerging
technologies is scarce. Second, the cultural factors were often treated as supporting roles of the popular TAM model and the direct impacts of cultural factors on the process ICT adoption have not yet gained sufficient attention. In view of this, the paper is aimed at postulating a conceptual model based on Hofstede’s cultural consequence theory to analyze the determinants of MCT acceptance.

2.2 Basic Hypotheses

Before discussing the determinants of acceptance, it is particularly meaningful to distinguish the acceptance environments between voluntary and mandatory contexts and, consequently, to recognize the variance between these two situations. Most of the early researches in the information technology adoption area were conducted in the voluntary environment (Davis et. al. 1989), following the conceptual path of “Determinant → Attitude → Intention → Actual Use”. Later researches often omitted the factor of “attitude”, following the path as “Determinant → Intention → Actual Use” (Davis 1989, Venkatesh & Davis 2000, Venkatesh et. al. 2003). However, in the mandatory acceptance environment, it is frequently assumed that there is little variance in usage, making it difficult to empirically test the full impact path (Hartwick & Barki 1994, Venkatesh et. al. 2003). To deal with this problem, some scholars introduced the concept of Symbolic Adoption in the mandatory environment to replace the actual use for exploring users’ mental acceptance (Nah et. al. 2004). Although users in the mandatory environment are usually required to use the system by their superior authorities, the extent of use may vary, which would further lead to the verification in user performance. In our study, we propose that the influence path in mandatory environment is “Determinant → Attitude → User Performance”. Therefore, we have the following hypotheses:

H1a: User’s adoptive intention toward the target technology has significant positive influence on his/her actual use behaviour in the voluntary environment.

H1b: User’s attitude toward the target technology has significant positive influence on his/her user performance in the mandatory environment.

Power distance (PD) and uncertainty avoidance (UA) are the two most important dimensions of the Hofstede’s theoretical framework. PD is defined as “the extent to which the less powerful members in an organization accept and expect that power is distributed unequally” (Hofstede 2001), while UA is defined as “the extent to which a culture programs its members to feel either uncomfortable or comfortable in unstructured situations” (Hofstede 2001). In Hofstede’s famous UA-PD matrix, China is located in the up-right quadrant and described as a culture with long power distance and weak uncertainty avoidance (See Fig. 1).

<table>
<thead>
<tr>
<th>Low Uncertainty avoidance</th>
<th>Low Power distance</th>
<th>High Power distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Countries: Anglo, Scandinavian, Netherlands Organization type: implicitly structured Implicit model of organization: market</td>
<td>Countries: China, India Organization type: personnel bureaucracy Implicit model of organization: family</td>
<td></td>
</tr>
<tr>
<td>Countries: German-speaking, Finland, Israel Organization type: work-flow bureaucracy Implicit model of organization: well-oiled machine</td>
<td>Countries: Latin, Mediterranean, Islamic, Japan, some other Asian Organization type: full bureaucracy Implicit model of organization: pyramid</td>
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</table>

Figure 1. Hofstede’s UA-PD Matrix (Hofstede 2001).
In the condition of high PD culture, the users usually attach more importance to leader’s attitude toward the technology. The results regarding key issues of information management in China has proved that “top management support” is generally regarded as an important factor (Chen et. al. 2007). Besides, in some former technology adoption research, the cultural effect related to PD has been validated in China and some other countries with similar cultural characteristics (Huang et. al. 2003, Lim 2004). Hence, there are hypotheses as follow:

**H2a:** User’s perception on leader support has significant positive influence on his/her adoptive intention toward the target technology in the voluntary environment.

**H2b:** User’s perception on leader support has significant positive influence on his/her attitude toward the target technology in the mandatory environment.

In some early studies, Straub asserted that the high degree of Uncertainty Avoidance (UA) in Japanese culture has decreased the speed of the diffusion of new technologies such as E-mail (Straub 1994, Straub et. al. 1997). In such environments, users often tend to avoid or resist the unfamiliar technologies. In China, the situation is exactly the opposite. Chinese people have very high passion for new ICT and the familiarity to the new technology is not as important as in other country. Hence we have hypotheses as follow:

**H3a:** User’s perception on his/her technology experience has no significant influence on his/her adoptive intention toward the target technology in the voluntary environment.

**H3b:** User’s perception on his/her technology experience has no significant influence on his/her attitude toward the target technology in the mandatory environment.

When Hofstede’s original framework was found to be limited in the ability to explain the characteristics of Eastern cultures, the fifth dimension, long-term orientation (LTO) or Confucian dynamism, was added, referring to “the extent to which a culture programs its members to accept delayed gratification of their material, social, and emotional need” (Hofstede 2001, Hofstede et al. 1988). However, critical opinions argue that LTO couldn’t represent all of Confucian dynamism (Fang 2003). Since ‘Zhongyong Zhidao’ (moderation, following the middle way) is often considered as a core discipline of Eastern culture, we introduce “fitness”, a more comprehensive concept related with “harmony” and “moderation” in Confucian dynamism, and adapt related hypotheses from Zhang et al. study (Zhang et. al. 2007):

**H4a:** User’s perceived fitness has significant positive influence on his/her adoptive intention toward the target technology in the voluntary environment.

**H4b:** User’s perceived fitness has significant positive influence on his/her attitude toward the target technology in the mandatory environment.

The basic cultural model for acceptance is shown as the Fig. 2.
2.3 Moderators and Related Hypotheses

Although widely used in the IS and some other research areas, Hofstede’s theory has been criticized for its absoluteness (Ford et. al. 2003, Gallivan & Srite 2005). Some researchers also challenged that “whether the IBM employee could represent the culture of the whole country or not” (Gallivan & Srite 2005). On the other hand, different people generally have different perceptions on some cultural dimensions because of some personal attributes, even when they are in the same cultural context. By using the method provided by Chin and his colleagues (Chin et. al. 2003), we add Power Distance (PD), Uncertainty Avoidance (UA), and Confucian mechanism to the cultural model for acceptance as moderators, so as to examine their interaction effects on the relevant influence paths. Hence we have hypotheses as follow:

**H5a:** The influence of leader support on intention/attitude will be moderated by power distance, such that the effect will be stronger for people have high power distance perception.

**H5b:** The influence of technology experience on intention/attitude will be moderated by uncertainty avoidance, such that the effect will be stronger for people have high uncertainty avoidance perception.

**H5c:** The influence of perceived fitness on intention/attitude will be moderated by Confucian mechanism, such that the effect will be stronger for people have high Confucian mechanism perception.

The extended cultural model for acceptance including moderators is shown as the Fig. 3.
3 RESEARCH DESIGN

3.1 Research Context: A Mobile Government System in Beijing, China

In order to validate the cultural model for acceptance proposed above, we will conduct a survey among municipal patrollers and investigate their acceptance of a newly implemented mobile government system, particularly with regard to their attitude towards the handset terminal for the system. In order to utilize the innovative ICT to improve the effectiveness and efficiency of municipal administration, the municipal administration commission (MAC) has been actively promoting the "gridding administration pattern" in all administrative districts in Beijing since 2006. One of the critical supporting issues for this infrastructure system is the acquisition of high quality data. To solve this problem, the district government established a new department, the supervision and command centre (SCC), to take the responsibility of data collection. SCC recruited 1000 patrollers to help monitoring the status of municipal facilities. Each patroller is responsible for about 12 residential blocks, or about 180,000 square meters area, and up to 1400 public facilities. The patrollers are required to spot, check, and report the municipal administration related problems, as well as to take necessary steps to ensure the problems are properly solved. Each patroller is equipped with a bicycle and a smart mobile terminal, which is called “Chengguantong” in Chinese, with the meaning of “all-in-one city management” (Song 2005, Song & Comford 2006). In December 2007, SCC upgraded the software and hardware of the Chengguantong system to eliminate some technical obstacles for the users. The survey on the patrollers’ perceptions to the mobile terminals will be conducted in the first quarter after the upgrade. Since Chengongtong is indispensable to patrollers in their daily work, the acceptance environment in this case is mandatory. Therefore, we will validate the hypotheses H1b–H4b in this survey.
3.2 Measurement & Analysis

Items that will be used in the survey are listed in Table 1.

Table 1. Variables and instrument items

<table>
<thead>
<tr>
<th>Construct</th>
<th>Items</th>
<th>Origins</th>
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<tbody>
<tr>
<td>Power Distance</td>
<td>PD1: My superior expects me to comply with his/her decisions loyally without argument.</td>
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<tr>
<td></td>
<td>PD2: I am afraid to express my disagreement to my superior.</td>
<td>Hofstede 2001</td>
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<tr>
<td>Uncertainty Avoidance</td>
<td>UA1: The rules of the organization should not be broken.</td>
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<td></td>
<td>UA2: I don’t think I can work in an unchanged environment for a long time.</td>
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<td>Confucian mechanism</td>
<td>CM1: I respect the tradition of China in my life and work.</td>
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<tr>
<td></td>
<td>CM2: Keeping in harmony with colleagues is important to me.</td>
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<tr>
<td>Leader Support</td>
<td>LS1: My superior attaches great importance to the project of Chengguantong.</td>
<td>Adapted</td>
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<td></td>
<td>LS2: The top directors of the department (MAC) consider Chengguantong as an important project.</td>
<td>from Lewis et. al. 2003</td>
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<tr>
<td>Technology Experience</td>
<td>TE1: Before I became a patroller, I often used short message service (SMS) with my mobile phone.</td>
<td>Developed in our study</td>
</tr>
<tr>
<td></td>
<td>TE2: Before I became a patroller, I often used personal computer.</td>
<td></td>
</tr>
<tr>
<td>Perceived Fitness</td>
<td>FIT1: Using the Chengguantong is compatible with my day-to-day work.</td>
<td>Adapted from Zhang et. al. 2007</td>
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<td></td>
<td>FIT2: Using the Chengguantong fits with my work style.</td>
<td></td>
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<td></td>
<td>FIT3: I would find the Chengguantong fits well with the other IT/IS applications used in my work.</td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td>ATT1: Generally speaking, the Chengguantong is a good system.</td>
<td>Adapted from Davis et. al. 1989</td>
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<tr>
<td></td>
<td>ATT2: Using the Chengguantong in my municipal administration work is a good idea.</td>
<td></td>
</tr>
<tr>
<td>User performance</td>
<td>UP1: I am satisfied with my performance in my work.</td>
<td>Developed in our study</td>
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<tr>
<td></td>
<td>UP2: The amount of reported cases per week.</td>
<td></td>
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</tbody>
</table>

All the items were translated into Chinese and adjusted in wording in the light of the characteristics of the technology for better understanding. Most of the items were measured using a five-point Likert-type scale, ranging from “strongly disagree” (1) to “strongly agree” (5).

After reliability test and validity test (Gefen & Straub 2005), the research model will be validated using partial least squares (PLS), a structural equation modelling (SEM) technique which is more suitable for highly complex predictive models. All SEM analysis in the research will be done by the PLS-Graph 3.0. In addition, the interaction analysis (moderator analysis) will be conducted by the same software. All these analysis will follow some classical guidelines in literatures of QPR methodologies (Chin et. al. 2003, Gefen & Straub 2005).

4 EXPECTED CONTRIBUTIONS & FUTURE GOALS

This study is expected to generate valuable implications both theoretically and practically. On the theoretical aspect, if the cultural model for acceptance based of the Hofstede’s theory provides good results in the validation analysis, it would be reasonable to believe that the model has well validity to explain individual’s adoption and acceptance behaviour from a novel perspective in Chinese context. At the same time, the moderator analysis may also offer a new method which taking advantage of interaction analysis to investigate the impact of cultural elements (e.g. power distance) in a mono culture background.

On the practical aspect, the analysis results and related discussion will support the local government to plan for more feasible strategies in the process of promotion and utilization of the Chengguantong terminals and some other mobile government systems implemented in future. For instance, if the
hypothesis H3b were validated, the SCC may consider canceling some requirement about

Based on the results of this study, future research will attempt to conduct one or more cross-culture comparisons for the provided model, so as to further test and develop the research model, as well as to further investigate the cultural driving factors of ICT usage and management in China and other countries in this new MCT era.

References


