The Role of Perceived Cost toward on Continuance Intention of Mobile TV: Focused on Chinese users

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Abstract This study highlight the role of perceived cost on user’s continuance intention to use mobile TV service in china. We proposed research model based on the expectation-confirmation model(ECM) and reclaim 243 questionnaires from experienced users in china. Above all, the analysis results support significant relationship perceived variables, satisfaction, and continuance intention of mobile TV. First, while expectation confirmation has positive influence on perceived playfulness and satisfaction, the effect on perceived usefulness is not significant. Second, perceived cost can significantly predict perceived usefulness and satisfaction, however, we found no evidence of a statistically significant influence on perceived playfulness. Third, perceived usefulness and perceived playfulness have a positive influence on satisfaction, and perceived usefulness, satisfaction, and perceived playfulness have a positive influence on continuance intention. This results provide implications from both theoretical and managerial perspectives and the limitations have been discussed for future research.

Key Words : Mobile TV, Perceived Cost, Expectation-Confirmation Model(ECM), Continuance Intention
1. Introduction

Mobile TV is an entertainment service on mobile device which allow users to enjoy stream and broadcast television programs, including drama and spots, by using service either at home or on the move. As the 3G(3rd generation) communication technologies and big-screen mobile device(e.g. smartphone) continue to mature around the world, mobile TV service is increasingly becoming popular. According to CCNIC, an authoritative consulting firm, the mobile TV users have reached 130 million, account for 32% mobile users, by the end of 2012 in China. And that, with the popularity of 4G technology and expansion of wireless network coverage in future, the number of users of mobile TV will further increase. However, the continuous usage of mobile TV is still lower than other mobile recreational service(e.g. online music 50.9%, online literature 43.3%) distinctly [3]. Therefore, it is necessary for researchers and operators that understanding what factors affecting subscribers’ continuous intention of mobile TV in China.

Demonstrating the determinants of individual adoption and usage of new technology is a core stream in IS research [17]. Such research mainly focus on initial adoption and have advanced various theoretical perspectives, including Technology Acceptance Model(TAM), Innovation Diffusion Theory(IDT) and the unified theory of acceptance and use of technology(UTAUT). According to Reichheld and Schefter [6], however, the cost of acquiring a new customer is five times that of retaining an existing customer. Bhattacherjee [1] also confirms that the eventual success of a new IT is more dependent on users’ continued usage rather than its initial adoption. Although prior research have extensively adopted these perspectives as theoretical foundation in studying the context of mobile service, the factors that influence users to “continue to use an IT” has received less attention [1][5]. In addition, since service provided by operators, cost is also considered a hot topics in the field of mobile TV [15].

Therefore, this study explores two questions: (1) what is the role of cost on the continuous usage of mobile TV. (2) what factors influence the consumers’ decisions and intention to continue using mobile TV services in China.

Simultaneously, we also put forward several useful advices and strategies from the conclusion of this research for the correlative further study and terminal vendors, telecom or TV operators in China.

The rest of this study is organized as follow: We review relevant literature and discuss the theoretical background in the next section. In the section3, We proposed research model based on the expectation-confirmation model(ECM) and incorporated some important elements adopted from related studies. And then, we serve round questionnaires and reclaim them. Thereafter, the statistical results will be tested by the covariance-based structural analysis after collect the data from participants. Then we will validate and discuss the research model according to the results from the statistical data. Finally, the implication, limitations and some directions of this paper will be indicated for the future research.

2. Theoretical Background

2.1 Expectation-Confirmation Model(ECM)

Expectation-Confirmation Model(ECM) is introduced by Oliver [14] to widely research consumer satisfaction and repurchase intention. The ECM framework proposed that: consumers firstly come into being an initial expectation of purchase service, and then form some perceptions about its performance after initial consumption. In this stage, consumers may decide the satisfaction level based on the expectation of theirs is confirmed through evaluating the perceived performance.
by their original expectation. And then, the consumers form repurchasing intentions after they satisfied. Bhattacharjee [1] built a new ECM to examine the cognitive beliefs and affect influencing consumers’ intention on continuance of IS domain. The research assessed that consumer’s continuance intention is influenced by the satisfaction and perceived usefulness directly. User’s satisfaction is affected the confirmation of expectation from prior IS use and perceived usefulness. Post-acceptance perceived usefulness is determined by confirmation level. [Fig. 1] shows the ECM model proposed by Bhattacharjee [1]. The revised ECM model has been widely used to explain the continuance usage intention in IS discipline.

![Fig. 1] ECM of IS Continuance

2.2 Reviews of Relevant Literatures

Several research draw on the expectation confirmation theory model (ECM) as the theoretical base in the articles. Lin et al. [4] investigated the value of ‘playfulness’ in expectation-confirmation model when studying continued usage of websites. The results illustrated relationship between confirmation and perceived playfulness is positive. Simultaneously, perceived playfulness, perceived usefulness, satisfaction all contributed significantly to the continuance intention of a web site. Chea and Luo [16] suggested an conceptual model on the basis of ECM for testing the elements affecting the continuance intention of e-service and found there are positive relationships among the variables of ECT. In the meantime, the three additional variables: negative effect, complaint and recommendation are also verified in the research. Despite ECM and TAM focus on different aspects of user perceptions, Kim and Malhotra [19] developed a hybrid research model to evaluate the determinants of continuance of process modeling technique. The result of study indicated perceived ease of use has significant impact on perceived usefulness.

3. Empirical Research Design

3.1 Research Model

Based on the theoretical background reviewed early, ECM has emerged as a strong theoretical perspectives on the continued acceptance intention. In this study, the ECM model is chosen as the foundation of our developed model to evaluate the consumers’ continuance intention on the mobile TV services. The research model is indicated in [Fig. 2]

![Fig. 2] Research Model

3.2 Operational Definition of Variables

Expectation confirmation refers to users acquire the expected experience and benefits when they use IT service. Bhattacharjee [1] firstly introduces the construct of expectation confirmation into continuous intention in ECM, which claims that post-adoptation expectation plays an essential role in determining IT users’ perceived usefulness and satisfaction decisions. Studying in different context, Zhou [20] suggest...
confirmation as users acquire the expected experience and service quality when they use mobile services. In this article, if mobile TV providers can match expectations of users, they will satisfy to the mobile service and obtain a playful experience and are useful for their life. Therefore:

H1: Consumers’ level of confirmation will positively influence on perceived usefulness of mobile TV
H2: Consumers’ level of confirmation will positively influence on satisfaction of mobile TV
H3: Consumers’ level of confirmation will positively influence on perceived playfulness of mobile TV

As a mobile service, users always need to be charged communication fees and mobile data fees [7]. Hong and Tam [17] reported that perceived monetary value affects the intention to continue using mobile data services. Pagani [11][12] demonstrated that a detailed cost/throughput model of the economics of service adoption, which include cost of network access, service price, and terminal price, influences the attitude toward adoption. Users always seek to low-cost and high quality service. They will satisfy with mobile TV service when service free is appropriate rather than expensive. Thus:

H4: Consumers’ perceived cost will negatively influence on perceived usefulness of mobile TV
H5: Consumers’ perceived cost will negatively influence on satisfaction of mobile TV
H6: Consumers’ perceived cost will negatively influence on perceived playfulness of mobile TV

Bhattacherjee [1] employed the ECM and TAM to evaluate customer satisfaction and continuance in the domain of IS research firstly. The model argued four key elements: confirmation, perceived usefulness, satisfaction and users’ continuance intention. It furnished an important and available tool for researching information systems continuance. Satisfaction suggests that user’s affect with prior mobile TV use and continuance intention refer to the user’s intention to reuse mobile service. Meanwhile, perceived usefulness is defined as user’s perception of the benefits of mobile TV service. We conducted the ECM and TAM as the foundation of research model in this empirical study.

In addition, Chen et al. [10] defined that playfulness is an important factor to motivate users to utilize a system. In addition, Moon and Kim [8] regarded perceived playfulness as: ‘The extent to which the individual perceives that his or her attention is focused on the interaction with the World Wide Web; Is curious during the interaction; and Finds the interaction intrinsically enjoyable or interesting’. In this research, we adapt the perceived playfulness of as an independent variable, because mobile TV would bring enjoyment to people who watching mobile TV.

Lin et al. [4] and Thong et al. [9] introduced a study for integrating perceived playfulness into expectation-confirmation model for web portal context and Information Technology. The result proved the perceived playfulness is positively associated with consumer’s satisfaction and continuance intention. Hence, the related hypotheses are therefore suggested as shown below based on the model such as ECM and TAM.

H7: Consumers’ perceived usefulness will positively influence on satisfaction of mobile TV
H8: Consumers’ perceived playfulness will positively influence on satisfaction of Mobile TV
H9: Consumers’ perceived usefulness will positively influence on continued usage intention of mobile TV
H10: Consumers’ satisfaction will positively influence on continued usage intention of mobile TV
H11: Consumers’ perceived playfulness will positively influence on continued usage intention of mobile TV
3.3 Measurement

In order to assess the post adoption behavior of mobile TV users and clarify the influencing factors of user’s continued usage intention, all research variables are defined as follows in [Table 1]. Deriving from existing literature, although each variable demonstrates appropriate validity and reliability, it is also modified and supplemented so as to fit the actual state of mobile TV in this study. All of the constructs used in our study are followed by a seven point scale anchored by ‘1 = very low’ to ‘7 = very high’ likert-scales.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Operational Definition</th>
<th>Code</th>
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<tr>
<td>Confirmation</td>
<td>Users’ perception of the congruence between expectation of mobile TV service use and its actual performance</td>
<td>CONF 1-3</td>
<td>[1][8]</td>
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<tr>
<td>Perceived Cost</td>
<td>Users’ perceptions of equipment, access and transaction cost associated with using mobile TV</td>
<td>COST 1-4</td>
<td>[7][11]</td>
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<tr>
<td>Perceived usefulness</td>
<td>User’s perception of expected benefits of mobile TV service use</td>
<td>PU 1-3</td>
<td>[1][16]</td>
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<td>Perceived playfulness</td>
<td>User’s perception of that interacting with Mobile TV service will fulfill user’ intrinsic motives</td>
<td>PP 1-5</td>
<td>[1][20]</td>
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<tr>
<td>Satisfaction</td>
<td>User’s perception of satisfaction of using mobile TV</td>
<td>SAT 1-3</td>
<td>[1][14]</td>
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<tr>
<td>Continuance Intention</td>
<td>Users’ intention to continue using mobile TV</td>
<td>CUI 1-4</td>
<td>[9][18]</td>
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4. Research Method and Analysis Results

4.1 Survey Design and Sampling

In order to test the model issued in this study, we collected data from customers who used mobile TV service in China from March to April of 2013. We chose the participants from Shanghai, Wuhan, Shijiazhuang and Zhengzhou which cities are like to represent the level of mobile service of China. A total of 400 printed questionnaires were distributed to users personally and 261 were received, however, only 243 questionnaires (61%) were usable for the purpose of this study. The profiles of respondents were summarized in [Table 2].

<table>
<thead>
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<th>Table 2 General Characteristics of Samples</th>
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<td>Distribution</td>
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<td>Profession</td>
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<td>Others</td>
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<td>Total</td>
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4.2 Measurement Model Analysis

We evaluated composite reliability (CR≥0.7) and the average variance extracted (AVE≥0.5) to measure internal consistency of the measurement model. All values in this research exceed the generally accepted criterion, indicating good reliability.

Moreover, a confirmatory factor analysis was conducted with related data in order to acquire evidence of convergent and discriminant validity. Convergent validity is demonstrated when item loading exceeded the acceptable value of 0.5 recommended by Fornell and Larcker [2]. The statistics in Table 3 indicates that all constructs meet the acceptable levels of the data existed in measurement model.

To examine discriminant validity, we compared the square root of AVE(√AVE) and factor correlation coefficients. As listed in [Table 4], for each factor, the square root of AVE is significantly larger than its correlation coefficients with other factors. Thus, the scale has a good discriminant validity [2].
The results of path coefficients and significance levels of research model are summarized in [Table 5], which indicate that most study hypotheses were strongly supported except for hypotheses H1 and H5. Above all, for hypothesis 1, the result indicated that the confirmation of mobile TV impacts on perceived usefulness is not significant. However, it has a significant effect on both perceived playfulness and satisfaction (H2, H3). This means that users’ expectation confirmation an important determinant of playful experience and satisfaction of mobile TV. H5, although the result also shows the usage cost has not significant influence on perceived playfulness, the effects of appropriate usage cost on perceived usefulness and satisfaction are supported(H4, H6). The result reveals that appropriate cost is essential factor of usefulness and satisfaction in using mobile TV. The results show H7, H8, H9, H10, H11 are supported, which confirm that perceived usefulness and perceived playfulness have a significant direct effect on continuance intention of mobile TV, and also show a direct influence on continuous through satisfaction. H10 reveals satisfaction has a significant effects on continuous use intention of mobile TV.

4.3 Analysis of Structural Model

We employed AMOS 6.0 to evaluate ‘goodness of fit’ indices of structural model. The indices for the research model were $\chi^2/\text{df}=1.485$ ($\chi^2=384.551$, df=259), GFI=0.936, AGFI=0.909, RMR=0.047, NFI=0.946 and CFI=0.971. All goodness-of-fit indices surpassed the acceptable levels.
5. Discussion and Implication

The purpose of this study is to develop an extent model based upon the ECM to explain what factors, especially the effect of cost, determine consumer’s continuous use intention of mobile TV. As revealed in the results of analysis, usage cost has indirectly positive influence on user’s continuous intention through perceived usefulness and satisfaction, which was in accordance on prior literature [1]. Besides the significant effect of cost, confirmation also indicated a indirect influence on continued usage intention of mobile TV though perceived playfulness and satisfaction. In addition, perceived usefulness, perceived playfulness and satisfaction is confirmed as direct predictors of continuous intention of mobile TV use.

For theoretical perspective, this research employed ECM as theoretical foundation to empirically demonstrate the determinants which affecting the continuous intention of mobile TV. The results indicated the positive effect of usage cost on user’s satisfaction and continuous intention. This study integrated perceived playfulness into purposed model and investigated its direct and indirect significant influence on continued usage of mobile TV. This showed same evidence with the issues that the higher enjoy and interesting perception of users of hedonic information system(likes mobile TV) contributes to higher level useful performance and satisfaction [9][13].

For practical perspective, the results reveals that operators need to consider several factors for user’s continued usage of mobile TV. It is critical that capture more consumer by means of matching user’s expectation of mobile TV. The designers of device and contents providers need to enhance the entertainment experience of usage into their products and service for improving the level of perceived playfulness and satisfaction of mobile TV service. Additionally, device providers and service operators also need to institute rational price rules for different consumers to increase the degree of perception of usefulness and satisfaction of mobile TV. Finally, this study also provide significant directions for device providers and service operators who want to access to the Chinese market.

This study only highlights perceived cost as a significant factor on continuous usage of mobile TV, rather than other aspects. On one hand, technological elements(like accessability, performance of device) also need to be considered in future research; on the other hand, this article does not distinguish difference between stream and broadcast mode of mobile TV, it also should be regarded. This study collected data and demonstrated affecting determinants in China. Conducting a research to study Chinese market is useful for researchers and operators of surrounding countries because of the challenge of globalization. Borrowing ideas from the comparative research of mobile services between Korea and China conducted by Yang & Lee[19], In future research, we need to conduct a survey for subjects of Korea, where launched mobile TV service firstly in the world, and it will be a viable candidate.

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