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A PROCESS VIRTUALIZATION THEORY APPROACH TO UNDERSTANDING THE USAGE CONTINUANCE OF CROSS-CHANNEL INSTANT MESSAGING

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Abstract

Increasingly, we are witnessing the advent of IM software on mobile devices for users to communicate with other users who are using either the desktop or mobile channel. The emergence of such cross-channel instant messaging (CCIM) demands a renewed understanding of users' continuance behaviours. In this research-in-progress paper, we draw upon the process virtualization theory perspective to extend the expectation-confirmation model for IT (ECM-IT). According to PVT, we propose that users' confirmation of using the virtualized CCIM is determined by the communication process's dimensions of sensory, synchronism, relationship, and identification & control. In addition, we propose that the extent to which the communication dyads make mutual adaptation to one another will moderate the relationship between confirmation and perceived usefulness of CCIM. We expect our findings to make theoretical contributions to the domain of research on IT usage post-adoption behaviours as well as managerial implications to CCIM application developers and other stakeholders in the mobile industry.

Keywords: Cross-channel Instant Messaging, Process Virtualization Theory, Mutual Adaptation, ECM-IT, Personal-tie Building
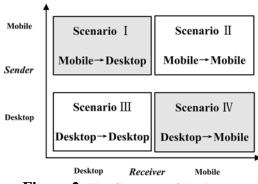
Introduction

The adoption of instant messaging (IM) has witnessed phenomenal growth during the last decade. The number of IM accounts has increased from 590 million in 2003 to 1060 million in 2007. It was estimated that the number of IM accounts will rise to 1700 million by 2011 [1]. This projection is largely expected because as more people begin to use IM to communicate with their friends and colleagues. Instant messaging is fast becoming a social tool for people to establish and facilitate their personal ties with others. In 2007, Gartner group published a global survey report on the mobile messaging indicating that mobile messaging would eventually become the primary solution for P2P communications in the future [2]. With the development of mobile technology, cross-channel instant messaging (CCIM) has emerged to allow users to chat with others regardless of whether they are using desktop-based IM or mobile-based IM. Figure 1 provides an illustration of CCIM in use. Users who are using either the desktop or mobile version of the CCIM would be presented with the information as to whether the other party is using desktop or mobile terminal (represented by different avatar).

Figure 1. Screenshots of CCIM (Both from mobile device and desktop device)

Figure 2. The Category of the Instant Messaging Communication

As depicted in Figure 2, there can be four possible instant messaging communication scenarios. When users use IM, they can choose the
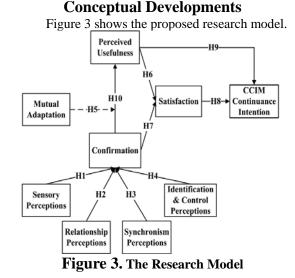
desktop or the mobile IM to send messages; the receiver can also choose to receive the message either through the desktop or mobile terminal. In Scenario I, the sender uses the mobile terminal to send message and the receiver uses the desktop terminal to receive the message; In Scenario II, both the sender and receiver use the mobile terminal to send and receive the message; In Scenario III, both the sender and receiver use the desktop terminal to send and receive the message; In Scenario IV, the sender uses the desktop terminal to send message and the receiver uses the mobile terminal to receive the message. In the present study, our scope of CCIM is limited to Scenarios I and IV. Accordingly, we define CCIM as follows:

Cross-Channel Instant Messaging (CCIM) refers to the use of instant messaging software where the source and receiving party are on different channels and includes communications with another party from the mobile to desktop channel or from the desktop to the mobile channel.

In the extant research, instant messaging communication has been studied in a single channel context on the desktop computer. Studies were conducted to validate the established technology adoption models such as TAM model, TPB theory, Flow theory in this application context [3] [4] [5] [6] [7] [8]. It has been found that perceived usefulness, perceived enjoyment and concentration have positive effects on the intention to adopt IM [6] [9] [10] [11]. Prior to the availability of IM on mobile terminals, users communicated with each other on the same channel - there are no differences between the sender's device and the receiver's device (e.g. screen size, processor capability, keyboard, IM software interface). However, in the case of CCIM, the communication partners use different methods to chat with each other (e.g. one uses desktop-based CCIM while the other uses the mobile-based CCIM). They have to deal with the differences in the desktop and the mobile devices. Consequently, their communication behaviours may be influenced both by the hardware constraints and by the CCIM communication process characteristics.

To the best of our knowledge, no studies have been conducted in the cross-channel IM context, especially in the case of post adoption [10] [12].

In this paper, we extend the ECM-IT model by process virtualization theory (PVT) perspective to predict the usage continuance of CCIM. PVT [13] aims to explain the virtualization mechanism of a process from the four essential facets: sensory, relationship, synchronism, and identification and control. Since CCIM is purely a communication process, it is appropriate to use the process

characteristics outlined in PVT to assess confirmation and continuance of its usage. It has been pointed out that there is a lack of research on the post adoption of mobile services [14], our study attempts to fill this gap by adopting a new theoretical perspective to investigate an emerging mobile service. We also expect the findings from this study to provide new insights to inform managerial practices in the mobile services industry.

Conceptual Developments
Figure 3 shows the proposed research model.

Figure 3. The Research Model

Expectation-Confirmation Model for IT (ECM-IT)

Drawing attention to the substantial differences between initial adoption and continued usage behavior in the IT context, Bhattacherjee (2001) developed and empirically tested an expectation-confirmation model of continued IT usage. ECM-IT had its roots in the expectancy-confirmation paradigm. The model predicts users' intentions to continue using IT with three antecedent constructs: (1) user satisfaction with the IT; (2) extent of user confirmation; and (3) post-adoption expectations, represented by perceived usefulness. In the ECM-IT model, perceived performance was not included as the assumptions has been made that the effects of perceived performance is already captured by the confirmation construct. Based on the logic of ECM-IT, confirmation is the congruence of the expectation and the actual performance [15] [16]. If the actual performance cannot meet the expectation, users will feel disconfirm. If the actual performance is better than expectation, users will feel satisfied and regarded it as a bonus. In order to assess the users' perceived performance/confirmation of the communication process in using CCIM, we draw upon the process characteristics outlined in the process virtualization

theory.

Process Virtualization Theory

Prior research has investigated shopping and commercial exchange processes and provided findings as to which products are best suited for trading in virtual environments [17] [18]. Other research has also looked at relationship development processes and how they might be conducted via virtual mechanisms such as email, online dating sites, and virtual worlds [19]. The process virtualization theory [13] was developed to provide a framework to answer the question: "What factors affect the 'virtualizability' of a process?"

In PVT, process is broadly defined as a set of steps to achieve an objective. We adopt this perspective to investigate the CCIM process thoroughly. Consider the process of friendship development. The steps in this process include meeting, identifying mutual interests, creating shared experiences, etc. This could be done online through exchanging e-mails and sharing experiences in the same online role playing game. The objective is to develop a mutually beneficial relationship. PVT proposes that sensory, relationship, synchronism, and identification and control are the four dimensions that can be used to characterize a process. Communicating using CCIM is a process that involves all of these four aspects and hence users' perceived confirmation of its performance can be appropriately evaluated using these PVT process characteristics.

Sensory Perceptions

Sensory perceptions refer to the overall sensation that users feel when engaging in the CCIM communication (e.g. excitement, sadness) [13]. It determines whether users are able to perceive a full sensory experience of the communication via CCIM. When users feel happy in using the CCIM, they would like to use the CCIM and enjoy the process of chatting. This will enhance the communication performance.

Much research has been done on the users' sensory perceptions of IT. In the context of IM adoption, Kang et al. (2009) found that enjoyment has positive effect on IT actual usage and performance[20]. Other scholars also found that the perceived sensory aspects, such as perceived concentration, are positively associated with IT performance [5] [10]. Therefore, we hypothesize that:

Hypothesis 1 (H1): The users' perceptions of CCIM sensory aspects are positively associated with their confirmation of the use of CCIM.

Relationship Perceptions

Relationship perceptions refer to the quality of personal tie-building in the CCIM communication context. Such interactions often lead to knowledge acquisition, trust, and friendship

development [13].

Relationships have a direct impact on cooperative communication performance. Some scholars found that personal ties are special in that they create an emotional intimacy and social and/or cultural sense of belonging [21] [22] [23]. Fulfillment of the needs of participants' interpersonal interaction is thus linked to a willingness to cooperate. Users may characterize their relationship in various terms such as "friends", "classmates", or "professional associates". Users will tend to seek help from and provide help to people with whom they have close relationships rather than people they do not know or whom they dislike. Hence, relationship perceptions will likely to positively influence the communication performance. Therefore, we hypothesize that:

Hypothesis 2 (H2): The users' perceptions of CCIM relationship aspects are positively associated with their confirmation of the use of CCIM.

Synchronism Perceptions

Synchronism perceptions refer to the degree to which the activities that make up the CCIM communication need to occur quickly with minimal delay [13].

The partners should respond as soon as possible in order to improve mutual understanding [24]. This is so because replying synchronously makes the communication process more seamless. The communication partners would like to chat with each other synchronously in order to enhance the performance of communication [25] [26]. This is particularly important because of the users' need to always remain contactable and to communicate with those on their CCIM contact list. Therefore, we would expect that synchronism is likely to have an influence in computer-mediated communication process such as CCIM. Therefore, we hypothesize that:

Hypothesis 3 (H3): The users' perceptions of CCIM synchronism aspects are positively associated with their confirmation of the use of CCIM.

Identification and Control Perceptions

Identification and control perceptions refer to the degree to which users can identify other communication participants and the ability to exert control over/influence their behavior in the CCIM communication [13]. We note that the conceptual definition of control in the PVT is similar to the notion of perceived behavior control in TPB.

In the context of CCIM, the ability to recognize friends when they logon, ability to logon anonymously and the ability to execute service functions are examples of such perceptions. The ability to exert control may have positive influences on the communication performance [27] [28] [29] [30]. The provision of identification by

CCIM can allow users to choose an appropriate manner to chat with the other party (e.g., chatting with trusted friends more casually, and chatting with anonymous parties more prudently) [31]. Therefore, we hypothesize that:

Hypothesis 4 (H4): The users' perceptions of CCIM identification and control aspects are positively associated with their confirmation of the use of CCIM.

Mutual Adaptation

Mutual adaptation is arguably on of the most essential characteristics of every interpersonal interaction. It refers to the magnitude and type of influence that one person's overt behavior has on the partner [32]. Mutual adaptation is similar with the concept "reciprocity" in interpersonal communication [33]. Reciprocity involves responding to a positive action with another positive action, and responding to a negative action with another negative one. A point of difference is that mutual adaptation focuses only on the positive reciprocal activities. In the distributed learning context, mutual adaptation plays an important role in the teaching experience and self-learning [34] [35]. When parties communicate remotely using computer-mediated communications (CMC), the ability to make mutual adaptations based on hardware, software and bandwidth constraints and variations are important. In the context of CCIM, we consider mutual adaptations as the users' self-regulation behavior to adapt to the partner's real-time situation in the CCIM communication.

Mutual adaptation is likely to moderate the relationship between confirmation and perceived usefulness. In the ECM-IT model, confirmation tends to elevate users' perceived usefulness and disconfirmation will reduce such perceptions. Mutual adaptation will strengthen this positive effect. When using CCIM, users would like to adjust to their communication partner in order to improve overall communication performance (e.g. change the typing speed, use some abbreviation if their partner is using mobile terminal). These self-regulation behaviors may enhance the communication performance and in turn make the users feel that the CCIM is useful (see Figure 1). This is because on the basis of reciprocity, people know what they can expect from cooperating parties, and are more likely to commit themselves to the formal and informal obligations associated with the cooperative relationship [21] [22] [24]. Mutual adaptation thus has a harmonious and stabilizing effect on the relations between the parties. The result will be greater continuity in communications with minimum delays. Thus, with the moderating effect of mutual adaptation, confirmation may have a greater influence on the perceived usefulness of CCIM. Therefore, we hypothesize that:

Hypothesis 5 (H5): Mutual adaptation positively moderates the relationship between users' confirmation and perceived usefulness of CCIM.

Perceived Usefulness, Confirmation, Satisfaction, CCIM continuance intention

The remaining hypotheses in our proposed model have been previously investigated in numerous ECM-IT studies [15], and have now become well established in the literature of ECM-IT [20] [36]. We expect these relationships to hold in the context of CCIM. First, a user's satisfaction has positive influence on his/her intention to continue using CCIM. Second, a user's extent of confirmation and perceived usefulness are two key determinants of satisfaction. Third, perceived usefulness is the most important factor in determining users' adoption intentions. Finally, the extent of confirmation resulting from the usage experiences is hypothesized to positively affect perceived usefulness. Hence:

Hypothesis 6 (H6): Users' perceived usefulness of CCIM use is positively associated with their satisfaction with CCIM use.

Hypothesis 7 (H7): Users' extent of confirmation is positively associated with their satisfaction with CCIM use.

Hypothesis 8 (H8): Users' level of satisfaction with initial CCIM use is positively associated with their CCIM continuance intention.

Hypothesis 9 (H9): Users' CCIM continuance intention is positively associated with their perceived usefulness of CCIM use.

Hypothesis 10 (H10): Users' extent of confirmation is positively associated with their perceived usefulness of CCIM use.

Research Method

A survey using a communication-dyad approach will be conducted to test the research model. Data will be collected from existing users of the CCIM. Only users who had experiences in using IM to communicate across desktop and mobile channels (i.e., Scenario I and IV) will be used as respondents. It will be performed in three stages. First, a mailing list of current users will be obtained from a major CCIM firm. Next, we will randomly select several respondents and send them invitation letters to participate in our study. Upon completion of the survey, users will be asked to provide the contact information of another friend/colleague whom they communicate using CCIM frequently. The dyad assessment approach would allow us to assess the mutual adaptation aspect.

We plan to examine two major Chinese

CCIMs: QQ (pc.qq.com) and Fetion (www.fetion.com.cn). QQ is the primary product of Tencent Company, which is the largest Internet service provider in China. QQ started off with a desktop version and has introduced a mobile version in recent years, users can chat via both versions of QQ. Fetion is the IM product of China Mobile, which is the largest mobile network carrier in China. Fetion began as a mobile service and recently provided a desktop version. These two CCIMs have their unique aspects and are suitable for our research. For QQ, it is the dominant desktop IM in China, and is now extending its usage into the mobile domain; for Fetion, it has an edge in the mobile network domain, and is now moving into desktop domain. By studying two competing CCIMs with different focused markets, we expect to uncover some interesting insights when doing comparative analysis.

Constructs from the ECM-IT in the research model are operationalized using established scales and adapted to suit the CCIM context. The items to assess the four process characteristics are developed based on the theoretical conceptualizations of Overby (2008) and other related research in the CMC literature. We expect to have approximately 200 respondents for each CCIM. Data will be analyzed using partial least squares (PLS) technique.

Status of Research & Expected Contributions to Theory and Practice

Status of Research

We have completed the conceptual developments and validation process and have developed a preliminary version of the questionnaire. Data collection is targeted during summer 2009. We expect to complete the preliminary data analysis by fall 2009.

Expected Contributions to Theory and Practice

The main theoretical contribution of this research is that it provides a new perspective to understand users' post adoption behavior with the introduction of the process virtualization perspective. Our proposed research model provides a more holistic assessment of users' confirmation of IT by considering them from the four aspects of sensory, synchronism, relationship, and identification and control. Next, our unique research context of cross-channel IM allows us to examine the effects of mutual adaptation. The findings would provide new insights to study other cross-channel information services. We expect the revised model to further enhance the explanatory ability of the ECM-IT model. Third, further development and test of ECM-IT could advance research into users' interpersonal interaction. From a managerial point of view, empirical findings from

our study would identify the aspects that are important to cross-channel information service users. The results regarding the importance of mutual adaptation would inform cross-channel services designers and providers about offering users the ability to identify and make mutual adjustments to other users in order to improve usage continuance.

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