Does adoption mean the same to every user? A study of active and passive usage of mobile instant messaging applications

Research-in-Progress

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Abstract

This research-in-progress paper studies the active and passive usage of mobile instant messaging (MIM) applications. Grounded on two-factor theory and three-factor theory, we propose the features of MIM applications influence the active/passive usage of MIM applications through users' satisfaction and dissatisfaction. The proposed features are categorized into three factors: exciting factors which contain design aesthetics, customization and enjoyment, performance factors which include sociability, convenience and privacy assurance, and basic factors which are application costs and technical functionality. To test hypothetical relationships in this study, we plan to use a survey method. The potential implications to both literature and practice are discussed.

Keywords: Information systems adoption, information technology acceptance, two-factor theory, three-factor theory, active and passive usage

Introduction

Mobile devices are widely used and proliferating fast globally in recent years. According to Deloitte's report (Deloitte 2013), more than 1 billion smartphones were estimated to be sold and more than 2 billion smartphones were used in global market by the end of 2013. Among the applications in mobile devices, mobile instant messaging (MIM) applications which provide real-time communication service are quite popular. Nearly half of smartphone owners have used some forms of MIM applications in addition to or instead of short messaging services (SMS) in United States, while nearly 90 percent mobile device users have used MIM applications in China (Ankeny 2012; CNNIC 2014a).

Although the usage of MIM applications increases fast in these years, the emerging MIM applications make their competition be intense and make application providers' profit be suffered. Meanwhile, emerging studies have recognized that active participation could impact users' behavior and enhance their loyalty in virtual communities and instant messaging context (Huang et al. 2013; Koh et al. 2007; Pagani et al. 2011). Therefore, we can expect that active usage of MIM applications brings benefits to the success of MIM applications, while passive usage of MIM applications may not contribute to MIM applications' survival and development.

However, previous literatures about the adoption or usage of MIM applications do not distinguish the active and passive usage of MIM applications. Deng et al. (2010) considered the role of service quality and perceived value in the satisfaction and loyalty of MIM usage. Zhou and Lu (2011) discussed MIM users' loyalty from the network externality and flow perspective base on technology acceptance model. Ke and Li (2009) studied the adoption of MIM in China based on the decomposed theory of planned behavior (DTPB). Although several antecedents have been explored for MIM usage or adoption, none of them go deep to discuss the active and passive usage of MIM.

In the meantime, many classic adoption models like technology acceptance model (TAM)(Venkatesh and Davis 2000), theory of planned behavior (TPB)(Ajzen 1991), decomposed theory of planned behavior (DTPB) (Taylor and Todd 1995) and the unified theory of acceptance and use of technology (UTAUT)(Venkatesh et al. 2003) also only propose the antecedents of behavioral intention and actual behavior. These models imply users who possess different degree of antecedents would adopt or use the information systems differently. But different degree of adoption and usage of information systems may have significant different behavioral formats and the according consequences. For example, posting in virtual communities can increases the content of communities and promote the communities' development, but just reading in virtual communities may not have the same results (Ridings and Gefen 2004; Tonteri et al. 2011). Therefore, it is very necessary to go deep to look into the different usage behaviors and identify the different corresponding antecedents.

Besides, we also notice that more possible antecedents should be studied to better reflect the distinctiveness of MIM applications. Thus, we propose our research question as follows:

What factors influence the active and passive usage of MIM applications?

We think to study this question can distinguish factors which have different effect on different usage of MIM applications and can bring many implications to both literature and practice. To address this question, we ground on two-factor theory and three-factor theory to develop hypotheses about the relationships among antecedent factors, working mechanisms and active/passive usage of MIM applications. We also discuss the methodology to test the relationships and potential implications of this research-in-progress paper.

Theoretical background

In this study, we integrate the two-factor theory and three-factor theory to help us explore and understand the factors influencing MIM active/passive usage. Among them, two-factor theory is mainly used to identify the working mechanisms of different antecedents, while three-factor theory can help us to categorize the antecedents in this study.

Two-factor theory

Two-factor theory is originally proposed to explain the job satisfaction in organizational context. According to the theory (King 1970), the factors which account for employees' job satisfaction can be classified as two categories. One category is called motivator or satisfier, which are intrinsic factors related to job itself, like work interest, content or challenge, while the other category is labelled as hygiene factors or de-motivator which are extrinsic factors about job context, like company policy, working condition, relationships with other employees and supervisors, etc. The theory also defines the relationships between satisfaction and these two factors. The satisfiers can lead to satisfaction, but the absence of satisfiers may not be sufficient to produce dissatisfaction, while the absent of hygiene factors will produce dissatisfaction, but their fulfillment is not necessary for satisfaction production.

Although two-factor theory has been used to explore the antecedents or influential factors, it is criticized as lack of considering situational and individual factors, and oversimplification of the influential factors (House and Wigdor 1967). Thus, we mainly use two-factor theory to understand the working mechanisms of influential factors of active/passive usage of MIM applications in this study, that is, satisfaction and dissatisfaction. Towards the antecedents of usage of MIM applications, three-factor theory that provides more refined categories can help us explore the influential factors more comprehensive.

Three-factor theory

Based on two-factor theory, Kano et al. (1984) first extended the two factors into three factors: basic factors, exciting factors, and performance factors which contained five attributes of quality. In the model of Kano et al. (1984), basic factors correspond to hygiene factors which do not affect the satisfaction even if these factors have been triggered, while exciting factors equal to motivational factors which do not lead to dissatisfaction if these factors are not provided. The performance factors are the biggest difference between two-factor theory and three-factor theory, and are hybrid factors which contain the characteristics of both exciting and basic factors. Performance factors affect satisfaction if they exist and induce dissatisfaction if they are not implemented. Otherwise, the specific factors of the three types which cause satisfaction and dissatisfaction are not defined in advance, and should be confirmed according to users' expectation level.

Previous literature has shown the validity and power of three-factor theory in studying the influential factors of information systems usage or adoption. We think three-factor theory can provide a comprehensive perspective to dig out the antecedents of usage of MIM applications. Therefore, three-factor theory is used in our study to guide the exploration process of antecedents in this study.

Research model and hypotheses development

According to two-factor theory, we think the features of MIM applications can make the users be satisfied with MIM applications or dissatisfied with MIM applications. Such satisfaction and dissatisfaction may lead users to use MIM applications actively or passively. In line with three-factor theory, the features of MIM applications can be divided into three classes: exciting factors, performance factors, basic factors. The specific hypothetic relationships are depicted in figure 1.

Figure 1. Research Model
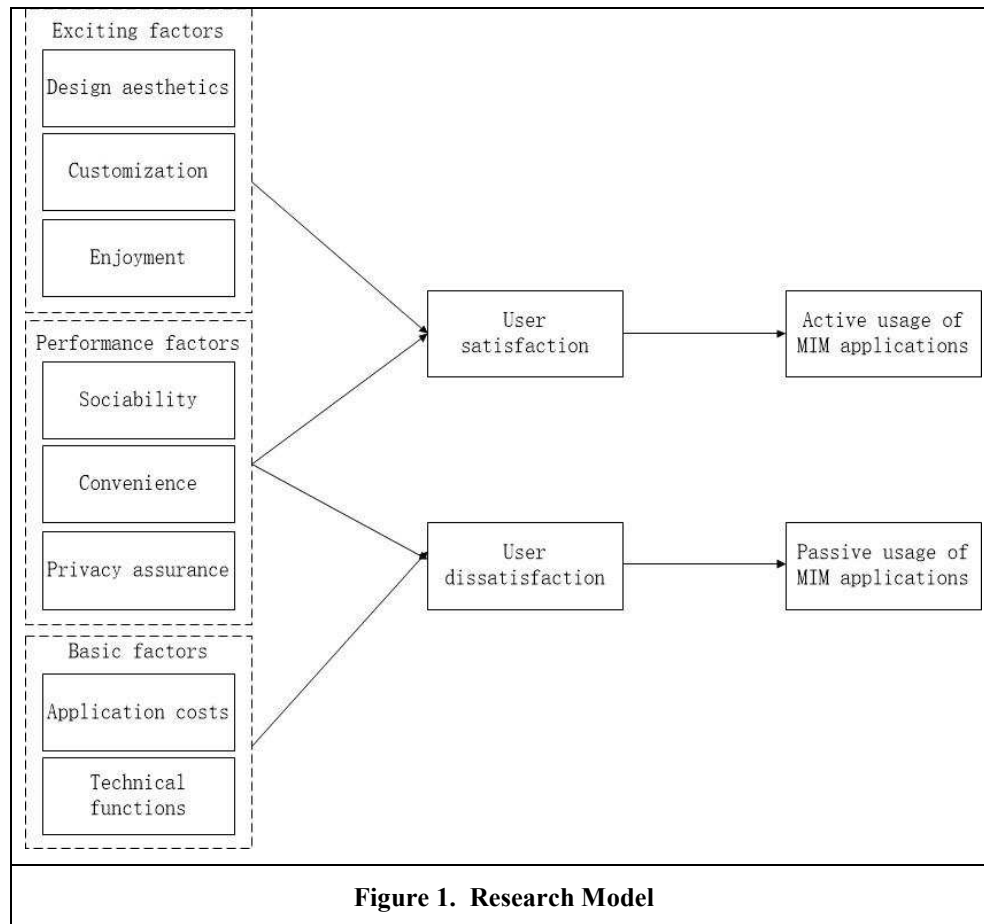
Active and passive usage of MIM applications

Although previous literature has given some definitions of active participation or usage, none of them are figured out in MIM contexts. Pagani and Mirabello (2011) thought the active participation in SNS ranged from merely searching information to creating content and interacting with others, while Kang et al. (2014) thought active users of SNS were highly motivated to engage. Depending on prior literature, active usage of MIM applications in this study can be defined as users' behaviors motivated by high engagement to fully apply MIM applications in users' daily life. The forms of active usage can be the results of highly motivated engagement in using MIM applications such as interacting with friends through MIM frequently, posting and updating personal information frequently, using the untraditional functions including m-SNS, m-gaming, m-banking and m-dating, etc.

Towards passive usage of MIM applications, we understand it from the view of lurking. Pagani and Mirabello (2011) has operationalized passive participation in SNS as reading which is congruent with the lurking definition of Preece et al. (2004), while other lurking behaviors like visiting without posting (Rafaeli et al. 2004), less contribution to online communities (Taylor 2002) or the early stage of participation in online community (Yeow et al. 2006) also can be applied to MIM context because many popular MIM applications like Whatsapp and Wechat have grouping function and provide accesses to social networking sites (AOL 2007; Brinkmann 2014; Ma 2014). The functions and accesses can make the lurking behaviors exist in MIM applications. To be consistent with the conceptualization of active usage of MIM applications, we define passive usage of MIM applications in this study as users' behaviors under low engagement with occasional utilization of MIM applications in users' daily life. The forms of passive usage can contain using few functions of MIM applications, seldom contacting friends through MIM applications, just reading and browsing the contents generated by friends, and hardly updating personal profile in MIM applications, etc.

The definitions of active and passive usage of MIM applications reflect the characteristics of MIM applications context and become the starting points of discussing their relevant relationships in our study. Based on the definitions, we will discuss the relationships between satisfaction/dissatisfaction and active/passive usage of MIM applications in next section.

User satisfaction and dissatisfaction

We propose user satisfaction and dissatisfaction as the working mechanisms of features of MIM applications. Based on the process view of consumer satisfaction, user satisfaction is the evaluation of whether the actual performance of product or service is congruent with users' expectation (Yi and Zeithaml 1990). This definition reflects the formation process of user satisfaction (Oliver 1980). Previous literature has revealed user satisfaction can change users' attitude towards products or services (Oliver and DeSarbo 1988), make users participate in positive word-of-mouth activities (Anderson 1998), increase the repurchasing behavior (Anderson and Sullivan 1993), etc.

As active usage of MIM applications is the behaviors motivated by high engagement which is strong commitment to the relationship between users and MIM applications (Mollen and Wilson 2010), active usage is the behavioral representation of user engagement to MIM applications. In previous literature, Van Doorn et al. (2010) had directly proposed that user satisfaction was the antecedent of user engagement. Garbarino and Johnson (1999) thought commitment was the reflection of user satisfaction. Beatson et al. (2006) found satisfaction positively influenced all three types of commitment. It is important to consider the possible relationship between user satisfaction and active usage of MIM applications because prior literature about information technology (IT) adoption and usage only consider the effect of satisfaction on continued use (Hu et al. 2014), intention to use (Petter et al. 2013) and loyalty to IT (Lin et al. 2015), but not on active usage. Meanwhile, in MIM context, when users get satisfied experience in using some MIM applications, they will have positive attitude towards the MIM applications and engage in using them. As user engagement motivates the active usage of MIM applications, we can hypothesize as:

H1: User satisfaction affects users' active usage of MIM applications positively.

As the opposite of user satisfaction, user dissatisfaction also should reflect users' evaluation process of the negative discrepancy between expectations and actual performance of products or services (Anderson 1973). Previous literature also uncovered user dissatisfaction may make user switch to other products or services (Richins 1987), complain to producers or service providers (Singh 1988), participate in negative word-of-mouth communications (Anderson 1998), etc. Meanwhile, in accordance with our definition of passive usage of MIM applications, we can interpret passive usage of MIM applications as some weak commitment to the relationship between users and MIM applications. In MIM context, if the features of MIM applications fail to fulfill the users' expectations, dissatisfaction will be users' response and negative emotions like regret and disappointment will be produced based on cognitive appraisal perspective(Smith and Ellsworth 1985). Those negative emotions may make user commit to MIM applications weakly or even not commit to MIM applications. Therefore, we can hypothesize that:

H2: User dissatisfaction affects users' passive usage of MIM applications positively.

Features of MIM applications

To choose the features which influence users' active and passive usage of MIM applications, we adopt both "down-top" and "top-down" methods. On one hand, we conducted open-ended interviews with 50 Chinese MIM applications users by asking them questions as "what features of MIM applications you are using make you feel satisfaction/dissatisfaction?". We recorded the key words or short sentences if they were about the features which made interviewee feel satisfaction/dissatisfaction. The recorded content of interview was analyzed by two PhD students to abstract the items which may reflect the features of MIM applications. The disagreements of items between the two PhD students were resolved through discussion. Almost 27 interviewees were male and the age range of all interviewees was from 20 to 28. On the other hand, we visited the literatures about MIM/IM adoption and screened the possible features that were necessary to be studied (Li et al. 2005; Li et al. 2011; Ou and Davison 2011). By integrating the results of these two methods, we propose the specific features that may influence the usage of MIM

applications and categorize them into exciting, performance and basic factors according to their definitions and nature.

Exciting factors

Generally speaking, users are not aware of the existing of exciting factors before they use the MIM applications and these factors provide high added value to users. Based on the nature of exciting factors, we propose three features of MIM applications may represent exciting factors: design aesthetics, customization and enjoyment.

Design aesthetics is users' perceived beauty or attractiveness of MIM applications' interface (Van der Heijden 2003) and fulfill users' needs or expectation for aesthetics. Previous literature has shown that design aesthetics generate satisfaction towards virtual travel communities (Sanchez-Franco and Rondan-Cataluña 2010). Meanwhile, Customization refers the extent to which MIM applications can be tailored by their users and increase users' perception of ability to satisfy their personal needs by themselves (Shostack 1977). Previous literature also showed the positive relationship between customization and satisfaction. Finally, enjoyment is the extent to which usage of MIM applications makes users feel enjoyable and can satisfy users' expectation of pleasurable (Thong et al. 2006). According to expectation-confirmation model of satisfaction, design aesthetics, customization and enjoyment of MIM applications all can satisfy users' different expectations, we can hypothesize as:

H3: Design aesthetics of MIM applications affects user satisfaction positively.

H4: Customization of MIM applications affects user satisfaction positively.

H5: Enjoyment of MIM applications affects user satisfaction positively.

Performance factors

For performance factors, users recognize them as necessary factors which compose the quality of MIM applications. The factors reflect the main motivations which users make use of MIM applications. Based on the nature of performance factors, we propose three features of MIM applications may represent performance factors: sociability, convenience and privacy assurance.

Sociability is the extent to which MIM applications support users to do social interactions with their friends (Preece 2001). Because social interaction is an important way to build relationship with users' friends and satisfy the needs of relatedness based on self-determination theory (Deci and Ryan 2002), sociability of MIM applications may bring about user satisfaction. Otherwise, if MIM applications could not facilitate users' social interaction, needs of relatedness will be not satisfied and dissatisfaction comes out. Meanwhile, convenience is the extent to which MIM applications save users' time and effort in different tasks (Berry et al. 2002). MIM applications provide convenience through their many functions, such as mobile payment, instant messaging, mobile social networking sites, etc. If MIM applications save users' time and effort in finishing various tasks in their daily life, satisfied experience will be produced by using it. Otherwise, if MIM applications cannot save time and effort, users may turn to the other more convenient applications instead and such swiftness is the sign of dissatisfaction. At last, privacy assurance is the extent to which MIM applications protect users' privacy (Hui et al. 2007). Besides security techniques, MIM applications assure their privacy protection through third-party seals, privacy policy and advertising reputation, etc. Those protection actions create a security environment for leveraging MIM applications and satisfy users' requirement for security (Kim and Benbasat 2003). Otherwise, if MIM applications cannot protect users' privacy, users will be worry about the potential loss and feel dissatisfied with using MIM applications. Therefore, we can hypothesize that:

H6: Sociability of MIM applications affects user satisfaction positively (a) and user dissatisfaction negatively (b).

H7: Convenience of MIM applications affects user satisfaction positively (a) and user dissatisfaction negatively (b).

H8: Privacy assurance of MIM applications affects user satisfaction positively (a) and user dissatisfaction negatively (b).

Basic factors

With regard to basic factors, users are usually not aware of them because they are users' minimum requirements towards MIM applications. The absence or bad change of basic factors will cause dissatisfaction. We identify applications costs and technical functionality as basic factors.

Application costs are the various costs of employing MIM applications in their daily life. The costs not only contain the financial cost users may take, but also include the opportunity costs if they do not use MIM applications. Based on expected utility perspective, users maximize their utility by choosing the low cost option (Mongin 1997). If the costs to use MIM applications become high, employment of MIM applications will impede users to maximize their utility. Thus, dissatisfaction will emerge. Meanwhile, technical functionality is the extent to which MIM applications realize their supposed functions (Kim et al. 2002). The set functions are usually users' basic reasons to use MIM applications and malfunctioned MIM applications will disconfirm user's original expectation. To conclude above theorizing, we can hypothesize as:

H9: MIM applications costs affect user dissatisfaction positively.

H10: Technical functionality of MIM applications affects user dissatisfaction negatively.

Methodology

The hypothetical relationships in this study will be tested by using a survey method which can gather information from the targets we will study. We will make questionnaires for all variables and issue the questionnaires to our sample randomly.

Sample and data collection

Respondents in this study will be undergraduate and graduate students in universities in Mainland, China. According to the statistic report of CNNIC (2014b) and CNNIC (2014a), the age of the largest segment of mobile internet users in China is from 20 to 29 (33.4%) and the age of largest segment of instant messaging application is also from 20 to 29 (32.4%). Thus, these respondents can be representatives of Chinese MIM applications users and also should be appropriate for this study. To conduct the survey, the survey instructions will ask participants to recall the most recent MIM applications they used, and then complete the questionnaire.

Measurement instruments

Every construct was operationalized based on previous measurement to ensure its face validity. Furthermore, to confirm the measurement instrument, the questionnaire had been discussed with experts in IT adoption research and had been conducted a pre-test with almost 20 Chinese undergraduates students which would be not in the final sample. Based on the results of pre-test and discussion, the questionnaire is decided. The questionnaire is designed as seven-point Likert-type scale. The active and passive usage of MIM applications are adapted from Pagani and Mirabello (2011) and Pagani et al. (2011); User satisfaction is from Taylor and Baker (1994), while user dissatisfaction is from Babin and Griffin (1998); Design aesthetics is from Lavie and Tractinsky (2004); Customization is from Srinivasan et al. (2002); Enjoyment is from Sun and Zhang (2006); Sociability is from Animesh et al. (2011); Convenience is from Udo et al. (2010); Privacy assurance is from Lowry et al. (2012); Application costs is from Peace et al. (2003) and technical functionality is from Ou and Sia (2010).

Data analysis

To test the research model, we will utilize structural equation modelling (SEM) technique with using partial least squares (PLS) estimation analysis. The analysis will be conducted by using SmartPLS (Ringle et al. 2014) .

Structural equation modelling technique needs estimate two models: measurement model and structural model (Anderson and Gerbing 1988). To evaluate measurement model, we will use confirmatory factors analysis (CFA) to assess the reliability of each constructs by using Cronbach's alpha, composite reliability

(CR), and the significance of items' loading. We also will assess the convergent validity by using average variance extracted (AVE) and evaluate the discriminant validity by comparing the square root of AVEs and construct correlations. To test structural model, we will estimate the path coefficients of each relationship and judge model's fit by using some indices.

Potential contribution of this research-in-progress

We think this study can contribute to literature in several ways. First of all, we divide usage of MIM applications into active and passive usage. This differentiation can help us understand IT adoption or usage deeper. Second, we leverage two-factor theory and three-factor theory into MIM applications context. These two theories provide a comprehensive framework to help us figure out how the features of MIM applications influence the usage of MIM applications. At last, we identify several antecedents of usage of MIM applications. Of course, those features may still need further empirical study to confirm their role and provide richer insights to the relationships in our study.

This study also can bring implications to practice. First of all, the proposed features can be the predictors to forecast users' usage of MIM applications or the references for MIM applications' providers to design and promote their MIM products. Secondly, MIM applications providers can locate the two kinds of adopter: active users and passive users, and make targeted and effective promotion plan based on our research results. At last, the empirical results of this study will help MIM applications to take actions to transform passive users to active users.

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