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Investigating User Switching Intention for Mobile Instant Messaging Application: Taking WeChat as an Example

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INVESTIGATING USER SWITCHING INTENTION FOR MOBILE INSTANT MESSAGING APPLICATION: TAKING WECHAT AS AN EXAMPLE

Abstract: *Post adoptive IT use is an important research topic in information systems field, mainly including sustained behaviours and switching behaviours. While there are a great number of studies on users' continuance intentions for diversified IT, users' IT switching behaviours are less studied. This research attempts to identify the features of users IT switching behaviours. We introduce a migration theory from social network perspective to explore the intrinsic and extrinsic factors influencing users' switching intention in the context of mobile instant messaging (MIM) application. In particular, we develop a model that examines the role of networks, deprivations and trusts on MIM users' switching intentions to WeChat in China. A survey research method is utilized to test this model and hypotheses. We found that functional deprivation, monetary deprivation and personal innovativeness could positively influence users' switching intentions. Networks of obligation was found to have no significantly direct influence on switching intentions, but fully mediated by functional and monetary deprivations. However, trust transferred from MIMs provider has no significant effect on switching intentions. The findings are believed to theoretically contribute to further understand users' IT switching behaviours and yield some practical implications for designers and managers in MIM providers and their products propaganda.*

Keywords: *Post adoptive IT use, User switching intention, Migration theory, Mobile Instant Messaging, WeChat.*

1 INTRODUCTION

In recent years, Internet and information technologies develop rapidly. Computers and mobile phones now are not luxuries any more, but necessities which are almost afforded for most people. Faced with the huge market demand and economic benefits, different IT companies are scrambling to roll out various IT products with similar main functions. IT innovations have proliferated which brings users opportunities to switch from one IT to that of a competitor. This switching phenomenon has been documented in various IT products, such as web browsers (e.g. Internet Explorer, Chrome), office software (e.g. Microsoft office, WPS), social network sites (e.g. MySpace, FaceBook), and IT services, such as broadband Internet access (Bhattacharjee et al., 2012). Switching behaviour is believed to have important influence on companies' success in marketplace. For example, customers' switching behaviours pose a great threat to long-term customer-firm relationships from relationship marketing perspective (Ganesh et al., 2000). IT switching can bring new challenges to IT vendors, which even can knock down their business. For instance, Kaixin.com, a social network site which has been popular for some time in China, has totally been replaced by other online social networks, such as Weibo. Given the huge impact of IT switching behaviour, more and more information systems scholars pay attentions on this subject. IS studies have investigated the users switching behaviours in computer-based IT products, such as Blogs, social networks sites and online auction (Zhang et al., 2008, Chang et al., 2014, Lin et al., 2012). However, there seem to be two research gaps in this area.

First, previous studies mainly investigate switching behaviour through the lens of IT acceptance and diffusion. Related constructs, including satisfaction, relative advantages, habit, and switching costs, etc., are used to explain IT switching intention (Hsieh et al., 2012, Bhattacharjee et al., 2012, Ye and Potter, 2011). Most of these factors are individual-based, while switching is a collective movement that may need to explore some factors from the community perspective. It is interesting to note that user's switching behaviour in online context might have some similarities with the human migration in the offline communities or societies, especially when some users are making the switching decisions or have switching intention after a period of usage time. To address this gap, we introduce a migration theory from social network perspective by Curran and Saguy (2001) to explore the intrinsic and extrinsic factors influencing users' switching intention in MIM context.

Second, most previous studies focus on computer-based IT, while there are few studies focusing on the user switching behaviour of post adoption in the context of mobile applications. Along with the development of smart phones and the related operating systems (e.g., iPhone, Android, Windows Phone), users of smart phones are able to install various service applications. According to the report from Statista (2015a), the numbers of apps available in the two leading app stores (Google Play and Apple App Store) have both reached 1.4 million as of May 2015, seeing exponentially rapid growth in recent years. Compared with computer-based software, mobile applications have higher update speed. In this case, users are more likely to have switching intentions in mobile application context. Hence, the current study sets mobile applications as research context.

Among various types of mobile applications, we focus on mobile instant messaging (MIM), a typical example that has been widely adopted by individuals and organizations as an effective communication tool. Compared with traditional short message services (SMS), MIM provides more user-friendly features and tremendous conveniences for customers (Deng et al., 2010), such as voice chat, group chat, moments, live chat and so on. According to the survey results of China Internet Network Information Center (CNNIC, 2014a), by the middle of 2014, 89.3% of mobile phone users (564 million) have adopted MIM in China, and the number is still growing. Furthermore, MIM has been gradually developed from a simple online chat tool to an integrated platform with social networking, entertainment, e-payment and other services that presents a huge commercial value (CNNIC, 2013). Therefore, third-party mobile services providers are scrambling to grab customers by updating functions or releasing new versions of MIM. In particular, WeChat, also known as Weixin in Chinese, has become the most popular messaging app in China since 2011. It is witnessed that WeChat has attracted more than 500 million monthly active users nowadays (Statista, 2015b). Meanwhile, the stickiness of WeChat users also increases continuously in the recent years. According to the report from iResearch (2015), in the end of 2014, the total monthly operational use time of WeChat has reached over 2 billion hours, increasing by 0.7 billion compared with the beginning in 2014, and the monthly use frequency of WeChat has reached over 54 billion with an increasing of 16 billion times.

In general, MIM users are provided with diversified instant communication options, and it is easy for them to switch between MIMs with less switching cost, as Bhattacharjee et al. (2012) indicated, nowadays, new IS substitutes are only one click away. Attracting new users and retaining existing ones are critical to the success of MIM providers (Chang et al., 2014), and switching behaviour may result in user exodus and thus negatively influence the profitability of firms (Ganesh et al., 2000). Hence, it's of great importance to investigate the switching behaviour between MIMs from users' perspective. Following the trend of post-adoption research, we focus on the users switching intention from former popular MIM to WeChat in China. This study aims to gain insight into this topic by answering the following research question:

- Why do people, who have already adopted a certain MIM, decide to switch to a competing one?

In particular, based on migration theory, we develop a model that examines the role of networks, deprivations and trusts to determine MIM users' switching intentions to WeChat in China. This study contributes to the IS post-adoptive literature by emphasizing the effects of network related factors on IT switching intention. This enriched and nuanced understanding can provide supports for firms which are dealing with the problems in maintaining consumer loyalty or facing challenges in entering a new IT product area. In addition, this paper also contributes to real world migration literatures that the knowledge in migration domain can be adapted to understand the IT switching behaviour.

The remainder of the paper proceeds as follows. We begin by reviewing relevant prior work in IT post-adoption and switching behaviour. Section 3 builds the theoretical arguments for the proposed research model. Then we conduct a quantitative survey to test this model. The results

are presented in section 4, which are based on a sample of 252 MIMs users. Finally, we provide a discussion of the major findings, limitations, and implications for future research.

2 RELATED WORK

2.1 Post-adoption Behaviour Research

Users' post-adoption behaviour is one of the most mature streams of IS research. Previous IT post adoption studies focus on users' continued usage (Bhattacharjee, 2001, Karahanna et al., 1999). Ultimate success of an IT service or product mainly depends on individuals' continuance intention of the IT (Parthasarathy and Bhattacharjee, 1998, Karahanna et al., 1999). IS researchers have attempted to develop and empirically test models of IT continuance intention. Among them, the expectation-confirmation model (ECM) developed by Bhattacharjee (2001) has been applied with approval most. In IS domain, a large amount of studies examines the continued usage of diverse IT, such as social networks sites and mobile internet services, by extending the ECM (Hayashi et al., 2004, Kim et al., 2011, Thong et al., 2006). In addition to continuance behaviour, switching behaviour research is another stream in post-adoption behaviour research (Ye et al., 2008).

2.2 User IT/IS Switching Behaviour

As early as the mid-1990s, many marketing scholars have paid substantial attention to consumer switching behaviours in different industries (Hsieh et al., 2012). For example, Keaveney (1995) identified eight general categories of customers' reasons for switching in services industries by using the critical incident method. Based on Keaveney's (1995) findings, Bansal and Taylor (1999) integrated the theory of planned behaviour with other factors proposed to influence switching, and developed a model of service provider switching. In line with the growing prevalence of online services activities, the number of studies on switching behaviour of IT/IS increases in recent years (Zhang et al., 2009).

At the early stage of Internet, researchers usually focused on switching behaviour from physical space to virtual world. For example, Lee et al. (2011) explored the factors that affect the attitude and intention towards switching from the physical to the virtual market in the context of online banking. Subsequently, some studies started to concentrate on switching behaviour in online services (Keaveney and Parthasarathy, 2001). Chen and Hitt (2002) examined switching of online brokerage services at the firm level and found that users' switching behaviour can be predicted by their usage patterns and website characteristics. Recently, the continued rapid growth of Internet technologies and services have attracted more and more scholars involved in topics on switching behaviour of IT products or services, such as blogs and social network sites (SNS) (Zhang et al., 2008, Zhang et al., 2009). We believe that users' IT switching behaviour is somewhat different from other products and services: a) Proliferative IT innovations today allow users switch between different IT products freely since they have more options with increasing and changing functions. New IT choice is only a click away on the internet and switching to a competing IT is almost as easy as downloading and installing it (Bhattacharjee et al., 2012); b) IT switching behaviour among different alternatives does not

necessarily indicate that users discontinue using previous IS services (Xu et al., 2013, Keaveney and Parthasarathy, 2001), hence it involves a complete or partial replacement of the use of former IS services with a substitute that serves similar needs (Cheng et al., 2009, Bhattacharjee et al., 2012).

However, due to novelty of switching behaviour in IS, there is no currently agreed model for IT switching behaviour available (Cheng et al., 2009). A number of IS researchers introduce the related theories and concepts based on the Push-Pull-Mooring (PPM) framework to explore IT switching behaviour research (Nimako and Ntim, 2013). PPM framework is regarded as the most important theoretical contribution in migration literature to date (Jackson, 1986), which can be traced to the “Laws of Migration” introduced in 1885 (Lee, 1966). In PPM framework, factors influencing human’s decisions for moving from one place to another can be categorized into push, pull and mooring categories. Push factors refer to the negative factors driving people away from original area, while pull factors are positive factors attracting people to a destination (Bogue, 1969). Mooring factors refer to all life-course, cultural and spatial issues that act to facilitate or hamper migration decisions (Moon, 1995). According to various research contexts, prior IT switching studies introduce different constructs into these three categories. Push, pull and mooring factors in these studies are presented and summarized below in Table 1.

Table 1. Push, Pull and Mooring factors in prior IT switching studies

Previous studies	Push	Pull	Mooring	Research context
(Ye and Potter, 2011)	Breath of use, Counter-intention habit	Relative advantage, Perceived relative ease of use, Perceived relative security	Subjective norm, Perceived switching costs, Personal innovativeness in IT	Personal information technologies
(Zhang et al., 2008)	Satisfaction	Attractive alternatives	Switching cost (sunk costs)	Blogs
(Cheng et al., 2009)	Dissatisfaction with technical quality; Dissatisfaction with information quality; Dissatisfaction with community support; Dissatisfaction with member policy	Attractiveness of alternatives, Peer influence	Setup cost, Continuity cost	Social network sites
(Hsieh et al., 2012)	Weak Connection; Writing Anxiety	Enjoyment, Relative usefulness, Relative ease of use	Switching cost, Past experience	From blogs to social network sites

(Chang et al., 2014)	Regret; Dissatisfaction	Alternative attractiveness	Sunk cost, Setup cost, Continuity cost	Social network sites
(Xu et al., 2013)	Perceived enjoyment	Alternative attractiveness; Descriptive norm	Sunk cost, Adaptation cost	Social network games

Besides PPM-based models, some studies also construct their own distinct switching models by reviewing pertinent IS literature. For instance, based on theories of IT acceptance, innovation diffusion theory and expectation disconfirmation model, Bhattacharjee et al. (2012) explored how relative advantage, personal innovativeness, satisfaction with prior IT and habit may affect users' IT switching intention and behaviour. Based on the relevant literature on cultural, social, economic, and motivational factors of SNS use, Choi et al. (2013) investigated the tension of local vs. global SNSs and the reasons for a global SNS's popularity in S. Korea. Hermosa and Hachtmann (2013) explored the process of social media migration among young professionals by using grounded theory method, and a series of theoretical propositions are developed.

3 THE RESEARCH MODEL

3.1 Theoretical Foundation

Enlightened by the previous studies introducing PPM theory from human migration field, we develop a research model of switching intention, primarily based on Curran and Saguy's (2001) study. By reviewing the relevant theories of migration in the existing literatures (Massey et al., 1990, Massey, 1990, Portes and Sensenbrenner, 1993, Portes, 1997, Stark and Blackwell, 1991), Curran and Saguy (2001) described the relations between networks of obligation, relative deprivation, trust and migration, in which networks of obligation link individuals (both migrating and non-migrating), relative deprivation motivates migration, and trust influences the content and formation of migrant network ties.

Massey (1990) debunked individual cost-benefit assumption that migration decisions are based on the calculations of a rational individual who weighs her/his expected gains against possible losses the model, advanced by Todaro (1986). He revealed that rather than isolated agents people are linked to one another through social networks. Networks of obligation could actuate people's migration intention, and reduce their perceived risk and accelerate further migration behaviour, through circulating positive information of migration among potential migrants.

Relative deprivation can be viewed as a necessary supplement to the impact of networks of obligation on migration process. Relative deprivation is first introduced by Stoffer et al. (1949) to study American soldiers' combat behaviours after World War II. Later, this concept is widely developed. Runciman (1966) notes that there are four preconditions of relative deprivation: a) Person A does not have X; b) Person A knows of other persons that have X; c) Person A wants to have X; d) Person A believes obtaining X is realistic. Curran and Saguy (2001) indicate that relative deprivation is not an automatic response to situations of inequality, nor is it a purely

rational assessment of ownership of various resources; rather, relative deprivation, or the perception that one unjustly lacks desirable resources that others possess, operates through personal identity. Different kinds of identity influence the experience of relative deprivation. Then it drives migration as individuals and households use migration to gain new and better goods (Stark and Blackwell, 1991).

Trust also plays a significant role in the relationship between networks and migration. Different scholars defined trust from diversified perspective. Curran and Saguy (2001) identify four most relevant types of trust: a) the assurance based on embeddedness in dense social networks; b) the good will based on cognitive bias (for example, childhood experience); c) the process based on past interactions; d) bounded solidarity or identification with a group. Among them, assurance and bounded solidarity can be effectively affected by networks.

3.2 Research model

Based on the above discussion, a research model in MIM context is developed where networks of obligation, trust and relative deprivation are proposed to be the impetuses to switching intentions for MIM, as shown in Figure 1.

Figure 1. The research model

3.2.1 Relative Deprivation

The concept of relative deprivation is widely used in sociology to investigate people's collective behaviours, such as social movement and human migration (Runciman, 1966, Curran and Saguy, 2001, Stark and Blackwell, 1991). It refers to "the experience of being deprived of something to which you think you are entitled" (Walker and Smith, 2002). Relative deprivation is related to the perceived gap existing between ones' economic and/or social conditions and certain reference groups (Silber and Verme, 2012). Relative deprivation is an affective consequence of inequality, facilitated by comparisons between "Haves" and "Have not" (Smith et al., 2012). It comes from perceived value asymmetry or competitive disadvantage compared

with other people who have better things. For example, when mobile phones are common in most societies, those who are unable to afford one is much more likely to feel deprived. Relative deprivation is a kind of subjective feelings and thus is highly related to individual differences in personality, such as age, impulsivity (Mishra and Novakowski, 2016, Callan et al., 2015). In addition to collective action like migration, relative deprivation can also predict other outcome variables: individual achievement and deviance, physical and mental health and personal decision making (Smith et al., 2012). For example, relative deprivation has been empirically verified to affect gambling and job hopping behaviour (Cho et al., 2014, Smith et al., 2012, Tabri et al., 2015). In this study, according to previous literatures investigating the advantages and values brought by MIM, we consider users' perceived relative deprivations from two perspectives, namely functional and monetary.

Functional deprivation refers to the practical or technical benefits deprivation that users perceive from a new type of IT service when they do not have any usage experience (Deng et al., 2010, Runciman, 1966). The distinctive functions of products or services determine whether to use them or not (Sheth et al., 1991, Deng et al., 2010). Function value is an important and fundamental predictor for users' satisfaction and loyalty for any innovative technologies (Tzeng, 2011, Zhou et al., 2011), including MIM. As a typical ICT tool, MIM has successfully integrated multiple communication functions as a portfolio, such as sending text messages, voice chatting, and group chatting, etc. All these functions are constantly improved by MIM providers to keep users' viscosity and attract new users. Nowadays MIM is a multi-functional social platform rather than a communication tool. WeChat can be seen as the first MIM to introduce various distinctive functions to users. For example, users can share their photos, routine lives with their friends on WeChat, and they can also play social games on it. Moreover, WeChat is also the pioneer to introduce "red bag" function, a cultural activity during Chinese new year, and this function has great impact in China (Willson and Leaver, 2016). Users may generate a great sign of envy and then this envy transfer to feelings of function deprivation, when they find people surrounded them are using these distinctive functions in WeChat. The feeling of functional deprivation then would trigger people's intention to use the new MIM. In addition to functional deprivation, we also propose monetary deprivation, which has been found to influence users' choices of mobile services and applications in previous IS literatures (Hong et al., 2008, Deng et al., 2010). Monetary deprivation is related to the economic issues about the new MIM, which means how much the MIM is satisfactory considering the cost, time and effort spent in using the MIM (Deng et al., 2010). This factor cannot be ignored because economic considerations are often regarded as an important aspect for customers' usage of WeChat. According the report of ChinaByte, one of the most essential reasons for people to use WeChat is "free voice and text chat". Before WeChat, China's MIM market was dominated by Fetion by China Mobile. At that time, compared with WeChat, the free range of Fetion functions was pretty limited that both messaging non-china mobile users and voice communication charged fees. In 2013, a rumour that WeChat might charge fee even induce a national discussion in China that most people feel disappointed with it. As low or even free charge for MIM is a great attractiveness for most users, monetary factor should be included

when considering the relative value deprivation for MIM. Consistent with Curran and Saguy's argument that relative deprivation motivates migration, we propose the following hypotheses:

- H1a: Users' functional deprivation on a new MIM has positive effect on their switching intention to the new MIM.
- H1b: Users' monetary deprivation on a new MIM has positive effect on their switching intention to the new MIM.

3.2.2 *Networks of Obligation*

In Curran and Saguy's study, they demonstrate that social networks are essential elements to understand human migration. Networks could link individuals with similar culture or values. One could obtain the evaluation of things and objects around them from other people in their networks, especially those who are in the important positions of influence. The effective instrumental information transmitted by social networks could gradually influence people's behaviour decisions (Hammel, 1990). Curran and Saguy (2001) suggest that people's perceived risks of migration will decline as they gain more and more positive information from other migrants. IS researchers have tried to use terms like "Peer influence" or "Interpersonal influence" to explore the effect of individuals' social networks on their post adoptive IS behaviours. Kim (2011) examines that interpersonal influence, referring to the extent ones' social networks influence their behaviours, has positive effect on users' continuance intentions in SNS, while Cheng et al. (2009) empirically examine that peer influence, referring to the effect of ones' friendship on their behaviour, is positive associated with users' switching intentions in SNS. In our research context, since Chinese people tend to believe and value strong social ties (Bian, 1997), and the major function of IM is to help people construct social networks, it is reasonable to assume that ones' networks of obligation could effectively activate their intention to switch to a new MIM when some of their friends, kin and other people important to them are using the new MIM. Therefore, we propose the following hypothesis:

- H2: Users' networks of obligation have positive effect on their switching intention to a new MIM.

Moreover, Curran and Saguy also state that networks, which expose people to different social groups, serve as conduits for strategic information, as well as cultural values and desires. Exposure to new ideas or objects can derive changes to individual identity and value. These, in turn, foster a pressing and urgent desire for market goods that are perceived as necessary for affirming the new identity (Csikszentmihalyi and Halton, 1981). According to the definition of relative deprivation, it is not an automatic response to situations of inequality, nor is it a purely rational assessment of ownership of various resources. Relative deprivation means the perception that one unjustly lacks desirable resources that others possess. Comparison with others is the necessary condition for the perception of deprivation. Network is the channel for individuals to generate potential deprivations and desires. When multiple channels, or more networks of obligation, push them to a new MIM, they have more possibilities to perceive situations of inequality. More exposure to the new MIM and the subsequent impact then

introduce more relative deprivations. Therefore, it is reasonable to consider that networks of obligation can positively influence individuals' perceived relative deprivation.

- H3a: Users' networks of obligation have positive effect on their functional deprivation on the new MIM.
- H3b: Users' networks of obligation have positive effect on their monetary deprivation on the new MIM.

3.2.3 *Trust*

Consistent with Curran and Saguy's argument that trust has great impact on human migration process, trust is also regarded as an important factor influencing users' IS behaviours (Gefen and Straub, 2003, Stewart, 2003). According to McKnight et al. (2002), trust building mechanisms in IS can be classified into three types: institution-based trust, knowledge-based trust and transfer-trust. Institution-based trust suggests that an organization believes that impersonal structures are in place to support the likelihood of transaction success (Pavlou, 2002). Institution-based trust is defined from an organizational view. However, since this study focused on user's cognitive trust, it is hard to measure institution-based trust in our research context. Gefen et al. (2003) describe that knowledge-based trust of a new IT artifact relies on ones' familiarity with it, a sort of experience with the what, who, how and when of the current situation. Knowledge-based trust of a party comes from their previous interaction with the party, which is relevant to ongoing trust rather than initial trust (Wang et al., 2013). We believe that in our context of switching intention to use a new IT, it is not appropriate to consider the knowledge-based trust as initial trust of a new IT directly. Hence, we focus on the third type of trust: transfer-trust.

As Wang et al. (2013) defined, trust transfer process refers to "a trust mechanism that one's trust in an unknown person/object can be derived from her/his trust in a known person/object which has certain association with the un-known person/object". Trust transfer can be described as a mechanism including three actors: the trustor who assesses the trustworthiness of trustee, the trustee who is judged by trustor, and a third person who acts as a broker. The concrete logic is that if the third person has a close relationship with the trustee, the trustor's trust on the third person may be transferred to the trustee. One research stream of transfer trust is discussing how to transfer trust on successful products/services to new ones, such as from offline services to online services (Lee et al., 2007) and online services to mobile services (Lu et al., 2011). These studies verify the feasibility of the trust transfer theory. In our case, individuals could use the new MIM by entering their account registered in other IT services provided by the same companies. For example, new users can log in WeChat using their QQ accounts which is designed by the same provider - Tencent. We assume that trust on a new MIM can be transferred from the IT provider and other IT products released by it. In the context of mobile application market, previous studies have empirically found that the characteristics of the Apps providers, including their App volume, App categories (Lee and Raghu, 2014), and users' reviews on them (Zhu et al., 2015), have important effects on users' choices of their products. Therefore, we

assume that when users have higher trust on Tencent, the provider of WeChat, and its other IT products or services, they will have higher switching intention to use WeChat.

- H4: Users' transfer trust from the provider of a new MIM has positive effect on their switching intention to a new MIM.

4 RESEARCH DESIGN

4.1 Data Collection

To test the research model, an online survey of MIM users was conducted. We adopted convenience and snowball sampling strategies in this study. A population of students at a university in eastern China were firstly invited to answer the questionnaire, and at the same time we asked them to spread our survey to their friends and families. Respondents would have the opportunity to get awards from a lottery draw after the survey, which included 5 first prizes (gift card with 50 RMB value), 20 second prizes (gift card with 20 RMB), and 30 third prizes (gift card with 10 RMB). The questionnaire was written in Chinese, and the scales used to measure the research constructs were translated from English. These scales were translated into Chinese by one researcher, and then the Chinese version of questionnaire was translated back into English by another researcher. Minor changes were made to the Chinese version to ensure that the meanings of all the items had been kept the same during the translation process. Before conducting the main survey, we invited 10 students from our school to perform a pretest to validate the instrument, and then we revised the questionnaire to make the wording of the items more precise. We examined subjects' perceptions and intention related to switching to use WeChat from other MIMs released before WeChat, such as mobile QQ, Feixin and so on. At the beginning of the survey, a simple task was designed to help subjects to retrospect switching behaviours and relative deprivation, considering some people might not be aware of their switching behaviours. We received 358 responses. Among them, 106 responses were deleted for some reasons: (1) the surveys were completed within 3 minutes, since the questionnaire was estimated to take 10 to 15 minutes to complete, and/or (2) the respondents gave the same score to all questions (e.g., all 6's). Finally, we obtained a sample consisted of 252 valid responses. The demographic characteristics of the final sample are shown in Table 2. We compared the demographics information of our sample and the population of China's mobile Internet users. We got the population data from a report published by China Internet Network Information Center (CNNIC, 2014b), and there was no difference between them. Hence, our sample is representative of mobile users in China.

Table 2. Demographic information

Variables	Sample Composition		
Gender	Male	99	39.29%
	Female	153	60.71%
Age	Under 20	29	11.51%
	21~25	128	50.79%
	26~30	53	21.03%

	31~35	22	8.73%
	Above 35	20	7.94%
Degree	Bachelor	171	67.86%
	Master	72	28.57%
	PhD	9	3.57%
Occupation	Students	133	52.78%
	Teachers	15	5.95%
	Company employees	82	32.54%
	Civil servants	13	5.16%
	Others	9	3.57%

4.2 Operationalization of constructs

There were five constructs of interest to this study, including networks of obligation, transferred trust, functional deprivation, monetary deprivation and switching intention. All the constructs were measured using multiple-item perceptual scales. All the items wording will be adapted slightly based on the context of our specific empirical research object – WeChat. They were adapted from validated instruments in previous studies whenever possible. The questionnaire was created in English and reviewed for content validity by a group of academics. As the questionnaire was designed in the context of a Chinese MIM, we translated the English questionnaire to Chinese and then back to English to ensure the translation equivalence (Brislin, 1970). Two PhD students independently translated the original items into Chinese, and then made an agreement on the final version for the questionnaire. The Chinese items were translated back into English by another professional translator to confirm translation equivalence. Before data collection, we interviewed 15 WeChat users using two questions: a) before switching to use WeChat, do they use any other MIMs? If so, how are their usage frequency of WeChat and their previous MIMs? b) What can WeChat bring to them from functional and monetary perspectives? The answers have been used to situate the items of questionnaire.

Appendix A lists the measures used in this study. Measures for networks of obligation were adapted from Cheng et al. (2009); measures for switching intention were adapted from Bhattacharjee et al. (2012). The indicators of trust were measured by the items adapted from Deng et al. (2010). In addition, since relative deprivation was little appeared in IS literature, following the procedure suggested by Moore and Benbasat (1991), the items used to measure relative deprivations were self-developed from integrating Runciman's (1966) four preconditions of relative deprivation and the results in our simple task interview mentioned before. All the constructs were measured with 7-point Likert scales, ranging from “strongly disagree” to “strongly agree”. Four demographic variables (age, gender, education, occupation) were included as control variables, because these individual differences might have effects on their IT behavioural intention (Venkatesh et al., 2012). In addition, a dispositional variable, personal innovativeness was also included as an alternate control variable of switching intention. Personal innovativeness refers to one's propensity to try out or experiment with new IT (Agarwal and Karahanna 2000). Individuals who are highly innovative and enjoy

experimenting with new products are more prone to IT switching (Bhattacharjee et al., 2012). The measures for personal innovativeness were from the work by Agarwal and Karahanna (2000).

5 DATA ANALYSIS AND RESULT

There were two stages during data analysis: (1) measurement modelling, for the reliability and validity of the measurement scales, and (2) structural modelling, for hypotheses testing. Partial least square (PLS) was utilized to accommodate the exploratory nature of the research model.

5.1 Measurement model

The goal of measurement modelling was to access the validity and adequacy of the measurement scales. Because there are two new instruments (functional and monetary deprivation) in our survey, we firstly used exploratory factor analysis (EFA) to check the quality of instrument and identify ways to improve instrument, using SPSS. Principal component analysis with Varimax rotation was utilized. The rule of thumb is that loading on intended factor >0.5 while loading on unintended factors <0.4 . Appendix B shows that all but one of the items meet the suggested threshold. One item for switching intentions (SI1) is dispersed over factors, and was dropped.

Although exploratory factor analysis has improved the instrument design, confirmatory factor analysis (CFA) checks the accuracy of item-factor matching. We used CFA to examine the convergent and discriminant validity of our data. Tables 3 and Table 4 present the measurement model results, including information about reliability, validity, correlations, and factor loadings. Convergent validity was identified by three criteria: 1) the loadings of all scale items should exceed 0.707; 2) the average variance extracted (AVE) for each construct should have high value (greater than 0.50); and 3) the composite reliability of each construct should be greater than 0.80. Results of our analysis are shown in Table 3 and 4. All the items had loadings greater than 0.707, and were significant at the 0.001 level. In addition, the composite reliability and AVE of each construct also satisfied the criteria. Hence, all the three conditions of convergent validity were adequate in our sample. Discriminant validity is assured when the squared root of the AVE for each construct is higher than the bivariate correlations between that and all other constructs. As shown in Table 4, this condition was also qualified in our sample. Hence, both convergent and discriminant validity were adequate.

Table 3. Psychometric properties of measurement scales

Scale Item	Item Mean	Item Std. Deviation	Item Loading	Standard Error	P value
NB1	4.62	1.551	0.883	0.047	<0.001
NB2	4.8	1.483	0.89	0.049	<0.001
NB3	5.13	1.338	0.878	0.057	<0.001
NB4	5.02	1.182	0.829	0.067	<0.001

TT1	4.76	1.33	0.92	0.054	<0.001
TT2	4.81	1.233	0.918	0.054	<0.001
TT3	4.77	1.32	0.91	0.052	<0.001
FD1	4.56	1.414	0.863	0.046	<0.001
FD2	4.9	1.359	0.925	0.057	<0.001
FD3	5.1	1.339	0.912	0.062	<0.001
MD1	5	1.397	0.901	0.053	<0.001
MD2	5.15	1.356	0.908	0.052	<0.001
MD3	4.91	1.498	0.82	0.063	<0.001
SI2	4.8	1.62	0.905	0.047	<0.001
SI3	4.39	1.556	0.905	0.05	<0.001
PI1	4.85	1.309	0.879	0.055	<0.001
PI2	4.22	1.561	0.914	0.041	<0.001
PI3	4.44	1.528	0.93	0.043	<0.001
NB, Networks of Obligation; TT, Transfer Trust; FD, Functional Deprivation; MD, Monetary Deprivation; SI, Switching Intention; PI, Personal Innovativeness					

Table 4. Inter-construct correlations

	CR	AVE	VIF	Inter-construct correlations					
				NB	TT	FD	MD	SI	PI
NB	0.93	0.76	2.07	0.87					
TT	0.94	0.84	1.70	0.47	0.92				
FD	0.93	0.81	2.72	0.65	0.57	0.90			
MD	0.91	0.77	2.23	0.64	0.50	0.65	0.88		
SI	0.91	0.82	1.78	0.46	0.45	0.60	0.55	0.91	
PI	0.93	0.83	1.54	0.37	0.48	0.53	0.37	0.45	0.91

Variance inflation factor (VIF) statistics were examined to assess the multicollinearity problems. According to the Table 4, all the VIF values were lower than 3.3. Hence, desired low multicollinearity was observed. Moreover, full collinearity VIFs can also be used for common method bias tests (Kock and Lynn, 2012, Lindell and Whitney, 2001). Hence, as all the VIFs are lower than 3.3, which means that common method bias is not an issue in this study.

5.2 Structural model

The next step is to examine the significances and strengths of each hypotheses and the variance explained of the dependent variable. Bootstrapping resampling procedure with 500 resamples was performed to test the structural model. In a PLS structural model, paths are interpreted as standardized beta weights in a regression analysis. Figure 2 shows the path coefficients and

explained variances for the model. In order to eliminate the confounding effects from specific individual characteristics, respondents' personal innovativeness to IT, age, gender, education and occupation were included as controls.

Figure 2. The structure model results

One of the dependant variables, switching intention, was jointly explained over 45% of the variance. The variances in functional deprivation and monetary deprivation were both explained over 40% by networks of obligation. There are six hypotheses in our model, and four of the hypotheses were supported in our PLS structural model. As is evident from Figure 2, both functional deprivation ($\beta = 0.28$, $p < 0.001$) and monetary deprivation ($\beta = 0.25$, $p < 0.001$) had significant effects on switching intention, providing empirical support for H1a and H1b respectively. Networks of obligation had significant effects on functional deprivation ($\beta = 0.65$, $p < 0.001$) and monetary deprivation ($\beta = 0.64$, $p < 0.001$), providing support for H3a and H3b, respectively. Moreover, one of the control variables, personal innovativeness, was found to have significant effect on switching intention, consistent with the finding by Bhattacharjee et al. (2012) that personal innovativeness do play a role in shaping ones' IT switching intention.

However, networks of obligation ($\beta = 0.05$, $p = 0.27$) had no significant effect on switching intention. Although the results suggested that Hypothesis 2 was not empirically support by our sample, it didn't mean this construct was not important to switching intention. Networks of obligation might not have direct effect on switching intention, but influence it through functional and monetary deprivation. Hence, we examined the mediation role of functional deprivation and monetary deprivation based on Baron and Kenny steps (1986). Table 5 presents the results of mediation analysis. In the step 3, when either eliminating functional deprivation or monetary deprivation, the path between networks of deprivation and switching intention became significant, indicating that the effects of networks of obligation were mediated through FD and MD.

Table 5. Mediation analysis

	Step 1	Step 2		Step 3	
	SI	FD	MD	SI	SI
R-squared (%)	39	42	41	43	42
Networks of obligation (NB)	0.30***	0.65***	0.64***	0.13*	0.14*
Functional deprivation					.37***
Monetary deprivation				0.33***	
*p<0.05, ** p<0.01, ***p<0.001					

However, the path from the trust transferred from provider to switching intention was not significant, which suggested that Hypothesis 4 was not supported. To understand the reasons of non-significance, we also analyzed the potential moderator effects, since the causal assumption of H4a might be conditional (Frazier et al., 2004). As suggested by Bhattacharjee et al. (2012) and Sun (2012), personal innovativeness has important moderated effects on other predictors' effects on post-adoptive IT behavioural intentions, including switching behaviour, thus we examined the moderated effect of PI to explain the H4. However, the moderated effect of PI was not statistically significant, indicating this explanation was not suitable in our context.

6 DISCUSSION

This paper focuses on the topic of IT switching behaviour brought by proliferated IT innovations. Drawing on a migration theory based on networks, this paper attempts to understand people's switching intentions in the context of mobile instant messaging (MIM) applications from a community perspective. The results of the empirical study confirm the role of networking in shaping IT switching intention indirectly. The results also confirm the motivated effect of relative deprivation on IT switching intention.

6.1 Major Findings

As expected, the two types of relative deprivations are significant antecedents of IT switching intention. Users' switching intentions can be enhanced if they are engaged with feelings of deprivation when they don't choose to use the new IT products or services at the beginning. In addition, the feelings of deprivation also fully mediate the effect of networks of obligation on switching intention, which means that networks of obligation may not influence switching intentions directly but through the effects of relative deprivations. In the context of MIM application, network is apparently pertinent to the adoption and switching of IT artifact. It is reasonable that if users find some people in their networks using a new IT, which introduce more feelings of deprivation, they would have higher switching intentions.

The analyses did not confirm the hypothesized relationship between transferred trust from IT providers and switching intention. We have tried to evaluate the moderated effect of personal innovativeness to understand the possible underlying reasons. However, it doesn't work in our case. We suppose another potential reason may be related to the public reputation of Tencent,

the service provider of WeChat. Though Tencent is one of the biggest Internet technology companies in China, its word-of-mouth is always questioned by the public. For example, Tencent is often accused of plagiarism (ChinaDaily, 2012). Hence, we may infer that although many people in China don't appreciate Tencent for some brand reasons, they could still continue to use various IT products and services provided by Tencent, which may weaken the predictive effect of transfer trust on the switching intention in our study. Another possible explanation may be the age of our sample. Age has been indicated to moderate the relationship between belief (e.g. satisfaction) and loyalty (Deng et al., 2010). Our respondents mainly are young people under 30 years old. Young people always have the tendency to embrace change and seek discovery and thus they hardly have strong commitment to IT service brand, like Tencent in this context. The moderated effect of age therefore should be examined in future by involving more respondents with broader age range.

6.2 Limitations

The first limitation of our study is the generalizability issue. We built our research model on the basis of Curran and Saguy's migration theory, which emphasizes the importance of networks, values and cultures on migration behaviour. MIMs are virtual platforms corresponding to home and destination in migration theory. Hence, Curran and Saguy's theory is fairly adaptable to study MIMs. However, due to the complex nature of migration phenomenon, the findings in this study may not be generalizable to other context, for example, the user switching behaviour in online game community. The future study may need to elaborate on the various types of user switching behaviour in online context, for instance, the switching from one brand to another, or the switching from one kind of social media to the others. In addition, some interesting factors, such as the Internet gene and community identity, should be considered and incorporated in the research model.

The second limitation of the study is that we use young people (most of them were students) as subjects. It can be argued that findings inferred from a student sample are not generalizable to a population of organizational users. However, according to the report from the China Internet Network Information Center, the main population of MIMs users are young people. University students are typical MIMs users. Moreover, many previous studies of IT use behaviour have successfully employed the sample of students and their inferences were not significantly different from other studies with relatively more generalizable sample. Future study may need to conduct some lab experiment or field experiment to test if there exists a significant difference between digital natives and digital immigrants in terms of the switching behaviour in MIM context.

Third, given the exploratory nature of adapting migration theory to study IT switching behaviour, we introduce a new concept, relative deprivation, to IS field. There are no existing instruments validated by prior research. Hence, we develop the measurement for relative deprivation by ourselves and consider it from two perspectives: functional and monetary. There may be additional aspects of relative deprivation beyond the two factors examined in our study that could be further explored in the future studies.

6.3 Implications for research

First, as IT switching problem has emerged to be a fertile and potentially insightful area of research, it has attracted more and more attentions from IS researchers. IT switching is viewed as an instance of adopting an incremental innovation, in contrast to first-time adoption of a new IT (Bhattacharjee et al., 2012). Although previous innovation diffusion theories, IT acceptance and continuance use theories can explain this phenomenon to some degree, studies are needed to understand the additional predictors omitted by previous research. This study complements literatures in this field from a migration perspective, which emphasizes the important role of social networks. IT switching phenomena, especially the online communication tools like MIMs, are collective-based rather than individual-based that a great deal of people choose to use a new IT in a relative short time. Hence, this study empirically verifies how network and its impacts influence IT switching.

Second, our study is an example of adapting a theory from other areas focusing on real world phenomenon to study similar phenomenon in virtual world. Our research question was related to “cyber migration” (Cheng et al., 2009), which drove the use of human migration theory in human geography. According to the recommendations from Grover (2012), we adapted Curran and Saguy’s migration theory to the IT context. For example, we examined the concept of relative deprivation from functional and monetary dimensions based on the specific feature of WeChat. In that case, our study serves as a demonstration on how to study new IT phenomenon by leveraging knowledge of existing theories from other disciplines.

The last contribution of our study is to introduce the concept of relative deprivation into IS field. Relative deprivation is an important concept with mature definition in sociology, but seldom examined by IS researchers. Relative deprivation has tight relationship with social networks. Social impacts, such as peer influence, social identity and so on, have been verified empirically as predictors of diverse IT phenomena. Hence, we suppose that the relative deprivation can be used to study IT switching as well as other personal or organizational usage of information systems that may be explored in the future studies.

6.4 Implications for practice

Our study has important practical implications as well. First of all, it is extremely important for IT practitioners to make product differentiation strategy. Nowadays, the constant deepening of economic globalization and increasingly fierce of market competition lead to homogenization of IT products and services, especially online communication tools. Our study finds that both functional and monetary deprivations are the main reasons why people switch to a new IT artifact. For IT practitioners who facing the problems that some of their users are switching to use other similar products, they should reduce the impact of relative deprivations by providing free or cheap product upgrades, or adding more creative and valuable functions and features to retain their users.

Our study also confirms the essential role of networks for online communication tools. How to continuously improve the convenience of communication by using these IT products should

always be a key issue for the designers of IT products and services. Moreover, we find that the trust transferred from IT providers have little impact on users' switching intentions. Hence, for those IT practitioners who hope to enter a new market, they should not over think about the peer pressure from the existing vendors, since users' choices of IT products seem to be less influenced by the familiarity of brands. With better functions and services, there are still some profit points and opportunities for new IT practitioner even although the competition is tough.

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APPENDIX A

List of measures	
Switching intention	<ul style="list-style-type: none"> • I would likely start using WeChat more. • I am considering increasing time on my WeChat and decreasing time on other MIMs • I am determined to switch to use WeChat.
Networks of obligation	<ul style="list-style-type: none"> • People important to me, such as friends, lovers and kinships, hope me to use WeChat • People important to me, such as friends, lovers and kinships, recommend me to use WeChat • A lot of my friends have moved to WeChat • My friends are satisfied with WeChat
Transfer trust	<ul style="list-style-type: none"> • I believe the IT products released by Tencent are reliable • I trust Tencent's products that I am using • I think Tencent is trustworthy

Functional Deprivation	<ul style="list-style-type: none"> • With the functions of WeChat, I feel I should also use these functions • With more needs being met by WeChat, I feel I should also have WeChat • With the convenience introduced by WeChat, I feel I should also have the convenience
Monetary Deprivation	<ul style="list-style-type: none"> • With the communication cost reduced by WeChat, I feel I should enjoy the reduction • With the price value introduced by WeChat, I feel I should also enjoy the value • With the economic value introduced by WeChat, I feel I should also have it
Personal Innovativeness	<ul style="list-style-type: none"> • If I heard about a new technology, I would look for ways to experiment with it. • Among my peers, I am usually the first to try out new technologies. • I like to experiment with new technologies.

APPENDIX B

The results of EFA						
	Component					
	1	2	3	4	5	6
NB1	.801	.050	.131	.207	.235	.180
NB2	.804	.002	.123	.171	.290	.245
NB3	.801	.157	.126	.293	.169	-.028
NB4	.720	.291	.268	.207	.103	.087
PI1	.140	.832	.125	.255	.165	.031
PI2	.144	.836	.214	-.005	.112	.217
PI3	.055	.874	.214	.057	.147	.169
TT1	.200	.201	.818	.180	.207	.070
TT2	.119	.183	.862	.124	.104	.216
TT3	.188	.203	.829	.174	.156	.092
FD1	.226	.380	.272	.104	.580	.308
FD2	.304	.209	.264	.202	.724	.257
FD3	.368	.164	.242	.273	.706	.179
MD1	.289	.059	.143	.776	.202	.224
MD2	.265	.102	.220	.773	.259	.133
MD3	.298	.194	.260	.619	.100	.286
<i>SII</i>	<i>.212</i>	<i>.115</i>	<i>.027</i>	<i>.479</i>	<i>.565</i>	<i>.054</i>

SI2	.095	.183	.137	.267	.235	.769
SI3	.215	.212	.185	.178	.158	.796
Extraction Method: Principal Component Analysis.						
Rotation Method: Varimax with Kaiser Normalization.						
NB, Networks of Obligation; TT, Transfer Trust; FD, Functional Deprivation; MD, Monetary Deprivation; SI, Switching Intention; PI, Personal Innovativeness						