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Examining mobile instant messaging user loyalty from the perspectives of network externalities and flow experience

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ABSTRACT

Due to the intense competition and low switching cost, building user loyalty is critical for mobile instant messaging (IM) service providers. Integrating both perspectives of network externalities and flow experience, this research identified the factors affecting mobile IM user loyalty. Network externalities include referent network size and perceived complementarity. Flow experience includes perceived enjoyment and attention focus. We conducted data analysis with structural equation modeling (SEM). The results show that both network externalities and flow experience significantly affect perceived usefulness and satisfaction, further determining user loyalty. Thus mobile service providers need to improve their IM platforms, and deliver positive network externalities and good usage experience to users. Then they can facilitate users' loyalty.

1. Introduction

The application of third generation (3G) mobile communication technologies has triggered the rapid development of mobile commerce. A report indicates that 40% of adult Americans go online wirelessly with cell phones (PewInternet, 2010). A China Internet Network Information Center (CNNIC) report shows that the number of mobile Internet users in China has reached 277 million, accounting for 66% of the Internet population (420 million) (CNNIC, 2010). These figures demonstrate the great user base and market potential of mobile commerce. Faced with this opportunity, mobile service providers have released a variety of services, such as mobile instant messaging (IM), mobile games and mobile payment. Among them, mobile IM, which enables users to conduct ubiquitous interactions with their peers, represents a popular mobile service in China and has ever been used by 61.5% of mobile Internet users (CNNIC, 2010). In US, about 30% of cell phone users have adopted mobile IM (PewInternet, 2010). There are many mobile IM products in the Chinese market, such as mobile QQ, mobile MSN, China Mobile Fetion, and Mobile Wangwang. These mobile IM products have similar functions such as text chat and facial emotion icons, and there exists intense competition among them. Thus a challenge facing mobile service providers is to retain their customers. On the other hand, the switching cost is low. Users can easily switch from a mobile IM platform to another. Thus, it is imperative to identify the factors affecting user loyalty towards mobile IM. Then mobile service providers can adopt effective measures to improve users' stickiness to their IM platforms.

As a real-time communication tool, mobile IM may produce significant network externalities as the number of users increases (Lin & Bhattacherjee, 2008). Network externalities mean that users can get additional values as mobile IM user network expands (Strader, Ramaswami, & Houle, 2007). For example, a user can communicate with more peers when the number of mobile IM users increases. Another example is that with the wide adoption of mobile IM, users have access to rich value-added applications, such as avatar shows, games, and music, which can improve their experience. Network externalities have received a considerable attention in economics (Dickinger, Arami, & Meyer, 2008). In the information systems discipline, network externalities have been integrated with the technology acceptance model (TAM) to explain user adoption of Internet IM (Wang, Hsu, & Fang, 2004), interactive information technologies (Lin & Bhattacherjee, 2008), communication technologies (Strader et al., 2007), and short message services (SMS) (Lu, Deng, & Wang, 2010). Thus network externalities are a significant determinant of user behavior. Users are probably more willing to continue using a mobile IM platform that can bring them network externalities.

On the other hand, due to the constraints of mobile terminals, such as small screens, low resolution and inconvenient input, mobile users' experience has been negatively affected (Lee & Benbasat, 2004). This will decrease their continuance usage intention. In this research, we measure user experience with flow, which represents an optimal experience (Hoffman & Novak, 2009). Extant research has found the effect of flow experience on user behavior in a

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variety of contexts, including mobile TV (Jung, Perez-Mira, & Wiley-Patton, 2009), mobile games (Ha, Yoon, & Choi, 2007), online shopping (Guo & Klein, 2009; Guo & Poole, 2009), e-learning (Ho & Kuo, 2010), and IM (Zaman, Anandarajan, & Dai, 2010). Flow also positively affects users' continuance intention. Deng, Turner, Gehling, and Prince (2010) noted that cognitive absorption (similar to flow) affects users' satisfaction, which further determines their continuance usage of mobile Internet services. Lee, Kang, and McKnight (2007) proposed that flow affects online banking user behavior through satisfaction. Hausman and Siekpe (2009) found that flow affects online consumers' purchase and return intention.

The purpose of this paper is to theoretically propose and empirically validate a research model to identify the effects of both network externalities and flow experience on mobile IM user loyalty. Network externalities include referent network size and perceived complementarity, whereas flow experience includes perceived enjoyment and attention focus. We involve perceived usefulness and satisfaction as mediators.

2. Research model and hypotheses

2.1. Network externalities

Network externalities mean that a user's utility increases with the number of users (Strader et al., 2007). Products or services that demonstrate network externalities are called network goods. Network externalities include two categories: direct externalities and indirect externalities (Katz & Shapiro, 1985). Direct externalities are associated with user number. For example, when the user base of a mobile IM platform expands, individual user can interact with more peers. Indirect externalities mean that many complementary products, services and functions are available to users with the network growth (Strader et al., 2007). For example, the wide adoption of Windows operation systems leads to the fact that there are rich software and applications running on them. In contrast, due to its limited number of users, Linux has fewer available applications. Another example is that as more users adopt wideband Internet, the price is lower and the access speed is faster.

Following Lin and Bhattacherjee (2008), we measured network externalities with two factors: referent network size and perceived complementarity. Referent network size reflects the number of people in a user's social circle that adopts a mobile IM platform (Lin & Bhattacherjee, 2008). Users employ mobile IM to interact with their friends, colleagues and relatives. Whether these groups adopt a mobile IM platform will affect their adoption and usage decision. Thus we are concerned with referent network size rather than the total network size. When referent network size is large, users can communicate with more peers. This may improve their perceived usefulness and satisfaction. In contrast, when referent network size is small, users may perceive low utility and give up using a mobile IM platform. Previous research has suggested the effect of referent network size on perceived usefulness (Lu et al., 2010; Strader et al., 2007; Wang et al., 2004). Thus, we propose,

H1.1. Referent network size significantly affects perceived usefulness.

H1.2. Referent network size significantly affects user satisfaction.

Compared to referent network size that represents direct network externalities, perceived complementarity represents indirect network externalities (Lin & Bhattacherjee, 2008). Perceived complementarity means that as user base expands, users can acquire many complementary functions and services (Strader et al., 2007), which bring additional values to them. For example, when more users adopt a mobile IM, they are able to access rich entertainment applications, such as games, music and avatar shows, which are developed by third-party organizations. These ancillary services will advance users' perceived utility and satisfaction as they can access various services via a single platform. The effect of perceived complementarity on perceived usefulness has been supported in previous research (Lin & Bhattacherjee, 2008). Thus,

H2.1. Perceived complementarity significantly affects perceived usefulness.

H2.2. Perceived complementarity significantly affects user satisfaction.

2.2. Flow

Flow is described as a holistic sensation that people feel when they act with total involvement (Csikszentmihalyi & Csikszentmihalyi, 1988). Flow is characterized by: (1) a seamless sequence of responses facilitated by machine interactivity, (2) intrinsic enjoyment, (3) a loss of self-consciousness, and (4) self-reinforcement (Hoffman & Novak, 1996; Novak, Hoffman, & Yung, 2000). Flow indicates that users' skills and challenges reach a good balance. When skills are larger than challenges, users feel bored. In contrast, when challenges are larger than skills, users are anxious. If both skills and challenges are lower than the threshold values, users feel apathy. Only when both skills and challenges exceed the threshold values and have a good fit will users experience flow.

As an elusive and broad concept, there exist different viewpoints on the components of flow (Hoffman & Novak, 2009). Koufaris (2002) noted that online flow experience includes three dimensions: perceived enjoyment, perceived control and attention focus. Guo and Poole (2009) suggested that flow includes six constructs: concentration, perceived control, mergence of action and awareness, transformation of time, transcendence of self, and autotelic experience. Hausman and Siekpe (2009) reported that flow includes four dimensions: challenge, concentration, control and enjoyment. Zaman and colleagues (2010) found that flow can be measured with two factors: perceived enjoyment and concentration. Among the components of flow, perceived enjoyment and attention focus are two of the most-often used factors (Finneran & Zhang, 2005; Hoffman & Novak, 2009). They are also directly used to measure flow in recent research (Lu, Zhou, & Wang, 2009; Zaman et al., 2010). Thus we will adopt perceived enjoyment and attention focus to measure flow experience.

Perceived enjoyment reflects that users acquire enjoyment and pleasure when they use mobile IM. Users adopt mobile IM to not only conduct communication, but also acquire enjoyment. Especially, as a personal communication tool, IM represents an entertainment platform rather than a productivity tool (Lin & Bhattacherjee, 2008). Thus perceived enjoyment is an important factor affecting user adoption of IM (Li, Chau, & Slyke, 2010). Perceived enjoyment represents an intrinsic motivation that emphasizes the usage process itself, compared to the extrinsic motivation such as perceived usefulness that emphasizes the outcome (Davis, Bagozzi, & Warshaw, 1992). If users get enjoyment when using mobile IM, their perceived usefulness may be improved because a good experience leads to their positive expectations towards future results (Deng et al., 2010). Agarwal and Karahanna (2000) noted that cognitive absorption (including perceived enjoyment) has a strong effect on the perceived usefulness of WWW. Ha and colleagues (2007) found that perceived enjoyment significantly affects the perceived usefulness of mobile gaming.

In addition, perceived enjoyment also affects user satisfaction. Users often expect to acquire enjoyment when using mobile IM. When their expectations are met, they will be satisfied. The effect