



Understanding users' intention to switch personal cloud storage services: Evidence from the Chinese market



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ABSTRACT

Cloud storage services have been rapidly gaining popularity among Internet/Mobile users. Prior studies largely focused on users' early adoption of cloud storage services, continual usage of the services and users' willingness to pay. However, limited attention has been paid to switching behaviors. In the Chinese market, as services provided by different platforms become homogeneous, non-functional factors are expected to play an important role in affecting users' selection of services. Based on the push-pull-mooring framework, we propose a research model by incorporating four factors: risk, trust, switching cost and social influences (critical mass and social norm). Results from a field survey suggest that all push (risk), pull (trust, critical mass) and mooring (switching cost, social norm) factors each have direct impacts on switching intention. Mooring factors fail to moderate the impact of push factor on switching intention, but they are able to moderate the effects of pull factors on switching intention. The results yield both theoretical and practical implications.

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1. Introduction

Cloud storage services have been rapidly gaining popularity among Internet/Mobile users, due to their advantages over traditional storage approaches. For example, cloud storage platforms usually provide a large storage quota for free (e.g., Baidu Cloud: 2TB; Dropbox: 2GB), along with high reliability. Users can upload files to the cloud when their local storage space is limited, and they do not need to worry about data loss due to obsolescence of local storage media (Burda & Teuteberg, 2015). Moreover, files stored in the cloud can be accessed in multiple ways, including web browsers, PC software clients, and mobile apps. File sharing is also convenient. Users can easily create sharing groups (in Dropbox) or send out temporary access passwords (in Baidu Cloud).

According to recent industrial statistics, in the Chinese personal cloud storage market,¹ the number of users increased from 23 million in 2011 to 380 million in 2014, and this number is expected to reach 450 million in 2015 (Iimedia, 2014). Such a huge market

has attracted many enterprises to provide cloud storage services. It has been reported that there used to be more than 30 known personal cloud storage platforms in Chinese market (e.g., Baidu Cloud, Mi Cloud, Tianyi Cloud and Tencent Cloud), and the providers of these platforms range from Internet service providers to telecommunication companies (Guo, 2014).

However, despite these exciting developments, the cloud storage market is relatively nascent in China. On one hand, due to fierce competition and a lack of mature business models, the services provided in different platforms become homogeneous (Csdn, 2014). On the other hand, imperfect government interventions and unstable regulations have caused serious trust issues and risk concerns. For example, the adaptability of a platform under changes of government policies, and whether a platform can perform as a protector to secure users' personal data under the interventions from the government (Jing, 2016). Although there is no official statistic about the number of users who have exhibited switching behavior, market investigators have estimated that over 237 million cloud storage accounts are needed be switched because of a newly proposed regulations against pornography and illegal publications (Mydrivers, 2016). Another noticeable issue is network effect caused by file sharing. A user's switching behavior might motivate others to switch. For instance, when a user moves his account to another platform, his followers (e.g., people who wish to acquire

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¹ Due to government policies, many global cloud storage platforms are blocked or not stable in China, such as Google Doc, DropBox and Box.net.

shared files) may be motivated to switch accounts. Therefore, by jointly considering market scale, homogenous services, unstable policies, a large volume of switching behaviors and network effect, understanding what factors influence a Chinese user's switching choice of personal storage service is essential.

As the services become similar, it is reasonable to argue that factors, which are not related to functional differences among services, will play an important role in affecting users' choice of services. These non-functional factors, according to prior studies on cloud storage, include trust, risk and social factors (e.g., social influence) (Arpaci, 2016; Burda & Teuteberg, 2014b, 2016; Yang & Lin, 2015). In this paper, we are interested in understanding how non-functional factors affect users' switching of personal online storage services. Particularly, we consider both individual and social factors, while most of the studies on online storage lean toward evaluating individual-oriented variables (e.g., privacy) (Burda & Teuteberg, 2015, 2016; Goode, 2015; Stantchev, Colomo-Palacios, Soto-Acosta, & Misra, 2014).

Compared to prior studies on IT switching or cloud storage, this study is interesting from the following aspects. First, prior studies largely focused on users' early adoption or acceptance of cloud storage (Ambrose & Chiravuri, 2010; Burda & Teuteberg, 2016; Stantchev et al. 2014), while a few began to address users' continual usage intention (Huang, 2016; Yang & Lin, 2015), as well as users' willingness to become paid users (Yan & Wakefield, 2015). However, limited attention has been paid to users' switching behaviour. Second, risk is one of the most important factors in cloud computing. Previous studies only measured general perception of risk, while this study explores multiple dimensions of risk and tries to highlight their differences. Third, the majority of previous studies only consider the impacts of peer opinions or suggestions (social psychological aspect of social influence); our study further evaluates the economic aspect of social influence. Despite recommendations from important people or herd effect, users might be attracted by a cloud storage platform because they can enjoy a better performance/service quality caused by richer resources.

2. Literature review

2.1. Users' IT switching behavior

Since users' post-adoption behaviors determine the ultimate success of an information system, much attention in Information System (IS) field has been paid to this issue. Switching is one of these unfavorable post-adoption behaviors. It refers to users' migration from one provider to another (Ranganathan, Seo, & Babad, 2006), and it is usually associated with users' dissatisfaction with incumbent product/service, as well as perception of the relative advantage of a substitute. However, IT switching behavior does not necessarily indicate that users abandon incumbent services (Keaveney & Parthasarathy, 2001). Therefore, it usually involves a partial replacement that the users use both services but rely more on the substitute. In line with previous studies (Peng, Zhao, & Zhu, 2016), we do not strictly define that a switching behavior should involve a complete abandon of incumbent service.

A summary of previous IT switching studies is shown in Appendix A. Current IS studies have addressed three types of switching. The first type is switching across different media channels, such as switching from traditional context to online context or mobile context (Lai & Wang, 2015; Park & Ryoo, 2013; Polites & Karahanna, 2012), or from online context to mobile context (Zhou, 2016). Such switching behavior is usually caused by the diffusion of new technologies, which bring creative usage experiences and benefits. The second type is switching between two homogeneous services, for example, users switch from one social

network site (SNS) to another SNS (Chang, Liu, & Chen, 2014), and from one instant messaging (IM) software to another IM (Fang & Tang, 2017). Users' dissatisfaction of incumbent service (e.g., low system quality, smaller user group) and attractiveness of alternatives (e.g., better interface design) could be major influential factors. The third type is switching between different services. For instance, users stop using blog services and start to use SNS (Hsieh, Hsieh, & Feng, 2011, 2012). As the substitute service can provide more comprehensive functions, users switch to enjoy more benefits (e.g., usefulness, ease of use). However, despite the factors mentioned above, it should be noted that other factors cannot be neglected, such as curiosity (need for variety), habit, past switching experience and social influence.

In previous studies, no consensus has been reached regarding theories or frameworks. Many researchers extend their theoretical foundations on the basis of the PPM framework (Hou, Chern, Chen, & Chen, 2011), while others build their own models according to their application contexts (Peng et al., 2016). Some constructs, which are extracted from technology acceptance models (TAM) (e.g., perceived usefulness and perceived ease of use), expectation-disconfirmation model (ECM) (e.g. expectation, satisfaction), decomposed theory of planned behavior (DTPB) (e.g., subjective norm, self-efficiency) and innovation diffusion theory (e.g., relative advantage and personal innovativeness), have been repeatedly tested for explanation power, while other constructs have not received sufficient attention, such as trust and risk.

2.2. Current studies on personal cloud storage

In personal cloud storage, researchers have mainly focused on solving technical issues, rather than understanding users' motivations. The majority of studies on motivation focus on two topics: users' adoption and continual usage.

Regarding users' adoption of personal cloud storage, Ambrose and Chiravuri (2010) and Stantchev et al. (2014) investigate the impacts of perceived ease of use, perceived usefulness and privacy concern. The results suggest that the former two factors are motivators while the latter is a demotivator. In a series of works conducted by Burda and his colleagues (Burda & Teuteberg, 2014a, 2014b, 2016), the effects of factors such as reputation, familiarity, trust, risk, service quality, price, personal IT innovativeness are validated. Arpaci (2016)'s work further confirms that subjective norm and ubiquity of services motivate users to use cloud storage services.

Among studies on continual usage, Yang and Lin (2015) build their model based on Task-Technology Fit theory and suggest that perceived usefulness, service support, unstructured task, self-efficiency and social influence have positive relationships with users' continual usage intention, but risks (e.g., lack of policy, privacy protection issue) suppress these relationships. Huang (2016)'s work suggests that social presence is a strong predictor of users' continual usage. In another study, Yan and Wakefield (2015)'s work focuses on converting free-trial users to paid users. They find that system usage has a positive effect on free-trial users' willingness to pay, and this effect is mediated by perceived value towards the use of cloud storage services.

However, knowledge of users' switching behavior, as well as users' discontinuance, is limited. Goode (2015)'s work is the only study we found to address switching issues in cloud storage area. However, this study only considers users' dissatisfaction towards incumbent services based on individual-oriented factors, while attractions from substitute services and impacts from social factors are not addressed.

In all, despite the achievement of previous work, there is a gap in understanding users' switching behavior in cloud storage services.

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