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Retaining and attracting users in social networking services: An empirical investigation of cyber migration

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ABSTRACT

Users are the most critical strategic resource of any online social networking service (SNS). This paper offers strategic recommendations for SNS providers based on an empirical study exploring why users switch from a primary SNS to others. We first identify important characteristics that *combine* to distinguish SNSs from conventional information systems, then develop a "cyber migration" research model that includes push, pull and mooring factors which influence user intention to switch from one SNS to another. Findings from a field survey of 180 users reveal four significant factors that promote switching: dissatisfaction with socialization support, dissatisfaction with entertainment value, continuity cost, and peer influence. Strategies grounded in these factors are suggested for SNS providers to better attract and retain users.

Introduction

In the last decade, online social networking services (SNSs) such as Facebook, LinkedIn, and Google+ have seen dramatic growth in popularity. This demand has promoted the advent of many new SNSs, meaning even the major, established SNSs face fierce competition for users. Failures in the face of such competition include the very first SNS provider, SixDegrees, which folded in 2000, while Microsoft's Windows Live Space shut down in 2010. Google Orkut has been successful in certain geographic areas, but has failed in others (Boyd and Ellison, 2008). Facebook, currently the largest SNS, also faces key challenges to growth in its post-IPO era (Forbes, 2012).

Conceivably, the long-term success of SNSs depends on a critical mass of users, particularly active users (Zeng and Reinartz, 2003; Enders et al., 2008). Users can easily switch to other SNSs without a financial cost. Thus, in order to retain users, it is imperative for SNS providers to understand why users switch. What factors affect users' intentions to switch between SNSs? What are the specific constituent design and social factors that contribute to users' evaluations of an SNS? How should the answers to these questions influence SNS providers' strategy? To seek answers to these questions, we consider related theoretical perspectives and develop a research model based on the *push–pull–mooring* (*PPM*) framework from migration literature (Moon, 1995; Lee, 1966; Bogue, 1969). The subsequent empirical study reveals

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important and specific factors that promote the switching or migration of users between cyber communities (i.e., cyber migration). In a cyber migration, users typically do not completely terminate an existing account even after switching to another SNS. Thus, users' *switching between SNSs* can be considered a usage-level shift from their primary SNS to an alternative one.

While in strategic information systems (IS) research literature, it has been claimed that a critical mass of active members determines the success or failure of a digital marketplace (Koch, 2010), little research to date has directly and empirically investigated users' switching between SNSs. And though user switching and the consequent change in the market share of SNSs is a recognized strategic issue (Rust et al., 2004), the study of member behavior and its strategic implications in the networked business ecosystem is a relatively new focus (Merali et al., 2012). Furthermore, the extant IS literature regards users as relatively independent decision makers in the choice and use of conventional productivity-oriented ISs, while in the context of SNSs, users are tightly knit residents. This difference implies a significant change in users' relationships with systems, and hence demands a fresh look at user acquisition and retention strategies.

The literature on social networks and social media largely emphasizes issues *within* SNSs, such as privacy, security, primary functionalities and the influence of, and information sharing among, users (Boyd, 2004; Ellison et al., 2007; Jagatic et al., 2007; Aral and Walker, 2012). Research by Wang et al. (2008) that examined the effect of computer self-efficacy on users' continuance intention towards an SNS, and by Hu and Kettinger (2008) that discussed the benefit and cost factors that affect users' continuance in using an SNS, are pertinent to our research; however, the models developed did not consider competition *between* alternative SNSs and have not been empirically tested.

Prior service-switching literature, that applied the PPM framework, examined consumer behavior, but not user behavior in SNS contexts. Bansal et al. (2005), one of the most cited studies in this field, identified a list of first-order reflective push, pull, and mooring factors in the marketing context; the key factors included product quality, price, value, and consumer variety-seeking. Lui (2005) explained user switching between commercial IT services using satisfaction, price, and attractiveness of the alternatives as push and pull factors (switching cost was considered a moderator). However, purchase decision-related factors do not directly apply in the online social network context, where services are typically offered to users *free* of charge.

Recognizing this critical difference between consumers and system users, Ye and Potter (2011) used a PPM-based model to study users' switching between Web browsers; relative advantage, ease of use, and perceived security were identified as pull factors while lack of satisfaction with the current software was the push factor. Zhang et al. (2012) investigated blog service switching and found users' dissatisfaction with the existing platform, the attractiveness of alternatives, and sunk costs to be the push, pull and mooring factors. Chang et al. (2013) studied users' regret and dissatisfaction as push factors, attractive alternatives as pull factors, and switching costs as mooring factors in SNS switching. These three studies have confirmed the existence of general push, pull and mooring forces in users' switching of systems, but have not revealed more specific and actionable constituent factors for these forces for SNS providers to act upon.

We first identify important characteristics that *combine* to differentiate SNSs from conventional ISs. Based on those characteristics, we identify a comprehensive list of *specific, constituent factors* that influence users' switching between SNSs. This list elaborates on the overarching push, pull and mooring factors. Our empirical study reveals that dissatisfaction with socialization support, dissatisfaction with entertainment value, continuity cost, and peer influence are the significant constituent factors to users' switching intention. Furthermore, this research also investigates factors related to the communal nature of SNSs, such as the non-financial cost of losing connection with existing friends (i.e., continuity cost), socialization support, member policy, and entertainment value provided by different SNSs. These factors – which are important considerations in the context of today's flourishing digitalized social systems (Merali et al., 2012) – have received little attention in existing service switching and IS continuance literature. Finally, this study places users' switching decisions in a competitive context by incorporating not only properties associated with their current choice, but also a comparison with a competitor. Therefore, our findings at an individual level have clear strategic implications.

In the next section we discuss three roles of SNSs and use these to identify relevant theories. Based on this theoretical ground, we then propose a research model which consists of factors that are accountable for SNS users' switching intention. Finally, the survey, its findings and implications are discussed.

Characteristics of SNSs and theoretical perspectives

A social networking service (SNS) is an online service where a user can create and share a personal profile, and seek, connect, and build relationships with others via personal networks (Boyd and Ellison, 2008; McDowell, 2006). In this paper, we examine three roles online SNSs play: SNSs as information systems, SNSs as services, and SNSs as cyber communities. The three roles *combine* to characterize SNSs and differentiate them from traditional ISs. We then discuss useful theoretical perspectives that help to understand user behaviors in SNSs.

SNSs as information systems

From a technological perspective, SNSs are a type of *information system*. A service provider is the owner of the online technological platform, and SNS users voluntarily join and use the platform. Therefore, related IS literature is useful for understanding user behavior in SNSs.

IS continuance theories

An extensive body of IS research has examined the *early-stage* interaction with an IS (see a review in Venkatesh et al., 2003). IS use in the *post-adoption stage*, the stage when an individual seeks to reinforce an adoption decision or to reverse it, has also attracted significant research attention (De Guinea and Markus, 2009). According to expectation confirmation theory (ECT), consumers' intention to repurchase a product or service is determined by their *satisfaction* with their prior use of the product or service (Anderson and Sullivan, 1993). In IS literature, while perceived usefulness is crucial to adoption intention and even to continuance intention (Kim et al., 2007), satisfaction is theorized as the more critical antecedent of IS use and success (DeLone and McLean, 1992, 2003). Satisfaction is empirically shown to be a stronger predictor of continuance intention than perceived usefulness (Bhattacherjee, 2001).

In contrast with ECT, which has a focus on attitudinal evaluation of an IS, the integrated framework of technology use (Kim, 2009; Kim and Malhotra, 2005) argues that earlier usage behavior is an important factor affecting later use. Research suggests that with increasing use, there is a "locked-in" effect due to *switching costs* which can also influence continuing use of an IS (Jones et al., 2002; Xue et al., 2006). Recent research on IS continuance has also started to pay attention to the effects of *social influence*. In the online context, maintenance of social capital is conceptualized as an important motivator for remaining in a community (Hu and Kettinger, 2008). In the offline context, research has shown that social support from colleagues is positively related to continuing use of an IS (Sykes et al., 2009).

SNSs as services

SNSs are online *services* provided by a platform owner to facilitate socialization among users. Users not only use the service for free, but also can switch between service providers (Keaveney, 1995). Previous IS continuance research has focused on contexts where there were no competing systems. This assumption might be viable for organizational systems where there are typically no alternatives. However, for consumer applications, there are always competing products or services, for example, Microsoft Office versus Open Office, iOS versus Android, and Facebook versus MySpace. IS continuance research suggests that discontinuance is a function of the disconfirmation of current systems in comparison to the initial expectation (Bhattacherjee, 2001), but users' expectations of SNSs may change when the site is challenged by another SNS. Therefore, we examine service switching literature and use it to guide the development of our cyber migration research model.

Service switching theories

While there is rich literature on service switching and customer retention, the main themes in customer retention research are satisfaction, service recovery, relationship, alternatives and switching cost (Colgate et al., 2007). Relevant to our study, a few key tenets can be summarized from service switching literature. First, consistent with IS continuance theories, *satisfaction* with the current service provider is consistently regarded as the most critical factor to customer loyalty and retention (Heesup et al., 2010; Kim et al., 2006; Lemon et al., 2002; Mittal and Kamakura, 2001; Varki and Colgate, 2011). Second, *value of service* is the main antecedent of satisfaction (Heesup et al., 2010). Constituent factors of the value of service, such as core service quality, service encounters (Heesup et al., 2010), service recovery (Keaveney, 1995), and relationship with service personnel (Burnham et al., 2003), have been examined in the literature. Monetary expenses (e.g., product price or other financial costs) and service convenience (Keaveney, 1995) are considered value components of service. The competition between service providers mainly focuses on value components (Colgate et al., 2007; Keaveney, 1995; Kim et al., 2006; Yen and Horng, 2010). Third, service switching literature has also suggested various dimensions of *switching costs*. For example, Jones et al. (2002) classified switching costs into learning cost (i.e., search, evaluation and setup cost), continuity cost (i.e., the cost of foregoing the service of the current firm) and sunk cost (i.e., investment with the current firm). Similarly, Burnham et al. (2003) identified procedural cost, financial cost and relational cost as part of customer switching costs.

SNSs as cyber communities

SNSs, in addition to being systems and services, are primarily *cyber communities* where people seek to build relationships with others. SNS community members not only use the system, but also reside in it. Users of traditional productivity-oriented ISs do not reside in the system. Such ISs do not provide support or facilitate socialization among users. Thus, users' discontinuance of use would not incur a community continuity cost. The effect of offline community support in a traditional IS is to help IS users cope with IS/IT-induced organizational change (Bruque et al., 2008) rather than continuing use. In contrast, the movement of Web 2.0 places users right into a connected community. Therefore, in cyber migration, an additional theoretical lens needs to be applied in understanding SNS users as community residents, rather than typical consumers (Bansal et al., 2005) or users of other ISs such as Internet browsers and blogs (Ye and Potter, 2011; Zhang et al., 2012).

Push–pull–mooring human migration framework

The PPM framework was developed based on Ravenstein's (1885) accumulative "Laws of Migration", and has been regarded as the most important theoretical contribution to migration literature (Boyle et al., 1998). Factors affecting a migrant's decision to move from one geographical area to another are categorized into push, pull and mooring factors. The *push factors* refer to the negative attributes of the original place which drive people away from it, while the *pull factors* are the positive factors of the destination which attract people to it (Bogue, 1969; Lee, 1966). The *mooring factors* were

originally labeled as "intervening obstacles" (Lee, 1966) that bind a person to a particular place (Moon, 1995). Mooring factors can be life-course, cultural, social or environmental issues that act to either hinder or facilitate migration (Bansal et al., 2005; Moon, 1995; Lee, 1966). In agreement with the literature, this study recognizes that mooring factors could be either barriers or facilitators of migration.

There are two theoretical tenets of the PPM framework. First, push and pull factors are often economic factors (e.g., employment, wage, tax, and housing), environmental factors (e.g., climate and pollution), and community factors (e.g., race composition, security, and size). These push and pull factors are generally symmetrical. For example, a factor such as employment or cost of living is often considered both a push and a pull factor, depending on its pertinence to the origin or destination. In contrast, mooring factors often pertain to relationship factors (e.g., kinship and friends). Second, the PPM framework does not mandate a fixed set of push, pull or mooring factors as a variance theory would do. Rather, it serves as a useful framework to categorize factors for a specific migration phenomenon. The framework requires considerations of the distinct characteristics of an SNS to further identify specific push, pull, and mooring factors.

In the light of the PPM framework, this paper defines *negative properties associated with a user's original SNS* as push factors for switching intention, and *positive properties of the destination SNS* as pull factors. We regard *the user's social relationships at the origin and destination* as mooring factors, because these properties are not attributes of migration origin or destination per se, but rather are user-specific factors which impede or facilitate migration.

Research model and hypotheses

Based on our review of IS continuance and service switching literature, we suggest dissatisfaction with the primary SNS as an overarching push factor of switch intention. We consider the attraction of alternative SNSs as an overarching pull factor. Inspired by the PPM-based studies, we identify switching costs and peer influence from an alternative SNS as mooring factors. Switching costs and peer influence are modeled as separate mooring factors because they are conceptually distinct constructs.

Fig. 1 presents an overview of the research model and hypotheses. Dissatisfaction, attraction, switching costs, and peer influence are conceptualized as *aggregate* constructs in order to offer more insights specific to the SNS context. The reason for using aggregate constructs is twofold. First, an aggregate construct offers conceptual simplicity, semantic richness, and practical relevance simultaneously (Edwards, 2001). Second, the use of aggregate constructs is methodologically consistent with the original development of the push–pull–mooring framework (Jarvis et al., 2003).

We draw on the IS success model (DeLone and McLean, 2003), the IS hedonic value (Van der Heijden, 2004), and social penetration theory (Altman and Taylor, 1973) to identify technical quality, information quality, entertainment value, socialization support, and member policy as constituent factors of dissatisfaction with the current SNS. The attraction of alternative SNSs is also comprised of these factors. Constituent mooring factors include the switching costs that would be incurred, and peer influence from the alternative SNS. These two factors work as hinderer and facilitator respectively. Based on the user switching process, we further include setup cost at the alternative SNS and continuity cost as constituent factors of switching costs.

Push factors – dissatisfaction and its constituent factors

In IS literature, satisfaction is considered a summary of recent and distant past experiences, and it reflects both utilitarian and emotional evaluation of a system (Bhattacherjee, 2001; De Guinea and Markus, 2009; Kim, 2009). In service switching

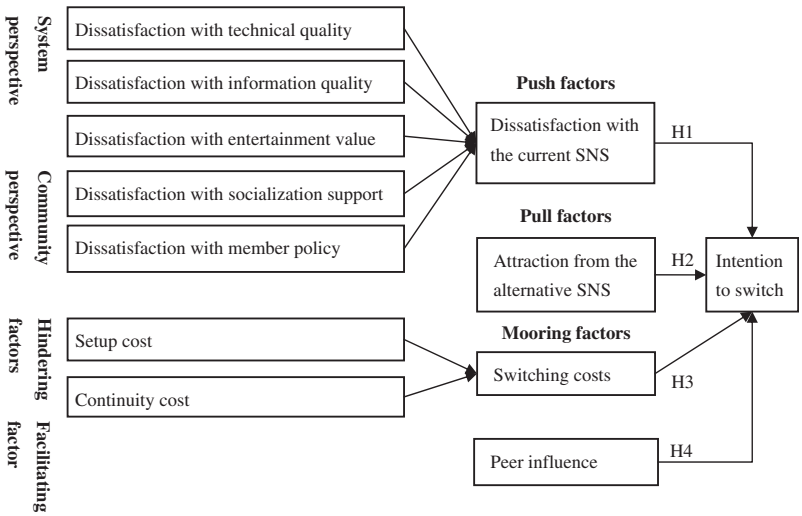

Fig. 1. The research model.

literature, dissatisfaction is shown to be caused by service value attributes, and is positively associated with an intention to switch service providers (Bansal et al., 2005; Heesup et al., 2010; Mittal and Kamakura, 2001; Varki and Colgate, 2011). In online contexts, satisfaction is also found to be negatively associated with bloggers' switch intention (Zhang et al., 2012). We therefore define users' dissatisfaction with diverse aspects of their current SNS as an aggregate push factor which amplifies intention to switch to another SNS.

H1 (*Dissatisfaction with the current SNS*). A user's overall dissatisfaction with the current SNS is positively associated with the intention to switch to an alternative SNS.

In behavioral research, satisfaction or dissatisfaction is often examined as an aggregate multidimensional construct (Edwards, 2001). The theoretical completeness of an aggregate multidimensional construct depends on the completeness of its dimensions (Diamantopoulos and Winklhofer, 2001). Based on theories in IS research and empirical research into SNSs, we conceptualize dissatisfaction as a second-order aggregate construct consisting of five dimensions of users' dissatisfaction with an SNS: technical quality, information quality, entertainment value, socialization support, and member policy.

Technical quality and information quality

First, from a system user perspective, research has established that system users' satisfaction is influenced by technical quality and information quality (DeLone and McLean, 2003). *Technical quality* includes the speed of downloading, navigation structure, convenience of maintenance, and functional richness. *Information quality* relates to the characteristics of the information that an SNS produces, concerning the timeliness, reliability, format and amount of information provided by the SNS. While the main purpose of SNSs is for socialization, extant research into SNSs nevertheless found that information quality was an important variable. For example, Park et al. (2009) found that for Facebook users information need is an important dimension besides socialization. Professionals use SNSs to collect and share information that would help promote their projects or advance their career (DiMicco et al., 2008). Meanwhile, the problems of fake profiles, Internet trolling (i.e., messages to provoke other people) and spamming have long plagued most SNSs. Therefore, we posit that a user's dissatisfaction with the technical and information quality of the current SNS are constituents of their overall dissatisfaction with the site.

Entertainment value

While technical quality and information quality represent the utilitarian aspects of users' needs, recent IS research suggests that hedonic value is also an essential element of users' needs. Hedonic value refers to the enjoyment users derive from the process of participating in and using an SNS, apart from its utilitarian values (Van der Heijden, 2004). Empirical research suggests that perceived enjoyment is very important in the contexts of web systems, games, and systems for home and leisure purposes (Van der Heijden, 2004; Venkatesh, 1999).

Users derive *entertainment value* from SNSs in two ways. First, socialization is in itself entertaining for SNS users (Boyd, 2004; Park et al., 2009). Second, the entertaining media on SNSs contribute to their entertainment value. The socialization aspect is covered by other constructs in the model, so we focus on the second aspect here. Pempek et al. (2009) found that besides socialization, seeking and posting images and seeking entertainment were respectively the second and third most important motivations for Facebook users. Most third-party applications on SNSs are designed for entertainment purposes too. According to AppData.com, of the top 10 Facebook applications in August 2011, seven were game, music, or photo applications. Therefore, we posit that a user's dissatisfaction with entertainment value is a constituent of the user's overall dissatisfaction with the current SNS.

Socialization support and member policy

SNS users are not only system users, but also community members. Undoubtedly, the major function of an online community is to facilitate socialization (Boyd and Ellison, 2008; Ellison et al., 2007; Hu and Kettinger, 2008). According to the social penetration theory, a socialization process is a communication and self-disclosure process characterized by opening up one's personal space to build intimate relationships with others (Altman and Taylor, 1973). On the benefit side, SNSs facilitate communication and self-disclosure among friends. On the cost side, SNSs may expose a user to an unintended audience and bring about privacy concerns. In this light, we derive two service attributes for socialization: the *socialization support* of the SNS that facilitates communication between users and the *member policy* that defines the general nature of the audience of self-disclosure.

Research into online social networks has identified various forms of socialization support that SNSs could offer. Among them, the main functions include communication with existing friends through messages, posts, comments, blogs, and walls (Boyd, 2004), maintaining a personal profile for self-presentation and image management (Boyd, 2004; Park et al., 2009), meeting like-minded new friends (DiMicco et al., 2008; Pempek et al., 2009), and organizing group events (Pempek et al., 2009). These functions help members to present themselves and access details about one another's lives to develop deeper relationships. We posit that a user's dissatisfaction with the socialization support of the current SNS is a constituent of the user's overall dissatisfaction with the site.

SNSs are public environments that raise members' privacy concerns (Chen et al., 2009). As Boyd (2004) observed, in mediated online spaces, the audience of self-disclosure is not limited to a few friends, but the whole community. From the service provider's perspective, the member policy defines the eligibility of participation, rules of conduct, content allowed, and

information privacy. Therefore, it defines the degree of uninvited social penetration and privacy risk to which one is exposed. Therefore, we posit that a user's dissatisfaction with the member policy of the current SNS is a constituent of the user's overall dissatisfaction with the site.

Pull factors – attraction and its constituent factors

Migration literature suggests that migrants compare various attributes of their origin and their destination in their decision-making. Service switching research demonstrates that, similarly, users' intention to switch services is positively associated with their perception of alternatives (Kim et al., 2006; Zhang et al., 2012). Therefore, besides dissatisfaction with their current SNS, we hypothesize that attraction from an alternative SNS affects users' switching intention:

H2 (*Attraction from an alternative SNS*). Attraction from an alternative SNS is positively associated with the intention to switch to the alternative SNS.

Based on the analysis of the nature of SNSs in the development of *H1*, we posit that attraction from an alternative SNS can include a combination of the technical quality, information quality, entertainment value, socialization support, and member policy of the alternative SNS.

Mooring factors – switching costs, peer influence and their constituent factors

When there are mooring factors, migrants may not move to another geographic location even when they are under strong push and pull influences (Lee, 1966). *Switching costs* are typical *hindering* mooring factors. They are the costs that users have to bear when they switch from the current service to another, such as continuity, learning and sunk costs (Jones et al., 2002).

H3 (*Switching costs*). The overall switching costs associated with a potential move to an alternative SNS are negatively associated with a user's intention to switch to the alternative site.

Switching cost is conceptualized as a second-order aggregate construct. There are two major switching costs in SNS contexts. First, users have to spend additional time and effort to sign up for a new SNS account and to build a new profile. Moreover, the messages posted, the images uploaded, and other personalized information contributed to the current site would become a sunk cost unless users made an effort to move them to the new site (Xue et al., 2006). These costs constitute the *setup cost*. Therefore, we posit that the setup cost at an alternative SNS is a constituent of a user's switching costs to the alternative site.

Second, if users intend to switch to another SNS, they would have to notify their friends of the move. Users need to exert a considerable effort in order to move their relationships to the new SNS. Otherwise they may lose these relationships. This is the SNS users' *continuity cost*. In an offline context, the difficulty of moving or breaking off current relationships has long been regarded as a deterrent to one's switching to another social context (O'Reilly et al., 1989). Therefore, we posit that the continuity cost at the primary SNS is a constituent of a user's switching costs associated with a potential move to the alternative site.

In contrast to switching costs, some mooring factors could *facilitate* a migration decision (Bansal et al., 2005; Moon, 1995; Lee, 1966). In traditional IS contexts, peer influence is regarded as an important factor in the adoption of new technology. In SNS contexts, peer influence is defined as the influence of friends who have already moved to the alternative SNS and invited the member to move. Most existing SNSs provide functions such as automatic email invitation and suggestions of friends-you-may-know to encourage users to invite more friends to join. Nevertheless, earlier research into online service switching behaviors did not take into consideration this peer influence on users (Lui, 2005; Zhang et al., 2012). When peer influence is defined as a subjective norm to use the current IS, some research treated peer influence as a mooring factor that made users stay (Ye and Potter, 2011). Note that such a subjective norm is incorporated into our conceptualization of continuity cost. In this study, we consider peer influence from the alternative SNS as an important facilitator.

H4 (*Peer influence*). Peer influence to move to an alternative SNS is positively associated with a user's intention to switch to the alternative site.

The survey

Instrument development

A survey was conducted to empirically validate the research model. In the instrument development process, we paid careful attention to the theoretical and empirical distinctions between formative and reflective indicators in the measurement model based on related prior research (Kim et al., 2006; Cheng et al., 2009; Palmer, 2002; Xu and Chen, 2006). All items were measured on a seven-point Likert scale or on a semantic differential scale. For formative items, a global item was also

added for each first-order construct in order to assess their external validity. Appendix A presents the final instrument with constructs, items, their scales, and sources.*Technical quality* of an SNS was measured based on the process of using the service (i.e., download speed, navigation, and profile management). *Information quality* was measured by adequacy, reliability, organization, and usefulness of information on an SNS site. *Entertainment value* included applications, games, and multimedia content. *Socialization support* included group management, communication, event organization, and people searching. *Member policy* included eligibility, user privacy, user conduct, and user content. *Attraction of an alternative SNS* included users' evaluation of the alternative SNS through five items (i.e., technical quality, information quality, entertainment value, socialization support, and member policy) in comparison to the primary SNS. We treated the first-order dimensions of dissatisfaction as items of the attraction of an alternative SNS because (1) it reduced questionnaire length and participant fatigue, and (2) subjects would have an understanding of these dimensions having answered items on dissatisfaction. *Setup cost* included sign-up, profile building, and content moving. *Continuity cost* included notification of friends, cost of contact loss, and rebuilding of a network. *Peer influence* included friends' attitudes, percentage of friends switched, and friends' recommendations and invitations to switch. The dependent variable, *intention to switch*, was measured with reflective items on a seven-point Likert scale adapted from existing research.

Control variables (i.e., age, education, gender, and work experience) were included in the study. Age, education, and gender are basic demographic variables often used to indicate the demographic generalizability of findings. They have also been found to influence Internet usage (Venkatesh et al., 2003). As our sample included mainly subjects who were working professionals, work experience was also included.

To check the face validity, we invited two senior IS researchers to evaluate the instrument, and conducted a pretest involving 25 employees from an industrial research institute. A focus group discussion was conducted with the respondents to gauge their understanding of the instrument and to collect feedback. Minor revisions were made to the questionnaire. Specifically, the "N.A." option was added to the item which asked about respondents' perception of games provided by SNSs, because not all SNSs provide games and not all users choose to play the games provided.

The main study

Survey invitations with the URL of the questionnaire were posted on the personal homepages of a convenient set of active users of Facebook, Windows Live Space, LinkedIn, and Friendster, and were mass emailed to employees of an international business park in Singapore, for 10 days in 2009. The survey was conducted in English. The invitation stated that only people with at least one SNS account and at least one year of work experience were eligible for the study. The definition of SNS and a list of SNSs were presented in the survey instructions. As a motivation for participation, a S$10 donation was promised to an international charity for each completed questionnaire. During the study period, S$1 was about US$0.80. Participants were also offered a chance to take part in a lucky draw of a S$200 cash prize.

A total of 180 valid responses were collected. The majority of the respondents were aged above 25, with at least a Bachelor's degree and a year of work experience. Most of the respondents had experience of using an SNS for more than a year, and used an SNS more than twice a week. Facebook was the most popular primary SNS, followed by Windows Live Spaces and Friendster. The sample consisted of 46% Singaporean, 32% Chinese, and 22% from other nationalities. Table 1 presents the details of the demographics and SNS usage statistics of the sample.

Results and discussions

The mean level of respondents' familiarity with the alternative SNS was 4.15 on a six-point scale, indicating that respondents were reasonably familiar with the alternative SNS. Because 31% of respondents chose the "N.A." option in response to their dissatisfaction with games provided by their primary SNS, we decided to drop this item for subsequent analyses (robustness tests showed no significant change to the result when this item was included).

The reliability and convergent validity of intention to switch, the only superordinate construct, was satisfactory when verified using structural equation modeling in LISREL. Its Cronbach's α was 0.86 (>0.70); composite reliability was 0.92 (>0.70); average variance extracted was 0.79 (>0.50); and factor loadings were all greater than 0.70. Since other constructs are aggregate constructs, content validity and indicator validity were ensured through careful definitions of construct and the choice of items in the instrument design stage (see Appendix B for descriptive statistics and correlations among constructs). A multicollinearity check and external validity tests were conducted on formative items. Results of the analysis of variance inflation factor (VIF) showed no sign of multicollinearity. To assess external validity, the correlation between a formative item and the corresponding global item of the first-order construct was checked. They were all significant.

Hypothesis testing was performed by examining the size, sign, and significance of path coefficients using Partial Least Squares (PLS). For each second-order construct, we included all items of its subordinate constructs as its items. A bootstrapping procedure was used to generate 250 random samples with 160 observations per sample. These random samples were used to estimate the significance of path coefficients. The predictive validity was assessed by examining the R^2 values and structural paths.

In order to assess the impact of theoretical variables, we estimated three models: the full model with all variables, the research model with only theoretical constructs, and the control model with only control variables. The full model explained

Table 1
Demographics and SNS usage statistics of the respondents (n = 180).

Gender	Male: 109 (60.56%) Female: 71 (39.44%)	Age	Below 18 years: 0 (0%) 18–20: 20 (11.11%) 21–25: 49 (27.22%) 26–35: 99 (55%) 36–45: 10 (5.56%) Above 46: 2 (1.11%)
Education	High school and below: 31 (17.22%) Bachelor degree: 71 (39.44%) Masters: 53 (29.44%) Ph.D.: 25 (13.89%)	Work experience	Less than 1 year: 50 (27.78%) 1–5 years: 85 (47.22%) 5–10 years: 36 (20%) 10–20 years: 6 (3.33%) More than 20 years: 3 (1.67%)
SNS experience	Less than 0.5 year: 1 (0.56%) 0.5–1 year: 3 (1.67%) 1–2 years: 22 (12.22%) 2–4 years: 54 (30%) More than 4 years: 100 (55.56%)	Frequency of SNS use (per week)	Less than once: 21 (11.67%) Once or twice: 27 (15%) 2–4 times: 24 (13.33%) 4–8 times: 40 (22.22%) More than 8 times: 68 (37.78%)
Primary SNS	Facebook: 111 (61.67%) Windows live: 25 (13.89%) Friendster: 11 (6.11%) LinkedIn: 8 (4.44%) Orkut: 6 (3.33%) Kaixin: 3 (1.67%) Others: 16 (8.89%)	First alternative SNS	Facebook: 50 (27.78%) Friendster: 50 (27.78%) MySpace: 21 (11.67%) Windows Live: 19 (10.56%) Kaixin: 11 (6.11%) LinkedIn: 7 (3.89%) Others: 22 (12.22%)

the variance of intention to switch substantially better (R^2 = 0.56) than the control model (R^2 = 0.06). No control variable was found to significantly affect intention to switch. Therefore, this difference (R^2 = 0.50) can be attributed to the research model.

Fig. 2 summarizes the results of hypotheses testing based on the research model.

Overarching push, pull, and mooring factors

At the framework level, our study confirmed all four hypotheses: Dissatisfaction with the current SNS (H1), Attraction from an alternative SNS (H2), Switching costs (H3), and Peer influence (H4). This result indicates that the research model can provide a conceptually parsimonious explanation of users' switch intention between SNSs. For a robustness check, we tested the moderating effect of mooring factors with the dissatisfaction and attraction factors because prior literature indicated that mooring factors might moderate push and pull factors (Bansal et al., 2005). Interaction effects were insignificant. This suggests that mooring factors in our research model only had an additive rather than multiplicative effect.

Constituent factors

At the more granular level, our data also surfaced significant constituents as well as insignificant constituents of the overarching push, pull, and mooring factors. Results suggested that dissatisfaction with entertainment value and dissatisfaction

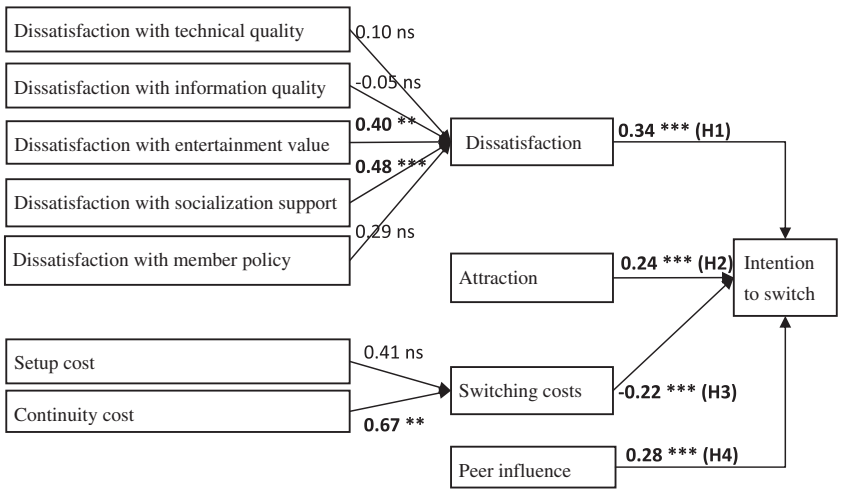

Fig. 2. Results of PLS analysis of the research model ($^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$).

with socialization support were significant components of overall dissatisfaction with the users' current SNS. For switching costs, results suggested that continuity cost was a significant factor that was negatively associated with users' switch intention.

Dissatisfaction with technical quality and dissatisfaction with information quality were insignificantly associated with users' switch intention. Users in the sample gave a relatively high evaluation of the technical and information quality of their SNS. Zhang and von Dran (2002) classified website factors as motivation or hygiene factors based on Herzberg's two-factor theory of workplace satisfaction and dissatisfaction (Herzberg et al., 1959). They considered many technical and information quality aspects as hygiene factors. Recent research suggested that utilitarian factors might not be the most important factors in users' acceptance of web-based systems (Venkatesh, 1999; Van der Heijden, 2004). This prior literature offers a plausible explanation for our findings.

We expected member policy to be an important concern for users, but our results indicated otherwise. A plausible explanation is that social pressure might have forced SNS providers to adopt similar member policies over time. For example, in February 2009, Facebook's terms of service claimed its right to use a user's content even after the user had deleted his or her profile. This term immediately incurred protests from user groups as an invasion of privacy. As a result, the term was revoked. Industrial and societal norms seemed to exert huge pressure on SNS providers, making their policies largely similar. As a result, member policies might be a hygiene factor rather than a motivating factor in the context of our investigation.

The setup cost turned out to be insignificant in the presence of continuity cost. A post hoc analysis of items showed that the mean values of items measuring sign-up and profile building costs were low. A plausible reason is that relational continuity overshadows setup cost in the SNS context. This can be attributed to the rapid technological improvement in most SNSs with the provision of tools for SNS users to import their profile information and past posts into a new site.

Implications

Strategies for SNS providers

Given the fierce competition among SNSs, and the ease with which users can switch between them, it is critical for an SNS provider to know how to retain existing users and to attract new ones. This research revealed four specific constituent factors that influence users' intention to switch their SNS: dissatisfaction with socialization support, dissatisfaction with entertainment value, continuity cost, and peer influence. SNS providers can leverage these findings to devise user-retention strategies.

First, our findings suggest that users' dissatisfaction with the socialization support of an SNS is a significant dimension of their overall dissatisfaction. SNS providers need to focus on providing innovative support features for users to socialize with each other. For example, Friendster launched a photo-tagging feature in April 2010 after Facebook. Facebook began to incorporate live news feeds for members (Hoffman, 2008) in response to Twitter's action in supporting instant group communication. Our findings show that socialization support is a critical factor in users' intention to switch, and that socialization support functionalities can be an important user-retention strategy.

Second, SNS providers can gain a competitive edge by providing better entertainment value, with attractive applications and multimedia content. For example, instead of competing with Facebook or Twitter on networking services, MySpace strategized the rebuilding of the site around entertainment functions (Chmielewski, 2009). YouTube, the No. 1 social network for video sharing, was more popular than Facebook before May 2009, according to traffic statistics from Alexa.com. These examples illustrate the strategic value of entertainment content in both maintaining an online community and gaining a competitive edge.

Third, this study also suggests increasing switching costs (Kim and Son, 2009) as a mechanism for SNS providers to build strategic advantage and to defend against peer influence. A key strategy to build customer loyalty is through community building (Oliver, 1999). Switching costs include both the setup cost of building a new profile and the continuity cost of losing one's existing connections. Continuity cost is a community-based strategy to enhance loyalty. Past theorization of user cost in IS contexts extensively focused on ease of use. However, the advances in user interface design, particularly for online systems, has rendered the learning cost marginal, and has greatly reduced the setup cost. In this light, continuity cost and peer influence, together with other push and pull factors, comprise a more comprehensive implementation of Oliver's loyalty building strategy in the SNS context.

The significant effect of peer influence suggests that building strong community bonds is a viable defensive strategy, if creating superior value is an offensive one (Zeithaml, 2000). Users are inclined to switch when their friends invite them to another SNS. An important implication is that SNS providers need to manage not only individual users, but also their friends, in order to embed users in a dense network. Consequently, if most friends stay, the user experiences less peer pressure to move to another SNS. Even if a user wants to switch, the cost of persuading their friends to move would be high, hence incurring a high continuity cost. Therefore, building community bonds is an effective defensive mechanism SNS providers can use to retain users.

To seek possible new insights into users' switching behavior, we conducted a one-on-one interview with three SNS users in September 2013 to complement the survey findings. The interview was facilitated with semi-structured questions focusing on eliciting previously undetected factors about users' switching experiences. Two useful observations emerged. First, peer influence continues to appear as a strong motivator. Without any probing from the interviewer, all three interviewees

consistently mentioned that the most important reason for their switch intention was the invitation from friends at another SNS. One interviewee noted that she switched from Windows Live Space to Facebook when the friends she wanted to follow were using the latter. Second, while technical quality appeared to be insignificant in predicting switch intention, innovative enhancement of socialization support with a high level of technical quality was an important motivator. One interviewee highlighted that the reason for him switching from Facebook to WeChat was that the latter provided better group chatting support which satisfied his need to keep in touch with relatives and friends. In general, factors identified by interviewees were within the constituent factors identified in this model.

Theoretical contributions

IS-business strategic alignment in more network-based and turbulent environments is an emerging strategic challenge in both practice and research (Merali et al., 2012). This research offers a response to that call.

First and foremost, this research offers a theoretical analysis of the roles of online social networking services which differentiate them from conventional IS, and empirically examines strategies for providers offering SNSs, to retain and attract users. A key position that differentiates our contribution is the conceptualization of SNS users as community members, rather than as consumers (Bansal et al., 2005), or users of other ISs such as Internet browsers and blogs (Ye and Potter, 2011; Zhang et al., 2012). Therefore, this research widens the view of IS users from isolated individual users to members of a community. The community view emphasizes that users are woven together *in* the system to form a digital community. Because they are rooted in anthropological research, migration theories inherently take into consideration the social and communal nature of SNSs. Therein, SNS users are treated not only as system users, but also as community residents. In this context, communal variables like socialization support, peer influence, and continuity cost, become critical, while technical quality and information quality play a much less important role in enhancing users' satisfaction. Therefore, our research model is particularly relevant to the management of SNSs, or more generally Web 2.0 systems which are community-oriented, easy to emulate, and have a low technological entry barrier.

It is worth mentioning that traditional ISs have begun to embrace socialization support by adopting community functions. Our findings, which highlight the importance of socialization support, are consistent with moves by traditional productivity tools such as Microsoft Office to offer packages such as Groove to allow users to work together and form an online community. Google's online document is another example that has built-in functions for users to co-author a document. Such functions have been quickly adopted in the newer versions of Microsoft Office (e.g., versions 2007 and 2010). It is important to note that the shift in technology from supporting isolated users to supporting a community of users requires new design considerations to ensure the users' socialization needs are met. As DeLone and McLean posited, "'service quality', properly measured, deserves to be added to 'system quality' and 'information quality' as components of IS success" (DeLone and McLean, 2003, p. 18). Socialization support will be regarded as an integral aspect of service that a productivity-oriented IS should provide.

Second, our migration-theoretic framework is a valuable alternative theoretical lens through which to view existing IS theories, such as the technology acceptance model (Pavlou, 2003), expectation–confirmation theory (Anderson and Sullivan, 1993; Bhattacherjee, 2001), and the integrated framework of technology use (Kim, 2009; Kim and Malhotra, 2005). As the nature of SNSs is multi-faceted, our model has the theoretical advantage of incorporating a rich range of important constituent factors that affect users' evaluation of SNSs and their intention to switch. Our empirical study showed that a PPM-based research model is advantageous in accommodating important theoretical constructs such as satisfaction with past experience (Bhattacherjee, 2001), evaluation of the utilitarian properties of ISs (Kim and Malhotra, 2005), and the locked-in effect (Kim and Son, 2009) into a conceptually parsimonious framework. While recent studies have applied the PPM framework in the IS/SNS domain (Ye and Potter, 2011; Zhang et al., 2012; Chang et al., 2013), they have not fully investigated the constituent factors in each category as the PPM framework requires.

Limitation and future research

Findings of this research should be interpreted within the boundaries imposed by the nature of the methods employed. A mixed method or a comparative approach would offer richer insights in future research. An anthropological approach would also fit PPM theory well. As a validation of our findings, we interviewed three users regarding their experiences of SNS switching. The preliminary findings confirmed that the significant constituent factors in our model were indeed important to users. Future research may employ a more in-depth anthropological method to study SNS users.

Second, the present study has investigated the antecedents of intention to switch, from a cross-sectional perspective. The study does not track users' actual switching behavior. Over the years, emerging mobile social networks such as WhatsApp and WeChat have appeared to gain popularity and erode Facebook's market share. As more and more SNSs emerge, and users maintain multiple profiles on different SNSs, it is desirable to monitor users' actual usage history at different sites in order to get an objective measure of migration.

Finally, the respondents of the survey study were mainly adult SNS users in Asia. Half of our respondents were Facebook users. While this is consistent with the dominant position of Facebook, further research could investigate the switch intention of a specific SNS in order to find more pertinent switch antecedents.

Conclusion

As emergent ISs extend beyond organizational boundaries to a larger societal context, strategic IS research should also navigate the competitive landscape of dynamic social systems (Merali et al., 2012). This study establishes a research model of the factors leading to users switching between online social networking services. Findings suggest that a user's intention to switch is significantly associated with their dissatisfaction with their current SNS, attraction from an alternative SNS, switching costs, and peer influence. We identified a number of design and social factors (i.e., entertainment value, socialization support, continuity cost, and peer influence) that are particularly important for user retention and attraction strategies. By revealing these important constituent factors, this research can serve as a basis for future research to investigate users' switching of social networking services or other online social systems.

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Appendix A. Constructs and items.

Constructs	Items (scales)	Sources
Dissatisfaction with the current SNS		
Dissatisfaction with Technical Quality (TQ)	1. The speed of downloading web pages and files from this site is (extremely fast – extremely slow) 2. It is (extremely easy – extremely difficult) to understand the navigation structure of the site 3. To what extent do you think it is inconvenient to maintain your profile pages on this site? (extremely convenient – extremely inconvenient)	Partially adapted from Palmer (2002) and Cheng et al. (2009)
Dissatisfaction with Information Quality (IQ)	1. The site does not provide enough information that I need (strongly disagree – strongly agree) 2. How do you feel about the reliability of information on this site? (extremely reliable – extremely unreliable) 3. The organization of information on this site is (extremely clear – extremely unclear) 4. The information on this site is (extremely useful – extremely useless)	Partially adapted from Xu and Chen (2006) and Cheng et al. (2009)
Dissatisfaction with Entertainment Value (EV)	1. To what extent are you dissatisfied with the applications provided by this site? (extremely satisfied – extremely dissatisfied) 2. To what extent are you dissatisfied with the games provided by this site? (extremely satisfied – extremely dissatisfied) 3. To what extent are you dissatisfied with the multimedia content provided by this site? (extremely satisfied – extremely dissatisfied)	Authors developed
Dissatisfaction with Socialization Support (SS)	1. To what extent do you think it is inconvenient to create and manage a group on this site? (extremely convenient – extremely inconvenient) 2. I cannot communicate with my friends effectively through this site (strongly disagree – strongly agree)	Authors developed

(*continued on next page*)

Appendix A (*continued*)

Constructs	Items (scales)	Sources
	3. This site provides poor facilitation for the organization of group events (strongly disagree – strongly agree) 4. Through this site, it is difficult to find a group of people of shared interests with me (strongly disagree – strongly agree)	
Dissatisfaction with Member Policy (MP)	1. To what extent are you dissatisfied with the member policy on registration eligibility (i.e. who is allowed to sign up to this site)? (extremely satisfied – extremely dissatisfied) 2. How do you feel about the member policy on user privacy (i.e. how this site handles users' personal information)? (extremely satisfied – extremely dissatisfied) 3. To what extent are you dissatisfied with the member policy on user conduct prohibited by this site (i.e. what kind of action users are not allowed to do)? (extremely satisfied – extremely dissatisfied) 4. How do you feel about the member policy on user content (i.e. what types of content users are not allowed to post on this site)? (extremely satisfied – extremely dissatisfied)	Authors developed based on community policies adopted by existing SNS such as Facebook
Attraction from the alternative SNS		
Attraction from the Alternative Site (AA)	1. I am confident that the technical quality (downloading speed, navigation structure, profile management, etc.) of Site B is (much worse – much better) in comparison to Site A 2. I am confident that the information quality (information adequacy, information reliability, information organization, information usefulness, etc.) of Site B is (much worse – much better) in comparison to Site A 3. I am confident that the entertainment value (applications, games, multimedia, etc.) of Site B is (much worse – much better) in comparison to Site A 4. I am confident that the socialization support (group management, communication with friends, facilitation of event organization, locating people of shared interests, etc.) of Site B is (much worse – much better) in comparison to Site A 5. I am confident that the member policy (on registration eligibility, user privacy, user conduct prohibited, user content, etc.) of Site B is (much worse – much better) in comparison to Site A	Authors developed based on the symmetric constituent factors of dissatisfaction
Switching costs		
Setup Cost (SC)	1. Signing up and entering information to join Site B is inconvenient (strongly disagree – strongly agree) 2. Building a new personal profile on Site B takes up too much time and effort (strongly disagree – strongly agree) 3. Moving my personal contents (photos, blog entries, etc.) from Site A to Site B is troublesome (strongly disagree – strongly agree)	Authors developed; Partially adapted from Cheng et al. (2009)
Continuity Cost (CC)	1. It takes too much time and effort to notify my friends on Site A about my move to Site B (strongly disagree – strongly agree)	Authors developed; Partially adapted from Cheng et al. (2009)

Appendix A (*continued*)

Constructs	Items (scales)	Sources
	2. I may lose contact with some friends if I move from Site A to Site B (strongly disagree – strongly agree) 3. It is difficult to (re)build a network of friends on Site B (strongly disagree – strongly agree)	
Peer influence		
Peer Influence (PI)	1. My friends are dissatisfied with Site A (strongly disagree – strong agree) 2. Approximately, what percentage of your friends have registered at Site B? (0–100%) 3. To what extent did your friends recommend Site B to you? (very small extent – very great extent) 4. My friends have sent me invitations to sign up at Site B (strongly disagree – strongly agree)	Authors developed; Partially adapted from Kim et al. (2006)
Intention to switch		
Intention to Switch (IS)	1. I am considering participating more on Site B than Site A soon (strongly disagree – strongly agree) 2. The likelihood of me participating more on Site B is high (strongly disagree – strongly agree) 3. I am determined to switch to Site B as my primary site (strongly disagree – strongly agree)	Kim et al. (2006)

Appendix B. Descriptive statistics and correlation among variables (n = 180).

Variables	Mean	Std.	TQ	IQ	EV	SS	MP	AA	SC	CC	PI
TQ	2.96	1.15	1								
IQ	3.30	0.85	0.30***	1							
EV	3.16	1.05	0.32***	0.33***	1						
SS	3.04	1.00	0.42***	0.47***	0.48***	1					
MP	3.45	0.79	0.20**	0.29***	0.30***	0.38***	1				
AA	3.72	0.97	0.22***	0.22***	0.39***	0.31***	0.22***	1			
SC	4.65	1.35	−0.11	−0.04	−0.10	−0.08	−0.10	0.05*	1		
CC	4.70	1.32	−0.19**	−0.03	−0.14	−0.15*	0.02	−0.21***	0.55***	1	
PI	3.60	1.26	0.23***	0.12	0.22***	0.22***	0.36***	0.39***	−0.04	−0.11	1
IS	2.80	1.29	0.23***	0.15**	0.37***	0.40***	0.29***	0.51***	−0.27***	−0.30***	0.51***

TQ: Dissatisfaction with Technical Quality.
IQ: Dissatisfaction with Information Quality.
EV: Dissatisfaction with Entertainment Value.
SS: Dissatisfaction with Socialization Support.
MP: Dissatisfaction with Member Policy.
AA: Attractions of the Alternative Site.
SC: Setup Cost.
CC: Continuity Cost.
PI: Peer Influence.
IS: Intention to Switch.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

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