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# POST-ADOPTION OF SOCIAL NETWORK SITES: A LITERATURE REVIEW AND A PROCESS FRAMEWORK

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# POST-ADOPTION OF SOCIAL NETWORK SITES: A LITERATURE REVIEW AND A PROCESS FRAMEWORK

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## Abstract

*This article provides a comprehensive literature review about the post-adoption stage of social network sites (SNS) usage with the special focus on habitual use and terminating stages. The extant research has examined this topic mainly from two perspectives: namely, intentional and habitual. Findings from each of these two perspectives are synthesized and used to build a process model to better understand how different intentions and behaviors of users manifest in different stages of SNS post-adoption phase. The process model suggests that disturbances such as technical glitches and privacy leaks trigger users' awareness of the 'dark sides' of habitual SNS use. In addition, the awareness of negative impacts of addictive use, which are perceived as threats, motivates people to switch from or quit SNS. This paper contributes to SNS research by synthesizing fragmented theoretical explanations and providing a visual tool that helps researchers to develop a deeper understanding of the dynamics in the SNS post-adoption phase. Practitioners will gain insights into how to retain existing users and better manage processes related to users who wish to quit.*

*Keywords: Social Network, Maladaptive Use, Post-Adoption, Process Model*

# 1 INTRODUCTION

During the past two decades, the use of Social Network Sites (SNS) has become one of the fastest growing areas of both information systems (IS) research and practice. This dramatic growth is further accelerated by the development of mobile technologies that facilitate SNS use. However, not all SNS providers are doing well. For example, the publicly traded site Renren.com, which was one of the largest SNS in China, saw a 10% decrease in their monthly log-in user base in March 2015 (Trefis Team 2015). Since the loss of active users hurts both short- and long-term returns for stakeholders of SNS providers (Smith & Hasnas 1999), SNS providers need to know more about how to retain users once they have adopted the sites. On the other hand, SNS usage may become a habitual or even addictive behavior for some users. Consequently, policy-makers are interested in questions about how SNS use becomes habitual and even addictive, and what can they do to help addicted users in quitting the maladaptive use of SNS. What is clear is that a better understanding of the post-adoption usage of SNS is needed.

Although each of SNS has some unique features, Boyd and Ellison (2007) defined SNS as “a bounded system” that allow users to build personal profiles, connect with other users, and view their own list of friends, as well as their connections’ lists (p. 211). I adopt this definition in this paper but focus only on two types of SNS: social networking communities (e.g., Facebook, Google+) and blogs.

For SNS, and indeed any specific IS artifact, its lifecycle has three stages: adoption, usage, and termination (Furneaux & Wade 2010). Adoption was the main focus of research before 2000 (Bhattacharjee 2001) and represents users’ acceptances or resistances of using a system (Davis 1989). On the contrary, post-adoption represents a period (or a phase) that spans the time from the using a system (e.g., SNS) to quitting the usage of that system. Meanwhile, Ye and Potter (2011) suggest that when users terminate the usage of one site, they tend to switch to other SNS rather than stop using all SNS. Thus, SNS post-adoption phase includes users’ behaviors (or behavioral intentions) of continued use, switching between, and terminating their usages of SNS (Parthasarathy & Bhattacharjee 1998).

Unfortunately, while we witness a growing body of research which tries to identify critical factors in the post-adoption stage of SNS usage by applying theories from different disciplines, little has been done in synthesizing those fragmented theories to provide a comprehensive picture (see Bhattacharjee and Lin’s (2015) article as an exception). Realizing the missing of a process framework for the post-adoption stage of SNS usage, I conduct a systematic literature review in an attempt to identify critical factors in each of the phases. My first research question is: 1) how can stages of SNS post-adoption be shown in a process model?

More importantly, while adoption is a decision of go or no-go, users’ decision-making processes are more complicated in the post-adoption stage due to interactions between conscious and habitual drivers. In fact, continuance and discontinuance may be driven by different sets of factors (Parthasarathy & Bhattacharjee 1998). Due to the existence of different drivers of continuance and discontinuance (including switching and quitting) intentions and behaviors, my second research question focuses on 2) what factors are more influential than others in different stages of SNS post-adoption?

This article contributes to both research and practice in several ways. For researchers, 1) this paper synthesizes past fragmented lines of SNS post-adoption research and offers insights on which factors may or may not explain users’ post-adoption intentions and behaviors. It supports the claim that continuance and discontinuance are not two sides of the same coin (Turel 2015). For practitioners, the proposed framework should help their decision-making in attracting and retaining users, as well as in preventing them from switching. This article also implies possible avenues to prevent and solve problems related to maladaptive use of SNS.

The rest of this article proceeds as follows: The next section specifies definitions of key variables and boundaries of my review. Then I present review methodologies and identify relevant articles. In the fourth section, I highlight important constructs identified in extant literature from two perspectives (i.e., intentional and habitual perspectives). In the fifth section, I propose an SNS post-adoption process framework and develop two propositions. The last two sections outline future directions and conclusions.

## **2 KEY VARIABLES & BOUNDARIES**

While SNS, blogs, and several other products (e.g., virtual game worlds, collaborative projects) all fall under the ‘social media’ umbrella (Kaplan & Haenlein 2010), I focus on SNS and blogs while other types are not examined here. Virtual social worlds, for example, differ from social networking communities in that virtual worlds users involve in benefit-achievement activities beyond the boundary of virtual communities (Jung 2011; Verhagen, Feldberg, Van den Hooff, Meents, & Merikivi 2012). I also exclude special-purpose SNS (e.g., professional SNS) since they have more specific and unique goals (e.g., job-hunting) comparing with general SNS such as Facebook. In addition, I am especially interested in the transition process from continued (or habitual) use to discontinuance.

When satisfied users interact with an IS artifact frequently and comprehensively (Limayem, Hirt, & Cheung 2007), they tend to develop the habit of using the artifact—SNS in our case. Based on Limayem et al.’s (2007, p. 709) definition of habit, SNS habit is “the extent to which people tend to perform behaviors [e.g., using SNS] automatically because of learning.”

Discontinuance, as I suggested above, has a different set of drivers from continuance. In this article, I modify Rogers’ (1995) definition of discontinuance and define it as “a decision to reject [a social network site] after it has previously been adopted during the confirmation stage.” (Cho 2015, p. 1533)

In this paper, I focus on the individual level of analysis since primary dependent variables here are individuals’ intentions and behaviors. However, I include one cross-level article (i.e., Huang and Lin’s (2011) article) because this article investigates group-level social capital’s impacts on individuals’ SNS continuance intentions.

## **3 THE REVIEW METHODOLOGY**

I followed guidelines provided by Webster and Watson (2002) and conducted a detailed review by searching for relevant articles in Google Scholar, Web of Science and INFORMS Global database. Keywords are identified mainly by scanning extant literature and consulting senior IS scholars. These keyword combinations are ‘Blog\*’, ‘Social Network\*’, or ‘Facebook’ with ‘Continu\*’, ‘Discontinu\*’, ‘Terminat\*’, ‘Quit’ or ‘Fail\*’. I looked for peer-reviewed journal articles and conference proceedings written in English. I further examined articles that these papers cite and those who cited articles I found in the previous step.

I also searched for extant literature reviews of this topic and found two. One focused on features of SNS and issues around the SNS (e.g., privacy) (Boyd & Ellison 2007), while the second one investigated users’ continuance behaviors for general IS artifacts rather than SNS specifically (Shaikh & Karjaluoto 2015).

While dates of publication are not considered as a criteria, only empirical papers which measure one or more constructs including continuance intention, continuance behavior, switching intention, switch behavior, and addiction of social network communities or blogs (a list of articles available upon request) are included. I organized these 65 articles by their dependent variables, theoretical bases, key independent variables, empirical studies’ subjects and data collection methodologies. This practice allows me to

discover frequently cited theories and frameworks, and to examine important factors affecting users' intentions and behaviors.

## 4 THEORETICAL PERSPECTIVES USED IN PAST RESEARCH

Responding to the early call of Karahanna, Straub, and Chervany (1999), researchers have investigated the topic of IS post-adoption using numerous theories and frameworks (a list of frequently cited theories available upon request). There are two streams of IS post-adoption research: one believes that users' continued SNS use is driven by conscious intentions, while the other stream highlights the importance of habit as a dominant driver of post-adoption intentions and behaviors (Ortiz de Guinea & Markus, 2009). As I said above, researchers have growing interests in the second stream (i.e., habitual stream), so I will mainly focus on this perspective, while I encourage other researchers to conduct similar studies from the 'intentional' perspective. As the reviewing process proceeded, several key constructs and frequently-applied theoretical lenses emerged. Figure 1 provides a visual summary of these constructs and theoretical perspectives. However, constructs covered in the figure (and this paper) is not exhaustive, since providing an exhaustive list is not the goal of this paper.

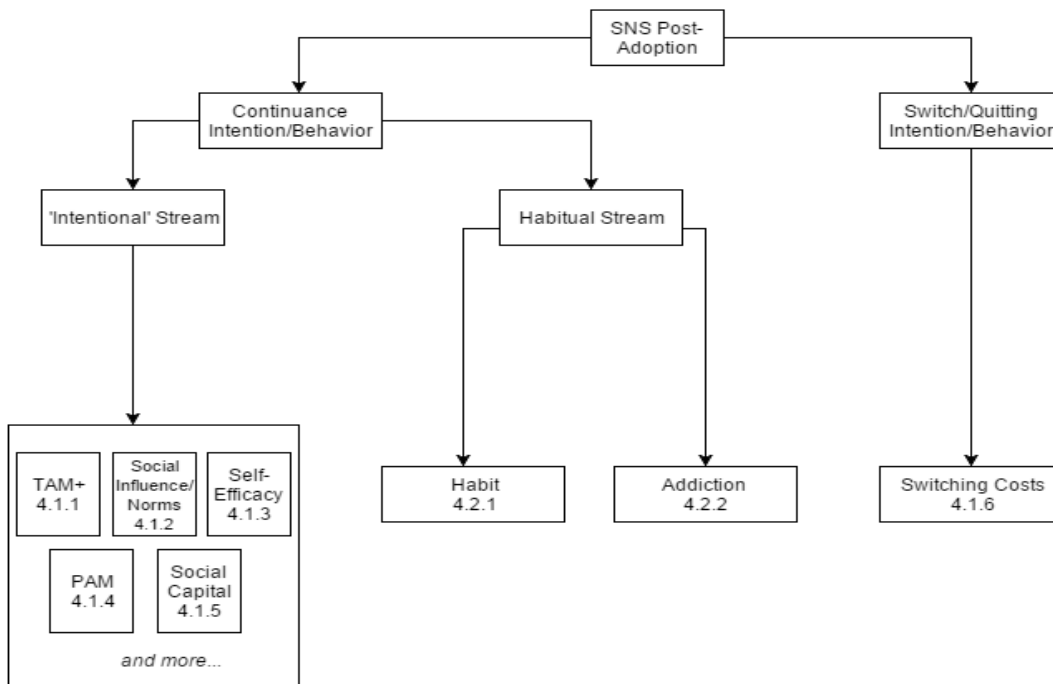


Figure 1: Theoretical Perspectives and Constructs Covered

### 4.1 Intentional Perspective of SNS Post-Adoption Research

#### 4.1.1 Perceived Usefulness (PU), Ease of Use (PEOU), Perceived Enjoyment (PE)

PU, PEOU and PE, which originate from Technology Acceptance Model (TAM) and its extensions<sup>1</sup> (Davis, 1989; Van der Heijden 2004; Venkatesh, Morris, Davis, & Davis 2003; Venkatesh, Thong, & Xu 2012), are found as significant antecedents of users' continuance intentions or behaviors (Jin 2013; Kang,

<sup>1</sup> We refer to TAM and its extensions as TAM+ in paragraphs below.

Hong, & Lee 2009; Kim & Min 2015; Lin & Lu 2011a; Shiao & Luo 2013; Shen & Chiou 2009; Sun, Liu, Peng, Dong, & Barnes 2014; Wang, Xu, & Chan 2008; Yin & Zhu 2014; Zhou 2015). Among these constructs, Lin and Lu (2011a) suggest that PE is the strongest predictor of intention. These constructs can also be integrated into other theoretical frameworks. For example, Hsieh, Hsieh, Chiu, and Feng (2012) suggest that in Push-Pull-Mooring (PPM) model of users' switching behavior, all three factors are pull<sup>2</sup> factors that affect users' switching intentions.

Although all three variables discussed here are found as significant antecedents by at least one extant studies, this fact does not imply that TAM+ are the most appropriate theoretical lenses in the SNS post-adoption context. TAM+ not only have lower predictive powers than competing models such as Post-Adoption Model (PAM) but also fail to capture negative perceptions that may grow after the initial adoption (Shiao & Chau 2012). Thus, we cannot take post-adoption behavior, either continued or discontinued use, "as the extension of acceptance behavior" (Bonsón, Escobar, & Ratkai 2014, p. 297).

#### 4.1.2 *Subjective Norms (SN) and Social Influence (SI)*

Extant research has reached minimum consensus regarding the role of SN/SI in the SNS post-adoption context. While some researchers find a significant relationship (direct or indirect) between SN (or SI) and intention (Al-Debei, Al-Lozi, & Papazafeiropoulou 2013; Chen, Yen, & Hwang 2012; Hsu, Yu, & Wu 2013; Ku, Chen, & Zhang 2013; Maier, Laumer, Eckhardt, & Weitzel 2015a; Zhou & Li 2014), others do not confirm such a relationship. For example, in Lankton, McKnight, and Thatcher's (2012) model where privacy policy and trust are included, SN does not affect users' continuance intentions. Kefi, Mlaiki, and Kalika (2010) find that neither shy men nor shy women see SI as an important source of their continuance intentions.

Lankton et al. (2012) suggest that since using SNS is often a voluntary decision, SN may not be as significant as it was in the mandatory use context. The other possible explanation is that SI may have a strong effect on the IS adoption, but such effect diminishes as the time goes by. Actually, SI represents an ongoing process and contains three steps: internalization, identification, and compliance (Kelman 1958).

Most of the researchers find significant relationships between proxies of the three processes to continuance intention or behavior (Hsu & Lin 2008; Min & Kim 2015; Zhou & Li 2014). However, matchings of constructs to three steps varies between different groups of researchers. For example, Zhou and Li (2014) use 'social identity' to represent the step of identification, while Min and Kim (2015) adopt 'motivation of relationship management' as the proxy of this step.

From the discussion above, we realize that researchers show disagreement regarding the importance of SN/SI in shaping users' intentions or behaviors. Actually, there are two types of SI: informational influence (represented by the internalization process) and normative influence (represented by identification and compliance processes) (Karahanna et al. 1999). It may explain why researchers reach different results regarding social factors' roles in the post-adoption stage of SNS usage: they sometimes use a single construct (SN or SI) to represent both types of social influences.

#### 4.1.3 *Computer General and SNS specific Self-Efficacy*

Adapted from Compeau and Higgins's (1995) model, researchers usually add constructs representing past experience and social factors as independent variables on one side, and continuance intention or behavior on the other side of the self-efficacy. Researchers also follow Marakas, Yi, and Johnson's (1998) suggestion and consequently separate the SNS-specific self-efficacy from the general self-efficacy.

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<sup>2</sup> Pull factors are those attract people to new destinations.

Lu and Hsiao (2007) find that knowledge self-efficacy has a direct link to the continuance intention of blogs, and Turel (2015) confirms the role of self-efficacy [to discontinue] as a direct antecedent of the discontinuance intention. Referring to past findings (Agarwal, Sambamurthy, & Stair 2000; Venkatesh 2000; Venkatesh & Davis 1996; Yi & Hwang 2003), Wang et al. (2008) hypothesize and find that both general and Facebook-specific self-efficacy indirectly affect the continuance intention via cognitive and affective factors (i.e., PU, PEOU, affect, and arousal).

Although researchers show inconsistencies regarding the self-efficacy's role as a(n) direct or indirect antecedent of post-adoption intention/behavior, its significance is generally supported.

#### 4.1.4 *Constructs from IS Post-Adoption Model (PAM): Confirmation & Satisfaction*

As one of the earliest IS models which dedicate to systems' post-adoption stage specifically (Bhattacharjee 2001), PAM is a prevalent theoretical lens used in the SNS post-adoption research.

Since PU is included in the original PAM (Bhattacharjee 2001), later researchers follow the same rationale and add other TAM+ constructs (e.g., PEOU) to extend PAM (Hsu et al. 2013). Researchers also extend PAM by adding constructs from other theories such as habit (Barnes & Böhringer 2011; Kefi, Mlaiki, & Kalika 2015; Shiau & Luo 2013), Social Capital Theory (Sun et al. 2014), flow theories (Chang & Zhu 2012; Hu & Kettinger 2008), user involvement (Shiau & Luo 2013), information overload (Kefi et al. 2015), self-efficacy (Turel 2015), customer value (Tang & Chiang 2010) and Theory of Planned Behavior (Hsu et al. 2013). Interestingly, while some researchers find that newly added constructs do not modify the significance of confirmation on satisfaction (Chen et al. 2012; Jin, Cheung, Lee, & Chen 2007, 2009; Kim & Min 2015), other researchers find such relationship be modified by certain newly added constructs. For example, Kang et al. (2009) find that while regret<sup>3</sup> and self-image congruity<sup>4</sup> affect continuance intention directly, confirmation does not affect satisfaction anymore. Tang and Chiang (2010) also find that experiential value fully mediates the link from confirmation to satisfaction.

Generally, since confirmation and satisfaction represent “a user's psychological motives” (Kang et al. 2009, p. 111), PAM outperforms TAM+ in explaining users' intentions and behaviors in the post-adoption stage (Shiau & Chau 2012). However, none of PAM constructs represents social factors (Ham, Park, Lee, & Moon 2012) and does not allow PAM to explain “how a technology, which is already internalized and thus go beyond the reach of our consciousness...to be reflexively evaluated independent from the routinized everyday activity and to be discontinued.” (Cho 2015, p. 1533)

#### 4.1.5 *Types and Dimensions of Social Capital*

According to Putnam (2000), there two types of social capital: bridging (which represents ‘weak ties’) and bonding (which represents ‘strong ties’). Ellison, Steinfield, and Lampe (2007) find that college students are more likely to use Facebook to maintain bonding social capital (from those who they have offline contacts), rather than the bridging social capital (from those who they meet online). On the contrary, Chang and Zhu (2012) replace PU by these two types of social capital in a modified PAM and find that only perceived bridging social capital leads to users' satisfaction and continuance intentions. They refer to Donath and Boyd's (2004) view that using SNS may be more helpful in establishing weak ties to explain this surprising finding (Chang & Zhu 2012).

Other researchers are interested in three dimensions (namely, structural, cognitive and relational) of social capital and their significances in SNS post-adoption stage by plugging these dimensions into PAM. In addition to Hu and Kettinger's (2008) paper where perceived value is added as an antecedent of

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<sup>3</sup> Regret results from the comparison between the target system's performance and an alternative product's.

<sup>4</sup> Self-image congruity results from the comparison between user's self-image and the image of the focal system.

satisfaction, researchers also integrate proxies of cognitive dimensions (e.g., network quality) and relational dimension (e.g., trust) in modified PAMs (Ham et al. 2012; Sun et al. 2013).

No matter which theoretical lens is used to organize the three dimensions, their direct or indirect impacts on intention/behavior are generally validated. However, researchers show inconsistencies regarding interrelationships between these constructs. Ham et al. (2012) find that network quality (cognitive dimension) affect trust (relational dimension). In addition, Lin and Lu (2011b) further confirm the link from the structural dimension (social interaction ties) to the relational dimension (trust).

Social capital can also be modeled as a dependent variable. Jin (2013, p. 164) hypothesize that continuance intention affect social-capital building since “social capital is driven by the intention to continue using SNS”. In fact, it reflects the core value of social capital building—reciprocity (Jin 2013): users contribute their efforts to create common capital (Hu & Kettinger 2008), but also draw values from those mutual-built capitals (Ellison et al. 2007).

Since SNS are communities where users build social capital in a reciprocity manner, type and dimensions of social capital are intuitively important for user’s continued usage. However, social capital factors may just represent part of motivations for users’ post-adoption intentions and behaviors (Chiu & Huang 2015).

#### *4.1.6 Switching Costs*

Costs of switching are mainly discussed in papers which applied PPM model, where these costs are hypothesized as mooring factors<sup>5</sup>.

Switching costs can be monetary, social, or psychological. Researchers include setup cost, continuity cost and sunk cost as antecedents of switching cost (Chang et al. 2014; Cheng et al. 2009; Hsieh et al. 2012; Zhang, Cheung, Lee, & Chen 2008; Xu et al. 2014). However, researchers usually use a subset of those costs. For example, Zhang, Cheung, and Lee (2012) exclude continuity cost since “[blog] users are less likely to suffer significant monetary costs regarding their switching behavior”, while Chang et al. (2014), Cheng et al. (2009) and Xu et al. (2014) include both continuity and setup cost in their models since users spend time and effort in building new profiles when they switch to other SNS.

However, less consensus has been reached regarding relationships between these costs and push or pull factors. While some researchers (e.g., Zhang et al. 2012) do not include interactions between switching costs (as mooring factors) and other constructs in their models, Hsieh et al. (2012) find moderating effects of mooring factors on the push-intention link.

## **4.2 Automated & Habit Perspectives of SNS Post-Adoption Research**

### *4.2.1 Habit*

Realizing the missing role of habit in the original PAM, Limayem et al. (2007) proposed an updated PAM where habit is added as a moderator. They also suggest four antecedents of IS habit: frequency of repetition, comprehensiveness, satisfaction and the relatively stable contexts (Limayem et al. 2007). These antecedents are intensively studied by researchers.

Most of the researchers confirm the relationship between frequency and habit (Barnes & Böhringer 2011; Turel & Serenko 2011; Yin & Zhu 2014). However, for comprehensiveness, Hu and Kettinger (2008) see it as a moderator while Turel and Serenko (2011) find that comprehensiveness is a direct predictor of habit. Barnes and Böhringer’s (2011) empirical study shows that comprehensiveness has no significant effect on intention. A possible reason is that although SNS have multiple functions, users may actually

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<sup>5</sup> Mooring factors are any consideration which alleviate or strengthen incentives to leave



just use a small set of them. Regarding satisfaction, while Barnes and Böhringer (2011), Turel (2015) and Yin and Zhu (2014) show that the satisfaction has a significant effect on intention. Kefi et al. (2015) find this relationship to be insignificant. It may be caused by sampling error or the problem with the operationalization of constructs (Kefi et al. 2015).

Since people use SNS mainly for social and hedonic purposes (Turel & Serenko 2011; Van der Heijden 2004), researchers add PE as an antecedent of habit (Turel & Serenko 2011; Yin & Zhu 2014). Both groups of researchers find that PE is actually the strongest predictor of habit comparing with frequency and comprehensiveness. Other confirmed antecedents of habit include social interaction ties (Yin & Zhu 2014), perceived critical mass (Barnes & Böhringer 2011) and confirmation (Kefi et al. 2015).

In fact, more controversies show up in the discussion of the habit's role in the post-adoption stage of SNS usage. Since Limayem et al. (2007) find that 'Habit-as-Moderator' model is better than 'Habit-as-Direct-Antecedent' model, Hu and Kettinger (2008) and Chiu and Huang (2015) suggest that the same moderating effect holds true in SNS continuance study context. The opposite group of researchers believes that habit can be a direct antecedent of intention/behavior (Barnes & Böhringer 2011; Kefi et al. 2015; Lankton et al. 2012; Turel & Serenko 2011; Yin & Zhu 2014). They refer to Triandis' (1977) and Ouellette and Wood's (1998) claims that habit can automatically trigger intention and behavior. They also refer to Venkatesh et al.'s (2012) model where habit is directly linked to both intention and behavior. However, Shiau and Luo (2013) find only a marginal indirect relationship between habit and intention.

Two studies directly compare and contrast the two competing models. However, Yin and Zhu's (2014) longitudinal study find that the 'direct' model is preferred while Chiu and Huang (2015) conclude that the moderation model has a higher explanatory power.

Inconsistent results may be explained by that researchers have different focuses regarding intention and actual behavior. Mentioned in Barnes and Böhringer's (2011) article, they choose the moderation model because their focus "is on use intentions rather than actual behavior" (p. 3). We should keep in mind that habit can surpass intention and directly affect behavior *in a stable context* (Ouellette & Wood 1998). In the initial stage, users may not be very familiar with the new site so they may meet difficulties that make the environment less stable. However, when they are capable of fixing these minor difficulties to minimize the instability of the environment, habit becomes the dominate driver of actual behavior.

#### 4.2.2 *Addiction & Relationships with Habit*

When the habitual behavior becomes a psychological attachment to SNS, users can become addicted to SNS. Empirical studies show that habit is a prerequisite of addiction (Turel 2015; Turel & Serenko 2011; Xu & Tan 2012). However, as noticed by Turel, Serenko, and Giles (2011, p. 1045), "simply over using a technology, automatically using a technology, or being over engaged in using a technology is not an addiction". Addiction is a compulsive behavior and has several symptoms which habitual usage does not have: salience, withdrawal, conflict, relapse and reinstatement, tolerance, and mood modification (Turel & Serenko 2011). One trigger of addiction is continued rewards (Turel 2015). Specifically, Huang, Hsieh, and Wu (2014) find that social needs, as a stimulus of arousal, indirectly leads to misuse of SNS. From another perspective, since media richness and synchronicity affect one's flow experience, these two characteristics serve as moderators of the link between SNS habit and SNS addiction (Xu & Tan 2012).

In the end, I need to highlight that among those past articles, causal relationships between habit, addiction, post-adoption intentions, and behaviors are inconclusive. While most of the researchers follow the logic that habit is an antecedent of intention, behavior and addiction, Xu and Tan (2012) see intention as the antecedent of habit since frequent and intentional use of SNS is a prerequisite of habit. On the other hand, Turel (2015) find that addiction may weaken users' discontinuance intentions by decreasing 'self-efficacy to discontinue'.

The above discussion has several implications regarding relationships between habit, addiction, continuance intention and behavior: continuance behavior is mainly driven by conscious intention in the initial use stage. When users are satisfied with their experience of using SNS and interact with the sites frequently, they may become habitual users. Again, I need to clarify here that high satisfaction and frequency are necessary but insufficient conditions of habit. Before the continuance behavior becomes habitual, we assume that behavior is constantly driven by intention. Similar to the formation of habit, users may be addicted to SNS when their habitual usage provides continued rewards. Under the condition of addiction, users may continue using SNS without the conscious decision-making. All in all, we believe that while the formation of intention is mainly a conscious-driven process, continuance behavior may be driven by habit and addiction under certain conditions.

### **4.3 Section Summary**

In the post-adoption stage, users either continue or discontinue using a social network community. However, these two simple behaviors involve numerous intentional and habitual, or both theoretical perspectives. Extant research also finds that demographic factors such as gender, cultural and other demographic differences make interactions between those factors even more ambiguous (Chang & Zhu 2012; Choi, Kim, Sung, & Sohn, 2011; Kefi et al. 2010; Kim & Min 2015; Lin and Lu 2011a).

I believe that two reasons cause the fragmentation in this area: The complex nature of SNS and the dynamic psychological activities of individuals. Specifically, TAM is originally designed to explain the adoption of utilitarian IS artifacts. However, since users also play with SNS and their embedded features such as games for fun, later researchers follow Van der Heijden's (2004) concept of hedonic IS and claim that SNS are actually hedonic systems. Theotokis and Doukidis (2009) go beyond the dichotomy and propose a new category called social IS.

Regarding psychological dynamics of users, Jasperson, Carter, and Zmud (2005, p. 528) suggest that although users proactively “engage in active cognitive processing” to make decisions in the initial use stage, the behavior becomes routinized and habitual-driven when behaviors are constantly repeated. Although their claim is made regarding utilitarian systems, I believe that their illustration holds true in the context of SNS. In addition, the habit usage pattern may be broken when external stimuli trigger changes in the environment.

Realizing the lack of a comprehensive framework for IS post-adoption research, Bhattacharjee and Lin (2015) synthesize PAM, Theory of Reasoned Action and habit in an attempt to understand the IS continuance intention. However, their model does not reflect unique features of SNS. More importantly, it fails to reflect changes of an individual's mind at different time points.

To fill these voids, in the next section I propose a process model to provide a visual illustration for researchers to further investigate issues we have seen above.

## **5 SNS POST-ADOPTION FRAMEWORK**

We have witnessed the shift of researchers' interest from the adoption to the post-adoption stage. Unfortunately, while usage gains more attention from researchers, little research has been conducted on the switching and quitting stages (Maier, Laumer, Eckhardt, and Weitzel 2015b). Turel (2015) notices that continuance and discontinuance intentions are not two extreme opposites and that both of them can exist simultaneously. Thus, I develop a process model by synthesizing ideas from both the articles I review here and other appropriate research for this topic. I also develop two propositions.

While variances models capture “covariation among properties within a system” (Burton-Jones, McLean, & Monod 2015, p.666), process models are appropriate in describing chronological orders of different events (Rivard 2014), which is the goal of this review. During the initial use stage of SNS, we have seen that intentions and behaviors are mainly cognitive-driven. When users use SNS frequently in a stable context, habit gradually becomes the dominant driver of users’ behaviors while conscious factors are hidden (Ortiz de Guinea & Markus 2009). Nevertheless, when the equilibrium of the environment is broken, the habitual usage pattern may be interrupted, and conscious factors which once affected initial intentions will, again, become primary drivers (Limayem et al. 2007). Consequently, a process model can best portray the ‘competition’ and role exchanges between habit and conscious factors in the post-adoption stage of SNS.

I develop my model (Figure 2) based on Furneaux and Wade's (2010, 2011) IS lifecycle model since other competing models are not user-centered (e.g., Iriberry & Leroy 2009). While the original model has three steps (i.e., adoption, usage and termination), I firstly split usage into continuance intention and continuance behavior because above discussions have shown that usage intention may not drive usage behavior in the presence of habit. Additionally, Ye and Potter (2011) notice that for personal IS artifacts, users seldom quit using all related products but simply switch to an alternative one, so in addition to ‘quit SNS’ as the last stage, a feedback loop which represents ‘switch’ is added.

Since numerous studies have been done on the adoption-continuance intention link, I here focus mainly on later stages. I am especially interested in questions of which types of disturbances tend to trigger users’ appraisals of their SNS habitual usage behaviors, and how such appraisals affect users’ adaptive behaviors (e.g., quit SNS).

In the discussions above, I highlighted the importance of a relatively stable environment in the formation of habit (Limayem et al. 2007; Ouellette & Wood 1998). In the context of work systems, Jasperson et al. (2005, p. 542) claim that in later stages of technology post-adoption, “habit becomes a predictor of an individual’s post-adoptive behavior.” However, when there is a novel situation, such as a discrepancy between expected and actual performance, the conscious thinking *may* gain its dominant role back (Louis & Sutton 1991). By using ‘may’ here, I contend that while all unexpected events interrupt them from the habitual SNS usage pattern, not all of them necessarily create equal effects. Those unbalanced effects are caused by the nature of SNS as instruments: users try to satisfy their needs of social-networking by using SNS as tools, rather than from SNS per se (Ortiz de Guinea and Markus 2009). In addition, some disturbances are technical issues (e.g., unloaded pictures) while some disturbances are related to main tasks (e.g., social-networking) or motivations of using SNS.

The difference regarding the natures of disturbances (as technical- or task-related) is not the only cause of such unbalanced effects. When using SNS, users tend to use the features that they are familiar with, and they can easily solve minor technical disturbances by using coping methods learned from accumulated knowledge of current other similar websites (Cho 2015; Jasperson et al. 2005). Heidegger (1982) names this process as ‘skillful coping’. Unless disturbances are severe enough to pull users’ intentions back to SNS per se and trigger users’ separation of SNS from their task of social-networking, conscious intentions do not manifest themselves (i.e., behaviors are automated), and users can simply respond to certain disturbances in an automated manner (Ortiz de Guinea & Markus 2009; Ortiz de Guinea & Webster 2013). However, when significant technical disturbances (e.g., SNS downtime or major privacy leaks) or social disturbances (e.g., being bullied in SNS) prevent users from conducting their main tasks, they step back and start to think about the relationships between the task, SNS and themselves (Cho 2015).

Ortiz de Guinea and Webster (2013) suggest that when disturbances are unexpected and have negative effects, users shift their attention to computer-related thoughts (i.e., SNS-related thoughts here). This process is similar to ‘technology sensemaking’ where users evaluate actual performance with “those

expected from pre-episode cognitions” (Jasperson et al. 2005, p. 540). Mentioned by Cho (2015), Dreyfus (1991) calls this process of thinking about technology independent of the task as ‘theoretical deliberation’.

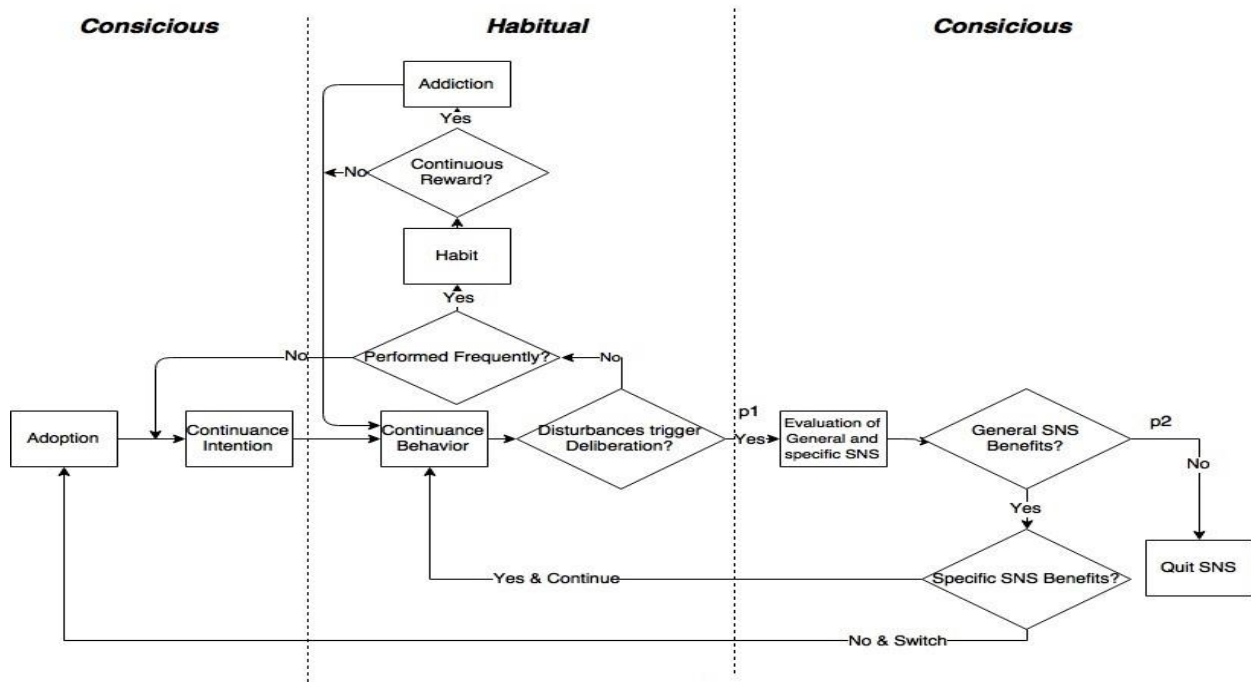


Figure 2: SNS Post-Adoption Framework

In addition, users interact with SNS to create reciprocal social capital (Jin 2013), and the perceived usefulness of SNS depends on their capability in helping users to create and maintain social capital (Chang & Zhu 2012). Furthermore, users’ gratification needs are derived from networking with others by using SNS, rather than from SNS per se (Yang & Lin 2014). Excessive SNS usage can cause the huge expense of missing other important activities (Turel & Serenko 2011). Issues which are related to these social activities, such as misalignment between perceived and actual outcomes, tend to trigger users’ conscious deliberations easier than technical issues of SNS do.

Generally, while users may continue their habitual use of an online community if they can predict and fix minor disturbances easily, major interruptions (e.g., major technical malfunctions, changes in applicable policies or issues with users’ task of social-networking) trigger users’ conscious deliberation of negative impacts of habitual (or addictive) use of SNS and consequently break the habitual usage pattern (Limayem et al., 2007). For those reasons, I believe that:

**Proposition 1:** When disturbances are minor, users tend to remain focused on the task of social-networking and continue to be driven by habit. On the contrary, when disturbances are significant, users tend to shift their focus towards SNS per se and evaluate social benefits brought by the current SNS and SNS as a whole.

As habit fades when the focus shifts away from the task to SNS per se, conscious factors retake the dominant role. As I mentioned above, the appraisal process here is essentially a contrast between perceived and actual performance of SNS. In addition, based on Theory of Belief Updating (Hogarth & Einhorn 1992), Kim and Malhotra (2005) suggest that input of previous stages (i.e., adoption and

continuance intention) are reevaluated in the formation process of the new intention. It is plausible that users measure perceived and actual performance of the entire set of intentional factors (including cognitive, affective and social factors) one-by-one again during the evaluation. While this concept implies a recursive loop of SNS usage, it does not address the question of why people withdraw entirely from using all SNS. Cho (2015) suggests that theories such as TAM, which explain people's quitting behavior by users' unmet expectations and perceived images, only explain a small set of drivers of discontinuance behavior. Consequently, I hypothesize that factors that are not expected beforehand may provide additional explanations for the quitting behavior.

Negative outcomes of addictive usage are one of such factors. Xu and Tan (2012) refer to a case where a person who was experienced in the Internet without symptoms of addiction became addicted to Facebook within only eight months (Karaiskos, Tzavellas, Balta, and Paparrigopoulos 2010). In the initial adoption and usage stages, users can hardly imagine that they will become addicted to SNS and sacrifice their long-term goals to gain short-term rewards (Ouellette & Wood 1998). (In fact, Turel et al. (2011) suggest that in both the medical field and IS field, studies on 'addiction' are not well-established). These negative effects (e.g., wasted time, impaired work/school performance) create threats to users' 'normal life'. The Coping Model of Users Adaptation suggests that users develop negative emotions when they perceive something as a source of the threats (Beaudry & Pinsonneault 2005, 2010). Those negative emotions further trigger behavioral actions such as withdrawing from the current site. While these threats are hidden in the habitual use stage, they become explicit during the appraisal process after the habitual (or addictive) usage pattern is broken.

Proposition 2: When users realize that their past habitual (or addictive) use of SNS creates threats to their life, they perceive the current site as a source of the threats, which triggers their discontinuance intention toward the current site.

## **6 STRENGTHS, LIMITATIONS & FUTURE OPPORTUNITIES**

Due to complexities of SNS per se and human cognitions, emotions, and behaviors, past researchers have investigated users' SNS post-adoption intentions and behaviors from different theoretical perspectives. Some of theories or constructs may be more appropriate in the two cognitive-driven stages (i.e., the initial adoption and the switching/terminating stage) while others may fit in the habitual factors-driven stage. My framework provides a visual tool for researchers to understand and further investigate different drivers in each phase of the SNS post-adoption stage. The framework clearly shows that while SNS continuance use is driven by conscious intention in the initial use, using SNS become a habitual or even addictive behavior when the environment becomes relatively stable. On the other hand, disturbances, either SNS-related or task-related, provide opportunities to consciously appraise negative impacts of the habitual usage, which further triggers users' adaptive behaviors such as quitting SNS.

One of the limitations of this article is that only constructs that are intensively investigated are highlighted, while a relatively complete list of constructs is available upon request. These constructs include cognitive-based (e.g., PU, PEOU), affective-based (e.g., arousal, satisfaction, anxiety), and social-related (e.g., social capital, critical mass, network externalities) ones. However, all of them are more salient before the formation of habit and after the breaking of habit. Due to the focus on the habitual use and terminating stages in this paper, I encourage future researchers to identify and validate these intentional drivers of other phases in the post-adoption stage of SNS usage.

In the meantime, I realize that constructs from different theories can interact with each other. For example, self-efficacy can be one antecedent of perceived behavioral control (Kefi et al. 2010) or of discontinuance intention (Turel 2015). As a state of being immersed in an activity and having feelings of control, curiosity and entertainment (Trevino & Webster 1992), flow experience can moderate the link from confirmation to

intention and the links from network externalities constructs to continued use (Zhou 2015). More studies need to be done in describing moderation, mediation, direct and indirect interrelationships of these constructs in order to create an integrated framework.

Regarding constructs of different theories, I do not look at measurement scales and ways they are operationalized in this review. It is not my intention to imply that measurements and operationalization methods of constructs are not important. On the contrary, further investigations of these issues will be very helpful in solving current conflicts among extant literature. For example, we see that many studies demonstrate an insignificant role of comprehensiveness in the formation of habit, which contradicts the findings in the original model (Limayem et al. 2007). I encourage future researchers to extend or modify measures of relevant constructs and adapt them better to the context of SNS post-adoption.

Actually, understanding interactions between different constructs and examining their measures are fundamental to building variance models. As we have seen above, dominant drivers in each sub-stage (i.e., continuance intention, habitual usage, and termination stage) change from intentional to habitual factors, and shift back to intentional factors in the termination stage. Furthermore, when we take a holistic view of SNS post-adoption dynamics, both natures of factors (i.e., intentional versus habitual) and time (i.e., three sub-stages) should be considered. I believe that the 'systems perspective' and configuration models, which are capable of capturing both emergent properties and time effects (Burton-Jones et al. 2015), will shed new lights on the SNS post-adoption research.

In addition, most of the articles I reviewed examine this topic from the users' perspective, and so does our model. Future researchers could look at this topic from the managers' perspective. For example, managing attraction and retention of users are similar to managing the stock of goods for managers in some ways, so researchers may apply and extend models such as the stock management model (Sterman 1989) into the SNS post-adoption context.

Replying to the call to investigate the formation, prevention, and solutions of addictive IS use (Lee 2015), my second proposition shows that those unexpected 'dark sides' of SNS, which can hardly be predicted in the adoption and initial usage stages, may lead to users' decision to quit using SNS. Specifically, when users become aware of threats of their previous excessive usage, they may start to think about the huge costs regarding time and efforts they spent on using SNS addictively. They may consequently decide to quit as a result of this appraisal process. Future researchers should focus on what environment cues or purposive 'disturbances' (which may be initiated by SNS providers, government, healthcare professionals, etc.) can trigger such evaluations. A recent article finds that SNS related fatigue may also lead to users' decisions to quit SNS temporarily or permanently (Ravindran, Kuan, & Lian 2014). Researchers should attempt to discover other 'dark sides' of SNS which may facilitate the formations of switching or quitting intentions and behaviors.

## **7 CONCLUSION**

This article provides a comprehensive review of past literature and highlights important antecedents, influential factors and theoretical frameworks for SNS post-adoption intentions and behaviors. I use a process model, instead of variance models which are common in most of the extant literature propose. I extend previous models by taking the role of habit into consideration and consequently splitting 'use' into 'continuance intention' and 'continuance behavior'. At the same time, because of the unique features and contextual factors of SNS, I add a feedback loop to represent switching, which is common in this era. This article also sheds lights on possible preventions and solutions of maladaptive use of SNS. I hope this article will encourage further investigations into topics related to the post-adoption stage of SNS, such as interactions between different factors, the maladaptive use of SNS, and preventions of additive SNS use from ethical and legal perspectives.

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