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AN INTEGRATED FRAMEWORK OF MOBILE APPS USAGE INTENTION

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Abstract

Over the past decade, mobile devices such as cellular phones and tablet computers have become an essential part of our lives. Mobile devices outsold personal computers for the first time in 2011 and users spend more time with mobile apps than the Internet. Although mobile apps are growing popularity, a number of questions remain to be addressed concerning the usage of mobile apps: What factors contribute to mobile apps usage intentions and how personal traits impact the actual mobile apps usage?

This paper classified mobile apps usage motivations into extrinsic, intrinsic and social motives according to user's variety of personal use of mobile apps. Based on literature review, mobile apps users' intrinsic motives (i.e., flow theory), extrinsic motives (i.e., perceived usefulness and perceived ease of use) and social motives (i.e., social influences) should impact on usage intentions. This study, applying the technology readiness (TR) concept as personal consumer traits, investigates how the four TR constructs (i.e., innovativeness, optimism, discomfort and insecurity) affect the actual usage intensity of mobile apps. This study further proposes the moderating effect of innovativeness on the relationship between extrinsic motives and mobile apps usage intentions.

Keywords: Flow theory, Technology readiness, Social influences, Mobile apps.

1 INTRODUCTION

As a result of the rapid diffusion of new technologies, mobile devices can now offer a variety of mobile apps (an abbreviation for 'applications') to meet consumers' needs and desires, in particular, with the advance of the third-generation (3G) network and handheld technologies. Mobile apps offers numerous services, ranging from information and communication services such as weather reports, stock quote, traffic information, short messages, multimedia messages and email to entertainment services such as music streaming, mobile games, watch TV and video downloads.

DC, the market research firm, recently reported that smart phones outsold personal computers for the first time in 2011 (Perez 2011). And, based on sales of mobile devices and adoption by users, Morgan Stanley now predicts that mobile computing will be bigger than the desktop equivalent within 5 years (Meeker 2011). Mobile service providers now offer a vast array of apps that can be downloaded directly onto mobile devices. Apple's App Store has more than 775,000 apps and Google Play has more than 800,000 apps as of January 2013 (http://www.rssphone.com/google-play-store-800000-apps-and-overtake-apple-appstore/). The rapid growth of mobile apps is indicative of its entry into mainstream culture and its integration into the daily lives of many people all over the world.

Although mobile apps are growing popularity, consumer behavior research into the context of mobile apps is still scarce. From services marketing perspective of mobile apps, an interesting question focuses on users' motivations and their consequent impacts on usage intentions. But what motivates people and why they use the mobile apps has not been researched in large scale. This is a gray area for research since it involves the psychological perspective and also the social perspective of mobile apps. During the past decade, researchers have applied Theory of Reasoned Action (TRA) and its successor, the Theory of Planned Behavior (TPB) (Ajzen 1991) and Technology Acceptance Model (TAM) (Davis 1989) to examine user behaviors. However, since these theories are originated from studying work-related technologies, they don't consider the unique nature of mobile devices used personally in a variety of social and hedonic contexts. Most studies are conducted in organizational contexts rather than end-user consumers and those theories focus on utilitarian aspect of technology. Thus, to address this gap, this study employs uses and gratification (U&G) approach to add flow experience as intrinsic motives and social influence as social motives to explore the antecedent of mobile apps usage intentions.

Previous research on technology acceptance suggests that personal traits may affect the acceptance (Lam et al. 2008; Parasuraman 2000). This study, applying the technology readiness (TR) concept as personal user traits, investigates how TR affects the actual usage intensity of mobile apps to describe the post adoption behavior of mobile apps users.

2 THEORETICAL BACKGROUND AND PROPOSITIONS DEVELOPMENT

2.1 Mobile Applications (Mobile Apps)

Over the past decade, with the introduction of Wifi and 3G mobile network, mobile devices such as cellular phones and tablet computers have become an essential part of our lives. Mobile apps (an abbreviation for 'applications') are either pre-installed on mobile devices during manufacture, or downloaded by users from various mobile software distribution platforms (App Store or Google Play). The App Store, launched by Apple Inc., has become the most widely recognized apps service, offering both free and paid apps that can be downloaded directly to the iPhone, iPod and iPad. Mobile service providers now offer a vast array of apps that can be downloaded directly onto mobile devices. Google Play, formerly known as the Android Market, is an online electronics store developed and maintained

by Google. Mobile analytics company, Flurry, states that users spend more time with mobile apps than the Internet, which is an average of 81 minutes for mobile apps compared to 74 minutes for Internet as of June 2011 (http://blog.flurry.com/).

Mobile apps users are more likely to use services in diverse locations and at any time of day, so the range of available services grows to include different purposes. Typical functional apps are commercial services such as ticket purchase, product shopping, reservation, banking business, and electronic payments. Additionally, informational content services such as news, stock quotations, shopping information, maps, and location based services included in this category. Users primarily use these functional services for information gathering purposes and financial transactions. On the other hand, typical hedonic apps, which stimulate emotional aspects, are leisure/entertainment content services such as game, book, and music/movie downloads.

In the paper, mobile apps is selected to be investigated, considering its increasing popularity and importance in mobile industry and a lack of relevant research.

2.2 Determinants of Mobile Apps Usage Intentions: Uses and Gratification Approach

Uses and gratifications (U&G) research has its foundation in communications research, which constitutes an integrated field of researchers in media and social psychology (Blumler & Katz 1974). According to U&G perspective, media use is determined by a group of key elements including people's needs and motives to communicate, and social environment (Rubin 2002). Various motives have been proposed to explain various consumer behavioral intentions. In the technology acceptance context, motives can be divided into extrinsic motives and intrinsic motives (Davis et al. 1989). Whereas extrinsic motives are based on achieving instrumental outcomes, including perceived ease of use and perceived usefulness, intrinsic motives refer to the pleasure of experience, including fun, enjoyment and flow. In addition to extrinsic and intrinsic motives, Koo (2009) also incorporates social motives, including social affiliation, social norm and social interaction. Stafford and Gonier (2004) have identified several gratifications from Internet use that motivate users' behavior. These include web searching, the acquisition of information, the ability to engage in interpersonal communication, and socialization. Through the usage of mobile apps, users are now able to satisfy their various needs. Katz et al. (1974) also suggested that the uses and gratification perspective focuses on "the social and psychological origins of needs, which generate expectation of the mass media or other sources, which lead to different patterns of media exposure resulting in need gratifications and other consequences". Therefore, this study takes U&G approach to understand the social and psychological constructs that motivate individuals to use mobile apps to fulfill their needs and wants.

The scope and usage of mobile apps have expanded beyond utilitarian objective to most encompass non-utilitarian objectives. Mobile apps as interactive systems has emerged that aims at enhancing users' hedonic needs such as socialize, enjoyment and interaction rather than utilitarian needs such as productivity or performance improvement. In the context of hedonic system studies, researchers have argued that extrinsic motives might be less likely to be salient predictors of consumer usage (Hsu & Lu 2004; Lin & Bhattacherjee 2007).Adding the flow theory allows us to incorporate intrinsic motives towards mobile apps usage and social influences in two forms of subjective norm and social image reflects social motives for mobile apps users.

In light of increasing competitive pressure within mobile apps context, attracting the potential users and retaining the existing user base become crucial for the future success. As is typical in predicting many human behaviors, one of the antecedent constructs to understand and measure is intentions. Research regarding the TRA, TPB, TAM and marketing research has identified behavioral intentions as a salient predictor of behavior. As a result, mobile apps providers are increasingly interested in understanding the factors influencing and driving users' behavioral intentions. From a marketing standpoint, usage intentions are crucial to perpetuate the mobile apps. Hence, the first proposition is formulated:

P1: Behavioral intentions toward using mobile apps are positively related to the actual mobile apps usage.

According to the research on technology, actual use is the key factor in explaining the technology's effectiveness (Son & Han 2011). In this study, the researcher defined the intensity of usage in two forms of the usage frequency and variety of use. Variety of usage is defined as the extent to which an individual uses various applications. Mobile apps allow users to engage in various services (Nysveen et al. 2005; Kim 2012). Wireless mobile services provide new dimensions of localization, personalization and immediacy to the Internet, which are major considerations for mobile users to utilize apps. For instance, swift exchange of messages, immediate access to current news, traffic status and stock quote, multimedia enriched content, and information about nearby restaurant and gas stations are available.

2.2.1 Extrinsic Motives

TRA posited that behavioral intentions are affected by attitude and subjective norm. However, it had a weakness in using abstract concepts such as 'belief' and 'evaluation' as factors influencing attitude. Technology Acceptance Model (TAM) is an adaption of TRA, which has been popularly used as an interpreter in user acceptance of technologies (Davis 1989). Abundant empirical studies have supported TAM to be a robust and parsimonious model for the explanation acceptance of various technologies. It is based on two specific beliefs that affect behavioral intentions, specifically perceived ease of use and perceived usefulness. Perceived ease of use is defined as the extent which a person believes that using the technology will be free of effort (Davis 1989). The small screens and inconvenient input methods of some mobile devices make the ease of use factor more salient (Choi et al. 2011). Perceived ease of use mobile apps refers to the degree of effort that users associate with using apps and it is revealed to influence intention to use mobile services (Hung et al. 2003; Nysveen et al. 2005). Perceived usefulness refers to as the extent to which a person believes that using the technology will enhance his/her task-related performance (Davis 1989). To fit the context of mobile apps, perceived usefulness refers to an individual's feeling of the level to which mobile apps help a user attain the purpose through mobile apps usage (Liu & Li 2011). As users identify mobile devices as new innovation resulting from the fusion of wireless Internet and mobile phone, perceived usefulness plays a significant role is mobile apps usage (Choi et al. 2011). Considering that mobile apps provide various services anytime and anywhere, mobile users believe that apps help in attaining certain goals such as informational services or recreation purposes. When users consider mobile apps to be useful, they are more likely to use it. Accordingly, the follow propositions were proposed:

P2: Perceived ease of use is positively related to usage intentions toward mobile apps.

P3: Perceived usefulness is positively related to usage intentions toward mobile apps.

Despite the successful reputation of TAM, some researchers point out that the task-related nature of the TAM makes researchers lean to overlook an effect of intrinsic factors (Wakefield & Whitten 2006). Recent TAM studies have employed intrinsic motivations (e.g., cognitive absorption, perceived enjoyment) in the model, and have empirically demonstrated their influential role in user behaviors of information systems (Agarwal & Karahanna 2000; Chang & Wang 2008; Koufaris 2002; Wakefield & Whitten 2006). The role of intrinsic motivations in shaping consumer decisions is further reviewed below.

2.2.2 Intrinsic Motives

Flow experiences are forms of intrinsic motivations. Flow is a highly enjoyable psychological state in which people are so involved in an activity that nothing else seems to matter (Csikszentmihalyi 2009,). Flow is therefore a state without consciousness (usually characterised by a loss of a sense of time passing) that is experienced by individuals who are deeply absorbed in an activity they are enjoying (Webster et al. 1993).

Hoffman & Novak (2009) expect that flow is qualitatively different from Web navigation and assert that social media would be excellent candidates for flow research due to the extensive amount of time users spend in the media. Here, the researcher conceptualizes flow as a multidimensional construct comprised of perceived enjoyment, concentration, and escapism as they relate to the mobile apps usage context. Since flow indicates ''the holistic sensations that people feel when they act with total involvement" (Csikszentmihalyi 1977, p. 36), this concept is assumed to have a key role particularly in users' perception of social-centric services such as the current mobile apps study. Evidence from flow studies has shown that perceived enjoyment is of key value to generate optimal flow. Perceived enjoyment is defined as the extent to which the activity is perceived to be enjoyable in it's own right (Venkatesh 2000). As mobile apps users frequently use entertainment services, mobile apps can be therefore viewed as interesting and entertaining, which taps into users' needs for aesthetic, pleasurable, and emotional experiences (Choi et al. 2011). Additionally, this study employs concentration which has been commonly used as flow experience in prior research. For users to be in a flow state, they must concentrate on their activities or experience total engagement (Agarwal & Kim 2000; Koufaris 2002; Novak et al. 2000). If mobile users pay much attention to apps usage to such an extent that there is little attention left to consider anything else, it is easier for them to acquire the flow experience (Ghani & Deshpande 1994; Hoffman & Novak 1996; Novak et al. 2000).

Mobile users sometimes use apps when they feel bored. Babin et al. (1994) recognized it as a self-gratifying, escapist, and therapeutic activity, describing people who view consumption as a "pick-me-up" and a "lift" when they feel depressed. Escapism is the aspect of emotions that allows the user to temporarily "get away from it all," often involving an element of "pretend" (Mathwick et al. 2001). Therefore, Mobile apps could be acknowledged as a form of emotion-focused coping in response to stressful events or simply to get one's mind off a problem. Mobile users engage in apps that are absorbing and allow them to escape from the demands of the day-to-day world. Escapism which is defined as the extent to which mobile apps users is perceived to be a relief from boredom and an escape from routine (Bloch et al. 1994)

Though the state of flow is temporal and highly subjective, during the interaction with mobile apps, a strong sense of concentration, escapism, and perceived enjoyment is developed. Many studies have provided empirical support that flow directly influences behavioral intentions such as online purchase intentions (Hausman & Siekpe 2009; Luna et al. 2003); revisit intentions (Koufaris 2002; Hausman & Siekpe 2009; Luna et al. 2003.); use intentions (Agarwal & Karahanna 2000); play online game intention (Hsu & Lu 2004); mobile TV (Jung et al. 2009).

Hoffman and Novak (1996) argue that favorable experiences result in larger website stay time and more frequent online usage. Arguments have been advanced that flow experiences can attract users and positively influence behaviors (Ghani & Deshpande 1994; Webster et al. 1993; Novak et al. 2000). Bridges and Florsheim (2008), for example, found that flow has impact on online purchase. The synopsis of prior work suggests that holistic experiences with mobile apps, as manifest in absorption and flow, are important explanatory variables in behavior theory. With this in mind, we believe that when mobile apps users are in the flow state, they might become absorbed in the apps, their awareness is narrowed to the apps, and they lose self-consciousness that leading them to prolong apps usage. The extant evidence suggests that following:

P4: Flow experiences are positively related to usage intentions toward mobile apps.

P5: Flow experiences are positively related to actual mobile apps usage.

2.2.3   Social Motives

Following the study of Lu, Yao and Yu (2005), the researcher models the construct of social influences by subjective norm and social image with consideration of mobile apps usage. The importance of subjective norm on intention to use mobile services is revealed in extant studies (Hung et al. 2003; Nysveen et al. 2005). Hofstede (1980) reported that Chinese, Japanese and Korean shared

a Confucian cultural background, which is group-oriented. Yau (1986) reported that persons from these cultures were more motivated to conform to social norms than persons from individualistic cultures. Chinese culture is conformity-oriented and we would expect that subjective norm would affect mobile apps users' behavioral intentions in Taiwan.

Moore and Benbasat (1991) defined it as the extent to which use of an innovation was perceived as enhancement of status. Mobile users are often in social situations. Mobile devices have changed from being communication equipment to fashionable accoutrement. For instance, many people buy Apple to show that they followed the latest trend and thus improve their social status. Hence, social image is defined as the extent to which the use of mobile apps is perceived as enhancement of one's image or status in one's social system (Moore & Benbasat 1991).

The relationship between social influences and behavioral intention has been empirically investigated by many previous studies (Agarwal & Karahanna 2000). Recently, in the context of mobile services, a number of studies incorporated social influences into their research (Lu et al. 2005). Thus, the following propositions are proposed.

P6: Subjective norm is positively associated with usage intentions toward mobile apps.

P7: Social image is positively associated with usage intentions toward mobile apps.

2.2.4   Technology Readiness (TR)

Previous research on technology acceptance suggests that personal traits may affect the acceptance (Lam et al. 2008; Parasuraman 2000). This study, applying the technology readiness (TR) concept as personal user traits, investigates how TR affects the actual usage intensity of mobile apps. The TR relates to how prepared consumers are for a new technology (Parasuraman 2000). The TR construct comprises four dimensions: optimism, innovativeness, discomfort, and insecurity. Insecurity and discomfort are inhibitors of TR, whereas optimism and innovativeness are drivers. Prior studies examine the relationships between TR and technology acceptance by using an aggregated measure of the four TR constructs (Parasuraman 2000; Parasuraman & Colby 2001). However, as Lam et al. (2008) suggest that these approaches may have limited value, because the four TR dimensions clearly have different meanings and relate to different psychological processes underlying technology acceptance.

Innovativeness often refers to a person's tendency to try out new things (Parasuraman 2000). Optimism relates to a positive opinion of technology and a belief that technology offers people increased control, flexibility, and efficiency in life (Parasuraman 2000). The controllability of mobile apps is very important to optimistic users because convenience is the most frequently stated benefit of using mobile apps. Optimists tend to apply more active coping strategies because they are less likely to worry about a possible negative outcome and more likely to accept their situation. Therefore, the theory expects that a highly optimistic user will use mobile apps more frequently. Discomfort consists of a perception of lack of control over technology and a feeling of being overwhelmed by the technology (Parasuraman 2000). Meuter et al. (2003) found that consumers' technology anxiety is significantly related to key self-service technology encounter outcomes such as word of mouth intentions and repeat usage intentions. Mobile users are not likely to use apps (even when they know its benefits) unless they feel comfortable with the technology. In January 2011, Starbucks launched the largest mobile payment program in the United States, consisting of an app that can run any smartphone into a Starbuck card. This app come from the inspiration in Japan, where mobile phones commonly serve as keycards, personal ID, airline boarding tickets and so forth (Kaplan 2011). Insecurity involves the distrust of technology for security and privacy reasons (Parasuraman 2000). Consequently, the users with a sense of insecurity become suspicious of new functions and reduce trials to use mobile apps. Zeithaml et al. (2002a; 2002b) further proposed that customers' TR has a positive impact on their e-shopping behavior. In contrast with previous TR studies, which have not discussed the variability of the TR effects across usage situations, Lam et al. (2008) postulate that the

effects of the four TR constructs are reasonably consistent across usage intentions, but the extent of effect of particular TR constructs could vary with usage situations. Specifically, we propose that four constructs of TR have positive effects on: (a) mobile apps usage frequency and (b) variety of mobile apps use for personal purposes.

P8a: Innovativeness is positively associated with mobile apps usage frequency.

P8b: Innovativeness has a positive effect on a user's variety of personal use of mobile apps.

P9a: Optimism is positively associated with mobile apps usage frequency.

P9b: Optimism has a positive effect on a user's variety of personal use of mobile apps.

P10a: Discomfort is negatively associated with mobile apps usage frequency.

P10b: Discomfort has a negative effect on a user's variety of personal use of mobile apps.

P11a: Insecurity is negatively associated with mobile apps usage frequency.

P11b: Insecurity has negative effect on a user's variety of personal use of mobile apps.

2.2.5   Moderating Effect of Personal Innovativeness

Moderators are variables that represent constructs proposed to magnify, attenuate, cancel, or reverse the association between two other variables. Findings about the influences of personal trait variables on technology acceptance are inconsistent (Dabholkar & Bagozzi 2002). Sun and Zhang (2006) suggest that the low explanatory power and inconsistencies of TAM may be explained by the exclusion of important moderating variables that reflect individual differences. Since there is an inconsistent or unexpectedly weak relation between a predictor variable and a criterion variable, a moderator is therefore introduced (Barron & Kenny 1986). Consistent with the Innovation Diffusion Theory (Rogers 1983, 1995), the propensity of individuals to innovate determines the sources of information they consider to make decisions about whether to accept a technology. Therefore, it affects the generation of perceptions with respect to the innovation.

Agarwal and Prasad (1998) and Dabholkar and Bagozzi (2002) suggest that innovativeness in the domain of information technology acts as a moderator variable on the antecedents and consequences of perceptions with regard to a particular system. In this way, the higher the innovativeness of an individual in the domain of information technology, the more intense the relation between his/her perceptions of the technology characteristics: perceived usefulness and ease of use and the intention of its use.

Consequently, and in accordance with the approach of the Theory of Diffusion of Innovations, we propose that the relationship between perceived usefulness/ease of use and mobile apps usage intentions may be contingent upon individuals' innovativeness.

P12: The greater the user's innovativeness, the stronger the effect of perceived ease of use on mobile apps usage intention.

P13: The greater the user's innovativeness, the stronger the effect of perceived usefulness on mobile apps usage intention.

3   RESEARCH FRAMEWORK

The theoretical framework and their propositions developed from existing literature were described as above. Based on proposed propositions, the research framework of this study posits that extrinsic motivations (perceived usefulness and perceived ease of use), intrinsic motivations (i.e., flow experiences) and social motivations (i.e., subjective norm and social image) are the primary antecedents of mobile apps usage intentions, leading to actual mobile apps usage. Flow experiences

will affect actual usage directly and indirectly via usage intention, while social influence will indirectly impact on actual usage. The intensity of actual mobile apps usage is associated with personal traits (i.e., the TR). And individuals' innovativeness moderates the effects of perceived ease of use and perceived usefulness on mobile apps usage intention. The proposed relationships in the model are shown in Figure 1.
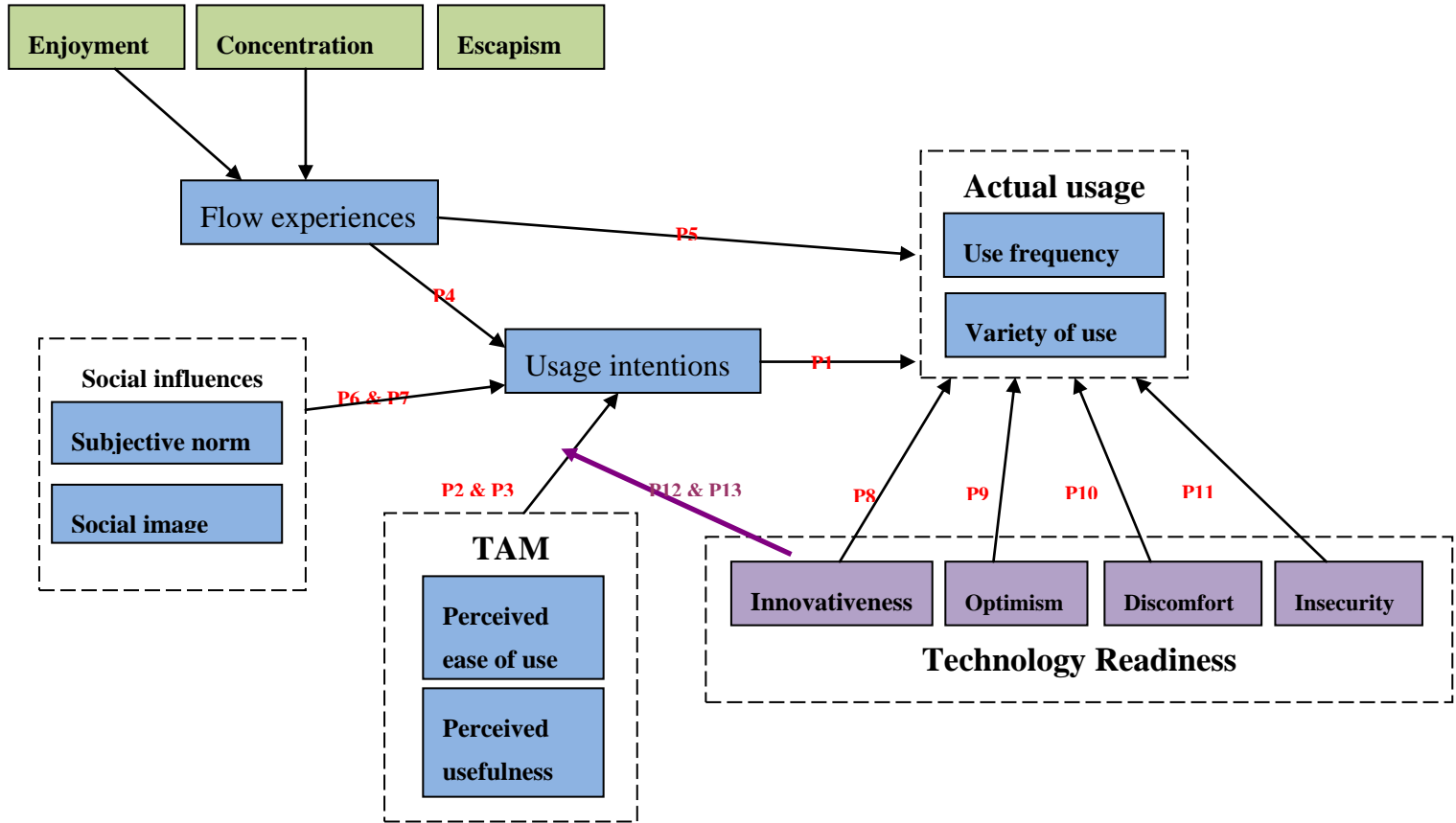

Figure 1.   Proposed Conceptual Framework.

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