Cheikh-Ammar & Barki / Technology Desirability

# **TECHNOLOGY DESIRABILITY**

Research-in-Progress

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### Abstract

Continuous-use of IT is a key post-adoption behavior and has been typically explored based on adoption theories, portraying individuals as rational actors whose decisions are driven by intentions. Yet, continuous-use may not always be shaped by conscious rationality as emotions have been suggested to directly influence post-adoption and to overcome the formation of conscious intentions. The present paper takes a non-rational view of continuous-use and examines how it can be shaped by emotional involvement and value commitment.

Building on previous work in Psychology, Marketing and Economic psychology, the present paper introduces the concept of IT Desirability, and argues for its central role, along with IT Loyalty, in explaining and predicting continuous-use. IT Desirability reflects the passionate and affective relationship individuals experience with IT and is hypothesized to significantly influence their future IT-related decisions. The nonrational perspective suggested here complements existing rational models and provides a new lens for exploring individual mental processes capable of shaping continuous-use.

**Keywords:** Adoption, Decision making/makers, Ubiquitous technology, Individual impact, Hedonic product.

### Introduction

The IT acceptance phenomenon is a central research topic in the IS literature (Sidorova et al. 2008; Benbasat and Zmud 2003) and has often been studied through adoption decisions and via theories such as the technology acceptance model TAM (Davis 1989) or its predecessors, such as the theories of reasoned action (Fishbein and Ajzen 1975) and planned behavior (Fishbein and Ajzen 1975; Ajzen 1991). However, adoption is only a first step towards IS success, an end which can only be achieved through post-adoption behaviors (Jasperson et al. 2005; Limayem et al. 2007). Researchers have therefore investigated post-adoption behaviors via adoption theories and models, incorporating new constructs, such as satisfaction (Bhattacherjee, 2001) and habit (Limayem et al. 2007). While these theories have withstood the test of time, their central premise is that post-adoption behaviors are mostly intentional and conscious decisions (Ortiz de Guinea and Markus 2009). More importantly, these theories also assume that individuals always follow a rational decision making process, and hence their post-adoption behaviors can be explained rationally, based on factors such as task-technology fit (Goodhue 1995; Goodhue 2007), transaction cost (Kim and Kankanhalli 2009) or satisfaction-disconfirmation (Bhattacherjee and Premkumar 2004; Kim et al. 2009).

Yet, halo attributes of IT have been found to influence individuals' perceptions of supposedly rational factors which suggests that post-adoption in general, and continuous-use in particular may not be shaped by conscious rationality alone. For example, manipulating the aesthetic aspects of an IT were found to change usability perceptions (Tractinsky et al. 2000), i.e., what was beautiful was considered usable. Along similar lines, some researchers have suggested that emotions are important factors that can directly influence continuous-use behaviors and override the formation of conscious behavioral intentions (Ortiz de Guinea and Markus 2009). While the study of emotions in the IS literature is not new (Davis et al. 1992; Chin and Gopal 1995; Compeau and Higgins 1995; Venkatesh 1999), most such studies have adopted a rational perspective, often examining the influence of emotions through beliefs such as perceived usefulness and perceived ease of use (Cenfetelli 2004; Venkatesh 2000) or based on their expected effects on intentions (Limayem and Hirt 2003; Venkatesh et al. 2003).

While IS research has recognized the relevance of emotions, they nonetheless remain relatively unexplored (Beaudry and Pinsonneault 2010). So far, researchers have investigated only a few emotions. essentially focusing on those that are negative or positive (i.e. anger, anxiety, satisfaction and happiness), while neglecting the more complex emotions which mix pleasant and unpleasant aspects (Pfister and Bohm 2008). For example, fear is typically viewed as a negative emotion, but in certain contexts like horror movies or extreme sports, it can provide a positive experience (Pfister and Bohm 2008). Desire is another emotion that is likely to be relevant in IS, and can also be experienced as both discomforting and pleasurable (Belk et al. 2003). Desires are powerful motivational forces capable of shaping behavior, sometimes even driving individuals into acting against their better judgment (Stocker 1990; Belk et al. 2003). Desire towards specific IT is thus likely to help better explain post-adoption continuous-use from a non-rational perspective. While most emotions studied in IS are experienced following a cognitive evaluation of threats and control levels, and are triggered by IT-related events (Beaudry and Pinsonneault 2005; Beaudry and Pinsonneault 2010), desires are triggered by the individuals themselves and are likely to strongly influence their future behaviors. Moreover, desires towards IT are particularly salient in contexts of experiential computing (Yoo 2010), hedonic IT (Van der Heijden 2004), ICTs (information and communication technologies), in IT for social networking and online communities.

The present study aims at investigating the relevance of non-rational decision making, mainly driven by affect and emotions, in predicting individual post-adoption usage (continuous use). The non-rational perspective suggested here is based on Etzioni (1988), and its central premise is that emotional involvement and value commitment strongly influence individual choices. This view is expected to complement existing rational models by providing a different lens for exploring individual mental processes capable of shaping post-adoption behaviors. Emotional involvement and value commitment were conceptualized via the constructs of IT Desirability and IT Loyalty, respectively (defined later in the paper). To this end, we first introduce the construct of IT Desirability as a means to capture how individuals can develop a psychological attachment and/or emotional relationship with a given IT. The concept of desirability is relevant both from a practical standpoint, e.g., for Microsoft usability professionals (Benedek and Miner 2002), as well as from a theoretical perspective, e.g., recent

suggestions that individuals can have affectionate relationships with IT, sometimes even in the form of love (Lindstrom 2011). Second, loyalty has also been often cited as a central factor influencing continuoususe in post adoption contexts (Kim and Son 2009). Loyalty refers to a deep, affectively held commitment toward a service (Beatty and Kahle 1988; Oliver 1999) and indicates a favorable attitude toward a provider or service (Kim and Son 2009). Loyalty's affective nature makes the construct very relevant to the current non-rational perspective. Moreover, desirability is also expected to play a central role in shaping and sustaining loyalty, and together they are expected to impact individual IT-related decisions.

The remainder of this paper is organized as follows: First, the literature on continuous-use as a postadoption behavior is summarized. Second, the construct of IT Desirability is introduced and relevant literature related to desires in IS, marketing and psychology are reviewed. Then, the IT Desirability and IT Loyalty constructs are conceptualized following MacKenzie et al.'s (2011) guidelines. Finally, a nonrational decision making model (Etzioni 1988) is discussed and used to develop a theoretical model of non-rational continuous-use with IT Desirability and IT Loyalty as its focal constructs.

### **Theoretical Background**

#### Continuous-use

Post-adoption research has typically focused on behaviors that follow initial acceptance of IT. While early acceptance studies focused on early adoption stages, researchers have recently begun to emphasize the importance of later stages, examining concepts such as continued use, routinization, automatic use and emergent use (Jasperson et al. 2005; Kim et al. 2005; Limayem et al. 2007). The present study focuses on continuous-use, which refers to the stage where the use of an IT goes beyond behavioral consciousness and becomes part of a routine (Bhattacherjee, 2001). IS continuance may better be pictured as the result of a series of repeated individual decisions to continue using a particular IT following initial adoption (Limayem et al., 2007), and it stops following a discontinuance decision (Bhattacherjee, 2001).

Past research has relied on different theories to explain continuous-use. Initially, the same set of constructs that influence usage was thought to also influence continuous-use (Karahanna et al. 1999), and hence, theories of reasoned action were employed to explore post-adoption behaviors. Later, continuous-use was viewed as being different than a simple extension of adoption, and thus the two behaviors were theorized to have different antecedents (Limayem et al. 2003). Continuous-use has mainly been investigated with TAM and Expectation confirmation theory (ECT) as its main theoretical foundations, and via antecedents, such as intention to continue usage (Hsieh et al., 2008), satisfaction, attitude (Bhattacherjee and Premkumar 2004), perceived usefulness, perceived ease of use, expectation confirmation, past usage and habit (Limayem et al. 2007).

Continuous-use in the post adoption context was mostly examined in terms of the overall utilization of an IT (relatively recently, e.g., last week or last month) and measured as a function of frequency and duration (Parthasarathy and Bhattacherjee 1998; Limayem et al. 2003; Limayem et al. 2007). While such conceptualizations have well-known limitations (Straub and Burton-Jones 2007; Jasperson et al. 2005; Barki et al. 2007) they could still be considered relevant in the non-rational contexts examined here, since one of our objectives is to show that affective feelings individuals have towards an IT could influence their IT-related behaviors which can be adequately evaluated via the frequency and intensity of their interactions with the IT. As will be explained later, based on the concepts of emotional involvement and value commitment (Etzioni 1988), the present study focuses on the constructs of IT Desirability and IT Loyalty, respectively, as key drivers of behavior in non-rational contexts.

Yet, frequency of use alone does not cover all of the conceptual elements embedded in post-adoption continuous-use. While this classical view is based on the intensity of system usage which is expected to reflect a diminished probability of discontinuance, it falls short in revealing the engagement an individual experiences with an IT, a key element in continuance behavior. Thus, we employ a rich conceptualization of continuous-use based on the staged approach suggested by Burton-Jones and Straub (2006). Accordingly, we define continuous-use of IT as an individual user's employment of one or more features of an IT. While task is an important element of the usage construct, it is likely to be less important in the context of non-rational behavior: affect and emotions can often drive individuals to interact with the IT with no predetermined task in mind (Fitzgerald, 2012), leading to compulsive usage (Herschlag and

Zwick, 2000). As such, task was not included in the definition of continuous-use which was modeled as an aggregate higher-order construct with two sub-constructs that together capture i) a user's engaged employment of the IT as represented by cognitive absorption and ii) frequency of use. Cognitive absorption, which denotes the extent to which a user is absorbed when using an IT (Agarwal and Karahanna 2000), was not initially developed to measure usage, yet recasting it to develop a rich measure of use has been suggested as a viable approach (Burton-Jones and Straub 2006).

#### IT Desirability

Before discussing IT Desirability as a construct, it is important to first examine the concept of desire and review how it has been typically used in the IS and marketing literatures. Past research, especially in IS, has conceptualized desires based on rational evaluations of objects and their characteristics, i.e., if something is expected to do me good, then I want it or, desire it. For example, if an IT is expected to help me achieve better results, then I desire it. This view originated in marketing and consumer research where desires were linked to fundamental needs, life goals and means to attain ends (Spreng et al. 1993). Accordingly, behavior was expected to be guided by products, attributes of products and the benefits that consumers ascribed to products that better agreed with their life goals. The concept of desire was thus mainly shaped by ideal properties that consumers looked for (Tse and Wilton 1988).

In the IS literature, a similar line of reasoning was followed with the concept of desire having been examined mainly in the satisfaction-disconfirmation stream. This work examined desire disconfirmation (Liu and Khalifa 2003), desired expectations (Suh et al. 1994), meeting original desires, users' desires based on system characteristics (Chin and Lee 2000), and desire congruency (Hong Sheng et al. 2008). Overall, desires have essentially been measured by asking participants whether they wanted a certain object (Spreng et al. 1993) or attributes of a product (Tse and Wilton 1988), whether a product was better or worse than what was desired (Suh et al. 1994; Chin and Lee 2000) or simply whether a system was useful, compatible and easy to use according to their needs (Hong Sheng et al. 2008). These studies examined desires by conceptualizing and measuring them in terms of wants and needs. While some similarities exist between desires, wants, and needs, they also have some important conceptual differences between them. For example, Frankfurt (1984) differentiated between needs and desires through their utility, urgency and moral relevance. When something is needed, it is expected that one cannot do without it, and one could also specify its purpose or what it is needed for. The same cannot be said about desires. According to Frankfurt (1984) a person with limited financial resources who has some medical condition and as a result needs surgery, might also desire to go on a vacation cruise. Thus, needs appear to have substantially greater moral impact than desires yet in many instances individuals can look to satisfy their desires before their needs, or even sacrifice a need to fulfill a desire. The sick person in Frankfurt's example could decide to go on the desired cruise rather than undergo the needed surgery. Moreover, wants are rational and highly cognitive expressions of wishes. They are mainly shaped by personal preferences and are based on judicious evaluations that make them directly subject to rational choices, whereas desires are expressed by passions immersed in a social context (Belk et al. 2003). Finally, needs and wants are concerned with the lack of a category of things (Ramlall 2004), while desires are more focused on specific things embedded in a context (Belk et al. 2003).

This highly emotional perspective on desires is prevalent in the psychology literature. For example, with the aim of developing the elaborated intrusion theory of desire, Kavanagh et al. (2005) defined desire as "...an affectively charged cognitive event in which an object or activity that is associated with pleasure or relief of discomfort is in focal attention" (p. 447). Thus, desires are events in time that vary in intensity and duration. Some researchers in marketing adopted a similar perspective (e.g., Belk et al. 2003):

"We burn and are aflame with desire; we are pierced by or riddled with desire; we are sick or ache with desire; we are tortured, tormented, and racked by desire; we are possessed, seized, ravished, and overcome by desire; we are mad, crazy, insane, giddy, blinded, or delirious with desire; we are enraptured, enchanted, suffused, and enveloped by desire; our desire is fierce, hot, intense, passionate, incandescent, and irresistible;...<u>Try substituting need or want in any of these metaphors and the distinction becomes immediately apparent</u>.... Desires, on the other hand, are overpowering; something we give in to; something that takes control of us and totally dominates our thoughts, feelings, and actions....We battle, resist, and struggle with, or succumb, surrender to, and indulge our desires. Passionate potential consumers are consumed by desire." This conceptualization of desires has been adopted in research on craving and desires for things such as alcohol, cigarettes, coffee and chocolate. Similar perspectives can also be seen in recent IS research that examined compulsive buying over the Internet and found that website characteristics significantly influenced consumers' urge to buy impulsively (Parboteeah et al. 2009; Parboteeah et al. 2011). The present study argues that IT can also be objects of passionate desires and that it is possible for individuals to feel emotional affect towards them. With the increased diffusion of IT, the increased reliability and reach of the Internet and the continued miniaturization of ICT. IT has become "ubiquitous" (Lyvtinen and Yoo 2002), invading individuals' daily lives and facilitating human efforts in new and innovative ways. IT is now a key part of the way we socialize with friends, debate with people or even the way we listen to music. Immersed in our daily private and professional lives, IT have rendered the traditional "task performance" conceptualization of individual-IT interactions insufficient (Yoo 2010). Thus, individuals who use Facebook, for example, do not continuously evaluate their social networking site based on its usability or usefulness, and continue using it because of their emotional attachment to it. For most of them Facebook has become part of their daily computing activities and a part of their world. In such cases it can be useful and relevant to focus on the desirability of IT as a construct in order to better understand this type of computing (Yoo 2010). Moreover, individuals are also likely to continue using a given IT, and not another, based on its desirability even if other IT exist with similar usefulness or usability levels. Following the steps suggested by MacKenzie et al. (2011) for construct conceptualization and inspired by Kavanagh et al. (2005) we define IT Desirability, as an affectively charged feeling, associated with pleasure and/or relief of discomfort, which an individual experiences towards an IT. It is materialized through individuals' conscious eagerness to acquire or engage with an IT.

### IT Loyalty

The concept of customer loyalty has been examined by marketing academics for many decades. It was only in the early 2000s, and with the emergence of electronic commerce that IS researchers began investigating loyalty in online services contexts (Toufaily et al. 2012). Many definitions and conceptualizations of loyalty can be found in the literature, with some reflecting an attitude, others an intention to interact or re-interact with an IT, and others a psychological attachment leading to a behavior (Toufaily et al. 2012). Some of these conceptualizations have been criticized for the confusion they create between the core of the loyalty construct and its behavioral outcomes (Kim and Son 2009).

Researchers in consumer behavior have often viewed loyalty as reflecting customers' dedication to a service. Loyalty in this context represents a consumer's intense commitment toward a product or service (Oliver 1999) which eventually guides their behavior, leading to long-term benefits (Lam et al. 2004; Oliver 1999). Consistent with this, IS researchers have considered loyalty as a dedication-based commitment and an important predictor of customer behavior in online service settings (Kim and Son 2009). As the loyalty concept refers to an individual's deeply held commitment toward a service or an object (Beatty and Kahle 1988; Oliver 1999), it is seen as a major factor influencing the survival of online businesses (Reichheld and Schefter 2000) and is thought to be initially formed based on individuals' perceptions of potential benefits. However, unlike perceived benefits, loyalty is somewhat stable in the short term (Kim and Son 2009). Hence, based on previous work (Oliver 1999; Lam et al., 2004; Kim and Son 2009), IT Loyalty is defined here as *an individual's overall attachment or deep commitment to an IT*.

## Theoretical Model

#### A rational continuous-use model (Bhattacherjee, 2001)

Bhattacherjee's (2001) post-adoption usage continuance model is thought to be powerful, parsimonious and successfully adapted to IS contexts (Limayem et al. 2007). Based on consumer research in marketing and expectation confirmation theory (ECT) (Oliver 1980), it portrays IS users as rational actors who are mainly driven by psychological cognitive motives that lead to the formation of intentions. The model includes usefulness, a traditional IS adoption construct, and introduces two new concepts, satisfaction and confirmation as the main antecedents of continuance intentions.

According to Bhattacherjee's (2001) model, users' decisions to continue to use an IT are comparable to consumers' repurchase decisions following the first time purchase of a product. Thus, following initial use, individuals re-evaluate their adoption decision based on their expectations, and then determine whether

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to continue or discontinue using the IT (Bhattacherjee 2001). Accordingly, users' expectations are embodied in the utilitarian value of the IT, represented via the construct of perceived usefulness (PU), a cognitive belief (or sum of beliefs) salient to usage (Bhattacherjee 2001; Davis et al. 1989). PU provides a baseline against which confirmation is evaluated to determine satisfaction, and in continuance contexts, PU has been studied as an adequate expectation and a central antecedent of satisfaction and use intention (Bhattacherjee 2001). Confirmation is then suggested to be positively related to satisfaction with use since it implies the attainment of expected IS benefits (initial PU). Moreover, the more the expected benefits are confirmed, the more the IT is perceived to be useful and the more users are satisfied with its usage. Finally, while the link between intentions and usage continuance is not shown in this model, it is nevertheless implied (Limayem et al. 2007).

While empirically supported, Bhattacherjee's (2001) model does not take into account the influence of affective drivers on post-adoption behaviors. The non-rational perspective discussed below integrates affectionate states and values as additional antecedents of continuous-use (Figure 1), thus providing a complementary lens to Bhattacherjee's reasoned action perspective.



#### Non-rational Decision Making

While widely used decision making models in economics and psychology emphasize rational behaviors, Etzioni (1988) suggested a fundamentally different perspective which views individual choices as being mostly based on emotional involvement and value commitments, rather than on logical and/or empirical factors. Emotional involvement represents individuals' affective attachments and emotional preferences, and value commitment refers to the moral convictions people abide by. Value commitment could be seen in individuals' moral judgments of what is right and wrong (i.e. sacrificing oneself for the benefit of others), loyalty towards an organization/workers' unions or one's nationalistic values (Etzioni, 1988).

According to Etzioni, emotional involvement and value commitments largely shape individual data processing, information gathering, inferencing, alternative selection and final decisions. A lack of rational evaluation does not imply irrational behaviors but rather depicts decisions where logical assessments are

omitted or diluted, i.e., individual choices are made based on non-rational decisions. Etzioni (1988) did not deny the existence of rational decision making, but suggested that non-rational processes could frequently intervene and reduce its lucidity. For example, rational decision making, which includes alternative identification and evaluation, can frequently be infused with emotional involvement (or value commitments or both) and make individuals either to completely ignore some alternatives or at least manipulate the weight of their significance. Moreover, it is common for individuals to rationalize their decisions after a choice has been made rather than before (Cohen and Goldberg 1970; Turel et. al 2011). Given such purely emotionally founded alterations, the purely rational perspective becomes questionable.

Non-rational processes underscore the role of affect and emotions in individual decision making and are consistent with calls for research in the IS field to examine "unplanned and unreasoned action" while emphasizing the direct impact (not through intentions) of emotions on post-adoption use (Ortiz de Guinea and Markus 2009). Emotions are thus expected to influence behaviors without the individual's conscious awareness. Thus, the present study explores the link between emotions and continuous-use through the constructs of IT Desirability and IT Loyalty, and leaves the investigation of IT as emotional triggers (Beaudry and Pinsonneault 2005; Ortiz de Guinea and Markus 2009) to future research.

The key premise of the non-rational model is that emotional involvement and value commitments strongly influence choices individuals make (Etzioni, 1988). The IT Desirability construct, as defined earlier, is hypothesized to play a central role in shaping post-adoption continuous-use. The scope of this construct is believed to extend to hedonic IT (Van der Heijden 2004), experiential computing (Yoo 2010), ICTs, as well as to social networking IT and online communities. Based on Kavanagh et al. (2009), a preliminary set of measurement items for assessing IT Desirability are provided in Table 1.

Table 1. Preliminary Measurement Items for IT Desirability		
DES1.	Did you think about XXX?	
DES2.	Did you feel an urge to use it?	
DES3.	How strong was this urge?	
DES4.	Did a picture of XXX come to your mind?	
DES5.	Did you imagine yourself using XXX?	
DES6.	Did you imagine how good using XXX would make you feel?	
DES7.	Does the thought of interacting with XXX make you happy?	

Desirable objects invade individuals' thoughts, and impel in them feelings of expected pleasure and relief of discomfort (Kavanagh et al. 2005; Kavanagh et al. 2009). Technologies like smart phones and certain social networking sites have been shown to have similar effects on adopters (Patterson, 2012). This suggests that individuals who have adopted "desirable IT" are likely to have intruding thoughts related to the IT and create positive images in their minds linked to their usage. These feelings could lead to compulsive usage behaviors (Herschlag and Zwick, 2000), where individuals might interact with the IT even with no predetermined task in mind (Fitzgerald, 2012). Detachment from a desirable IT will induce discomfort, a feeling individuals expect to be relieved from by interacting with the IT (Kavanagh et al. 2009). While IT Desirability is likely to be experienced differently by different individuals, the more intense the experienced desirability of an IT is for individuals, the more likely they will have thoughts and urges to interact with the IT, which in turn will be likely to influence their continuous-use behavior.

#### H1- IT Desirability positively influences its continuous-use.

IT Desirability represents a focal construct of the present study's research model, and captures the emotional involvement individuals experience with a specific IT. Addiction, a construct recently examined in the IS literature (Turel et. al 2008; Turel et. al 2011; Lu and Wang 2008), can be related to desires: intensified and frequent incidences of desirability could mutate into addiction (Kavanagh et al. 2005). While the effect of addiction on continuous-use has previously been observed in IS, not all desirably experienced IT are expected to be addictive, just like not every person desiring a glass of wine is an alcoholic. It is conceivable that other constructs and events could intervene and/or moderate the relation between desirability and addiction. As such, it would be interesting to explore the relationship between these two constructs in future research.

According to Etzioni (1988), individuals' decisions are also largely influenced by their value commitments, which could in many cases contradict the often cited motivation of utility maximization (Etzioni 1986a). Etzioni gives the example of a patriotic American who chooses to work in the US even if salaries and taxes might be more advantageous in other countries. Commitment to nationalistic values would then be the key factor influencing this person's behavior. Other examples of value commitment include loyalty towards one's community (or online community) and commitment to labor unions or organizations (Etzioni 1988). Here, value commitment would be represented by loyalty as earlier defined. Based on Kim and Son (2009), a list of preliminary items for measuring IT Loyalty is provided in Table 2.

Some studies have suggested that satisfaction with a service shapes long-term loyalty while the lack of it triggers discontinuance behavior (Arthasarathy and Bhattacherjee 1998). Trust has also been suggested as a strong determinant of loyalty in website contexts (Gefen 2002). Moreover, social presence has been shown to predict consumer trust (Gefen and Straub 2003) and loyalty (Cyr et al. 2007; Kumar and Benbasat 2006) in commercial websites. In sum, research has consistently found loyalty (as value commitment) to be a strong determinant of customer behavior in online service settings (Gefen 2002). These findings are consistent with many customer accounts of social networking sites, online communities, ecommerce websites or even ICT brands (e.g., blackberry or iPhone), who get attached to these platforms, express commitment to their provided services, while neglecting other alternatives offering similar services. Hence,

#### H2- IT Loyalty positively influences its continuous use.

Individuals who have high emotional involvement with an IT can also be expected to experience intense emotional commitment towards the IT as a product (Oliver 1999), which would eventually guide their behaviors. A desirable IT is likely to be perceived as beneficial, trustworthy and satisfactory, which are essential elements for loyalty formation (Arthasarathy and Bhattacherjee 1998; Gefen 2002). Desirable IT associated with enjoyment and relief of discomfort hinders the rational activities of alternative evaluation (Etzioni, 1988) which can help shape and strengthen individual loyalty. Consistent with this idea, Lu and Wang (2008) have suggested that addiction to online games, which is based on intense desires, as well as user satisfaction, positively influence loyalty. Hence,

H3- IT Desirability	positively influe	nces IT Loyalty.
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Table 2. Preliminary Measurement Items for IT Loyalty (Kim and Son 2009)		
LOY1.	I consider myself to be highly loyal to the portal site.	
LOY2.	I feel loyal towards the portal site.	
LOY3.	It means a lot to me to continue to use the portal site.	

## Methodology

In recent years, social networking sites have gained immense popularity around the world, with Facebook being a leader in this domain (Hsu et al., 2012). A venue for information sharing, Facebook is deeply integrated in the life of its users (Patterson, 2012) and supports multiple forms of communication and interactive features (Hsu et al., 2012), making it an appropriate example of desirable IT. Hence, our study will focus on Facebook users and employ a mixture of field studies and questionnaire surveys to investigate the proposed research model. The objective of the field study will be to adequately operationalize the IT Desirability and IT Loyalty constructs. Based on the definitions provided earlier, as well as past theoretical and empirical research, a representative sample of users will be interviewed to generate and refine items that capture the two constructs (MacKenzie et al., 2011). This will be followed by a pre-test survey for validity assessment, measurement model specification and scale purification. Next, based on the refined items, an online survey will be administered to current Facebook users who have had an active profile for at least a year, regardless of their activity level, with the aim of discriminating between frequent and low levels of usage based on their experienced desirability.

A second field study will be undertaken to investigate desirability-inducing IT characteristics suggested in the research model. While accessibility, communicability and traceability were inspired by the seven material properties of the digitalized artifact suggested by Yoo (2010), the field study will help sharpen their definitions and clarify their impact on social networking users. With this objective, semi-structured

interviews will be conducted with experienced Facebook users to generate and refine items that reflect these constructs. While the three suggested IT characteristics are expected to be relevant in social networks, they do not necessarily provide an exhaustive set of antecedents, and as such the interviews will also help uncover new IT characteristics capable of inducing desirability in social networking contexts. Finally, a third survey will be conducted to investigate the influence of the identified IT characteristics on IT Desirability, but this time for social software in organizational contexts (e.g., Yammer.com).

### Conclusion

The non-rational decision making model, driven by affect and emotions, is the main contribution of the present study to the post-adoption literature. The suggested perspective is expected to add to existing rational models by providing a complementary lens that captures influential individual mental processes in the post-adoption stage. This perspective integrates affectionate states and values as additional antecedents of continuous-use, which should help overcome the weaknesses of the reasoned action perspective in post-adoption contexts. As such, the present research also answers calls for IS research to examine "unplanned and unreasoned action" and the direct impact of emotions on post-adoption use (Ortiz de Guinea and Markus 2009). Moreover, this paper introduces the constructs of IT Desirability and IT Loyalty as key motivational forces, based on complex emotions, and capable of shaping individual behavior.

Etzioni (1988)'s non-rational decision making process was used as a theoretical foundation to develop a consistent story line and to support the study's research hypotheses. IT Loyalty and IT Desirability do not represent the sole value commitment and emotional involvement elements that can exist. They were selected in this paper for their relevance to IS and to illustrate the potential impact of non-rational decision making in continuous-use decisions. Moreover, other non-rational constructs such as habit could also have a significant impact on continuous-use. Such factors were not included in the proposed research model which was bounded by Etzioni's (1988) theoretical limits.

The present study provides a new and complementary perspective to past research on the influence of IT characteristics on individual behaviors, especially to research examining the social presence of online users (Olivera et al. 2008; Cyr et al. 2009). Past research examined the effect of social interactivity on knowledge seeking and contributions in online communities through socio-technical perspectives (Phang et al. 2009) while others studied the effect of website quality on purchase intentions (Wells 2011). The present study suggests that IT characteristics are likely to directly trigger emotional, non-rational decision making processes which can influence post-adoption continuous-use in such contexts. Attachment and affective connections to IT and online communities has recently attracted the attention of IS researchers (Yuqing et al. 2012). A central premise of this paper is that this type of attachment can be explained by the IT Desirability.

While desirability and usefulness are expected to correlate, the two constructs are conceptually different. The former revolves around emotional appeal, while the latter is related to the logic of rational performance enhancement. Their correlation is likely to stem from the fact that individuals tend to rationalize their behavior after making their decisions (Cohen and Goldberg, 1970). Hence, it is unlikely for users to negatively answer usefulness questions related to an IT they desire.

Finally, future research can also benefit from examining the role IT Desirability plays in shaping initial adoption decisions. While individuals are likely to need some experience with an IT before they can establish their emotional involvement with it, it is also possible that in certain cases other factors, such as social norms and image, could induce IT Desirability. Moreover, IT design characteristics could also play an important role in shaping IT Desirability in initial adoption contexts and could also be examined in future studies.

#### References

- Agarwal, R., and Karahanna, E. 2000. "Time Flies When You're Having Fun: Cognitive Absorption and Beliefs about Information Technology Usage". *MIS Quarterly*, 24(4), 665–694.
- Ajzen, I. 1991. "The theory of planned Behavior." Organizational Behavior and Human Decision Processes 50: 179–211.
- Ajzen, I., and M. Fishbein. 1975. "Belief, attitude, intention and behavior: An introduction to theory and research." *Reading, MA: Addision-Wesley*.
- Barki, H., R. Titah, and C. Boffo. 2007. "Information System Use--Related Activity: An Expanded Behavioral Conceptualization of Individual-Level Information System Use." *Information Systems Research* 18(2): 173–192.
- Beatty, S. E, and L. R Kahle. 1988. "Alternative hierarchies of the attitude-behavior relationship: the impact of brand commitment and habit." *Journal of the Academy of Marketing Science* 16(2): 1–10.
- Beaudry, A. and A. Pinsonneault. 2010. "The Other Side of Acceptance: Studying the Direct and Indirect Effects of Emotions on Information Technology Use." *MIS Quarterly* 34(4): 689–A3.
- Beaudry, A. and A. Pinsonneault. 2005. "Understanding User Responses to Information Technology: A Coping Model of User Adaptation." *MIS Quarterly* 29(3): 493–524.
- Belk, R. W, G. Ger, and S. Askegaard. 2003. "The fire of desire: A multisited inquiry into consumer passion." *Journal of consumer research* 30(3): 326–351.
- Benbasat, I. and R.W. Zmud. 2003. "The Identity Crisis Within the Is Discipline: Defining and Communicating the Discipline's Core Properties." *MIS Quarterly* 27(2): 183–194.
- Benedek, J., and T. Miner. 2002. "Measuring Desirability: New methods for evaluating desirability in a usability lab setting." *Proceedings of Usability Professionals Association*: 8–12.
- Bhattacherjee, A. 2001. "Understanding information systems continuance: An expectation-confirmation model." *Mis Quarterly*: 351–370.
- Bhattacherjee, A., and G. Premkumar. 2004. "Understanding Changes in Belief and Attitude Toward Information Technology Usage: A Theoretical Model and Longitudinal Test." *Management Information Systems Quarterly* 28: 229–254.
- Burton-Jones, A., and Straub, D. W. 2006. "Reconceptualizing System Usage: An Approach and Empirical Test". *Information systems research*, 17(3), 228–246.
- Cenfetelli, R. T. 2004. "Inhibitors and enablers as dual factor concepts in technology usage." *Journal of the Association for Information Systems* 5(11-12): 472–492.
- Chee W.P., A. Kankanhalli, and R. Sabherwal. 2009. "Usability and Sociability in Online Communities: A Comparative Study of Knowledge Seeking and Contribution." *Journal of the Association for Information Systems* 10(10): 721–747.
- Cheung, C. M. K., and Limayen, M. 2005. "The Role of Habit in Information Systems Continuance: Examining the Evolving Relationship Between Intention and Usage," in *Proceedings of the 26th International Conference on Information Systems*, D. Avison, D. Galletta, and J. I. DeGross (eds.), Las Vegas, NV, December 11-14, pp. 471-482.
- Chin, W. W, and A. Gopal. 1995. "Adoption intention in GSS: relative importance of beliefs." ACM SigMIS Database 26(2-3): 42–64.
- Chin, W. W, and M. K.O Lee. 2000. "A proposed model and measurement instrument for the formation of IS satisfaction: the case of end-user computing satisfaction." In *Proceedings of the twenty first international conference on Information systems*, , p. 553–563.
- Cohen, J. B, and M. E Goldberg. 1970. "The dissonance model in post-decision product evaluation." *Journal of Marketing Research*: 315–321.
- Compeau, D.R, and C.A. Higgins. 1995. "Application of Social Cognitive Theory to Training for Computer Skills." *Information Systems Research* 6(2): 118–143.
- Cyr, D., Hassanein, K., Head, M., Ivanov, A., 2007. "The role of social presence in establishing loyalty in e-Service environments." *Interacting with Computers* 19(1): 43–56.
- Cyr, D., Head, M., Larios, H., Pan, B., 2009. "Exploring Human Images in Website Design: A Multi-Method Approach." *MIS Quarterly* 33(3): 539–A9.
- Davis, F. D, R. P Bagozzi, and P. R Warshaw. 1992. "Extrinsic and Intrinsic Motivation to Use Computers in the Workplace1." *Journal of Applied Social Psychology* 22(14): 1111–1132.
- Davis, F. D. 1989. "Perceived usefulness, perceived ease of use, and user acceptance of information

technology." MIS quarterly: 319-340.

- Etzioni, A. (1986). The case for a multiple-utility conception. *Economics and Philosophy*, 2, 159–183.
- Etzioni, A. 1988. "Normative-affective factors: Toward a new decision-making model." *Journal of economic psychology* 9(2): 125–150.
- Fitzgerald, B. 2012. "Americans Addicted To Checking Smartphones Would 'Panic' If They Lost Device" *Huffington Post*. http://www.huffingtonpost.com/2012/06/21/americans-are-addicted-to-smartphones\_n\_1615293.html (Accessed August 13, 2012).
- Frankfurt, H. G. 1984. "Necessity and desire." Philosophy and Phenomenological Research 45(1): 1–13.
- Gefen, D. 2002. "Reflections on the dimensions of trust and trustworthiness among online consumers." *ACM SiGMiS Database* 33(3): 38–53.
- Gefen, D., and D. Straub. 2003. "Managing user trust in B2C e-services." E-Service 2(2): 7-24.
- Goodhue, D. L. 2007. "Comment on Benbasat and Barki's 'Quo Vadis TAM' Article." *Journal of the Association for Information Systems* 8(4): 219–222.
- Herschlag, M., and R. Zwick. 2000. "Internet auctions-popular and professional literature review." http://repository.ust.hk/dspace/handle/1783.1/1027
- Hong S., F.F. Nah, and K. Siau. 2008. "An Experimental Study on Ubiquitous commerce Adoption: Impact of Personalization and Privacy Concerns." *Journal of the Association for Information Systems* 9(6): 344-376.
- Hsu C., Chen, H.-C., Huang, K.-K., Huang, Y.-M. 2012. "A personalized auxiliary material recommendation system based on learning style on Facebook applying an artificial bee colony algorithm." *Computers & Mathematics with Applications* 64(5): 1506–1513.
- Jasperson, J., P.E. Carter, and R. W. Zmud. 2005. "A Comprehensive Conceptualization of Post-Adoptive Behaviors Associated with Information Technology Enabled Work Systems." *MIS Quarterly* 29(3): 525–557.
- Karahanna, E., D. W. Straub, and N. L. Chervany. 1999. "Information Technology Adoption Across Time: A Cross-Sectional Comparison of Pre-Adoption and Post-Adoption Beliefs." *Mis Quarterly*: 183–213.
- Kavanagh, D. J, J. Andrade, and J. May. 2005. "Imaginary relish and exquisite torture: the elaborated intrusion theory of desire." *Psychological review* 112(2): 446.
- Kavanagh, D. J, J. May, and J. Andrade. 2009. "Tests of the elaborated intrusion theory of craving and desire: Features of alcohol craving during treatment for an alcohol disorder." *British Journal of Clinical Psychology* 48(3): 241–254.
- Kim, D. J., D. L. Ferrin, and H. R. Rao. 2009. "Trust and Satisfaction, Two Stepping Stones for Successful E-Commerce Relationships: A Longitudinal Exploration." *Information Systems Research* 20(2): 237–257.
- Kim, H. and A. Kankanhalli. 2009. "Investigating User Resistance to Information Systems Implementation: A Status Quo Bias Perspective." *MIS Quarterly* 33(3): 567–582.
- Kim, S.S., and J. Son. 2009. "Out of Dedication or Constraint? a Dual Model of Post-Adoption Phenomena and Its Empirical Test in the Context of Online Services." *MIS Quarterly* 33(1): 49–70.
- Kumar, N., and I. Benbasat. 2006. "Research note: the influence of recommendations and consumer reviews on evaluations of websites." *Information Systems Research* 17(4): 425–439.
- Lam, S. Y., Shankar, V., Erramilli, M. K., Murthy, B. 2004. "Customer value, satisfaction, loyalty, and switching costs: An illustration from a business-to-business service context." *Journal of the Academy of Marketing Science*, 32(3): 293–311.
- Limayem, M., S. G Hirt, and C. M.K Cheung. 2003. "Habit in the context of IS continuance: theory extension and scale development." In *Proceedings of the 11th European Conference on Information Systems*, , p. 19–21.
- Limayem, M., S. G. Hirt, and C. M. K. Cheung. 2007. "How habit limits the predictive power of intention: the case of information systems continuance." *MIS Quarterly*: 705.
- Lindstrom, M. 2011. "You Love Your iPhone. Literally." The New York Times.
  - http://www.nytimes.com/2011/10/01/opinion/you-love-your-iphone-literally.html
- Liu, V., and M. Khalifa. 2003. "Determinants of satisfaction at different adoption stages of Internetbased services." *Journal of the association for information systems* 4(1): 12.
- Lu, H. P, and S. Wang. 2008. "The role of Internet addiction in online game loyalty: an exploratory study." *Internet Research* 18(5): 499–519.
- Lyytinen, K., and Y. Yoo. 2002. "Research commentary: the next wave of nomadic computing."

Information Systems Research 13(4): 377–388.

Oliver, R. L. 1999. "Whence consumer loyalty?" the Journal of Marketing: 33-44.

- Olivera, F., P.S. Goodman, and S.S. Tan. 2008. "Contribution Behaviors in Distributed Environments." *MIS Quarterly* 32(1): 23–42.
- Ortiz de Guinea, A., and M. L Markus. 2009. "Why Break the Habit of a Lifetime? Rethinking the Roles of Intention, Habit, and Emotion in Continuing Information Technology Use." *Management Information Systems Quarterly* 33(3): 433–444.
- Parboteeah, D. V., J.S. Valacich, and J.D. Wells. 2009. "The Influence of Website Characteristics on a Consumer's Urge to Buy Impulsively." *Information Systems Research* 20(1): 60–78.
- Parboteeah, V., J.S. Valacich, and J.D. Wells. 2011. "Online Impulse Buying: Understanding the Interplay between Consumer Impulsiveness and Website Quality." *Journal of the Association for Information Systems* 12(1). http://aisel.aisnet.org/jais/vol12/iss1/3.
- Parthasarathy, M., and A. Bhattacherjee. 1998. "Understanding post-adoption behavior in the context of online services." *Information Systems Research* 9: 362–379.
- Patterson, A. 2012. "Social-networkers of the world, unite and take over: A meta-introspective perspective on the Facebook brand." *Journal of Business Research* 65(4): 527–534.
- Pfister, H. R, and G. Böhm. 2008. "The multiplicity of emotions: A framework of emotional functions in decision making." *Judgment and Decision Making* 3(1): 5–17.
- Ramlall, S. 2004. "A review of employee motivation theories and their implications for employee retention within organizations." *Journal of American Academy of Business* 5(1/2): 52–63.
- Ross, J. W, C. M Beath, and D. L Goodhue. 1995. "Developing long-term competitiveness through information technology assets." *Working paper (Sloan School of Management); WP 3878-95.*
- Sidorova, A., Evangelopoulos, N., Valacich, J., and Ramakirshnan, T. 2008. "Uncovering the Intellectual Core of the Information Systems Discipline," *MIS Quarterly* (32:3), pp. 467-482.
- Spreng, R. A, S. B MacKenzie, and R. W Olshavsky. 1996. "A reexamination of the determinants of consumer satisfaction." *The Journal of Marketing*: 15–32.
- Stöcker, M. 1990. Plural and Conflicting Values. Oxford University Press.
- Straub, D.W. and A. Burton-Jones. 2007. "Veni, Vidi, Vici: Breaking the TAM Logjam." Journal of the Association for Information Systems 8(4): 224–229.
- Suh, K., S. Kim, and J. Lee. 1994. "End-user's disconfirmed expectations and the success of information systems." *Information Resources Management Journal (IRMJ)* 7(4): 30–39.
- Tractinsky, N., A. S. Katz, and D. Ikar. 2000. "What is beautiful is usable." *Interacting with computers* 13(2): 127–145.
- Tse, D. K, and P. C Wilton. 1988. "Models of consumer satisfaction formation: an extension." *Journal of marketing research*: 204–212.
- Turel, O., A. Serenko, and P. Giles. 2011. "Integrating technology addiction and use: an empirical investigation of online auction users." *MIS Quarterly* 35(4): 1043–1061.
- Turel, O., Y. Yuan, and C. E Connelly. 2008. "In justice we trust: Predicting user acceptance of ecustomer services." *Journal of Management Information Systems* 24(4): 123–151.
- Van der Heijden, H. 2004. "User acceptance of hedonic information systems." MIS quarterly: 695–704.
- Venkatesh, V. 1999. "Creation of favorable user perceptions: exploring the role of intrinsic motivation." *MIS quarterly*: 239–260.
- Venkatesh, V. 2000. "Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model." *Information systems research* 11(4): 342–365.
- Venkatesh, V., Morris, M. G., Gordon B. Davis, and Davis, F. D. 2003. "User Acceptance of Information Technology: Toward a Unified View". *MIS Quarterly*, 27(3), 425–478.
- Wells, J.D., J.S. Valacich, and T.J. Hess. 2011. "What Signal Are You Sending? How Website Quality Influences Perceptions of Product Quality and Purchase Intentions." *MIS Quarterly* 35(2): 373–A18.
- Yoo, Y. 2010. "Computing in Everyday Life: A Call for Research on Experiential Computing." *MIS Quarterly* 34(2): 213–231.