

# User's Perceived IS Slack Resources and their Effects on Innovating with IT

*Research-in-Progress*

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## **Abstract**

*While adaptation research significantly extends our understanding of how users adapt in reacting to new technology, scant attention has been given to the phenomenon of second-wave, proactive innovations, following the implementation of a disruptive information technology (IT). A proactive user behavior with IT voluntarily steps out of the defined job requirements and creates a new application of IT in the work. This paper conceptualizes a concept called innovating with IT (IwIT) as a post-implementation behavior which refers to user innovations that are proactively conducted with IT in one's work process or deliverables. The paper draws on proactivity literature and takes a novel "slack" perspective to understand what could facilitate IwIT. An integrative model that explores the relationship between user's perceived IS slack resources and IwIT has been developed. This project contributes to existing IS research by presenting a new and complementary approach to existing research on adaptive behaviors.*

**Keywords:** adaptive behaviors, innovating with IT, user innovation, information systems slack, slack resources.

## Introduction

Studies of IT innovation have extensively explored how an IT innovation, as a single disruptive event, has been adopted (e.g., Lyytinen and Rose 2003; Swanson and Ramiller 2004) and adapted (e.g., Beaudry and Pinsonneault 2005; Leonard-Barton 1988) over time at the organizational level. However, more recent IS research has moved from studying the disruptive IT innovation as a single product and instead, has started looking at the second-order effects of disruptive IT in blossoming waves of innovations by users of IT in their own working contexts (e.g., Boudreau 2012; Nambisan 2013; Yoo et al. 2012). This views IT innovation as a platform that leads to the emergence of several other distributed innovations within (e.g., Dougherty and Dunne 2012) and across (e.g., Boland et al. 2007) the firm. This is important because employees have the “sticky” knowledge of their task environment (Morrison et al. 2000, p. 1519) and are potentially among the best sources to use IT and innovate and discover areas for improvement. While these recent studies have looked into the second wave effects, they mainly remain at the organizational level. In effect, it is not clear how second-wave innovations are originated from the individuals, who are the real source of ideas and innovations. This discussion is generally positioned surrounding user adaptation research which looks at individual behaviors with an existing, already-implemented IT. Our paper focuses on this understudied phenomenon at the individual level, by taking a novel perspective: information systems slack resources.

Studying the wakes of innovation requires an operant view of IT which views information technology as a trigger of innovations, rather than its enabler (Nambisan 2013). The second wave of innovations originate from user adaptations that proactively apply IT in the work, instead of reactively tweaking it in order to resolve problems emerged from disruptive IT implementation (i.e., maintaining the status quo). In general, existing IT adaptation research informs us about reactive behaviors that follow an IT implementation, accommodate misfits, and resolves issues arise among IT, task, and individuals (e.g., Barki et al. 2007; Beaudry and Pinsonneault 2010). However, we do not know much about users’ adaptive behaviors when they *proactively* step out of the comfort zone of routine IT use, *discover* opportunities for improvement in one’s work domain, and *employ IT to* implement their novel ideas (i.e., second wave innovation). A proactive user behavior is the one that is not expected from job requirement perspective.

This paper sheds light on this phenomenon by conceptualizing one type of adaptive behavior called “*Innovating with IT (IwIT)*” that occurs as a second-wave innovative behavior following a disruptive IT implementation. Two research questions are explored in this study: First, *how can such proactive adaptations with IT be conceptualized and how are they different from other adaptive behaviors (RQ1)*? This is essential because, despite being generally among the post-implementation behaviors, routinized use of IT could be conceptually different from voluntarily stepping out of the box, and actively exploring and innovating with IT (see Nambisan 2013). Second, *what are the key antecedents of such a proactive behavior with IT (RQ2)*? This question is warranted because, after IT implementation, there exists a brief window of opportunity for users to explore and innovate with IT and failing to exploit such a limited window could lead to the freezing of unresolved problems into organizational practices (Tyre and Orlikowski 1994). Therefore, it is essential to understand the antecedents of IwIT in order to foster user innovations with IT after implementation.

In order to explore the first question (RQ1), we initially reviewed the existing literature on individual adaptations and concluded that it mainly extends our understanding of “*reactive*” behaviors in the “*process*” of accomplishing tasks. Reactive user adaptations are the behaviors that attempt to accommodate to conditions toward achieving role’s predefined objectives (i.e., maintenance or custodial behavior). Now that we have a good understanding of the reactive behaviors, it is necessary to study the proactive user adaptations. Further, adaptive behavior is predominately studied as a behavior that occurs in user’s work process. However, in addition to adaptation in one’s work process, users of IT may conduct adaptive behaviors with IT in their work deliverables (i.e., products or services one delivers to his/her manager, employees, or clients external to the company). Thus, we include both aspects by defining IwIT as *user innovations that are proactively performed with IT in one’s work process or work deliverable*.

In order to address the second key question, we reviewed adaptation literatures for its antecedents and compared it with antecedents of *proactive* behavior which is key in the conceptualization of IwIT. Our review shows several contextual antecedents of adaptation that are under management control:

organizational encouragement for innovation (Majchrzak and Cotton 1988; Wang et al. 2008), autonomy (Ahuja and Thatcher 2005; Ke et al. 2012), user emotions (e.g., excitement, anxiety) (Beaudry and Pinsonneault 2005; Wang et al. 2008), technology-related factors (e.g., restrictiveness and perceived ease of use) (Hsieh and Wang 2007; Silver 1991), and work overload (Ahuja and Thatcher 2005; Majchrzak and Cotton 1988). On the other side, while several antecedents of proactive behavior are similar to antecedents of adaptation (e.g., organizational encouragement, autonomy, emotions), (e.g., organizational encouragement, self-efficacy, autonomy, emotions in Bindl and Parker 2010; Crant 2000; Grant and Parker 2009; Morrison and Phelps 1999; Parker et al. 2006; Unsworth and Parker 2003), proactivity literature also points to another factor that is different from its similar factor (i.e., overload) in adaptation research: *slack resources*. These studies argued that the need to have some free, extra resources (e.g., time or cognitive resources) over and above what is necessary for role accomplishment fosters proactive behaviors (Fritz and Sonnentag 2009; Ohly et al. 2006). For instance, in a survey of 302 employees working in different departments, Ohly et al (2006) found that there is a positive relationship between routinization and proactive behavior. They argue that when job becomes routine for individuals, several resources are freed (e.g., mental resources and time) and this facilitates thinking more deeply about the work, problems and potential innovative solutions. Therefore, in this paper, we conceptualize the notion of slack in IS resources and argue that the perception of possessing slack surround IT could fundamentally change individual's *cognitive schema* from a risk-averse, passive follower of the routines to an active problem-solver and seeker of opportunities who is likely to divergently think about IT and work for improvement.

After the above concise review of the literature, first, the paper draws on adaptation and proactivity research, to develop the key concept of this study, IwIT. Subsequently, an initial model is proposed that explores whether the significance and strength of the relationship between perceived IS slack and IwIT depends on the type of IS slack resources. After elaborating on the methodology, preliminary findings are discussed. This paper contributes to IS research by taking a novel approach to the phenomenon of second-wave innovation by IT users. In particular, the paper investigates how the second-wave innovations can be facilitated by the perception of having IS slack resources surrounding a disruptive IT innovation.

## Conceptual Development—Innovating with IT

We draw on our review of the adaptation and proactivity literature to conceptualize innovating with IT (IwIT) as a post-implementation behavior that refers to *user innovations that are proactively performed with IT in one's work process or work deliverable*. While IwIT is conceptualized as an adaptive behavior, it has commonalities with other existing behaviors in IS and management research. First, IwIT is an individual-level adaptive behavior. In other words, it is not a stand-alone, isolated behavior. Instead, it is originated from and is triggered by the implementation of a disruptive IT innovation. Second, it is an innovative behavior in that it brings novel value to one's work (process or deliverable). Third, it is also a proactive behavior in that it challenges the status quo and voluntarily deviates from job requirements and goes beyond what is expected (i.e., a routine behavior). From organizational behavior perspective, IwIT is one among several types of proactive behaviors (e.g., taking initiative, organizational citizenship behavior, individual innovation) and can be classified as a subcategory under individual innovation.

IwIT is classified in two groups: user innovations in one's work process and work deliverables (i.e., products and services). Users may conduct user-initiated process innovations that take the status quo with respect what they delivers (as a service or product) for granted and instead, makes modifications in the work process of generating existing deliverables. For instance, adding new tasks or elements in work process, changing the sequence in which one does different tasks, automating her work process, and gathering new information to support decisions one make in his your work are some general example of this category of IwIT. Such innovations do not change user deliverable and capitalizes on improving the process of generating existing user deliverables. Yet, users may deviate from their existing outcomes and come up with innovations in their deliverables. Adding a new functionality to their work deliverables, improving the quality of their work deliverables, extending their service to new clients, customizing their work deliverables to different needs, or creating new work deliverables altogether are some examples of user innovation in one's work deliverables.

There are also some primary differences between other adaptive behaviors and IwIT (Table 1). First, IwIT is a "proactive" behavior which is self-initiated and challenges the status quo, either in the method by

which a user delivers value or the deliverable itself. In contrast, majority of the existing adaptive behaviors are reactive in nature in that they do not challenge the status quo and make minor changes and tweaks to existing condition: Customization (Desouza et al. 2007), intensive use (Wang et al. 2012), adjustment (Majchrzak and Cotton 1988), exploitative system usage (Burton-Jones and Straub 2006), appropriation (DeSanctis and Poole 1994), task adaptation (Beaudry and Pinsonneault 2010), reinvention (Boudreau and Robey 2005). Second, in contrast to existing IS research that is predominately focused on user improvements in the process of task accomplishment, IwIT also contains innovations that improve user's deliverables (i.e., product or service). Existing IS research has not specifically included adaptive behaviors that improves the product that users deliver and has not clearly differentiated these two categories. Finally, IwIT is conceptualized as a work-oriented concept, rather than an IT-oriented one. When innovating with IT, it does not matter whether a user is employing existing or new features to innovate. What matters is the proactive identification of successful and novel applications of IT in the work environment. While existing adaptation literature has defined adaptation based on changes in the IT, task, or self, IwIT is conceptualized exclusively surround the task. In sum, IwIT has roots in extant IS research. IwIT has been recognized as an important, strategic user behavior that can lead to organizational innovation, efficiency, effectiveness, and survival (e.g., Ahuja and Thatcher 2005; Nambisan et al. 1999; Wang et al. 2011; Yoo et al. 2012).

| Table 1. Comparing IwIT and other adaptive behaviors |   |   |
|--|---|---|
|  | Adaptive Behaviors  |   |
|  | Innovating with IT  | Other adaptive behaviors  |
| Type of behavior                                     | Extra-role and in-role  | In-role   |
| Intention  | Bring novel changes   | Maintaining the status quo  |
| Motivation   | Mainly intrinsic and self-directed                              | Mainly extrinsic from work environ.                                       |
| Job goals and characteristics                        | Challenged and redefined  | Taken for granted   |
| Intended target of impact                            | Task  | IT, task, and/or self   |
| User mindset   | Creating/controlling the situation                              | Adjust to situation   |
| Direction of change                                  | Mainly forward  | Backward  |
| Scope of behavior                                    | – Going beyond assigned tasks<br>– May include other users/SBUs | – Within the scope of expectations<br>– Limited to one's task environment |

## Model and Hypotheses

Lack of workload pressure is necessary for innovative, proactive behaviors, yet not sufficient. In fact, over and above what people need for role accomplishment, individuals need some space in the work ecosystem that provides them with margins for trial and error. The paper argues that slack in IS resources facilitates user's proactive behaviors and voluntary explorations with IT. It provides individuals with the relief from daily workload pressures and margins for error (Schulman 1993) which are crucial for innovative behaviors (Elsbach and Hargadon 2006). While other antecedents of adaptive, proactive behaviors have been more or less studied in existing IS research, no study has looked into the effect of slack resources and its different types on such behaviors. The few studies that studied the relationship between overload and adaptive behaviors have not found a significant relationship (e.g., Ahuja and Thatcher 2005). In our proactivity-based model of IwIT (Figure 1), we conjecture that different types of perceived IS slack resources (i.e., technological, knowledge, support personnel, and time) have distinct effects on the affective and cognitive conditions that facilitate innovation with IT. Several testable propositions are suggested.

### Concepts

As the main independent variable of our study, we define User's Perceived IS slack (UPIS) as the "perceived degree of *surplus* in user's surrounding IS resources that are beyond what s/he knows as generally necessary to accomplish his or her work roles". In contrast to other definitions of IS slack at organizational level (e.g., Rahrovani and Pinsonneault 2012), it is limited to individual level (not groups or organization), and is defined as a user perception. We initially disaggregate user's perceived IS slack resources into four meaningful subcomponents: *technological, knowledge, IT support personnel, and time*. We selected these types based on two criteria. First they should be a resource type, perceived at the

individual level. Second, they should be *directly* used by individuals for accomplishing a task with IT (e.g., cash slack is eliminated). These dimensions are not limited to technological (say IT) slack resources and includes other types of IS resources peripheral to the core disruptive IT and the work. In addition to technological resources (e.g., IT features and functionalities), other types of resources such as knowledge of IT, time, and IT support personnel are necessary for role accomplishment. This preliminary classification will be revised based on a qualitative case study. *Technological IS slack* is defined as the cushion of functionalities given to an organizational user that goes beyond the certain functionalities that are optimally necessary for doing his or her job with IT. In order to define knowledge IS slack, we build on Silver's (1991) notion of suggestive versus informative decisional guidance. Silver clarifies on how firm's training program "enlightens or sways" IT users when "they choose among and use the system's functional capabilities (p. 107)". Thus, we define *Knowledge IS slack* as the degree to which user knowledge goes beyond the step-by-step procedural knowledge necessary to be followed to do his or her job with IT. *Support personnel IS slack* is conceptualized as the cushion of IT support personnel surrounding an IT that are beyond what is optimally necessary by a user for doing his or her job with that IT. Organizations may allocate cushion of IT support personnel to individuals involved during and after IT implementation (e.g., Li et al. 2011). Finally, *time IS slack* is the user's cushion of time for doing his or her job with IT that is beyond what is optimally necessary for achieving it.

*Cognitive predictors* consist of beliefs, thoughts or perceptions of conditions supporting a user's experience of IT implementation. *Perceived autonomy* refers to "the degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out" (Hackman and Oldham 1976, p. 258). *Creative IT self-efficacy* is defined as the user's belief that s/he can creatively apply IT in work roles and processes. Two characteristics make creative IT self-efficacy a compelling construct in explaining IwIT. First, creative IT self-efficacy is not the feeling of competence in "doing a predefined task", but it is the feeling of competence in "being creative". Second, it is not a *general* feeling of competence, yet the feeling of competence to be creative "with IT". *Affective predictors* refer to emotional reactions initially activated by IT implementation. We selected the emotions that are future-oriented (i.e., emotions in which IT users feel to have control over) and are also influenced by perceived slack resources: playfulness and anxiety. As an example of the exclusion rationale, we eliminated the frustration emotion since it is different from anxiety in that the user feels to have no control over the consequences of the event and therefore, is not expected to affect frustration. *Playfulness* emotion is defined as the emotion of tendency to interact spontaneously with an IT application (Hackbarth et al. 2003). *Anxiety* emotion refers to "the tendency of individuals to be uneasy, apprehensive, or fearful" (Beaudry and Pinsonneault 2010, p. 692) of deviating from routines and exploring new areas with IT.

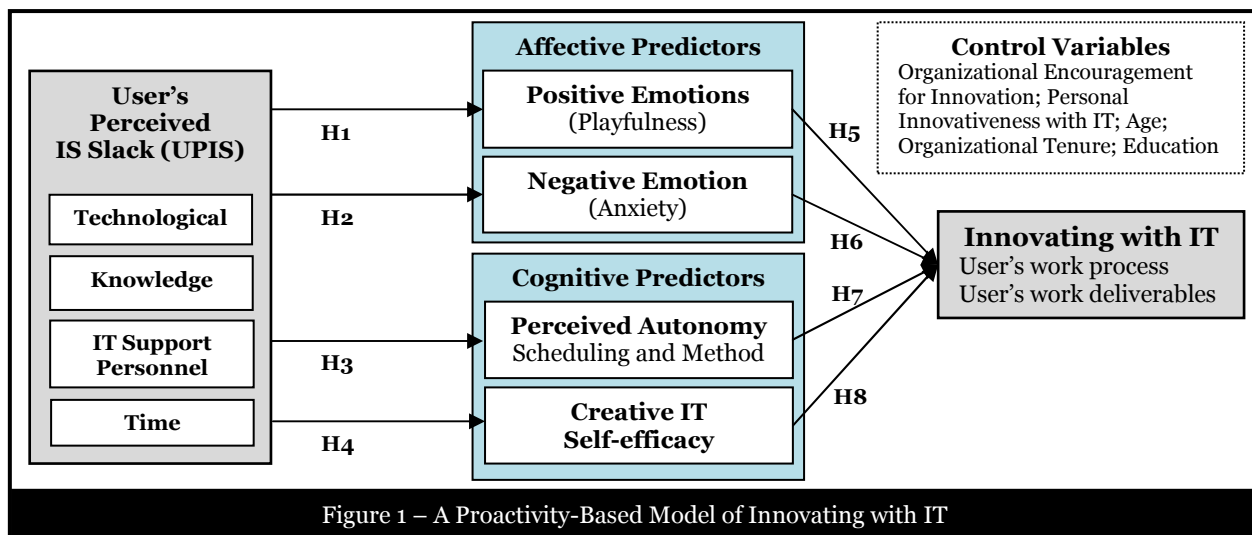


Figure 1 – A Proactivity-Based Model of Innovating with IT

## Hypotheses

The concept of “slack resources” and its consequences has been differentiated from the availability of *sufficient and necessary* resources required for role accomplishment and maintaining business operations alive. Much of the cognitive and behavioral activities of employees are found to occur automatically based on the predefined routines (Ashforth and Fried 1988; Langer 1992). Such individual’s tendency toward automatic behavior and confirmation of the status quo (i.e., reactivity) is magnified when coupled with the perception of resource scarcity. However, lack of overload (i.e., availability of sufficient resources for task accomplishment) could range from the availability of sufficient resources (for role accomplishment) to the perception of resource abundance beyond what is necessary. Resource sufficiency is not generally expected to trigger proactive behaviors (including IwIT) because, in this situation, user still does not have any extra resource that supplies exploration and accordingly innovation with IT. In fact, people have strong tendency to avoid losses rather than acquiring gains (Kahneman and Tversky 1979) and therefore, follow routines. However, resource abundance can fundamentally change individual’s cognitive schema to risk-taking rather than risk-aversion. The opposite of a perception could be theoretically and empirically different from that perception, and could lead to distinct consequences (Cenfetelli 2004).

Building on our review of the antecedents of proactive behaviors, in addition to slack resources, two other broad categories of contextual factors can be outlined to facilitate IwIT. From a cognitive perspective, autonomy and perceived competence (or self-efficacy) are argued to be positively associated with IwIT. From an affective perspective, emotions motivates innovative behaviors (for review see Beaudry & Pinsonneault, 2010) (e.g., Amabile 2000). A substantial amount of research suggests that positive affect improves intrinsic motivation and accordingly innovativeness among individuals (Fiol and O’Connor 2003; Isen and Reeve 2005; Kraiger et al. 1989; Russ 1999). In contrast, research shows that high degree of negative affect deteriorates intrinsic motivation (Elsbach and Hargadon 2006; Runco 2004). Due to the concurrent effects of both the very specific positive and negative emotions, scholars call for more nuanced view of emotion beyond the mere positive and negative categories (e.g., Beaudry and Pinsonneault 2010; Hennessey and Amabile 2010).

Table 1. Research Hypotheses

|    |  |
|----|--|
| H1 | Perceived IS slack is positively associated with playfulness.                  |
| H2 | Perceived IS slack is negatively associated with anxiety.                      |
| H3 | Perceived IS slack is positively associated with creative IT self-efficacy.    |
| H4 | Perceived IS slack is positively associated with user’s perceived autonomy.    |
| H5 | Playfulness emotion is positively associated with innovating with IT.          |
| H6 | Anxiety emotion is negatively associated with innovating with IT.              |
| H7 | Perceived degree of autonomy is positively associated with innovating with IT. |
| H8 | Creative IT self-efficacy is positively associated with innovating with IT.    |

**UPIS and Playfulness.** When IT users perceive to possess IS slack resources beyond what is necessary for role accomplishment, they feel to have the fuel necessary to drive deviating, innovative behaviors. For playing with system and exploring it, certain types of slack resources are required to enable such explorations (e.g., time and access to features). For instance, if there is no free time and the employee is under a significant amount of time pressure, there is no time left for the user for exploring novel things with IT. Second, perception of possessing slack may lead to the perception of higher degree of control over the consequences of such deviances from work routines. In fact, slack resources are necessary to minimize the risks associated with such exploratory behaviors with known and unknown consequences. The perception of extra resource coupled with higher sense of control may itself fuel user’s curiosity and intention to play in the work environment. Therefore, we generally expect a positive relationship between UPIS and playfulness.

**UPIS and Anxiety.** Perceived degree of threat, perceived lack of control, and perceived ambiguity and complexity are among some antecedents of anxiety (Blanchette and Richards 2010; Bowers 1968; Compeau et al. 1999; Izard 1977). In general, perception of abundance in IS resources could grant user an increased perception of competence and control over the technology, task environment, and the consequences of exploring with IT in the work. In addition, presence of slack generally decouples tightly

integrated tasks and decreases perceived ambiguity and complexity in the work context. These could enhance user's psychological safety and accordingly diminish anxiety (Schein 2009; Weick and Sutcliffe 2007). Therefore, we argue that perceived IS slack negatively affects user's anxiety through its antecedents.

**UPIS and Creative IT self-efficacy.** Perception of possessing slack resources beyond what is necessary for role accomplishment would also affect one's belief that s/he can creatively apply IT in one's work processes and products, i.e., creative IT self-efficacy. Perception of competence is predicted by several factors internal and external to an individual (Bandura 1977; Gist and Mitchell 1992). Availability of slack resources in the work environment is an external factor that triggers perceived competence in job accomplishment. This is generally the case with innovative behaviors. Innovative behaviors are generally unpredictable and accidental (Austin et al. 2012), yet require certain resources that help users to explore novel ideas and experiment with them toward finding a useful, workable innovation. IS slack is one among all types of environmental factors that could influence individual's "assessment of personal and situational resources/constraints" (Gist and Mitchell 1992, p. 189) and creative ability (Ford 1996). Consequently, it affects user's perception of competence and the belief in his or her capability in creatively using IT in the work. As a result, a positive relationship between perceived IS slack resources and creative IT self-efficacy is proposed.

**UPIS and Autonomy.** Perceived IS slack directly influences user's perceived autonomy. Autonomy provides users with freedom and flexibility to minimize the stress and work exhaustion through making own decision in managing the workload and schedule (Ahuja et al. 2007). When users are provided with IS slack resources, they perceive to have more independence, authority and discretion over determining the schedule and method of accomplishing the task with IT. That is because IS slack resources provides additional free space and choices over the methods one can take as well as the pace he or she can accomplish the work. Thus, a positive relationship between perceived IS slack resources and perceived autonomy is proposed.

**Cognition and IwIT.** From a cognitive perspective, when users perceive higher degree of autonomy, they feel free from "rigid schedules or tight control systems" (Ahuja and Thatcher 2005, p. 428) and are able to use their creative potential in the work environment (Unsworth and Parker 2003). Therefore, they perceive their quality of IT use to involve more of the experience of choice (i.e., more self-determined). Self-determination has been shown to increase intrinsic motivation (Deci and Ryan 1985, 1987, 2009; Hennessey and Amabile 2010) which is an antecedent of innovation. Thus we expect a positive relationship between perceived autonomy and IwIT. For creative self-efficacy, perceived competence has been found as an important facilitator of individual's proactive and innovative behaviors (Bindl and Parker 2010; Crant 2000; Ohly and Fritz 2007; Parker et al. 2006). In the context of IwIT, we argue that high degree of creative IT self-efficacy enhances intrinsic motivation to innovate. That is because people's perception of competence is necessary for personal cognitive or behavioral involvement (Deci and Ryan 1985, 1987) and the perception of having ability to innovate with IT is likely to increase the motivation for doing so. Therefore, a positive relationship between creative IT self-efficacy and IwIT is suggested.

**Emotion and IwIT.** In IS research, playfulness is argued to enhance people's duration of interaction and familiarity with IT (Hackbarth et al. 2003), and increase their openness to other possibilities by IT (Webster et al. 1993). It is also shown to boost computer usage (Atkinson and Kydd 1997) and user innovativeness (Woszczyński et al. 2002) through augmenting experimentation and curiosity (Webster and Martocchio 1992; Webster et al. 1993; Woszczyński et al. 2002), which are some antecedents of innovative behavior. Thus we suggest a positive relationship between playfulness and IwIT. Anxiety is argued to have a negative effect on proactive behaviors by diverting the attention from the innovative process (Unsworth and Parker 2003). It is also expected to affect intrinsic motivation by deterring users to take an active role in using IT and is found to negatively influence user's motivation (Compeau and Higgins 1995; Compeau et al. 1999; Venkatesh et al. 2003) to innovate. Thus a negative relationship between anxiety and IwIT is proposed.

## **Research Methodology**

Mixed-methods of data collection and validation were employed in this study. First, to explore the types of UPIS and their effects on IwIT, we conducted a qualitative study by interviewing innovative IT users, as

the unit of analysis. Multiple interview method is advantageous for this study since in-depth qualitative data can be used to seek support evidence for the proposed model and also the evidence that deviates from what was proposed in the model. The qualitative data is used to seek support evidence for the proposed model and also the evidence that deviates from what was proposed in the model. The findings of the case analysis were employed in different ways. First, the analysis of in-depth interviews helped in better understanding of the independent (i.e., UPIS) and dependent (i.e., IwIT) variables of this research project. This is important because UPIS and IwIT are new constructs that have some commonalities with other concepts in the literature (e.g., IS resources vs. UPIS or extensive use vs. IwIT). The interviews provided evidence on how these constructs are different from the existing ones and shed light on developing operational measures for the cross-sectional survey in the second phase of the study. In addition, the first phase led to modifications in the proposed theory that links UPIS to IwIT. This modification includes adjustments to the construct dimensions as well as the relationship between the independent and dependent variable.

After revising the model, cross-sectional questionnaire across industries will be sent to test the relationship between perceived IS slack and IwIT. In designing the survey, we borrowed from existing validated measures of the constructs that have been already used in the literature (e.g., playfulness, proactive personality, and job autonomy). Churchill (1979) and Moore and Benbasat (1991) guidelines were systematically followed to develop and validate measures for new constructs (e.g., IwIT and UPIS). To do so, item generation based on a comprehensive literature review, two rounds of card sorting, and interviews with IT users were conducted. Additional modifications were made to account for user's comments and suggestions. The questionnaire webpage is in HTTP protocol and survey is hosted on Qualtrics. We will initially run a pilot study that tests the whole model. After revising the measures, the main survey will be sent to several users of IT (not IT developers) across the globe. The sample frame comprises organizational employees who have recently (less than 6 months) experienced a disruptive IT implementation. Non-response biases will be analyzed and ex ante and ex poste techniques will be employed to minimize validity threats from common-method (e.g., Podsakoff et al. 2003). The predictive validity of the UPIS construct will also be tested by looking at its effect on user's general risk propensity to explore novel areas with IT.

### ***Data collection and Analysis***

Data collection started by nine in-depth, semi-structured interviews with innovative users in five companies. The interview sessions were conducted over phone/Skype, audio-taped, transcribed, and coded in Nvivo 9. We tried to maximize diversity by seeking individuals that are different with respect to industry (energy, insurance, healthcare, telecommunication, and video game), function (research and development, marketing, design, project management, and planning), and technology (ERP, hardware design software, Internet, Video game engines). Interviews lasted approximately for one hour. The interviews began with a general question on the story of user innovation, and continued on to more specific questions on the type of organizational supports they received during that journey, and how it contributed to their innovation. Initial code categories were created based on the salient constructs and relationships contained in the proposed model. As such, during the first round of coding, data elements were broken down and assigned to various concepts that emerged. The result of the analysis of the nine interviews led to some modifications. These modifications include adjustments to the construct dimensions as well as the relationship between the independent and dependent variable.

### ***Preliminary Findings and Future Steps***

In general, the data provides a strong support for several of the constructs as well as the proposed relationships in the initial model. With respect to IwIT, several instances of user innovation were brought up in the cases that were consistent with the classification of IwIT in two groups of user innovations in work process and deliverables. For instance, after ERP implementation in an oil-well drilling company, a user in project management team (Case 1) suggested an alternative work breakdown structure (WBS) that significantly improved the process of cost estimation in their core operation (i.e., innovation with IT in work process). As an instance of innovation with IT in work deliverables, a marketing manager (Case 3) introduced an entirely new campaign to reach new customers through IT. With respect to the types of slack resources, the presence of the four proposed types of IS slack resources were also evident in the



data. In addition, the link between the general notion of slack as well as certain types of slack (e.g., time, knowledge, or technology) and IwIT were also supported.

However, a number of new insights have already emerged from the iterative data analysis process. For instance, in the context of knowledge slack, some interactive technologies (such as YouTube or movies) appears to be a source of knowledge slack that may feed user with novel ideas for their own work. Case 9, who works on the graphic design of a video game, argued that *“usually I sit and watch movies everyday ... and try to say okay this is a good idea maybe if I can modify it”*. He specifically elaborated on one of his innovations and emphasized that the idea *“comes from a couple of videos ... on YouTube”*. This observation has some roots in the extant literature. This suggests that there could be another dimension to knowledge type of IS slack which is the interaction to interactive technological artifacts over and above the knowledge that resides in the community of coworkers surround an IS user. Cohendet and Simon (2007) studied a videogame company (VGC) that had an innovative team. For having novel ideas *“This team would play videogames, attend international gaming events, read about the industry and generally immerse itself in pop-culture to define the content orientations of VGC (p. 593).”* Therefore, we added another dimension to knowledge slack that includes such sources of knowledge.

As another example of deviance from the model, job complexity emerged as an important factor that moderates the relationship between time slack and innovation. For instance, in purely innovative tasks (e.g., in research scientists in Case 5, 6, and game design in Case 9) an interviewee indicated that *“you can’t force someone to do something within a reasonable timeframe (Case 9).”* In contrast, Case 1 and 2 (project control team member and planning expert in an oil well drilling company) point to some occasions of time pressures and tight deadlines under which they innovated. This contrast came to a compromise in Case 6 which brought up a novel idea from their *“Friday Afternoon Project”* (i.e., leaving employees on their own) while emphasizing the importance of having time pressure straight-forward tasks in daily operation. This conclusion is generally consistent with the literature that argues for the impact of job complexity or ambiguity on innovation. For instance, Ohly et al (2006) showed that job complexity has a positive relationship with individual innovation. They argued that job complexity *“enable employees to experiment with new ideas and to develop them (p. 261)”* and therefore it becomes better developed and workable. They also emphasize that employees need time for such a detailed development of an idea. More time may be required for such open-ended, complex tasks. Therefore, we conclude that the effect of slack time on IwIT is moderated by the degree of job complexity and as it is not a focus of our study, we will control for it.

## Expected Contributions

The importance of innovating with IT is increasingly attended in research and practice. The objective of this research is to extend our understanding of IwIT and by employing a slack perspective. The paper is expected to result in several contributions to research. First, our study advances our knowledge of IwIT, which is a specific form of user innovation, called second-wave innovations that follow disruptive IT implementations. Not much is known about user innovations that follow the big change (i.e., IT implementation) that challenge the status quo and generate entirely new functions for IT. Second, this study conceptualizes user’s perceived IS slack and presents a classification of IS slack. That is important because a better understanding of the antecedents of IwIT is also crucial in today’s innovation-intensive competitive business environment. While resources-based view have been significantly employed in IS research, availability of optimal or less than optimal amount of resources has been an unspoken assumption in majority of IS research. Less theoretical development and empirical investigation of the consequences of slack in IS resources have been envisaged in IS domain. The classification sheds light on this phenomenon by better capturing the types of perceived IS slack and how each type may have distinct consequence on user innovation. As a practical contribution of this study, comparing and contrasting different types of slack resources and their distinct impacts on user innovations with IT can help organizations in managing the implementation of disruptive IT innovations.

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