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Enhanced Use of IT: A New Perspective on Post-Adoption

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Abstract

A major problem confronting organizations is that they make large investments in information technologies (IT) that, in many cases, underperform following adoption because their features are underutilized. In information systems (IS) research, there is a need to develop a better understanding of the process by which individuals make new use of IT features. Using a grounded theory approach, we develop such an understanding by closely examining how individuals change their IT use following initial adoption. Based on analyzing interview data and expanding on extant literature to refine our results, we propose a construct called "enhanced use", which refers to novel ways of employing IT features. We conceptualize enhanced use as having distinct forms (using a formerly unused set of available features, using an IT for additional tasks, and/or using extensions of IT features and attributes). Our analysis reveals that these forms may differ in terms of their attributes (locus of innovation, extent of extensive use, and adaptation). Our study uncovers patterns of use that reveal the roles played by task characteristics, knowledge, and the IT type in shaping enhanced use. Thus, this study heeds repeated calls to theorize about use by proposing a novel and rich conceptualization of post-adoption use.

Keywords: *Use, Post-Adoption, IT Features, IT Implementation, Process Model, Qualitative Study.*

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1. Introduction

The literature on information technology (IT) use offers an abundance of studies examining the adoption of IT and its initial use (Davis, 1989, p. 66; Mathieson, Peacock, & Chin, 2001; Venkatesh, Morris, Davis, & Davis, 2003). These studies establish that beliefs related to performance expectancy, effort expectancy, social influence, and facilitating conditions are good predictors of users' intentions to adopt an IT, which, in turn, is a good predictor of actual adoption (Venkatesh et al., 2003). Because this is an important imperative in IT research, much effort has been expended in investigating the factors that influence IT adoption and the related dimensions of initial use. However, since the fate of technology use is not sealed at time of adoption, there is a rising need in IS research to take a closer look at post-adoption IT use (Jasperson, Carter, & Zmud, 2005). An organization's ability to achieve performance gains with IT depends largely on the way it uses the features of its IT applications. A major problem confronting organizations is that they spend millions of dollars for applications that underperform because they are underutilized (Jasperson et al., 2005). This underutilized IT potential stems from the fact that "users employ quite narrow feature breadths, operate at low levels of feature use, and rarely initiate technology—or task-related extensions of the available features" (Jasperson et al., 2005, p. 526). Most of the models used in IT adoption research employ a lean conceptualization of use and do not go beyond studying initial use; many only consider intention to use. As a result, the literature provides few rich conceptualizations of the IT use construct; the exceptions are the development of the construct of IS use-related activity (ISURA) (Barki, Titah, & Boffo, 2007) and effective use (Burton-Jones & Grange, 2012). A study of the way in which IT features are used and evolve over time is therefore well in order. The literature to date has paid scant attention to the need for a holistic and clear picture of the use of IT features and, in particular, to the question of *how* users apply IT in novel ways by changing how they use IT features. By developing an elaborate account of this phenomenon, we hope to stimulate additional research on the nature and outcomes of IT use (Griffith, 1999; Jasperson et al., 2005; Kwon & Zmud, 1987).

This study focuses on IT use by individuals; the data involve both IT use for personal purposes and IT use in organizational settings. We uncover the nature and processes of a new construct, which we call "enhanced use". Enhanced use represents novel ways of employing IT features and has distinct forms and attributes. The forms of enhanced use include using a formerly unused set of available features, using an IT feature for additional tasks, and using features extensions. Enhanced use also has key attributes: locus of innovation, extent of substantive use, and adaptation. Our study reveals patterns of enhanced use, which we describe as a process that includes the inception of an idea, the execution of that idea, and the related adaptation. These patterns are influenced by three key factors: task characteristics, knowledge used, and IT type.

Given its nature and objectives, our study uses a grounded theory approach, with multiple iterations between interview data and the literature (Ibarra, 1999; Strong & Volkoff, 2010). We start with the first set of interviews, designed to develop an initial understanding of the enhanced use construct. Then, we iterate using the literature and a second set of interviews to further investigate the themes that emerged from the first set of interviews in order to uncover the factors that shape enhanced use. Throughout the analysis, we weave the literature review into our findings (Strong & Volkoff, 2010).

This study makes several contributions. First, we propose a rich conceptualization of post-adoption use by including task-related variables, user-related variables, and system-related variables. Second, we explain how the process of enhanced use is shaped by task characteristics, knowledge, and the system used. Finally, our study heeds repeated calls to theorize about the IT artifact by discussing how the characteristics of different IT types relate to enhanced use (Benbasat & Zmud, 2003; Orlikowski & Iacono, 2001).

This paper is organized as follows. In Section 2, we briefly review the literature on IT use in the post-adoption phase. In Section 3, we describe the method we use to conduct this study. In Section 4, we present our conceptualization of enhanced use and, in Section 5, examine how the uses of IT

features are shaped over time. In Section 6, we discuss our results in light of the extant literature and, in Section 7, offer some concluding remarks.

2. IT Use in the Post-Adoption Phase

While IS research primarily focuses on IT adoption and the initial phase of IT use, there is growing interest in studying post-adoption phenomena (e.g., Jasperson et al., 2005; Limayem, Hirt, & Cheung, 2007). Post-adoptive use is studied primarily in two research streams. First, research on IT use continuance—also referred to as continued use—has generated several propositions concerning the factors that lead individuals to keep using (or discontinue using) an IT once it has been adopted (Bhattacherjee & Premkumar, 2004; Karahanna, Straub, & Chervany, 1999; Parthasarathy & Bhattacherjee, 1998). Second, habit formation in IT use, which refers to individuals' tendencies to use IT automatically (Limayem et al., 2007), has also been studied. This literature underscores the antecedents and consequences of habitual use and the influence of habit on users' interactions with an IT (e.g., intention to use, innovation) (Kim & Malhotra, 2005; Limayem et al., 2007; Limayem & Hirt, 2003; Ortiz de Guinea & Markus, 2009).

While the studies on IT use continuance and habit are important to IT research, they do not provide sufficient insight into the nature of post-adoptive IT use. For further insight, a better understanding of how technology is actually used is needed. Many studies provide detailed accounts of the intricacies of use following adoption (e.g., Leonardi, 2007; Orlikowski, 1992, 1996). Often drawing on qualitative and grounded theory approaches, they offer more elaborate descriptions of IT use. For example, many of these studies examine the intricacies of the context of use and how social dynamics shape the adoption, implementation, use, and meaning of a technology (Leonardi & Barley, 2010; Orlikowski & Iacono, 2001). Some studies also attempt to describe IT use from the perspective of the features employed to perform tasks including emergent use, deep use, and features extension (Jasperson et al., 2005; Saga & Zmud, 1994; Wang & Butler, 2006).

Recent papers have called for or propose an expanded conceptualization of use. Burton-Jones and Straub (2006) propose developing new measures of system use that would include system-related, user-related, and/or task-related dimensions because usage is a complex activity that involves these three elements. Similarly, some researchers have called for an expanded behavioral view of system use to capture what "users do in and around the notion of system use". They argue that "the advantages of an expanded behavioral view of IT use include a more faithful representation of usage activities that users engage in" (Benbasat & Barki, 2007, p. 215). An important empirical contribution in this regard is the information system use-related activity (ISURA) construct (Barki et al., 2007). ISURA identifies technology interaction behaviors (e.g., problem solving, exchanging with people, planning or following up, coordinating activities), task technology adaptation behaviors (e.g., improving functionalities, interfaces, hardware), and individual adaptation behaviors (e.g., reading manuals, learning from an IT specialist) as defining the use of a technology with greater consideration for the activities surrounding IT use. It does not provide an explanation of the process through which post-adoption use is enacted. More recently, Burton-Jones and Grange (2012) put forth the concept of "effective use", which refers to the use of a system "in a way that helps attain the goals for using the system" (p. 2). Their definition of use draws on information theory to fully integrate the nature and purpose of an information system, and thus is inclusive of not only the system, but also of the user and the tasks.

Our study adds to the recent development of richer use conceptualizations by developing the construct of enhanced use. Indeed, while recent studies on IT use provide different perspectives that help qualify and better conceptualize IT use, none has not yet focused on features use. We also develop the construct of enhanced use, which refers to the process of making new uses of IT features and to the related patterns of use. We contribute to the understanding of IT use by providing an elaborate account of what it means to make new use of IT features and discussing the process by which IT post-adoption use is shaped and evolves over time.

3. Methods

The study reported here uses an inductive grounded theory-building approach (Glaser & Strauss, 1967; Strauss & Corbin, 1990; Urquhart & Fernandez, 2006; Urquhart, Lehmann, & Myers, 2010) to define and conceptualize enhanced use and to identify and explain notable patterns of enhanced use. Given the study's exploratory nature and the objective of generating a descriptive model that takes into account the contextual and processual elements of an as-yet incompletely documented phenomenon, we deemed a grounded theory approach to be appropriate. As a result, the conceptualization of enhanced use that we propose in this paper is deeply embedded in our empirical data (Eisenhardt, 1989; Langley, 1999). In fact, we relied primarily on interviews to acquire a deeper understanding of enhanced use, its nature, and process. In addition, we performed iterations between data collection and the literature because the literature helps make sense of the new themes that emerge from the interviews (Urquhart, 2001; Urquhart & Fernandez, 2006). In other words, the interviews helped us gather a rich description of enhanced use process enacted by the users, while the literature helped us analyze its underlying characteristics (Eisenhardt, 1989; Ibarra, 1999).

We conducted the interviews in two phases to empirically develop our overall conceptualization of enhanced use. The first phase consisted of eight open interviews with a convenient sample of interviewees (Patton, 2002) in order to develop an initial conceptualization of enhanced use. We took the interviewees from a convenient sample of four female and four male graduate research assistants between the ages of 27 and 36 attending various faculties of a large North American university. Using an open-ended interview guide, we asked them whether and how their IT use had changed over time in terms of the features used. In response, they described their use of a wide range of systems including all of the Microsoft Office productivity suite and social networking applications. Some of them also described using enterprise resource planning (ERP) applications in their previous jobs. Each interview lasted between 30 and 60 minutes and was digitally recorded.

Building on these first interview results, which provided an initial conceptualization of enhanced use, we developed a semi-structured interview guide for the second round of interviews to ensure that we fully understood all the important characteristics of enhanced use and the underlying processes. We refined the interview guide first on the basis of comments from a university faculty member experienced in qualitative research, and second based on feedback from three pilot interviews (Boudreau, Gefen, & Straub, 2001). In this second round, the interviews began with a question that asks respondents to describe the ways in which their uses of IT features evolve over time. When appropriate, we posed specific questions to participants to prompt more detailed accounts of the system used, the task performed, and/or the overall process underlying their enhanced use. The interviews lasted between 30 and 90 minutes.

For this second phase of interviewing, and to ensure that we were covering a wide range of novel IT feature uses, we selected the first respondents using a purposeful sample; we identified additional respondents through a snowball sampling approach (Patton, 2002). Our initial sampling consisted of seven respondents who were experienced users of different IT types and had different professional backgrounds (see Appendix A). We encouraged these users to discuss various experiences of enhanced use. The goal was to gather information about a wide variety of experiences in order to gain further insight into the factors and patterns that shape enhanced use. We asked the first respondents to suggest other individuals who would have insights about the process of enhanced use. We continued to conduct interviews until we had established that their marginal benefit was significantly reduced (data saturation). As Appendix A shows, our final sample consists of 24 interviewees (20 to 40 years old; in different professions and from different industries) who had used a wide range of IT to perform tasks of different natures.

We first proceeded with open coding of the transcripts of the first round of interviews (Glaser & Stauss, 1967; Strauss & Corbin, 1990). Codes with the same content and meaning were then grouped into categories (axial coding), which allowed us, for example, to identify three forms of enhanced use. Selective coding was used to analyze patterns and revealed how different attributes

could be associated with all forms of enhanced use. We used NVivo QSR 9 to code and analyze these first transcripts.

In analyzing the second round of interviews, we sought to further develop the insights gained previously. As in the case of our first set of interviews, the analysis was consistent with our grounded theory approach, with open, axial, and selective coding. We subsequently reorganized the initial and emergent core categories (forms and attributes of enhanced use, tasks, IT types and IT-related knowledge) during a second axial coding phase when it was apparent that there were patterns in the attributes of enhanced use. These patterns are shaped by task characteristics, type of IT-related knowledge used, and type of IT used. Once these three variables emerged as being core to understanding enhanced use, we used selective coding to further analyze our data, which revealed additional information about the association between attributes of enhanced use and the types of tasks, systems, and knowledge involved in enhanced use. Given the diversity of our interviewees, we had information about a large number of diverse enhanced-use experiences.

Because of this diversity, our data include enhanced use experiences that differ widely in terms of the task, type of knowledge, and type of IT involved, which allows us to further refine our conceptualization of the patterns that shape enhanced use. We were able to map the influence of knowledge, task characteristics, and IT types in the enactment of enhanced use. Once again, we returned to the literature for additional insight. We stopped the iterations when we felt that we had reached theoretical saturation (Glaser & Stauss, 1967); that is, when (a) no new data or data relevant to the study seemed to emerge, (b) the themes were well developed in terms of the properties and dimensions that demonstrated variations, and (c) the relationships among the variables of this study were well established (Glaser & Stauss, 1967).

While our data highlight and illustrate the importance of key variables in the enhanced use process, our literature review helps us further refine our understanding of the data. In other words, besides clarifying and illustrating the insights that emerge from our data, we used the literature for clarifying and illustrating noted patterns of enhanced use.

We discuss the results of our analyses in Sections 4 and 5. We begin by defining the forms and attributes of enhanced use. For each form and attribute, we illustrate the results with particularly revealing quotations from our analytical data repository. We then discuss the contingencies underlying the different patterns observed in the process of enhanced use as it develops over time (i.e., the different elements that help shape enhanced use at each phase of the three-phase process).

4. Defining Enhanced Use

The first iterative rounds of analysis provide the insight needed to develop an initial conceptualization of enhanced use. More specifically, the data revealed that enhanced use can take three different forms and that it possesses several attributes. As explained above, our presentation of the findings intertwines the data with the literature (Ibarra, 1999; Strong & Volkoff, 2010).

4.1. Forms of Enhanced Use

The nature of IT use described by our interviewees varies greatly from one user to the next, but some similarities emerged as they repeatedly described their enhanced use in relation to the features used, and how use changed over time in relation to the tasks at hand. Features[1] and tasks are thus fundamental to understanding the different manifestations of enhanced use, which we label “forms” of enhanced use. They also correspond to two of the key elements for the richer conceptualization of use (Burton-Jones & Straub, 2006).

As Table 1 indicates, we identified three distinct forms of enhanced use that correspond to the different combinations of features and tasks identified in the interviews: (1) using formerly unused sets of available features (i.e., using new features to perform a current or additional task); (2) using

[1] Features refer to both very specific individual features (e.g. highlighter) and feature clusters (e.g. drawing features).

features to perform additional tasks (i.e., using currently used features to perform an additional task), and (3) using feature extensions (i.e., extending an IT's features to perform a current or additional task). Table 1 also situates enhanced use in relation to continued use, which until now has largely been the focus of research on post-adoption IT use. While continued use refers to situations where currently used features are employed to execute tasks that are currently performed with IT, enhanced use introduces additional IT features, additional tasks, or a mixture of both.

Table 1. Forms of Post-Adoptive Use

		Features		
		Current	Additional	Extended
Task	Current	Continued use: Using a *formerly used set of features* for current task	1. Using a *formerly unused set of available features* for current tasks	2. Using *feature extensions* for current tasks
	Additional	3. Using a *formerly used set of features* for additional tasks	4. Using a *formerly unused set of available features* for additional tasks	5. Using *feature extensions* for additional tasks

Table 1 outlines five possibilities of enhanced use that can be grouped into three categories that we label "forms of enhanced use".

4.1.1. Using a Formerly Used Set of Features to Perform Additional Tasks

In our interviews, there are numerous references to a form of enhanced use that involves using IT for new tasks. For example, an account manager described her enhanced use of an ERP system as follows:

> *Basically, at the beginning, obviously it was a lot of, again, sort of the same thing…checking information, reading financial reports, and little by little I was able to process payments, make expense reimbursements, and placing orders and participating in all of that.* (Interviewee 20)

As mentioned, this study relies on the available literature to gain further insight into key variables that emerged from our interviews. Accordingly, we searched for literature that refers, albeit tangentially, to individuals using formerly used sets of features to perform new tasks. This provided us with examples of this form of enhanced use with various technologies including health information systems, documentation and project management systems, Lotus Notes, and computer-aided software engineering systems (Davidson & Chismar, 2007; Lippert & Forman, 2005; Orlikowski, 1992, 1996, 2000; Rai & Howard, 1994). As an illustration, Orlikowski (2000) cites the case of Lotus Notes users who initially used the application only for record-keeping, but gradually came to use it for problem-solving tasks.

4.1.2. Using a Formerly Unused Set of Available Features

Several interviewees discuss engaging in another form of enhanced use that involves using formerly unused IT features to perform a current or additional task. As an illustration of this form of enhanced use, a research assistant gave the following description of how his use of MS Excel evolved: "Right now I am doing all my statistics on Excel, even filtering, grouping, data validation. Before, [I used] just tables" (Interviewee 1).

Again, we reviewed the literature for additional examples of this form of enhanced use. As in the case of the other form of enhanced use mentioned above, we did not find any studies that explicitly examine this form of enhanced use. However, we found several case studies that illustrate how new features may be used in decision support systems (Davidson & Chismar, 2007), documentation and project management systems (Leonardi, 2007; Orlikowski, 1996), and a variety of other applications (Igbaria & Tan, 1997; Lassila & Brancheau, 1999; Lippert & Forman, 2005; Schwarz, 2003). In the

context of ERP, Davidson and Chismar (2007) report on a group of physicians who went from using only the drop-down lists of a newly adopted heath information system to using its decision support features to dispense medications and prescribe tests.

4.1.3. Using Feature Extensions

Finally, some of our interviewees described enacting enhanced use by using feature extensions (i.e., developing or adding features to the IT) for current or additional tasks. One of the many examples of this form of enhanced use involves a web video transcriber who programmed a macro into a web browser to manipulate it more effectively:

> *For example, someone will want me to occasionally transcribe a video. I use a macro for that where I can put the mouse over the stop button of the video, and every time I hit a key, it will stop the video for me so I can catch up… It was easy to write* [this macro] *to do what I needed it to do.* (Interviewee 29)

In this case also, we surveyed the literature for any previous studies that refer to this form of enhanced use. Again, the literature provides additional illustrations of this form of enhanced use that include writing queries for information retrieval and writing additional code into an application to extend its features. For example, Tyre and Orlikowski (1994) observe in a case study how IT users use feature extensions, such as associating a series of commands with a particular function key (e.g., macros in Microsoft applications), to apply specific rules for sorting electronic mail. Similarly, Beaudry and Pinsonneault (2005) provide the example of a user who creates new applications in MS Excel to extend its features.

4.2. Attributes of Enhanced Use

From the first set of interviews, we also identified three attributes that characterize enhanced use in any of its forms: (1) locus of innovation, (2) extent of substantive use, and (3) adaptation. Each of these constructs initially emerged from our interviews and was conceptualized in light of the relevant literature. In other words, their importance to the conceptualization of enhanced use was first and foremost revealed by the interviews. We use the literature to support and refine the proposed conceptualization.

4.2.1. Locus of Innovation

Our interviews indicate that one of the salient attributes of enhanced use is the source of the idea that is embodied in enhanced use. They reveal that enhanced use may be initiated by different actors. Enhanced use may come from a third party who provides the user with a pre-defined pattern of use: “As far as I recall, with [the software] ‘Ascribe’ I just followed the steps, I didn’t become creative with it” (Interviewee 11).

Users can also enact enhanced use entirely on their own, which the following example illustrates:

> *For example when I was tweaking Microsoft Word to my needs, that took several trials to figure out what I could do better and how I could get it to work and it was more of a reflection process and me thinking about what I can do quicker. When I thought of something to do quicker it would only take half an hour, maybe less, to figure out how to do it but it was a reflection process where I had to come up with the idea in the first place.* (Interviewee 29)

We reviewed the literature to gain greater insight about the source of ideas that materialize into an enhanced use. Literature that focuses on IT adoption mostly considers users as relatively passive actors whose main role is to decide whether or not to adopt an IT (Davis, 1989; Venkatesh et al., 2003). It is in the context of research on innovation that we found greater support for the source of innovation. Von Hippel (1976) discusses the locus of innovation and identifies that users play a key role in the innovation process because they are best positioned to make the changes needed to meet their own needs. The few studies conducted on users innovating with IT after its adoption show that

users can actually play a significant role in pursuing ideas to make novel use of IT after its adoption (Nambisan, Agarwal, & Tanniru, 1999; Urban & Von Hippel, 1988).

We also found studies that illustrate how the locus of innovation may be tied to different entities. Some studies support the idea that new uses of IT may come from the user (Hsieh & Zmud, 2006; Jasperson et al., 2005; Tyre & Orlikowski, 1994). In contrast, some studies also illustrate how users may engage in a new use of IT without having been the source of the idea (Orlikowski, Yates, Okamura, & Fujimoto, 1995; Trigg & Bodker, 1994). This occurs when users simply implement what has been developed for them or follow steps that have been demonstrated to them. An example of this is found in a case study of software customization in which individuals used IT features such as button panels and macros that their more technology-savvy colleagues routinely designed for them (Trigg & Bodker, 1994). In summary, both our data and the literature suggest that ideas for enhanced use may come from different sources.

4.2.2. Extent of Substantive Use

Our interviewees mentioned enhanced use experiences that varied in terms of the amount of cognitive effort involved. The extent of substantive use refers to the extent of reflective engagement involved in system use (Jasperson et al., 2005). We use the term "extent of substantive use" to capture the different states of cognitive effort that characterize an act of enhanced use. While substantive use has formerly been defined as a state (Jasperson et al., 2005), our interviews show that this state can have different levels of intensity. Different forms of enhanced use may be characterized as being positioned anywhere on a continuum, from involving little to no extent of substantive use to involving a great extent of substantive use. In some instances, our interviewees report cases of enhanced use that involve a large extent of substantive use, as in the following:

> *I would download a macro, look at it, figure out why it's doing what it's doing, then alter it to do what I wanted it to do.* [I have to] *look it over, mess around with it for an hour, then from then on out, I could write one that did what I needed it to do.* (Interviewee 29)

In other cases, enhanced use involves little extent of substantive use. In fact, some enhanced use may even be closer to automaticity. In this regard, a user of a web-based learning system described her new uses of the system as follows: "It was pretty user friendly, it was pretty intuitive. If you could read, you could pretty much use the system" (Interviewee 13).

When we searched the literature for more insight into the different amounts of cognitive effort employed when making new use of IT, we found several relevant studies (Agarwal & Karahanna, 2000; Jasperson et al., 2005; Karahanna et al., 1999; Saga & Zmud, 1994). They generally indicate that users' reflective engagement is required for any new uses of IT and that the extent of such reflective engagement may differ across situations. One study actually suggests that new uses of IT can also occur automatically and may not require the reflective engagement of a user (Ortiz de Guinea & Markus, 2009). Across the many studies dealing with users' cognitive engagement with IT, we found only two that focus on the issue: one via cognitive absorption (Argarwal & Karahanna, 2000), and the other through substantive technology use (Jasperson et al., 2005). While cognitive absorption suggests that users enjoy being reflectively engaged in IT use, substantive use is defined as a state in which an individual reflectively engages with one or more features of an IT application.

4.2.3. Adaptation

Our interviews reveal that adaptation may be an integral part of the process through which enhanced use is enacted. Adaptation refers to the activities that occur around enhanced use and aid its completion. Individual adaptation behaviors can include communication activities such as talking to a colleague about how to use an IT or consulting IT professionals. It may also consist of independent exploration activities that include information search behaviors such as experimenting with different ways of operating an IT or reading help manuals to better understand a potential use of IT (Barki et al., 2007). Adaptation may also refer to changing tasks and business processes. In this study, we use the term adaptation to refer to these organizational and individual adaptation behaviors. As an illustration of the adaptation occurring in this process of enhanced use, interviewees noted the following:

> *In terms of managing the references, everything was changed… I put the previous process totally aside and the new process is completely different.* [Now] *when I find a file, I import it in Zotero, then I attach a file to it…and then I put tags on it.* (Interviewee 10)

> [When making new uses of IT], *most of the time I use the help* [function]. *If it is not working, I try to find somebody* [who knows] *and I ask him.* (Interviewee 8)

We reviewed the literature to better understand how adaptation relates to enhanced use. We found many studies underscoring the fact that adaptation can play an important role in new uses of IT (Barki, et al., 2007; Beaudry, & Pinsonneault, 2005; DeSanctis & Poole, 1994; Lassila & Brancheau, 1999; Orlikowski, 1992). The types of adaptation that emerge from our data correspond to task technology adaptation behaviors (Barki et al., 2007; Beaudry & Pinsonneault 2005; Lassila & Brancheau, 1999) and individual adaptation behaviors (Barki et al., 2007; Beaudry & Pinsonneault 2005; Boudreau, Ross, & Robey, 2002). In summary, both our data and the literature indicate that new uses of IT can be accompanied by changes to business tasks and/or user behaviors.

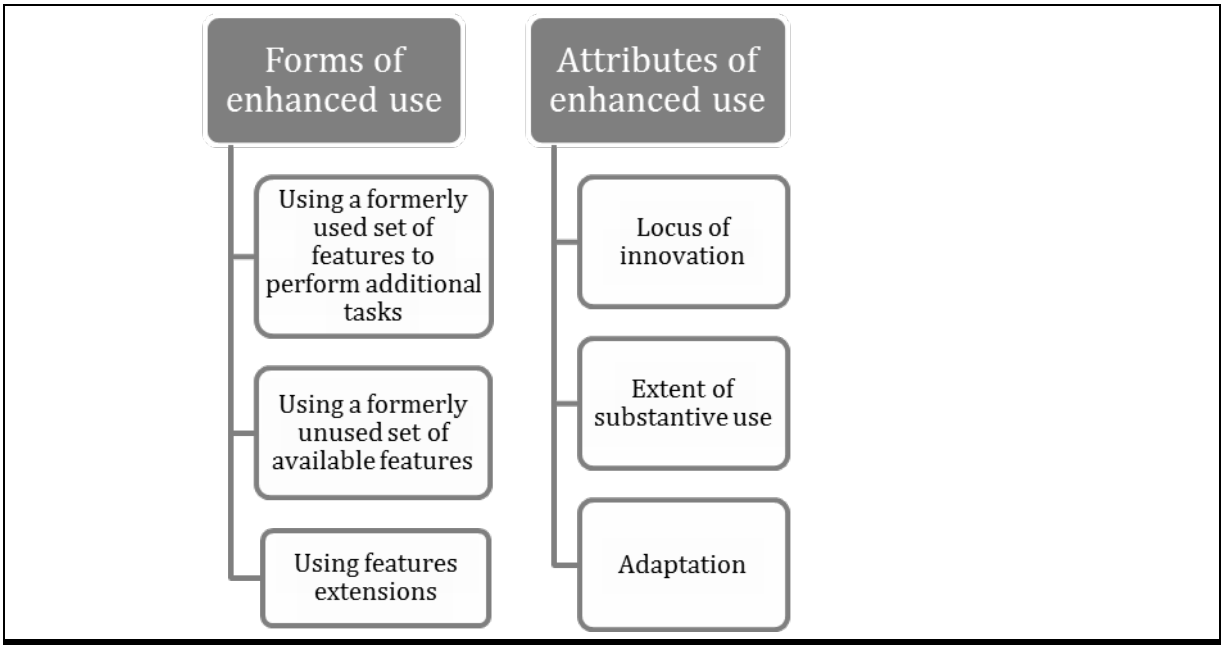

Figure 1. Forms and Attributes of Enhanced Use

5. Theory Development: The Process of Enhanced Use

In analysing the second round of interviews, we went beyond defining enhanced use in terms of its nature to revealing notable patterns that are common to the enactment process of all forms of enhanced use. These patterns are not said to relate to a quantifiable cause-effect relationship; rather, they emerge from probabilistic interactions between variables (Langley, 1999). In other words, the patterns that we uncover—and that we describe in Section 5—reveal how task characteristics, IT-related knowledge, and IT types influence enhanced use (as illustrated in figure 2).

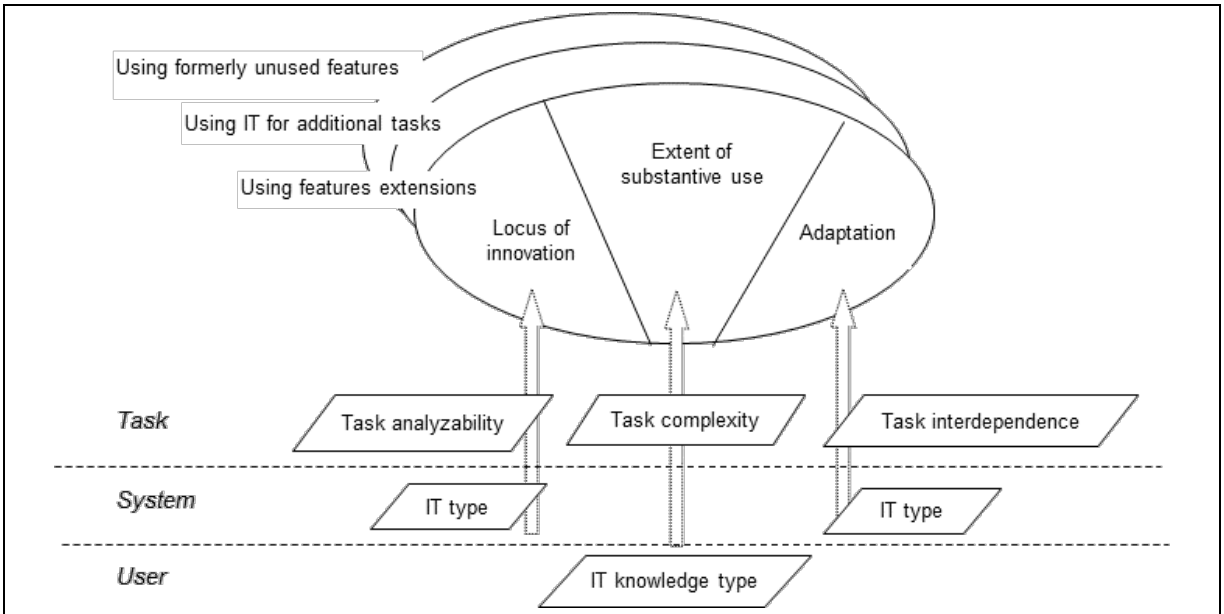

Figure 2. Process of Enhanced Use

5.1. Task Characteristics

Several interviewees mentioned the importance of the task and its idiosyncrasies in the process of enhanced use. For example, the user of an organizational accounting system explained that she could not take the initiative for enhanced use because of the characteristics of the tasks she was assigned to do with the system:

> *I really can't use the accounting software that we have at work to do something else. Because I have very set tasks to do, I can't really go outside what my task* [requires]… *I mean the software can be used differently by different people but for what I have been hired to do it's like this is pretty much what I have to do. I can't really maneuver.* (Interviewee 1)

In revisiting the literature, we sought to gain a better understanding of the role of tasks in shaping enhanced use in order to make sense of key variables that emerged from our interviews. We contend that, as in any use of IT, enhanced use involves the enactment of a task (e.g., filling out a new electronic form, writing a query, and/or creating a spreadsheet). Indeed, IT use is "an individual user's employment of one or more features of a system to perform a task" (Burton-Jones & Straub, 2006, p. 231). A task can be conceptualized at different levels of granularity. High-level tasks—which we refer to as business tasks—are more generic, such as writing a thesis or preparing a financial statement, while tasks occurring at the computer interface level involve an interaction with the system, such as filling out an electronic form or creating an electronic spreadsheet (Zhang & Eseryel, 2005; Zhang & Galletta, 2006). In studying the patterns of enhanced use, we focus on the tasks at the computer interface level.

Task characteristics have been found to influence IT use in a number of studies, including those using the task-technology fit theory (Goodhue, 1995), cognitive fit theory (Vessey & Galletta, 1991), and media richness theory (Dennis & Kinney, 1998). These studies usually focus on business tasks and suggest that several task characteristics influence IT use including task complexity (Zigurs & Buckland, 1998), task variety (also referred to as task predictability), task analyzability (also referred to as task difficulty) (Karimi, Somers, & Gupta, 2004), and task interdependence (Kang & Santhanam, 2003; Karimi et al., 2004). Other characteristics related to whether or not tasks are additive, multiplicative, or conjunctive have also been studied for their influence on IT use (Lam, 1997).

We observe that three task characteristics (i.e., task analyzability, task interdependence, and task complexity) are particularly relevant to understanding the process of enhanced use. Our interviews reveal that different levels of analyzability, interdependence, and complexity of tasks are associated with different patterns of enhanced use. Just as with business tasks, tasks that are performed with a system can be characterized as a function of these three characteristics (as Table 1 shows). As we explain in detail in Section 5.4 our interviews reveal that these distinct task characteristics shape the patterns of enhanced use in relation to the locus of innovation, extent of substantive use, and adaptation involved.

Table 2. Typology of Task Characteristics

Task characteristics	Definition	Examples of tasks
Analyzability	The extent to which the task performer has a formal, well-defined procedure for performing the task (Karimi et al., 2004; Perrow, 1967)	Low analyzability: designing new computer prototypes with a CAD system High analyzability: filling out a purchase order with an ERP
Complexity	The number of distinct acts that must be completed and the number of distinct information cues about the attributes of the task-related stimulus object that an individual has to process when performing a task (Wood, 1986)	Low complexity: formatting a document title High complexity: developing a macro to compute performance indicators
Interdependence	The extent of exchange of outputs between different parties concerned with the task (Kang & Santhanam, 2003; Karimi et al., 2004)	Low interdependence: typing a letter High interdependence: collaboratively designing a computer prototype on a shared electronic design workspace

5.2. IT-Related Knowledge Types

Our interviews show that different types of IT-related knowledge involved in enacting enhanced use also contribute to shaping patterns of enhanced use. One interviewee said:

> *A challenge that would be common to all of this software is more about the knowledge. Where do you get the knowledge and how do you apply this knowledge to the new technology that you use… LinkedIn is more about how do you use it effectively…to connect to people. MIMS is about how do you control the flow of information and how do you manage your time. Word and Excel and Outlook is about your knowledge of the software to increase your productivity. So yeah, it's different challenges.* (Interviewee 16)

After IT-related knowledge emerged in our data analysis as an important variable in the process of enhanced use, we reviewed the literature to elicit the specific relationship between IT-related knowledge and enhanced use. We found different typologies and taxonomies of knowledge used in IT research. They relate to the knowledge and skill requirements of IT personnel (e.g., Bartol & Martin, 1982; Benbasat, Dexter, & Mantha, 1980; Henry, Dickson, & LaSalle, 1974), the IT-related knowledge of managers responsible for championing and working on IT projects (e.g., Bassellier, Benbasat, & Reich, 2003), and end-users' IT-related knowledge (Sein, Bostrom, & Olfman, 1999). We found the latter to be particularly useful in that (1) it covers the different types of knowledge revealed by our data, and (2) it helps in comprehending the differences in the execution of enhanced use found across different situations.

According to this typology (Table 2), the spectrum of end users' IT-related knowledge runs from command-based knowledge to business motivational knowledge. In our interview data, we find that,

in all cases of enhanced use, users drew on the first two types of knowledge. Command-based knowledge and tool procedural knowledge are necessary in order to use a set of functionalities to perform a task, and this occurs in all cases of enhanced use. For instance, importing data into a spreadsheet requires knowledge of the steps required to bring data from other locations. The other types of knowledge are not always applied in the process of enhanced use. Business procedural knowledge refers to knowing how to apply the features in the context of a specific task. Tool conceptual and business motivational knowledge are more about the big picture of the software and its benefits. As we explain in Section 5.4 these different types of knowledge that are used for enhanced use are associated with different patterns of enhanced use, particularly in relation to the extent of substantive use.

Table 3. Typology of IT-Related Knowledge (From Sein et al. 1999)

Knowledge level	Definition	Example
Command-based: syntax and semantics	Awareness of the system's functionalities	Clicking on a button to enter a transaction
Tool procedural: combining commands to do generic tasks	Knowing how to use a set of functionalities together to perform a task	Creating a transaction
Business procedural: applying tool procedures to a task	Knowing how to apply the system's features in the context of a specific task	Querying a database for other functional transactions
Tool conceptual: the big picture of what to do with the tool	Understanding the principles underlying how a feature or the overall system works	Workflow tool
Business motivational: what the tool can do for the user and the organization	Understanding what the technology can do for (or how it can work against) the user and/or the organization	Enabling consistent transactions across organizational functions

5.3. IT Types

Finally, we observe that some of the differences in patterns of enhanced use can be linked to the different types of IT employed, as which following quote illustrates:

> *Excel I find it easier because all the information can be obtained. I can just get if I'm stuck somewhere I can go and get the information from the Internet, or the help feature, there are no restrictions in terms of authorization I can do anything I want. When it comes to Oracle there is some data that can't be extracted, there's information that is restricted and some I can access sometimes and sometimes I can't. There's just so much mystery I just don't know how to use it and I can't get any help so Oracle I would say is the most challenging… ERP is definitely the most challenging IT application I use.* (Interviewee 30)

Our data refer to a wide range of IT uses spread across different types of IT. We reviewed the literature to help us make sense of the way different types of IT relate to enhanced use. We found that McAfee's (2006) typology of IT, which classifies IT artifacts into three broad categories (i.e., enterprise IT, network IT, and functional IT) (McAfee, 2006; McLean, 2010), supports a better understanding of how the patterns of enhanced use relate to IT type. According to this typology, enterprise ITs, which include ERP, supply chain, and procurement systems, are used to specify business processes in the context of an organization. Network ITs, which include discussion threads, email systems, groupware, and wikis, are used to connect users without dictating interaction parameters. Functional ITs, which include a wide variety of systems from word processing software to

computer-aided design (CAD) software, are used to assist individuals with various types of knowledge work.

Overall, as we explain in the Section 5.4 and illustrate in Table 3, our evidence clearly indicates that most interviewees used these three different types of IT. The idiosyncrasies of each type of system often played a role in shaping their enhanced use.

Table 4. Typology of Types

Category	Definition	Examples
Functional IT	Assists with execution of discrete tasks	Spreadsheets, computer-aided design (CAD) and statistical software
Network IT	Facilitates interactions without specifying their parameters	E-mail, instant messaging, wikis, blogs, and mashups
Enterprise IT	Specifies business processes	Enterprise resource planning software, customer resource management, and supply chain management

In summary, task characteristics, IT-related knowledge types, and IT types are three variables that contribute to shaping patterns of enhanced use. We observe that these variables are not independent but show some associations. For example, enterprise systems as a type of IT are often used to perform highly analyzable tasks and, thus, are commonly seen together in a specific instantiation of the process of enhanced use. In Section 5.4, we discuss the associations between these variables in more detail and distinguish their relation to enhanced use (see Figure 2).

5.4. Patterns of Enhanced Use

Our data indicate that locus of innovation, extent of substantive use, and adaptation are the salient attributes of enhanced use. Enhanced use can therefore be represented as a process that includes the inception of an idea, the execution of that idea, and the related adaptation.

Our analysis of the interview data shows that there are different patterns representing the process of enhanced use and that these patterns vary based on how the attributes of enhanced use are influenced by the task, user, and system. Overall, we find that the locus of innovation often differs according to the analyzability of the task and the type of system used. Our analysis also shows that extent of substantive use depends largely on the complexity of the task at hand and on the IT-related knowledge used. For adaptation, our analysis suggests that the degree of task interdependencies and the type of system used are often associated with different patterns of organizational adaptation. As for individual adaptation, we have determined that it may occur throughout the entire enhanced use process.

5.4.1. Patterns Associated With Locus of Innovation

The different instances of enhanced use discussed with our interviewees reveal that the locus of innovation—the first attribute of enhanced use—is an integral part of the process of enhanced use. Based on our data analysis, we find that the analyzability of the task and the IT type shape the locus of innovation; they are key variables in understanding the pattern of enhanced use in relation to the different sources that initiate and conceive of novel use of IT. Although a lack of IT-related knowledge can prevent users from coming up with the ideas embodied in enhanced use, our interviews indicate that the influence of IT-related knowledge on the locus of innovation is minor in comparison to the factors that relate to the task and system. Understanding these patterns helps differentiate instances when users take the initiative and are personally innovative from others when a third party (e.g., managers, designers) is spearheading the process. Understanding these patterns can also help identify potential barriers to enhanced use. It is an important step for pinpointing actions that organizations can take to facilitate the initiation of enhanced use.

A task with low analyzability requires individuals to think about, create, or find satisfactory solutions with little reliance on procedures or on the predictability of the outcome to guide their actions (Perrow, 1967; Rice, 1992). In the context of IT use, such tasks encourage users to draw on their experience to initiate and develop their own approach to enhancing the use of IT. Our interviews show that tasks that are hardly analyzable often depend on users discovering on their own how to apply the features of IT to solve a problem at hand, as in the following quote from an accountant whose enhanced use typically evolved from exploring the system to meet different client needs:

> *We are not always faced with the same exact problem. First, you kind of have to manipulate the systems in terms of thinking out of the box and see how you can use what you have to fulfill your clients' needs.* (Interviewee 24)

In contrast, the user of a financial reporting system gave the example of high task analyzability that triggered very specific company-provided instructions for any new uses of the IT. She indicated that use of the system was highly prescribed in that any new use had to involve some training from the organization: "They have to train you to show you what type of information you need beforehand [i.e. before any enhanced use], and how to even get to the right query, and all that" (Interviewee 17).

The type of IT used also explains differences in the locus of innovation of enhanced use, partly because different types of IT can be associated with different levels of task analyzability. There are systems that automate a great deal of the business process such that they dictate users' actions and perform most of the work of the business process (e.g., enterprise systems, such as claim processing systems). Other systems co-execute the process with the user (e.g., a functional system, such as MS Excel, which handles such things as building spreadsheets and data analysis models) (Alter, 2002). For systems that support structured processes such as enterprise systems, the locus of innovation for enhanced use rarely comes from the user. These systems encourage standardization and use regulation at the expense of a user's initiative. For example, enhanced use with an enterprise system often happens at the request of a superior or because of a company regulation. The following quotes from two enterprise system users illustrate how the locus of innovation of enhanced use may come from regulations/supervisors:

> [The reason I came to use that new form is because, we were told:] *If you're making purchases of $2,500 or more, you have to use that form. So it's already a regulation for the entire university.* (Interviewee 20)

> *But before generating these* [new] *reports,* [I have to follow guidelines such that] *I have to know exactly how to push the buttons, what information I need to put there in order to have the credit report of the clients, for instance.* (Interviewee 16)

In contrast, many functional and network systems more easily enable users' initiatives. They provide tools for users to independently address the demands of their tasks (e.g., analyzing data, designing a computer circuit). Accordingly, users of such systems are often the locus of innovation of the enhanced use. In the following illustration, an analyst who uses an electronic spreadsheet for his work explains how he had to rely on himself to find and realize the idea for his own enhanced use:

> *It's mostly experimenting on my own and sometimes when I try to create a report and try to create some information from it and analyze data and I have something in my mind but I'm not able to find out what function to use, I'll sometimes go and check on Google.* (Interviewee 30)

In another example, a self-employed accountant using tax accounting software indicates that she initiated her own enhanced use by devising the idea of creating a new use for the IT that would help her become more efficient in her work:

> *I was like, Okay, I need to revise the way I'm doing this: it's not efficient. So I went to the Help and…read up a little bit and said: Okay, let me try it this time now this way. So it*

was basically just a learning problem. (Interviewee 24)

In summary, different levels of analyzability of the task and different types of IT play a role in influencing enhanced use patterns associated with the locus of innovation. We find that some tasks with low analyzability depend much more on user initiative in conceiving the idea of enhanced use, and we identify similar patterns in two types of systems: functional IT and network IT. Together, these findings suggest that patterns of enhanced use that relate to the locus of innovation are conceptualized through task-related (task analyzability) and system-related (types of IT) elements.

5.4.2. Patterns Associated With Extent of Substantive Use

The process of enhanced use as related to the second attribute—extent of substantive use—concerns the cognitive effort required on the part of the user. Task complexity and type of IT-related knowledge are the shaping factors that influence the differences in the extent of substantive use. Understanding the influence of these factors sheds light on the circumstances that contribute to making enhanced use cognitively demanding. This helps to pinpoint reasons for the different levels of difficulty experienced when performing enhanced use, which is essential in order to better support users in their attempts to enhance their use of IT.

Task complexity concerns the quantity of input to the task at hand; a complex task consists of numerous acts and/or requires the processing of numerous information cues (Wood, 1986). In the context of enhanced use, information cues represent pieces of information about the attributes of IT features and the context of use on which users can base their judgments when enacting enhanced use. Generally, task complexity sets "upper limits on the knowledge, skills and resources individuals need for successful task performance" (Wood, 1986, p. 66). Our data reveal that users who perform many steps as part of enhanced use engage to a greater extent in substantive use than those who have to do fewer steps. For example, enhanced use can involve substantive use to a considerable extent when it involves entering data into a detailed form with numerous parameters, which the following quote from the same user regarding a different IT illustrates:

> *It's a little bit daunting* [to use this IT] *because there's so many forms, and so many codes, and you're not really sure how to go to the next page and that's the one that I have most challenges with.* (Interviewee 20)

In contrast, the same interviewee indicated that her enhanced use is associated with substantive use to a lesser extent when IT use involves fewer steps:

> *Now it's all made so you can do that all together, just type the name and the vendor code comes up right away and you can place your order. So it's condensed and I feel like there's less steps.* [Using] *…it was really straightforward. There wasn't much room for a mistake anyway.* (Interview 20)

Our data also suggest that the extent of substantive use is high when many distinct information cues have to be processed as part of enhanced use, which the following quote shows: "I would spend an hour or so…thinking about [how to do the enhanced use]. You have to figure out why it [i.e., the feature] does this, or why it does that, or what this command means" (Interviewee 29).

In contrast, the following quotation shows how much less substantive use is needed when enhanced use involves little processing of information cues: "I just use plugins or widgets that are user friendly. I just have to download, put a link and that's it." (Interviewee 28)

A user's knowledge also plays an important role in explaining the extent of substantive use involved in enhanced use. Using a greater extent of IT-related knowledge than that associated with how to use a feature for enhanced use is typically linked to processing more information cues and requires more information processing (Byström & Järvelin, 1995; Zhang, 2012). When enhancing current use requires business motivational knowledge in addition to knowledge about how to operate a feature, that use is typically associated with processing more information cues than with a task that does not

have these requirements (all other things being equal). In this case, enhanced use involves more information cues than in a situation where knowledge about how to operate the feature would suffice. The following quotes illustrate the case of enhanced use involving IT-related knowledge that represents more than just knowing how to make use of a feature; they also illustrate how this relates to the extent of substantive use:

> *Aside from that initial research and reading on forums in terms of how to do it and like why it works that way, because before I implement things, I usually kind have to understand why. That, I think, was the initial thing and that took up the most time and effort.* (Interviewee 24)

> *So the challenge is not in how to use these plug-ins and where to put them…it's more not how it's used, but why. The bigger question is why. Why put this, or why put that. So they are more like gray area questions, not just black and white.* (Interviewee 27)

In contrast, the extent of substantive use is relatively small when enhanced use involves using more basic types of IT-related knowledge. As the following quotation illustrates, using the feature for document saving (which only requires command-based knowledge) does not require much substantive use: "Some functionalities are quite intuitive to use, like the one [for] saving in different formats. Then I don't fret, I quickly grasp the idea of [how to] use it" (Interviewee 22).

In summary, task complexity and IT-related knowledge types play an important role in shaping the patterns of enhanced use associated with the extent of substantive use involved in the process. The type of IT used seems much less salient in this regard. These findings indicate that tasks involving many steps and/or more information processing are associated with a greater extent of substantive use. Likewise, the use of more advanced types of IT-related knowledge is often associated with a relatively greater extent of substantive use for enhanced use. These findings highlight the fact that patterns of enhanced use relating to the extent of substantive use are influenced by task-related (task complexity) and user-related (user's knowledge) variables.

5.4.3. Patterns Associated With Adaptation

Our data analysis indicates that task interdependence and types of IT play an important role in shaping enhanced use with regard to adaptation. Analysis of patterns of enhanced use in relation to the task or individual adaptation helps pinpoint circumstances in which enhanced use extends beyond a direct interaction with the computer (to include activities directed at adapting the user or the task). It helps isolate the task and IT characteristics that contribute to making individual and task-related adjustments necessary as part of enhanced use. In terms of cognitive effort discussed in section 4.2.2, adaptation can represent a significant barrier to enhanced use because of the additional demand it places on users. Understanding the patterns of enhanced use that relate to adaptation paves the way to identifying how to support and encourage users' adaptation.

The proliferation of enterprise systems and the recent push for greater connectivity and collaboration between users of various applications has made the task of IT use much more interdependent. Indeed, individual users' actions increasingly affect other users (Dong, Neufeld, & Higgins, 2008; Kang & Santhanam, 2003; Robey, Ross, & Boudreau, 2002). Our data analysis suggests that these interdependencies-in-use help explain the patterns of organizational adaptation associated with enhanced use. Indeed, we found that organizational adaptation often occurs when one's use is part of a chain of interdependent tasks that make up a business process. This organizational adaptation can be essential to aligning one's IT use with that of others and with business rules, which the following quote from the user of a new feature of an enterprise system illustrates:

> *But now I think the main challenge is having to communicate through the system. For example, when someone prepares a contract or request, they have to prepare it in the system. Then it automatically goes to the person who is approving it… I'm an approver. I have to make sure I always go through the system to ensure there's nothing sitting in my inbox that I need to review, otherwise it gets stuck at my level.* (Interviewee 17)

The following quote from a user of a collaborative document editing system also highlights the link between task interdependence and organizational adaptation:

> *It's a collaborative tool and not just a program like Excel because people work in Excel individually. With this everyone has to move like a wave and it's harder when you have 15 people working on a project than if you have 3 people. So it's a bit more work up front but in the long run you're happy you did it because you're not spending hours looking back saying who made the change, is this the right document, is that the right version.* (Interviewee 16)

Our data indicate that the occurrence of task adaptation with enhanced use may also vary with the type of IT used. When enhanced use involves an IT that automates a business process, task adaptation may be necessary to accommodate the business rules supported by automation. For example, enhanced use of enterprise systems is often associated with users having to change the way they perform their tasks and with new input and query forms that embed work processes. Our data suggest that these forms follow rather inflexible business rules that leaves users unable to avoid changing the way they perform their tasks. This is illustrated by the following quote from an enterprise system user:

> *Every time they change the policy, they change the applications, we have to adapt to the new way the application is set up. So it's constantly changing. We can have maybe one or two new policies in a month and they could change and add a new button on MIMS or pick out a new function for MIMS. We have to adapt to that.* (Interviewee 16)

In contrast, the following example is a case where there is hardly any task adaptation, where enhanced use concerns a functional system that allows its users much discretion in applying its features to perform discrete tasks. The task in question involves minimal automation in that it was co-executed by the system and the user. This system allows users to choose the means and outputs for producing their reports and the enhanced use did not necessitate any task adaptation by the user, which the following quotation illustrates:

> *Well I did not change anything. I didn't have to accommodate it* [i.e., my enhanced use]*, it just made it easier for me to get what I want. Now instead of having to go to IT or my senior finance manager for any information I need I can just go into the screen where I can change the report and I can do it myself. So it made it easier for me really, quicker. Now instead of asking 10 different people I can do it myself.* (Interviewee 30)

In summary, different extents of task interdependence seem to impose different demands on users with regard to the adaptation that results from enhanced use. Likewise, the level of automation afforded by different IT types helps explain why, in our interviews, some types of IT seem to be more systematically associated with adaptation than others. In other words, our data suggest that task characteristics and IT types may engage users in adjustments that effectively incorporate enhanced use in the broader business processes performed by users. Accordingly, this highlights circumstances that may render enhanced use more challenging for users.

In addition, individual adaptation is an important facet of the adaptation associated with enhanced use. As mentioned in Section 4.2.3, the types of individual adaptation are wide ranging: from trial and error to using the system's built-in help function, consulting with system support specialists, or studying advanced user manuals. As with other attributes of enhanced use, our data reveal that individual adaptation may vary according to the task at hand, the IT-related knowledge used, and the type of IT. However, it also suggests that other variables such as individual characteristics, individual preferences, and the context of use have a greater influence on the occurrence of individual adaptation as part of enhanced use. In this regard, individual adaptation often varies across organizational contexts. For example, one of our interviewees suggests that time pressure from the organization may drive users to rely on some type of adaptation more than others (e.g., asking

someone vs. reading a manual). Another interviewee stated that she had to rely on more experimental learning to use her corporate accounting system because she was hired during a staff shortage and could not get more formal training. Additionally, users themselves may have different preferences about the resources they use to enact enhanced use. For example, an interviewee indicated that she preferred reading manuals to relying on others to show her how to use new features. Likewise, another interviewee mentioned that he never used the help function because he seldom found it helpful.

As Figure 2 illustrates, regardless of the forms that enhanced use may take, the process of enhanced use relates to the attributes of enhanced use: locus of innovation, extent of substantive use, and adaptation; in turn, these are influenced by task characteristics, IT-related knowledge types, and IT types. Our analysis of these patterns highlights the circumstances in which enhanced use is more or less difficult in terms of cognitive effort and task-related adjustments. It also underlines circumstances in which enhanced use depends on a user's initiative and on those in which users enact an enhanced use based on an idea from a third party. These findings help in understanding the challenges faced regarding enhanced use. Indeed, they are based on a detailed analysis eliciting the main variables at play in the enhanced use process.

6. Discussion

This study develops an understanding of how users make novel use of IT after the adoption phase. We discuss in this section several theoretical and practical implications of our results regarding enhanced use and related patterns. First, we explain how, with its explicit integration of IT-, user-, and task-related variables in conceptualizing enhanced use, this study provides a rich, multi-faceted view of IT use by individuals—in the specific context of new use—and addresses the call to better conceptualize IS usage (Burton-Jones & Straub, 2006). Second, we discuss how enhanced use goes beyond a static view to also include a dynamic process represented by patterns of use. Section 5 develops this new perspective for each of the elements that enrich the conceptualization of use. Third, we discuss the specificity of this study and how it complements other studies on use. Lastly, we discuss the practical implications and limitations of this investigation and of future research.

Enhanced use is fundamentally conceptualized using user, system, and task elements. In terms of the nature of enhanced use, our conceptualization shows that user-, system-, and IT-related variables play a role in defining use after the initial adoption of IT. The IT- and task-related variables are captured in the forms of enhanced use, which are defined in relation to current or additional IT features and tasks. User-related variables include locus of innovation, extent of substantive use, and adaptation. The related patterns of enhanced use also take into account users with knowledge of IT, tasks with task analyzability, complexity and interdependence, and, finally, the system, including types of IT.

Our study shows that a more comprehensive perspective of new use after adoption also encompasses the dynamics that relate key attributes of use to the factors that influence them. In that regard, our study makes a novel contribution to the literature concerning system usage by showing these dynamics through three salient patterns: how task analyzability and types of IT influence the locus of innovation, how complexity of the task and IT-related knowledge influence the extent of substantive use, and how task interdependencies and types of IT influence organizational adaptation. We expect these patterns to be consistent across all instances of enhanced use.

Moreover, this study contributes through its perspective on the user, system, and task. It is one of the first studies to examine the role of the task in direct relation to user interaction with the computer interface, which thus enables an understanding of the intricate patterns involved in the specific act of enhanced use. By looking at the role of types of IT in shaping patterns of enhanced use, this study theorizes about the IT artifact and thereby helps to fulfill another important need in IS research (Benbasat & Zmud, 2003; Orlikowski & Iacono, 2001). We also highlight the role that the IT artifact plays in influencing patterns of enhanced use because different types of IT are associated with different attributes of use. Most prior work analyzes IT use in relation to one particular technology with

the exception of Burton-Jones and Grange's (2012) work. Our perspective supports the idea that differences across technologies are consequential enough to significantly affect the theoretical value of much IT research. We also include an in-depth analysis of the user-related dimension of IT use. We do so by examining the role of extent of substantive use and type of knowledge employed for enhanced use. The literature suggests that it is important to include such variables related to the cognitive dimension of use in order to understand the patterns of use. This dimension influences the antecedents, the contingencies, and the impact of use (Hsieh, Rai, & Xu, 2011; Jasperson et al., 2005). Indeed, the fact that we consider it along with IT- and task-related variables enriches our insight into enhanced use.

Another contribution that makes this investigation unique is its focus on the micro-dynamics of use. In fact, this study zooms in on specific patterns that comprise the enhanced use process. It also examines a range of variables that influences these patterns. As such, it is different from the usual perspective taken in the literature, which consists of studying use in relation to broad tasks and general intentions. Our findings about enhanced use provide the much needed specificity to more effectively understand and influence use. Benbasat and Barki (2007) long ago called for finer and more focused analysis of use in specific task contexts.

Our conceptualization of enhanced use also complements other rich conceptualizations of system use. By examining a combination of variables that influence the process of use, we shed more light on the challenges and opportunities users face as they interact with IT. Similar to Burton-Jones and Grange's (2012) work, our study is one of the few studies that bring to light the specifics of this interaction with such richness. Our examination of enhanced use is unique because it not only considers a rich array of variables, but also looks at the related dynamics and identifies specific patterns of use. Both Barki et al. (2007) and Burton-Jones and Straub (2006) propose rich measures of use without examining the dynamics of use.

Our focus on explaining IT features use also complements the work of Burton-Jones and Grange (2012); although their study also zooms in on user interaction with IT, their focus is on understanding the effective use of IT, and, specifically, how that use relates to goals and impact performance. We provide insights on the dynamics involved in using IT in new ways, whereas they investigate how IT use can be effective. Additionally, our conceptualization of enhanced use provides important insight about patterns of feature use that could affect effective use.

This study contributes to prior literature by providing a rich description of how novel applications of IT are enacted by users, and by paying close attention to the interplay of key factors in the enhanced use process. Overall, the results of this study enrich our understanding of the role that IT, task, and user related factors play—not only in defining use, but also in explaining related patterns—therefore advancing the field's knowledge of this core construct.

One of the challenges of IT management in organizations is to create the conditions for IT to support users to the greatest extent possible. This includes creating conditions in which users utilize the full potential of information systems. With this paper, we highlight important factors that influence a user's likelihood to utilize a system's full potential. Indeed, we pinpoint what it takes to use an IT in novel ways and the reasons for differences across cases of novel IT use.

Our analysis also highlights the fact that managers dealing with enhanced use ought to consider differences across IT types. For example, a user who engages in enhanced use of one type of IT, such as enterprise systems, may be less likely to serve as the locus of innovation for this act or to have any control over adaptation to potentially new system use routines. Consequently, the managerial interventions needed to facilitate enhanced use with this type of IT would likely be different from those needed for functional and network systems. For example, interventions that include formal training, specific use instructions, and mechanisms to facilitate user adaptation may be most important for enhanced use involving enterprise systems.

This study provides managers with information on the different levers that influence enhanced use: IT, task and user. It suggests that managers may have to exercise care in assigning users to certain system use responsibilities. For example, when enhanced use requires drawing on high-level knowledge, it may be important to rely on users who have the time and the motivation to engage in high levels of substantive use. As we discuss in this paper, when users have to process information that goes beyond what is needed to just use the feature for an immediate task, the cognitive demands for enhanced use become much more significant. These demands could deter users from engaging in enhanced use unless they are provided with adequate incentives or support. Managers wishing to encourage enhanced use should pay close attention to such potential issues.

Managers also need to consider that adaptation represents an additional effort that sometimes must be made as part of enhanced use, depending on the type of task and IT that is being used. Our findings suggest that some types of tasks largely limit users' control over the adaptation that must accompany enhanced use. Hence, these types of tasks may discourage enhanced use. Our findings also underline the influence of automation and highly analyzable tasks on the locus of innovation. Systems involving minimal automation and hardly analyzable tasks are often conducive to user-initiated enhanced use because they make users feel more responsible for using an IT to its full potential. In either instance, managers wishing to encourage enhanced use should make sure that users are not deterred because the task in question is too structured or because of the need for adaptation.

Some limitations should be noted. The perspective taken in this study is that of the individual user and takes into account few of the social aspects of use that may link one user to others in the context of use. Social context has a role in shaping the patterns of enhanced use. In terms of the study design, because we interviewed individuals about their past experiences with IT, our results may be limited by their memory and potential bias. In this regard, the use of observations as a data collection method might have been preferable for this study. Finally, the nature and process of enhanced use identified in this study will gain from further empirical validation.

7. Conclusion

This study provides a new conceptualization of a core phenomenon in the IS field: the new use of an IT after the initial adoption period. The results from two rounds of interviews with users of different IT applications in different contexts show that enhanced use and the related patterns are defined by user-related, IT-related, and task-related variables. It highlights the dynamics and challenges occurring as users interact with IT to make new uses of it.

Our conceptualization of use has the potential to stimulate new research questions that lead to the development of theories on post-adoption IT use. Additionally, it can be further enriched by examining the influence of other factors on the dynamics of use (e.g., individual differences, organizational context).

This leads us to propose several avenues for future research. The role of individual user differences such as learning capabilities (Santhanam, Compeau, Yi, & Rodriguez, 2010), attitude, self-efficacy, personal innovativeness, and IT anxiety (Venkatesh et al., 2003) can affect the patterns of enhanced use identified in our study. Because the role of emotions helps to increase our understanding of IT adoption (Beaudry & Pinsonneault, 2010; Cenfetelli & Schwarz, 2011), it is worth identifying its potential role in use following initial adoption. Enhanced use also may be affected by situational conditions such as organizational IT support infrastructure; future research could examine how and when organizations should encourage enhanced use. It is important to explore questions that can establish the relationship between enhanced use and outcome measures such as performance, for both improvement and impediment.

Because this study also does not investigate the antecedent and impacts of enhanced use, further exploration of the nomological network of enhanced use could help in building greater understanding of the phenomenon. For example, motivation may be an important antecedent of an enhanced use that involves low task analyzability and high degrees of substantive use and

adaptation. In contrast, motivation may be insignificant when an enhanced use is not very demanding in terms of these attributes.

Furthermore, this study's findings offer insights regarding systems design. Designers need to take into account variables that can hinder new uses of features. For example, we identify the variables that can render enhanced use cognitively demanding. In particular, we spell out the way in which enhanced use may become more difficult when users are required to draw on certain types of knowledge. This information can assist designers in developing help tools to facilitate the retrieval of such knowledge or relieve users of the need to retrieve such knowledge. For example, a user who wants to use a system's new collaboration feature may have to consider how the system handles information and how this affects their privacy/control over their information. Designers could reduce the cognitive effort associated with the enhanced use of this feature by providing relevant information about privacy in order to assist users when they try to use the feature for the first time.

We hope that this study will stimulate research that considers use in all its complexity. That is, we hope that future research of use will consider task, user, and IT-related variables along with the micro-dynamics of use. Much of IT managers' ability to influence use and IT researchers' ability to understand use probably depends on such studies.

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Appendix

Table A1. Second Set of Interviewees

Profession	Industry	Gender	Age	IT types
Administrative assistant Interview 14	Higher education	Female	40	Enterprise
Bank clerk Interview 21	Banking and finance	Female	29	Enterprise
Public relations officer Interview 11	Services	Female	33	Functional
Electrical engineering researcher Interview 32	Higher education	Male	23	Functional
Middle Eastern Studies research assistant Interview 10	Higher education	Female	25	Functional
Internal auditor Interview 15	Energy	Female	32	Enterprise, functional
Accounting clerk Interview 18	Food and restaurant	Male	29	Enterprise, functional
Administrative assistant Interview 28	Healthcare	Female	24	Enterprise, functional
Administrative assistant Interview 31	Higher education	Female	34	Enterprise, network
Account manager Interview 16	Higher education	Male	30	Functional , network
Software developer Interview 9	Consulting	Female	26	Functional, network
Accountant Interview 24	Consulting	Female	26	Functional, network
Journalist, sound designer Interview 19	Media	Female	35	Functional, network
Sound and video transcriber Interview 29	Consulting	Male	20	Functional, network
High school teacher Interview 27	Education	Female	28	Functional, network
Electrical engineering intern Interview 26	Energy	Female	22	Functional, network
Strategy consultant Interview 25	Air transportation	Male	38	Functional, network
Lecturer Interview 22	Higher education	Female	28	Functional, network
Software developer Interview 23	Higher education	Male	32	Enterprise, functional, network
Grants manager, auditor Interview 17	Non–profit sector	Female	28	Enterprise, functional network
Accounting clerk Interview 13	Higher education	Female	29	Enterprise, functional, network
Accounting manager Interview 30	Logistics	Male	33	Enterprise, functional, network
Administrative coordinator Interview 20	Education	Female	27	Enterprise, functional, network

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