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The Nature and Determinants of Intranet Discontinuance after Mandatory Adoption

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The Nature and Determinants of Intranet Discontinuance after Mandatory Adoption

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Dedication

To my mom, Mrs. Deok-Ja Chae, and dad Mr. Tae-Jo Cho for their enormous love

Also to my wife, Eunjeong Moon for her encouragement and support

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I could write an entire dissertation on the incredible support and encouragement shown by so many people during this process, but those words are hard to find and I would rather deliver them in person. For the sake of prosperity, however, a few individuals need to be mentioned by name.

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The Nature and Determinants of Intranet Discontinuance after Mandatory Adoption

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This research examines post-adoption behavior (discontinuance versus continuance) with the context of Intranet use. Multiple theories are used as theoretical frameworks to extend information communication technology research to the case of post-adoption behavior. Three research questions and six sets of hypotheses are formulated to distinguish discontinuers from continuers, to identify factors related to discontinuance in comparison to continuance, and to explore reasons behind their discontinuance.

Results indicate that discontinuers can be discriminated from continuers based on technological attributes (compatibility and usefulness), use-related outcomes (satisfaction, behavioral control, and enjoyment), social influences (work group membership, subjective norms, image, and critical communication partners' perception), and organizational mediations (perceived voluntariness, organizational support, top management support, and organization's innovation climate). This research also found that there are different types of discontinuers (replacement, disenchantment, partial, reserved, indifferent, and political discontinuers) and that replacement and partial discontinuers can be discriminated from reserved and indifferent

discontinuers with respect to individual characteristics (risk-taking personality, independent judgment capacity, personal innovativeness, and self-efficacy) as well as factors associated with post-adoption system use. Additionally, this research found that discontinuers are more like to be dissatisfied with organizational communication than are continuers. Among discontinuer categories, reserved discontinuers are the most likely to be satisfied, while political discontinuers are the least likely to be satisfied with organizational communication.

Overall, these findings help us better understand the complex nature of post-adoption behavior in organizational context. In fact, the findings suggest that people are not passive recipients of an innovation even where the innovation implementation decision is made by an organization. Rather than accepting organizational decision, they experiment with it, evaluate it, develop positive or negative feelings about it, and work around it. Particularly, the diverse list of actions (e.g., replacement, reservation, indifference, partial use, etc.) highlights the complex nature of post-adoption behavior and contrasts with the widely cited adopter categories, where discontinuers are treated as identical with later adopters. This gives much needed attention to post-adoption behavior, which complements the diffusion literature's predominant focus on initial adoption. Theoretical and practical implications as well as future directions are also discussed.

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CHAPTER 1: INTRODUCTION

Over the past two decades, the information systems and communication fields have witnessed a significant growth in the number of studies on the adoption and use of information and communications technologies (ICTs). As a result, a multiplicity of theoretical streams has been drawn upon to understand adoption and use at various levels of analysis (e.g., Bhattacherjee & Premkumar, 2004; Davis, 1989; Hubona & Burton-Jones, 2002; Lin, 2003; Rogers, 1995; Venkatesh, 2000). Although the initial adoption of technology is an important first step toward realizing successful diffusion, the eventual stability of a particular technology also depends on its continued usage over a long period of time. In fact, previous research has demonstrated that the long term success of any given form of technology depends not only on its initial adoption but on its subsequent continued usage as well (Ajzen, 1991; Bhattacherjee, 2001; Hsu & Chiu, 2004; Karahanna, Straub, & Chervany, 1999; Parthasarathy, 1995; Parthasarathy & Bhattacherjee, 1998; Pollard, 2003; Rogers; Venkatesh, 1999; Venkatesh & Brown, 2001; Venkatesh & Davis, 2000). ICT failures continue to abound in organizations despite the progress made in acceptance, implementation and usage research at both the individual and organizational level of analysis. In fact, as many as one out of four ICT implementation projects end in failure (Keil & Robey, 2001), and an estimated 40-75% of implementations fail because adopted technologies are not effectively utilized within an organization (Griffith, Tansik, & Benson, 2002). Since individual technology adoption and continued use is deemed critical for organizations to derive the benefits of ICTs (Karahanna et al., 1999), such staggering statistics suggest that there is still much research to be done in this field. The reasons and ways that individuals adopt and continue to use new technologies remain important issues for ICT researchers; however, in order to understand the broad scope of ICT use, it is critical to know why others reject, discontinue or underutilize those initially adopted technologies. Thus, further research is needed in order to

more fully understand the factors that influence user intention to discontinue already adopted ICTs and to gain greater insight into the entire process of innovation diffusion and its duration.

Theoretically, discontinuance is closely related to the study of decision making. Discontinuance, like initial adoption, can be considered as one specific phenomenon of individual decision making. Thus, discontinuance brings up various theoretical considerations that can be involved in decision making process such as formal and practical rationality (Weber, 1978), normative-affective dimension of human subjectivity (or social and cultural embeddedness), habitual dimension of human behavior (Durkheim, 1953; Weber), and so on. However, more importantly discontinuance emphasizes the adaptive nature of human behavior rather than the stability of it. Due to bounded rationality (Simon, 1957) and uncertainty as well as complexity of a given situation, an individual has to dynamically adjust his or her behavior to constantly changing environments as well as one's own perceptions. Discontinuance exemplifies those adaptive choices made by an individual as he or she gets familiarized with a given innovation through firsthand experience.

Conceptually, discontinuance is located within innovation and communication studies that focus on understanding the processes of normalization of previously adopted technologies. Discontinuance also relates to ICT research that aims to predict users' acceptance and continued usage of ICTs. Thus, discontinuance, along with other types of post-adoption behaviors including continuing use, reinvention, and maintenance, is an important aspect of the complete diffusion process. Discontinuance may also provide the key to resolving the shortcomings of the current diffusion literature, such as Rogers's Innovation Diffusion Theory (IDT) and various technology acceptance models that have been developed in ICT research. Discontinuance also represents a turn away from the belief in the one-sided transformative power of technology. Until the mid 1980s, innovation diffusion research had focused on the adoption of technological innovations by individuals or other decision-making units at a micro-level, and on the spread of innovations within a social system at a macro-level. Adoption, considered a rational 'innovation-

decision' process, has been described by Rogers (1995) as a rather linear process or as a set of mechanical curves relating to adoption and diffusion. Similarly, ICT researchers have also assumed an individualized rational actor who carefully calculates costs and benefits in accepting a new technology. Nonetheless, the linearity and overly rationalistic bias of these theories and models have been challenged (e.g., Jeyaraj, Rottman & Lacity, 2006; Lyytinen & Damsgaard, 2001). The assumption of undifferentiated user evaluation of an innovation based on its objective features or functions has been questioned by the variability in user perception and recognition of the importance of the usage context. Subsequently, many researchers have stressed the importance of considering the different perceptions of individuals or groups regarding a given technology, as well as the influence of varied cultural appropriations as factors in explaining technology acceptance and usage (e.g., DeSanctis & Poole, 1994; Fulk, 1993; Kwon &Zmud, 1983; Markus, 1996; Orlikowski & Gash, 1994).

Practically, discontinuance of revenue-generating products or services, such as computer hardware and software, is an important consideration for at least three reasons. First, discontinuance of a product usually implies lost revenues (Rust & Zahorik, 1993). Second, discontinuance of products or services is likely to signal further loss in revenues through additional discontinuance (Arndt, 1967; Oliver, 1995), and by preventing adoption of the product or service (Ridgeway & Price, 1994). Third, since generating new customers is, as research on customer loyalty has shown, expensive and time consuming (Ridgeway & Price), it is cheaper to retain loyal customers than to acquire new ones (Oliver, 1980). Likewise, discontinuance of efficiency/productivity-increasing products or services, such as innovations for improving employee productivity or internal communications, also raises a significant concern. For instance, discontinuance or underutilization of a previously adopted innovation in an organization may cause psychological dissonance and stress (Rogers, 1983) that in turn could result in increased dissatisfaction with organizational changes (Bhattacherjee & Premkumar, 2004), and decreased organizational commitment (Nelson, 1990).

In spite of its theoretical and practical significance and the existence of a robust body of research on the adoption-diffusion process, there are at least two major gaps that should be filled in order to make this research stream even more relevant. The first gap stems from the notion that diffusion research has focused primarily on adoption behavior at the cost of discontinuance by members of a social system, both at the individual and the aggregate levels. Most of this previous work has been confined to the identification of the factors that lead to adoption, the processes through which adoption takes place, the different stages of adoption, and an explanation of the issues and relationships pertaining to adoption (Bhattacherjee & Premkumar, 2004; Davis, 1989; Davis, Bagozzi, & Warshaw, 1989 b; Davis & Venkatesh, 2004; Karahanna et al., 1999; Thompson, Higgins, & Howell, 1991; Venkatesh, 2000). While informative and insightful, these studies have neglected the issues of post-adoption behavior, including discontinuance, particularly at the individual decision-making level. The antecedents of discontinuance have been presumed to be the opposite of continuance. If, for example, end-users are provided with reliable and useful software, they are generally satisfied; if not, they are generally dissatisfied and stop using it. In the case of complex products, like information communication technologies, the adoption decision and the discontinuance decision are usually discrete; the same factors that led to adoption may not be able to account for the decision to discontinue. Users usually look for some general cues while adopting a product, including usefulness, but they might use more specific experience-based cues after initial adoption. Along the same lines, a user may use the product quite differently from what was originally intended, or in some cases, might actually find the innovation to be incompatible with existing needs (Orliokwski, 1992; DeSanctis & Poole, 1994). Furthermore, although recognizing the existence of discontinuance behavior, existing theories of diffusion have tended to implicitly assume that adopters will continue to use an innovation for the length of its life cycle. However, this assumption is clearly flawed, since some adopters discontinue use after only a short time.

The restrictive focus on adoption behaviors of the innovation diffusion research has been much the same at the aggregate level. For instance, on the level of collective decision-making for organizations, the exclusion of discontinuance from the study of diffusion has served to obscure the fact that diffusion is a dynamic activity with adopting entities constantly entering and leaving the process (Black, 1983). In fact, there have been many studies that attempt to identify organizational interventions that can enhance implementation, assimilation, and infusion of organizationally adopted technology (e.g., Agarwal & Prasad, 1997). These studies are helpful in understanding how an organization actively mediates its members' perception and use of the technology. However, we are still left to discover why an organization discontinues already adopted technology, whether its members' individual discontinuance rate affects an organization's decision for discontinuance, and how an organization's evaluation of its members' use or discontinuance level affect adaptation, replacement or redesign of the technology. As a result, we know very little about the actual extent to which there may be qualitative differences between antecedents for adoption, on the one hand, and those for discontinuance on the other, or precisely which factors tend to incite discontinuance and through what kinds of processes.

Another shortcoming of adoption-diffusion research is its relative silence on individual non-rational dimensions such as habit and value, as well as social dimensions such as normative pressure, organizational environments and cultural conditionings. The gap in knowledge and understanding of contexts of adoption and use, and the importance of social networks or subjective norms, still persist despite the contribution of the social influence perspective (Fulk, 1993; Fulk & Steinfield, 1990; Kraut, Rice, Cool, & Fish, 1998) on ICT adoption research. However, this is not to say that our focus on innovation adoption –use research should shift solely to social influence approaches. While turning away from rationalistic biases and technological determinism, we should avoid the replacement of one set of single-sided assumptions with another by encouraging a more complex and balanced model. When included in studies that challenge technological determinism, discontinuance takes the social

embeddedness of technology seriously, a divergence from common media and technology acceptance frameworks. That is, the emphasis on technological attributes should be incorporated with the understanding of how various types of technologies are embedded in different social relations. Furthermore, the concept of discontinuance does not adhere to the social constructivist stance that suggests that relevant social groups lead the principal interpretive flexibility of technology to closure, thus shaping its resulting function and form. The temptation to focus exclusively on the spheres of users' consumption must also be avoided since researchers are left with no objective way to evaluate competing technologies or technological changes when eliminating intrinsic attributes of technologies. Therefore, the study of discontinuance must not lose sight of the bigger picture in which we can properly understand the exchanges between micro practices and the encompassing social and cultural structures.

Along with recognizing the above-mentioned gaps in adoption-diffusion research, it is argued that the differences in types of technology should be considered when exploring factors that influence adoption, as well as post-adoption behaviors. It is natural to assume that spreadsheet software and instant messaging applications have very different meanings to individuals who utilize them within the workplace; therefore, different factors might affect their adoption and post-adoption behaviors. However, many studies treat technologies in an undifferentiated fashion and do not consider the effects on individual users of specific features of the technologies (Mankin, Bikson, Gutek, & Stasz, 1988). As a consequence of this ignorance, we have observed empirical studies that report confounding effects of the same variables on user acceptance and use, especially those of social influences such as subjective norms, images, and others. Interestingly, one meta analysis (Fichman, 1992) that discriminates between different types of technology found that different factors explain the acceptance of use depending on variations in technology. Even if the differentiation relies on the construct of complexity, the degree to which an individual is required to be accustomed to a technology, it provides a baseline parameter from which to determine the significance of discrimination between types of

technology. In other words, ICTs, the main concern of the current study, may be characterized by significant user interdependencies rather than single-user technology (e.g., micro-computers, laptops, word processing, spreadsheets). In consequence, classical diffusion and acceptance variables (e.g., usefulness, ease of use, compatibility) may become weakened or obscured by additional factors such as social influence variables or organizational interventions.

By concentrating on the study of discontinuance rather than that of adoption, this research intends to expand our understanding of the discontinuance-decision making process. The main foci of this dissertation are twofold. First, this research examines sets of factors related to discontinuance that can help to explain discontinuance in comparison to continued use. Second, this research explores discontinuers' motives for stopping use of a previously adopted technology. More specifically, this dissertation intends to answer, at least partially, the following questions:

R1: What are the salient factors that explain discontinuance? Do they differ from factors that explain continued use? What are the conditions that disrupt states of routinized and habitual use?

R2: Are there different types of discontinuance and therefore, discontinuers? For example, does categorizing discontinuance into the typology of replacement discontinuance, disenchantment discontinuance, partial discontinuance, reserved discontinuance, indifferent discontinuance, and political discontinuance have empirical validity?

R3: How do different types of discontinuers contrast with each other? Do they share certain individual characteristics? Are they affected by different factors with respect to their post-adoption behaviors?

R4: How does discontinuance or continuance of organizational members affect their evaluation of organizational communication? Do discontinuers and continuers differently perceive their overall communication in an organization?

Except for Rogers (1995) and Parthasarathy (1995), who identified different types of discontinuance and recognized the overall importance of discontinuance in the continued success of an innovation, these questions have not been addressed in previous studies of discontinuance. Therefore, this research could be of value in enhancing our cumulative knowledge of innovation diffusion. In addition, the managerial implications of this dissertation could be substantial, especially with regard to the following issues. First, this study helps to understand who discontinuers are, how they differ from continuers, and what their motivations (or reasons) to discontinue a given ICT are. Second, this study helps to understand whether discontinuers (or specific types of discontinuers) develop a negative sense of intra-organizational communication that can influence organizational effectiveness. If so, then the appropriate strategies to reduce discontinuers can be very important in preventing member dissatisfaction within an organization. Third, this study gives insight into whether discontinuance behavior can be prevented by an organization and if so, whether specific types of discontinuances are more susceptible to intervention than others. Fourth, this research will help us to understand whether there are specific organizational strategies that would be effective in prompting discontinuers to consider re-adopting. In addition, this study gives insight into whether all types of discontinuance are negative and if not, which types of discontinuance can be encouraged by an organization.

The technology that will be studied for this dissertation is Intranet that is a relatively complex technological innovation. It must be understood that the conclusions reached in this dissertation are applicable to this specific technology and, although many of the conclusions may apply to other similar types of communication technologies, some of the findings may not be transferable. In addition, the conclusions are drawn from an organizational context where there is not a strong organizational mandate for use of an innovation.

Since this dissertation views discontinuance as an indispensable part of diffusion—as a key post-adoption behavior—the relevant literature on discontinuance is reviewed in the first part of Chapter 2 where conceptualization of discontinuance and additional identification of

discontinuance types in conjunction with the current understanding are attempted. The second part of Chapter 2, relevant theories and empirical studies are discussed as they relate to the development of research hypotheses. In Chapter 3, research questions and sets of hypotheses are presented. The results of the pre-test for the validation of newly developed constructs and the proposed methodology for a new round of data collection are presented in Chapter 4. Chapter 5 presents the analysis and results of the statistical tests. These results are discussed in chapter 6, which also includes the implications and the limitations of this research. Directions for future researchers are also noted.

CHAPTER 2: LITERATURE REVIEW

Aspects of Discontinuance

Although we have a robust body of research on the adoption-diffusion process, little has been written concerning the discontinuance of innovation research. This work contributes to filling that gap in the literature along with an exploration of the theoretical conflict involved in locating discontinuance as it occurs throughout the adoption stages. In this section, I review discontinuance in IDT and other relevant theories in order to help us to differentiate adoption from post-adoption behavior. Next, discontinuance is explored on conceptual, exploratory, and theoretical levels, and the problematic aspects of the connection between adopter categories and discontinuers are also explored. Finally, different discontinuer types are developed, in addition to disenchantment and replacement discontinuance suggested by IDT.

DISCONTINUANCE IN IDT

According to Rogers (1995), “discontinuance is a decision to reject an innovation after it has previously been adopted (p. 21).” Rogers defines the innovation-decision process as “the process through which an individual (or other decision making unit such as a group, society, economy, or country) passes through the innovation-decision process" (p. 20). This researcher traces five stages in the innovation-decision process: (a) first knowledge of innovation; (b) forming an attitude toward the innovation; (c) decision to adopt or reject; (d) implementation of the new idea; and (e) confirmation of this decision. Discontinuance occurs in the last stage of the innovation-decision processes, the confirmation stage. During the confirmation stage, an adopter seeks reinforcement of an innovation-decision that has already been made. The adopter reevaluates her or his earlier acceptance decision during this final stage and decides whether or not to continue using an innovation (Rogers). For our purposes here, it is especially important to note that the adopter may reverse a previous decision if exposed to conflicting and/or controversial messages about the innovation.

With Rogers' conception of discontinuance, adoption is seen as a necessary condition for discontinuance, which is described as the "abandonment of a previously adopted innovation." Rogers defines adoption as an individual decision, "to make full use of an innovation as the best course of action available" (Rogers, 1995, p.21). As a result, adoption is seen as the completion of the implementation stage where routinization and institutionalization are achieved, and the innovation arrives at its full use. In other words, if individuals do not fully integrate an innovation into their normal work environments, we still interpret this stage as implementation. In addition, if the opportunities inherent in the innovation are never fully utilized, a strong argument could be made to suggest that the implementation of the innovation in question was never fully completed. One commonly recognized sufficient condition for discontinuance is a trigger that results from a rational-cognitive evaluation of the adoption and continuance of the innovation in question. Critical moments of decision for adopters occur when they make the decision of whether or not to continue the innovation; this generally involves a dissonance between user expectations and functional realities. Negative as well as positive information obtained through adopters' communication networks plays an especially important role in the decision-making process.

One problem at this point, however, with the above understanding of discontinuance based on Rogers's (1995) definitions of adoption and implementation, is that it appears to be inconsistent with his later discussion of discontinuance: "discontinuance is an indication of incomplete routinization and institutionalization" (p. 183). In fact, Rogers argues that during the implementation stage, an innovation loses its newness and its use tends to appear as a habitual practice. This is why Rogers suggests that an actual innovation adoption process ends at the implementation stage and not all adopters move on to the confirmation stage. This is important, because, from this perspective, routinization and institutionalization need be completed during the implementation stage. But, when Rogers attributes discontinuance to incomplete implementation, the distinction between rejection during implementation and discontinuance

becomes blurred. Thus, Rogers's emphasis on the importance of the differentiation between discontinuance and rejection calls out for greater clarification.

Active trials and evaluations occur, for Rogers, with the beginning of actual use at the implementation stage. Normalization/routinization of an innovation results from adopters' confirmation of their satisfactory evaluation. A perplexing question arises, however, when Rogers (1995) isolates a distinct stage, the confirmation stage, in terms of evaluations of adoption decisions. Do adopters process different types of information during the implementation and the confirmation stages? If so, what are the bases or factors that can be identified that generate different information? It is difficult to differentiate the implementation stage from the confirmation stage within Rogers's decision process model, and this is the central focus of what follows as we work with Rogers's model to overcome this difficulty in order to make the concept more useful.

A strong argument could be made that there is a persistent one-sidedness to the innovation-decision process, insofar as Rogers acknowledges that discontinuance can rectify the deterministic view of IDT. Although Rogers's model does possess a post-adoption stage—confirmation—and presumes that adoption itself is a function of information processing, discontinuance is generally thought to occur only in the case of a new idea becoming thoroughly integrated into the routine of the adopter. Therefore, in a strict sense, discontinuers are not adopters, even if adoption, conceptually speaking, has occurred to the extent to which it is possible for discontinuance to take place. Thus, the IDT has implicitly assumed that adopters will continue to use the innovation throughout its life-cycle only if the innovation passes on to the confirmation stage. Overall, these conceptual ambiguities and the persistent one-sidedness make it difficult to study discontinuance within the IDT framework.

SEPARATION OF DISCONTINUANCE FROM ADOPTION AND ITS CONCEPTUALIZATION

Within the ICT research tradition there are a few theories that can help us to better understand discontinuance even in the case where discontinuance is not the major focus of the

researchers. These include the Expectation Disconfirmation Theory (EDT) and the Theory of Reasoned Action (TRA). In particular, these theories help us to better understand the post-acceptance stage when ICT use transcends conscious behavior and becomes part of routine activity. Most specifically, Bhattacherjee and Premkumar's (2004) EDT is an especially useful behavioral model to explain post-adoption behavior, particularly through the description of parameters perceived as usefulness, satisfaction, confirmation, and continuance intentions. EDT can help us to account for the way that users' expectations about an innovation can change after their initial acceptance of the innovation. Bhattacherjee (2001) argues that previous research on ICT acceptance assumes the covariance between acceptance and continuance, yet fails to explain why some users discontinue ICT use after accepting it. In addition, he insists that prior research does not sufficiently elaborate or account for users' psychological motivations, especially those emerging after their initial acceptance, which potentially influence users' subsequent continuance as well as discontinuance decisions—although this may differ from their motivations for prior acceptance decisions.

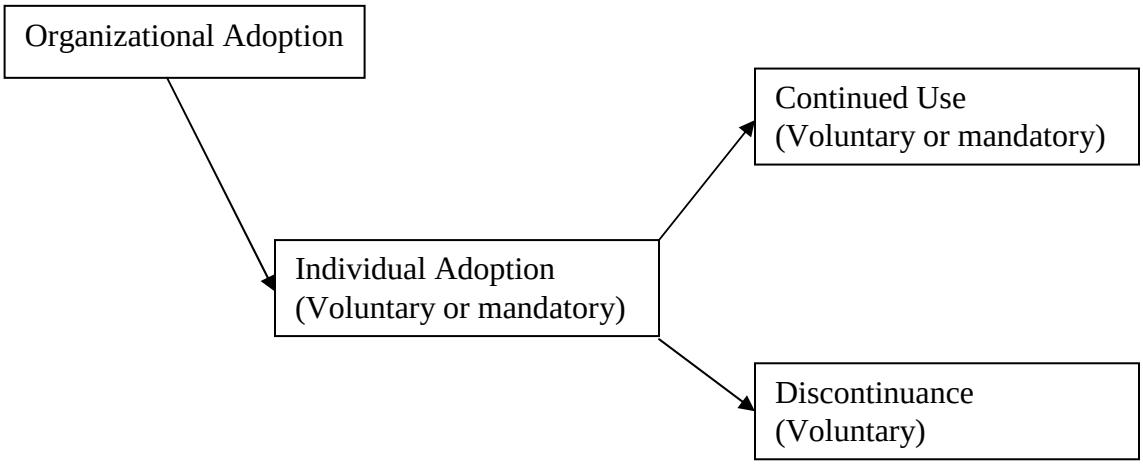
TRA is also useful for contrasting adoption with post-adoption behaviors, suggesting that pre-adoption criteria and post-adoption criteria may differ in important ways (Ajzen & Fishbone, 1980). Cooper and Zmud (1990) differentiate between acceptance as an innovation, employment in organizational work, and routinization as a normal practice. In addition, there have been empirical studies that suggest the existence of a post-adoption stage distinct from the adoption process. For instance, Venkatesh, Maruping and Brown (2006) demonstrate that the belief structure for household PC use is different from that of household PC adoption. Zhu and He (2002) also found that adoption and use of Internet in China appear to be two distinct processes that are influenced by different factors: Internet adoption is primarily affected by perceived popularity and perceived characteristics of the Internet, but Internet use is solely influenced by perceived need for Internet. In addition, they also found a weak impact of Internet adoption on Internet use.

From the combination of IDT and these other related theories, I conceptualize discontinuance as *a cessation of innovation use after a user assimilated it into his or her everyday practice*. It is true that most words, which denote discontinuance such as disuse (Kittel, Di Marco & Stewart, 2002), rejection (Gitlin, 1995; Parthasarathy, 1995; Rogers, 1983), avoidance (Scherer, 1993), and abandonment (Hocking, 1999; Kittel et al., 2002; Phillips & Zhao, 1993), have negative connotations. In fact, the reason for not using a previously adopted innovation may be related to a positive factor for an individual (e.g., replacement with a better one, alternative solution, adjustments to changed priorities or needs, and so on). A major advantage of the current definition is that discontinuance has a neutral connotation, refereeing to the behavior through which an individual cease to use a given innovation after a period of time.

Here, following EDT and TRA, assimilation in the current conceptualization is understood as routinized use. In an organizational context, assimilation has two phases: the institutionalization of ICT innovation by the organization and its routinization by users. Discontinuance is assumed to occur mainly through users' reflexive thoughts about routinized innovations, triggered by certain events such as negative incidents, contextual changes, or appearance of new innovations, etc. However, it is also logically possible that discontinuance can occur as a cumulative effect of diminished use without the occurrence of specific events.

In addition, I define discontinuance as a voluntary decision at the individual level after an innovation has been available to and used by the individual. As shown in Figure 1, in a workplace, individual decision making about discontinuance as well as continued use typically follows the organization's decision to adopt the innovation. Once the primary implementation decision has been made, an organization may proceed down at least two different paths to ensure its members' adoption and use: it can mandate that the implemented ICT be adopted and used throughout the organization at once, or it can provide the necessary infrastructure and support for members to adopt the ICT, while allowing its voluntary to use (Agarwal et al, 1997; Gallivan, 1996; Zaltman, Duncan, & Holbek, 1973).

Figure 1: A Conceptual model for Discontinuance



The main concern of the current study is the second path since there may be a minor possibility of discontinuance and small variations in the level of use when the organization forces its members to use the ICT innovation in order to complete his or her work assignments. However, even in those cases it is reasonable to assume that the degree of assimilation by the members varies depending on their experiences and perceptions of the ICT. When the organization chooses the second path, organizational members are provided with broadened opportunities to reevaluate use experiences and adjust their behavior to post-hoc perceptions or dissonance after their initial acceptance and use following the organizational implementation of the ICT (Gallivan, 2001). The continued use decision may occur voluntarily, particularly with use experience, or mandatorily, as an organization requires. However, by definition, the discontinuance decision is mainly voluntary except in the case of the organization deciding to no longer provide the innovation, or if certain services or products are no longer available.

It should be noted that continued use does not simply mean the continuing acceptance of a given innovation in a way that the innovation has been designed for. As discontinuance represents an individual's reaction to a given innovation that is inconsistent with a designer's expectation, continued use also reflects the complex relationships between the innovation and human agents. For instance, Orlikowski (1992)' recursive structurational account of technology criticizes the time-space separation of design and use in ICT research and suggests the iterative ability of users to constitute the social and physical characteristics of technology. In a similar vein, the Adaptive Structuration Theory (DeSanctis & Poole, 1994) developed in conjunction with the concepts of 'spirit' and 'appropriation' demonstrates the range of continued use, i.e., different appropriation of the structure embedded in a technology. In short, adaptation and structuration along with discontinuance depicts the complex nature of the interrelationship between ICT and human agents during the post-adoption stage.

Types of Discontinuance

Rogers (1995) differentiates between two types of discontinuance, replacement and disenchantment. Replacement discontinuance occurs when the adopter makes a decision to reject an idea in order to adopt a better idea. Disenchantment discontinuance is a decision to reject an idea because of dissatisfaction with its performance. This could be because the innovation is inappropriate for the user in question or fails to demonstrate advantageous functions over available alternatives. Discontinuance of an innovation is also widely perceived as evidence that a new idea failed to become fully adopted as standard practice for the individual or organization in question (Rogers). According to IDT, replacement discontinuance seems related to a new innovation that supersedes the current one, and disenchantment discontinuance appear linked to dissatisfaction with the performance of the current one. The classification of these two types of discontinuance relies on individual rational decisions and technological attributes. Therefore, the awareness of alternative innovations and of discrepancy between the performance of the current innovation and an adopter's expectations provide a rationale for discontinuance of the current innovation.

However, there are questions regarding Rogers's identification of two types of discontinuance: does the categorization of discontinuance into the typology of replacement and disenchantment have theoretical and empirical validity? Does this typology adequately deal with various reasons for adopters to discontinue? I would argue it does not for several reasons. First, replacement might be the consequence of disenchantment with the adopted innovation; that is, replacement follows disenchantment in regard to a sequential process. Second, these two types of discontinuance are identically based on the individual's perception of the innovation's relative advantage even if replacement discontinuance tends to be based on the comparison with other innovations while disenchantment discontinuance is mainly due to users' initial dissatisfaction. Third, the classification does not incorporate the phenomenon of underutilization that has been widely reported in ICT literature (e.g., Bhatterjee et al., 2002; Fichman & Kemerer,

1997; Pollard, 2003; Saga & Zmud, 1993; Zhu, Kraemer & Xu, 2006). Lastly, it is practically difficult to discriminate one from another if adopters become dissatisfied with the innovation's performance and substitute it for another innovation or a previously used one. There is no empirical test for the discriminatory validity of the differentiation of these two types of discontinuance. In fact, some empirical studies suggest that disenchantment and replacement may not be adequate or sufficient for explaining discontinuance (Myers, 1995; Papazafeiropoulou, Gandecha & Stergioulas, 2005; Parthasarathy & Bhattacherjee, 1998) and that the phenomenon is much more complex, involving a variety of different reasons (Cooper & Zmud, 1990; Zhu & He, 2002). Taken together, these studies suggest that we need to develop a more rigorous categorization of discontinuers.

Two additional types of discontinuance are identified by Parthasarathy (1995): underutilization and snob discontinuance. He argues that underutilization occurs when adopters gradually lose interest in or motivation to use the innovation. Snob discontinuance occurs when adopters abandon an innovation in order to maintain elite social status by disassociating themselves with inferior others who have also begun to adopt the innovation. However, underutilization discontinuance is closely related to disenchantment discontinuance by definition, because adopters react negatively to unpleasant consequences of using the innovation. Therefore, it is difficult to define underutilization as a distinct type of discontinuance, since underutilization only describes how individuals reach the cessation of an innovation as a result of disenchantment. Moreover, from a behavioral perspective, underutilization might be prevalent among different types of discontinuers before they completely abandon the innovation. In addition, defining ‘underutilization’ might become a troublesome question when we operationalize the term based on subjective recall of the frequency of use. However, it is important to note that adoption exists on a continuum, with routinized use of an innovation at one hand and discontinuance at the other. That is, an innovation may be adopted with great favor, but over time, the adopter loses interest and does not use it.

Snob discontinuance is also a problematic identification since it is difficult to distinguish snob discontinuance from replacement discontinuance in that snobs replace the innovation with something else that more effectively promotes one's status and image. However, like underutilization discontinuance, snob discontinuance provides a fresh insight for understanding discontinuers, since some discontinuers might be predominant among early adopters of an innovation. In fact, the reason some individuals may adopt an innovation in its early stage is because of its novelty and uniqueness. When a large number of later adopters adopt the innovation, the exclusiveness of the innovation diminishes. This line of inference questions a hypothesis of IDT, that discontinuers are similar to later adopters. Thus, the relationships between adopter categories and different types of discontinuers require further examinations.

IDENTIFICATION OF ADDITIONAL DISCONTINUANCE TYPES

Reserved Discontinuance

Reserved discontinuance occurs when individuals cease to use a previously adopted innovation with an intention of using it again. Conceptually, reserved discontinuance is distinct from other types of discontinuance since, for example, it is not induced by disenchantment (dissatisfaction with the performance of an innovation) or replacement (adoption of a better innovation). Reserved discontinuers maintain positive attitudes toward the innovation even if they might perceive the innovation impractical or unnecessary in current situations. In addition, they do not abandon it for adopting other innovations but keep the innovation at their disposal for future use.

There are at least two causes of reserved discontinuance. First, a changed perception of task-technology fit along with altered assignments and responsibility, which is contrast to an initial perception of task-technology fit, may induce reserved discontinuance. For example, members in organization who are assigned to different tasks may not find right applications for a previously useful technology. Yet, their perception is contingent to their current tasks, and thus

they have willingness to reuse the technology when they find appropriate applications for it. Second, reserved discontinuance may also be brought on by the temporal unavailability of adequate resources for utilizing an innovation. For instance, in an organization some regional locales may not provide infrastructure for a certain innovation regardless of perceptions of task-technology fit. Those who are repositioned to the locales are forced to temporarily discontinue the innovation.

The current conception of reserved discontinuance serves to fill the interim state between permanent rejection and continued use. For example, Pollard (2003) in her study initially expected that continued users would possess a greater willingness to use a technology in question rather than discontinuers. However, somewhat surprisingly, she found that some discontinued users expressed a strong intention to use it again in the future. The finding suggests that discontinuance may be a multidimensional state in contrast to Rogers' definition of discontinuance – a permanent rejection of a previously adopted innovation. Reserved discontinuance defined here does not mean the complete abandonment of an innovation, but the reservation of it for future or other contexts. Reserved discontinuers are temporal discontinuers who preserve positive perceptions of an innovation and have a strong intention of reusing it if the circumstances are right.

Partial Discontinuance

Partial discontinuance occurs when users routinely utilize certain features of an innovation but stop using other features. The existence of partial discontinuance is a counter-example or updated extension of Rogers's conception of adoption. As discussed before, Rogers understands (1995) adoption as full use of an innovation; thus, rejection and discontinuance means total abandonment of the innovation. However, some innovations, such as ICT applications and Internet, consist of a collection of specific feature sets, and make it possible for users to selectively use certain features (Katz, 1997). Some features are considered more valuable than other features depending on a user's experience (Japerson et al., 2005; Kay &

Thomas, 1995). Kay and Thomas used the monitoring method to study the use of the Sam text editor. The study involved more than two thousand undergraduate students enrolled at the University of Sydney from 1991 to 1993, and it tracked the frequencies of commands used by the students. Students were not compelled to use the Sam, so the sample included both committed and discretionary users. They reported very low frequencies of some types of commands, and the profile of command use was continuing to change. They attributed the low frequency of certain commands and the changing profile to users' learning process based on their experiences. Japerson et al. (2005) found that users of ICTs in the workplace selectively utilized certain features of the applications but ignored others. Some studies also report that individual use of specific features changes over time (DeSanctis & Poole, 1994; Griffith, 1999).

In addition, in Cho's (2005) study of a weblog that is similar to 'Facebook,' it was also apparent that users selectively rejected certain features of the communication technology. The studied technology had many features, including instant messaging, listserv, bulletin board, chat room, guest's book, photo galleries, etc. Some discontinuers stopped using the guest's book due to concerns about privacy, some discontinuers discontinued photo galleries due to the frustration of distorted self-image, and some discontinuers quit using other features due to time constraints or different reasons. Therefore, it is more realistic to loosen Rogers's initial conceptualization of adoption, "a full use of an innovation," since it cannot help us to properly understand users' selective choices or rejections among feature sets that might be prevalent with the recent development and complexity of IT applications.

Indifferent Discontinuance

Indifferent discontinuance occurs when users neglect the adopted technology without encountering any problems or feelings of dissatisfaction. This type of discontinuance does not require a reflexive thought for adopters to decide whether they have to discontinue the adopted innovation. Indifferent discontinuance is a sort of benign or mindless neglect of the adopted technology. This form of discontinuance seems to be similar to underutilization in a behavioral

sense, since indifferent discontinuers are likely to underutilize an innovation. However, in some cases, identical behaviors could be categorized as different types of discontinuance, depending on the perceptions and motives of the discontinuers. For instance, underutilization discontinuance proposed by Parthasarathy (1995) can be categorized into disenchantment, replacement or indifferent discontinuance. Adopters may underutilize the innovation because of their dissatisfaction with its functionality, consideration of its replacement with another innovation, or mindless neglect over time.

Conceptually, indifferent discontinuance fills an unrecognized intellectual gap in the current theories and models by assuming that an individual behavior has a rational foundation and is subject to logical discourse. In fact, it is argued that a large part of our behaviors are unconscious due to our limited intellectual capacity, and are retrospectively reconstructed as rational or reasonable (see Weiss, 1999). In our everyday lives, it is almost impossible to consciously compare and choose among alternative means to a given end (Wallace, 1990). We have to deal with many things with bounded rationality (Simon, 1957). Consequently, we pay a great deal of attention to certain things but ignore or habitually react to others. An innovation that once attracted our attention simply loses its priority and is replaced by others. Without affective reactions or rational evaluations, we routinely and habitually ignore previously adopted innovations or ideas. Similarly, Timmerman (2002) argues that media selection and use may occur either mindfully or mindlessly and that repetition leads mindlessness and over-learned behavior. For instance, upon receiving information from bulletin boards, if a user has repeatedly identified the information as useless, the information will likely to be classified similarly and likely not be read.

Surprisingly, a result of a pre-test for this study, which used student samples who had experience using a weblog, shows that indifferent discontinuance is more prevalent than one might assume. In fact, indifferent discontinuance is the most frequent type of discontinuance, 30.5 %. This result supports the above argument that people tend to behave without any reflexive

thoughts. In addition, even if the pre-test context is voluntary, indifferent discontinuance might still applicable to mandatory contexts since it reflects a part of human nature.

Political Discontinuance

Political discontinuance occurs when an individual cease to use a previously adopted technology due to her consideration of political disadvantages implied by the system implementation. Ferris et al. (1996) refers political behavior as being concerned with behavior that is self-serving and not sanctioned by the organization, causing conflict or disharmony between groups or individuals. In fact, many researchers have depicted organizations as political arenas populated by self-interested actors and organizational members' behaviors are inherently political (e.g., Alvesson & Willmott, 1992; Deetz, 1994; Mumby & Stohl, 1992). A small but thriving research in the ICT literature also suggests the different political interests among stakeholders, i.e., differences among the expectations and interests of stakeholders, attributing the general dissatisfaction with ICT implementation to unmet stakeholder expectations. For instance, Markus' political resistance model (1983) explains resistance in terms of the interaction between the system being implemented and the contexts of its use. The primary assumption of the model is that ICT often embody a distribution of organizational power among the members that it affects. A group of the organizational members will be inclined to use a given system if they believe the power shift implied in the system design will support their own position of power. If they think that it undermines their position of power, they will engage in resistance behaviors. Markus also suggests that the strength of resistance will be influenced by how much power is lost and its perceived importance, as well as by the organizational position of the unit to which a group loses power. In a similar vein, other researchers have pointed out that a new ICT may affect the distribution of power and authority (Bloonfield & Coombs, 1992; Burkhardt & Bass, 1990, Kling & Iacono, 1984; Cavaye & Christiansan, 1996; Lee, 2000; Long, 1993). For instance, Cavaye and Christiansan argue that organizational members' power speaks through the control over resources, which is less physical and more virtual in that members command

resources through information and its communication. A new ICT can threaten a group's autonomy, undermine present distribution of authority, challenge existing ownership of information and can be considered as a threat by some while an opportunity for others.

The current conception of political discontinuance emphasizes the role of power and politics in explaining the different behaviors during the post-adoption stage with respect to a given ICT. Put differently, the identification of political discontinuance recognizes the systemic contradictions that make conflict an inherent element of organizational life. Unfortunately, there have been few studies that focus on the relationship between organizational politics and ICT use during the post-adoption stage. However, some empirical studies have referred political resistance as a common cause of ICT implementation failure (Bird, 1992; Davenport et al, 1992, Markus, 1983). As the implementation of ICT can bring the heterogeneous interests of different interest groups into conflicts, it is reasonable to believe that the appropriation of ICT after the implementation will be also highly political due to the growing importance of ICT as a crucial organizational resource. Thus, the recognition of political discontinuance as a distinct type of discontinuance can enhance our understanding of the post-adoption behaviors as a negotiated outcome that may reflect the political and power dynamics of organizational context.

CHARACTERISTICS OF DISCONTINUERS

Current Understanding of Discontinuers

Rogers (1995) states, “Generally, high discontinuers have less education, lower socioeconomic status, less change agent contact, and the like, which are opposites of the characteristics of innovators. Discontinuers share the characteristics of laggards, who indeed have a high rate of discontinuance (p. 188).” Since a high rate of discontinuance is found in the later stages of the IDT’s diffusion process (Rogers), it stands to reason that discontinuers will tend to share the characteristics of later adopters (Parthasarathy & Bhattacherjee, 1998; Rogers). Thus, in comparison to continued users, discontinuers may be skeptical about new ideas and

somewhat more isolated from social networks. In addition, their decisions for adoption and discontinuance are mainly motivated by the pressure of peers, even if they are convinced of the utility of an innovation (Rogers).

In addition, based on the IDT framework, Parthasarathy and Bhattacherjee (1998) argue that dissatisfaction is a direct function of the expectation-reality gap that is less for earlier adopters in comparison to later adopters. Earlier adopters have more realistic expectations of an adopted innovation because their adoption decision is based on a rational assessment of the costs and benefits of the innovation. Later adopters have unrealistically high expectations of the innovation and thus have more opportunity for dissatisfaction with the innovation. This higher probability of discontinuance of later adopters is increased by their lack of skills or resources to utilize the innovation extensively.

Problematic Link between Later Adopter Category and Discontinuers as a Homogeneous Group

Rogers (1995) initially categorizes the adopters into five distinct groups: innovators, early adopters, early majority, late majority, and laggards, but the distinction between the earlier adopter and the later adopter has received more theoretically and empirically meaningful support (Parthasarathy, 1995; Rogers). Earlier adopters are influenced mainly by mass media and information outside the boundaries of their social system; later adopters rely mostly on interpersonal information in order to make an adoption decision. Earlier adopters are more receptive to new ideas and make innovation decision more independently of the communicated experience of others than later adopters (Midgley & Dowling, 1978; Rogers). In addition, in contrast to later adopters, earlier adopters have higher incomes, are better educated, are more risk taking, and are usually younger (Rogers).

Rogers (1995) also states that later adopters have a much higher probability of discontinuing the adopted innovation. However, the reasoning behind this hypothesis is that the inability to learn or understand the workings of the innovation increases the probability of

discontinuance. This reasoning is clearly biased toward a reliance on individual traits to explain discontinuance; thus, it does not strongly consider discontinuance from a social or communicative perspective. Moreover, IDT contends that innovations with high rates of adoption usually predict low rates of discontinuance, since innovation attributes, which affect individual adoption decision making, affect discontinuance in the opposite way. For instance, complexity negatively affects adoption decisions, but positively affects discontinuance. Here, complexity implies high non-monetary cost that an individual has to pay to adopt and use a technology. It is reasonable to argue that an individual may be reluctant to adopt a complex technology; however, it is untenable to assume that an individual may decide to stop using the already adopted-complex technology, since she or he has already paid the required non-monetary cost during the adoption process. This conflict, on the one hand, stems from the fact that discontinuance occurs in the implementation stage, which is the last stage of diffusion process, making discontinuance look more like 'late rejection' than post-adoption discontinuance. On the other hand, it is also partly due to incomplete identification of the types of discontinuance in IDT. As discussed in the previous section, replacement discontinuance is based on adopters' awareness of their use and the availability of other innovations; therefore, it is contradictory to the IDT's proposition that discontinuers are late adopters or laggards who have limited knowledge and understanding of the use of the current innovation and have limited social networks that inform them of other available resources.

Interestingly, Parthasarathy (1995) found that the probability of replacement discontinuance and the probability of disenchantment discontinuance were not affected by adopter categories in a study of the subscription discontinuance of an online service. In addition, the study reports that even if, in comparison with discontinuers, continuing users perceive the service as possessing a greater degree of relative advantage and greater compatibility, the discrepancies of the two groups' means scores are small. Moreover, continuing users and discontinuers do not differ with respect to their perception of the IDT's innovation attributes.

This result suggests that the IDT's proposition that the probability of discontinuance is, in part, a function of adopters' characteristics, may not be adequate (and there may be other factors that affect discontinuance even more directly).

PROCESS MODEL OF DISCONTINUANCE

Parthasarathy (1995) suggests that the discontinuance decision follows a similar process as the decision to adopt an innovation, as described by the five stages of Rogers' (1995) innovation decision model: knowledge, persuasion, decision, implementation, and confirmation. Parthasarathy proposes a five-step model of discontinuance that matches with Rogers's: (a) awareness, when the adopter becomes aware of some circumstance that may eventually convince him or her that the current innovation is either inadequate or that some other innovation is better; (b) evaluation, when the adopter processes the information in order to make a decision about whether to continue to adopt the innovation; (c) trial, when the adopter experiments with alternative innovations; (d) decision, when the adopters actually discontinues the innovation; and (e) post-decision, when the adopter evaluates whether or not the discontinuance decision made was optimal.

Unfortunately there has been no empirical test of the discontinuance process model, so we do not know how discontinuers reach their decision in comparison to adopters. It is, however, questionable whether all discontinuers follow a similar process to reach their discontinuance decision. For instance, while Parthasarathy's (1995) discontinuance model might use plausibility to resolve replacement and disenchantment discontinuance, it is certainly not applicable to indifferent discontinuers. In addition, trial is only applicable to replacement discontinuers. Thus, it is fair to say that we do not know yet how discontinuers reach their discontinuance decision or change their actual behaviors. Whether the suggested process model of discontinuance is justifiable or not, how we can provide more adequate accounts for discontinuance decision making is further explored in this dissertation.

Relevance of Extant Theories

This study explores discontinuance behavior in comparison to continuance among organizational members. It is true that even though discontinuance or post-adoption behaviors have received scant attention, there has been a substantial body of research that aims to explain or predict innovation adoption, acceptance, and continued use. In this section, I critically explore theoretical frameworks or ideas in regard to how these frameworks or studies may be of assistance in extracting factors that can explain why organizational members choose not to use already adopted technologies. The review also intends to give a glimpse into the mechanism explaining how post-adoption behaviors and discontinuance might differ from adoption and acceptance.

INNOVATION DIFFUSION THEORY

An Overview of Innovation Diffusion Theory

The Innovation Diffusion Theory (IDT) provides a systematic framework to explain when and how newly-introduced technologies are communicated, evaluated, adopted or rejected, and re-evaluated by users (Rogers, 1995; Vishwanath, 2003; William et al., 1994). The diffusion process is conceived fundamentally as a process of communication, which is facilitated by mass media and interpersonal relations within the social system (Rogers & Singhal, 1996). In addition, diffusion usually occurs in a time-ordered sequence of knowledge, persuasion, decision, implementation, and confirmation (Boone & Kurtz, 1995; Rogers, 1995). Types of information sought and contingent results of each stage are summarized in Table 1 and 2.

According to Rogers (1986), the decision to adopt or reject an innovation is subject to a wide variety of factors. These factors can be grouped into four major categories: (a) adopter-related personality traits; (b) socioeconomic influences; (c) interpersonal channels and mass media use; and (d) perceived attributes of an innovation. However, regarding research on diffusion processes, the issue of perceived attributes of an innovation has received much greater

attention than the others (Leung & Wei, 1999). From the extant studies grounded in IDT, the perceived attributes of an innovation have been influential in leading to an adoption decision, and explain between 49 to 87 percent of the variance in the rate of adoption (Rogers, 1995). These perceived attributes constitute the individual's subjective perceptions or beliefs about the innovation. Rogers details the following five characteristics of innovation that significantly influence the individual's attitudes: relative advantage, compatibility, complexity, observability, and trialability.

Relative advantage is the "degree to which an innovation is perceived as better than the idea it supersedes" (Rogers, 1995, p. 15). The greater the perceived relative advantage of an innovation is, the more rapid its rate of adoption. Compatibility is defined as "the degree to which an innovation is perceived as being consistent with existing values, past experiences, and needs of potential adopters" (Rogers, p. 15). Ideas compatible with existing values and norms are adopted more rapidly than innovations that are not. Rogers defines complexity as "the degree to which an innovation is difficult to understand and use" (p. 16). New innovations that are simpler to understand are adopted more rapidly than ones that require time and efforts to obtain required skills and knowledge to use them. Observability is "the degree to which the results of the innovation are visible to others" (Rogers, p. 16). This visibility increases the exposure of the innovation, stimulates discussion by other members in the social system, and thereby results in a rapid diffusion of the innovation. Lastly, trialability is "the degree to which an innovation can be experimented on a limited basis" (Rogers, p. 16). Trialability reduces the risk of adoption, thereby spurring its diffusion. According to Rogers, innovations that are perceived by individuals to have greater relative advantage, compatibility, observability, trialability, and less complexity, will be adopted more rapidly than other innovations.

Table 1: Contingent Results along with the Innovation-Decision Process (adapted from Rogers, 1983)

Stages	Results
Knowledge	● Acknowledgment of the innovation's existence ● Limited understanding of its function
Persuasion	● Attitudes toward the innovation
Decision	● Adoption (mental process) ● Rejection
Implementation	● Routinization or institutionalization ● Re-invention
Confirmation	● Continual adoption ● Later adoption ● Discontinuance ● Continual rejection

Table 2: Types of Information Sought during the Innovation-Decision Process (Adapted from Rogers, 1983)

Stages	Types of Information Sought	Influential Communication Channels
Knowledge	● Awareness knowledge ● How-to knowledge ● Principles knowledge	● Mass media channels ● Cosmopolite
Persuasion	● How-to knowledge ● Principles knowledge ● Innovation-evaluation information	● Interpersonal channels ● Localite
Decision	● Innovation-evaluation information ● Try-out information on a probationary basis	● Interpersonal channels
Implementation	● How-to knowledge ● Principles knowledge	● Interpersonal channels
Confirmation	● Reinforcement	

However, prior diffusion research on the impact of these five variables on diffusion process has often been inconsistent. For instance, in a meta-analysis of the relationship between the variables and adoption, Tornatzky and Klein (1982) found that compatibility and relative advantage were usually, but not always consistently, related to the rate of adoption in a positive direction. Lin (2003) and Karahanna et al. (1999) reported that relative advantage, compatibility and complexity have been found to be more influential than others in explaining the adoption and use of ICTs. Yet, Leung and Wei (1999) compared the effect of the above variables and the adoption of cellular phones in Hong Kong, and reported that only compatibility and observability had a significant impact on the likelihood of adoption. In addition, while the above five factors might be theoretically distinctive, certain factors may be more influential than others when predicting initial adoption. For instance, Karahanna et al. found that initial adoption decision was affected by perceptions of relative advantage, ease of use, result demonstrability, visibility, and triability while the intention to continued use was only influenced by relative advantage and perceptions of image enhancements. Similarly, Zhu and He (2002) in their study of the Internet adoption and use also reported that complexity tended to lose its explanatory power for explaining continued use as users become accustomed to the innovation.

It is true that there have been attempts to unify IDT with Technology Acceptance Model (TAM). For instance, some researchers (Agarwal & Prasad, 1997; Barnes & Huff, 2003; Karahanna et al., 1999) span several foci, mixing TAM variables with diffusion theory concepts. Even so, diffusion theory applied in technological contexts is predominantly a study of choice related to knowledge acquired from social networks and influence sources in the promotion of new technologies; it is a theory of interpersonal influence and persuasion related to technological innovations and related usage choices. In diffusion theory, there are many influences on potential adopters' perceptions of an innovation, but the strongest may come from interactions and observations of those close to the potential adopter, and from those in whose opinions the adopter places great value (Rogers, 1995).

Research on Discontinuance and Suggested Directions

Although, as I briefly indicated, this research tradition has rarely focused on post-adoption behavior; there are a few studies that are directly relevant to the study of discontinuance. For instance, Parthasarathy & Bhattacherjee (1998) argue that it is important to not only investigate initial adoption behavior but also whether or not and why consumers choose to discontinue online service. They explore the reasons for active discontinuance of an online service (e. g., AOL) using Rogers' conception of discontinuance (replacement vs. disenchantment) as a theoretical framework. They found that perceived usefulness and compatibility were significant predictors of discontinuance. Continuers perceived the service to be more useful and compatible than discontinuers. However, in contrast to their expectations, continuers did not perceive the service to be significantly easier to use than discontinuers, and continuers did not utilize the service more than discontinuers. In addition, relying on adopter categories and the relationship between adopter classification and post-adoption behavior, Parthasarathy and Bhattacherjee also suggested that discontinuers might share certain characteristics with later adopters. They found that discontinuers more relied on interpersonal influence and less relied on external influence during their initial adoption decision than continuers. Interestingly, however, they found no significant differences between replacement discontinuers and disenchantment discontinuers with respect to the reasons for discontinuance. This is illustrative of how difficult it may be to differentiate between replacement and disenchantment discontinuance in practice. In a similar vein, Zhu and He (2002) found that the adoption and use of the Internet in China appeared to involve two distinct processes that were influenced by different forces. While Internet adoption was affected by perceived popularity and perceived characteristics of the Internet (innovation characteristics in Rogers' diffusion theory), Internet use was solely affected by perceived need for the Internet (gratifications sought).

Another relevant study for our purposes is a two-year longitudinal study by Cooper (1991) with 210 employees at UC Berkeley. Implementing a survival function analysis, Cooper

found that half of all participants stopped using an implemented system, IBM PROFS Professional Office System, over a two-year period. It was found that the probability of discontinuance was not related to any individual characteristic—gender, age, job classification (e.g., executive, administrative analyst, general secretary, faculty, etc.) or tenure in the university. However, he did find that the probability of discontinuance had a direct relationship with an individual's departmental affiliation. He explained this finding as a function of different communication networks across departments and the existence of critical mass. Thus, that study suggests information communicated via interpersonal channels and the existence of critical mass may affect not only adoption but also discontinuance.

Recently, Pollard (2003) explored how perception, experience, attitude, communication behavior and environment had an impact on the continued and discontinued use of a group support system (GSS). She found that the lack of task-technology fit and the perception of GSS as a group tool affected discontinued use. She differentiated between four different types of users, i.e., continued users, stalled users, rejecters (discontinuers), and observers. Somewhat surprisingly, she found that stalled users and initial rejecters intended to use GSS if the circumstances were right. This finding calls into question Rogers' understanding of discontinuance. Particularly, Pollard's research suggests that discontinuance can involve a relapse depending on users' perceptions of contextual adequacy.

Even if there have been few studies on discontinuance, overall, these studies suggest that the effect of certain innovation attributes such as relative advantage (or compatibility) and compatibility (task-technology fit) may persist after initial adoption (Parathasarthy & Bhattacherjee, 1998). Interpersonal influence via communication network may also have persistent effects on continuance as well as discontinuance. The characteristics of communication networks, source and trustworthiness of unfavorable information, and content vs. carriers of unfavorable information, may result in discontinuance (Cooper, 1991; Parathasarthy, 1995; Parathasarthy & Bhattacherjee). The effect of perceived ease of use, trialability and

observability may wear off after an initial adoption decision and thereby have minimal effect on post-adoption behaviors. However, it is still premature to accept the suggested relationship between those predictors and discontinuance due to a very small number of studies on discontinuance. Therefore, further studies for the identification of predictors of discontinuance and the discrimination between discontinuance and continuance as well as initial adoption based on those predictors are needed.

In addition, the contextual effects of mandatory vs. voluntary use on discontinuance also need to be taken into consideration. Most previous studies have been done in the context of voluntary use (e.g., Parathasarthy & Bhattacherjee, 1998; Zhu & He, 2002), but mandatory use has become increasingly prevalent in modern organizations (Rawstorne et al., 2000). For instance, discontinuers of subscription-based online services such as AOL might be more affected by pricing competitive effect of other service providers, or the prevalence of the Internet (Parathasarthy & Bhattacherjee) than discontinuers of intra-organizational ICT applications such as GSS.

In addition, the discrimination between continuers and discontinuers in terms of individual characteristics, use-related outcomes, or other factors needs to be examined. Pararthasarthy and Bhattacherjee (1998) successfully discriminated between continuers and discontinuers based on their source of information, external vs. interpersonal influences, for initial adoption decision of an online service. Yet, they did not include use-related outcomes such as satisfaction or individual traits for their discrimination test. Moreover, as I discussed in the previous section, the studies suggest that disenchantment and replacement may not be adequate or sufficient for explaining discontinuance (Parthasarathy & Bhattacherjee; Pollard, 2003) and that we need more rigorous studies on discontinuance to identify various types of discontinuers and their reasons to discontinue.

COGNITIVE-MOTIVATIONAL THEORIES

Cognitive-motivational theories have provided researchers with another important theoretical framework to guide studies that have sought to predict and explain user acceptance and continuance of ICTs. The structure of user beliefs, its relationship with attitudes, and its effect on behavior have been the foci of ICT research, where understanding user acceptance of technology is a key determinant in the success or failure of an ICT implementation (Davis et al., 1989). In the field of ICTs, researchers have suggested motivational or intention-based models rooted in social psychology as a potential theoretical foundation for research on the determinants of user behavior; acceptance and continued use are mainly determined by users' cognitive/perceptual evaluation of technologies. As key cognitive-motivational theories of ICT use, the Technology Acceptance Model (e.g., Davis et al., 1989; Ventatesh & Davis, 1996; 2000) and TPB (e.g., Mathieson, 1991; Taylor & Todd, 1995; Venkatesh & Brown, 2001) have shown that user adoption and usage of an ICT is mainly determined by user beliefs and attitudes toward the ICT. Based on a similar motivational paradigm but with somewhat different explanatory variables such as continuance intention or continued use, expectation-disconfirmation models and the uses and gratifications perspective suggest that continuance intentions result from congruence between expectation/gratification sought and use experience.

Theory of Reasoned Action, Theory of Planned Behavior (TPB), and Technology Acceptance Model (TAM)

One of the influential models grounded in social psychology is TRA (Ajzen & Fishbein, 1980), which has proven to be successful in predicting and explaining the relationship between intention and behavior across a variety of domains. TRA is based on a conceptual framework where beliefs, attitudes, intention, and behaviors are differentiated from and interrelated to each other. Beliefs connote a degree of instrumentality tied to an action, whereas attitudes are affective. Beliefs relate to an individual's assessment that performing some behavior will result in a specific consequence, whereas attitudes relate to an individual's positive or negative feelings

about performing the behavior. According to TRA (Figure 2), a person's actual behavior is determined by his/her intention to perform the behavior, and the behavioral intention is jointly determined by the person's attitude and subjective norm concerning the behavior in question.

TPB modifies TRA by including a variable, perceived behavioral control (Ajzen, 1991). This measures an individual's perception of control over performing a given behavior. Perceived behavioral control has been theorized to directly predict and explain both intention and behavior. Even though there have been few studies (for exceptions, see Mathieson, 1991; Taylor & Todd, 1995) that have utilized TPB independently in ICT research, it has been employed in accordance with TRA or TAM and found to have direct and indirect effect on usage (Venkatesh, 1999; Venkatesh, 2000; Venkatesh & Davis, 2000).

In the discipline of information systems research, TAM provides one of the most parsimonious, yet robust, models in explaining the characteristics of ICTs and their effect on users' adoption and use (Davis, 1989; Robey, 1996). TAM uses TRA as a theoretical basis for specifying the causal relations between two key sets of constructs: perceived usefulness and perceived ease of use, and user's attitude, behavioral intentions and actual usage behavior. In the model, perceived usefulness is defined as the "prospective user's subjective probability that using a specific application system would increase his or her job performance with an organizational context" (Davis et al., 1989, p. 985). Perceived ease of use refers to "the degree to which the prospective user expects the target system to be free of effort" (Davis et al., p. 985). According to Davis et al., "complexity," as identified by Rogers (1995) in IDT, parallels perceived ease of use. Both perceived usefulness and perceived ease of use predict attitudes toward using a target system. As shown in Figure 3, TAM postulates that attitudes toward an ICT and the perceived usefulness jointly influence the individual's behavioral intention to use the system. The relationship between attitude and behavioral intention in TAM implies that individuals form intentions to perform behaviors toward which they have a positive effect (Davis et al., 1989). Actual use is predicted by behavioral intention.

Figure 2: A Simplified Model of the Theory of Reasoned Action as Applied to ICT Use

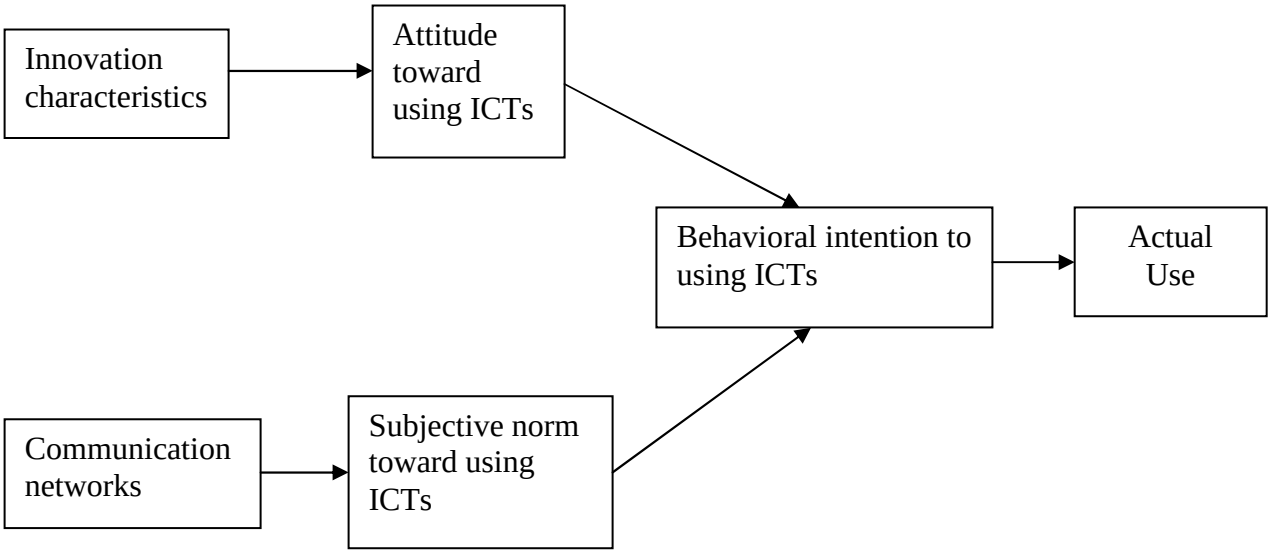
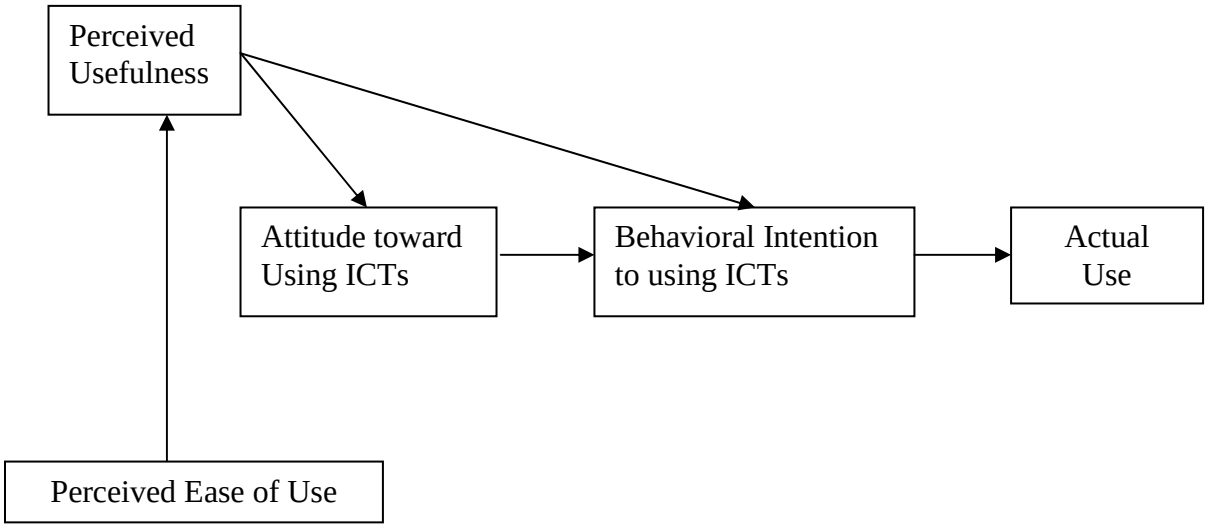


Figure 3: A Simplified Model of Technology Acceptance Model

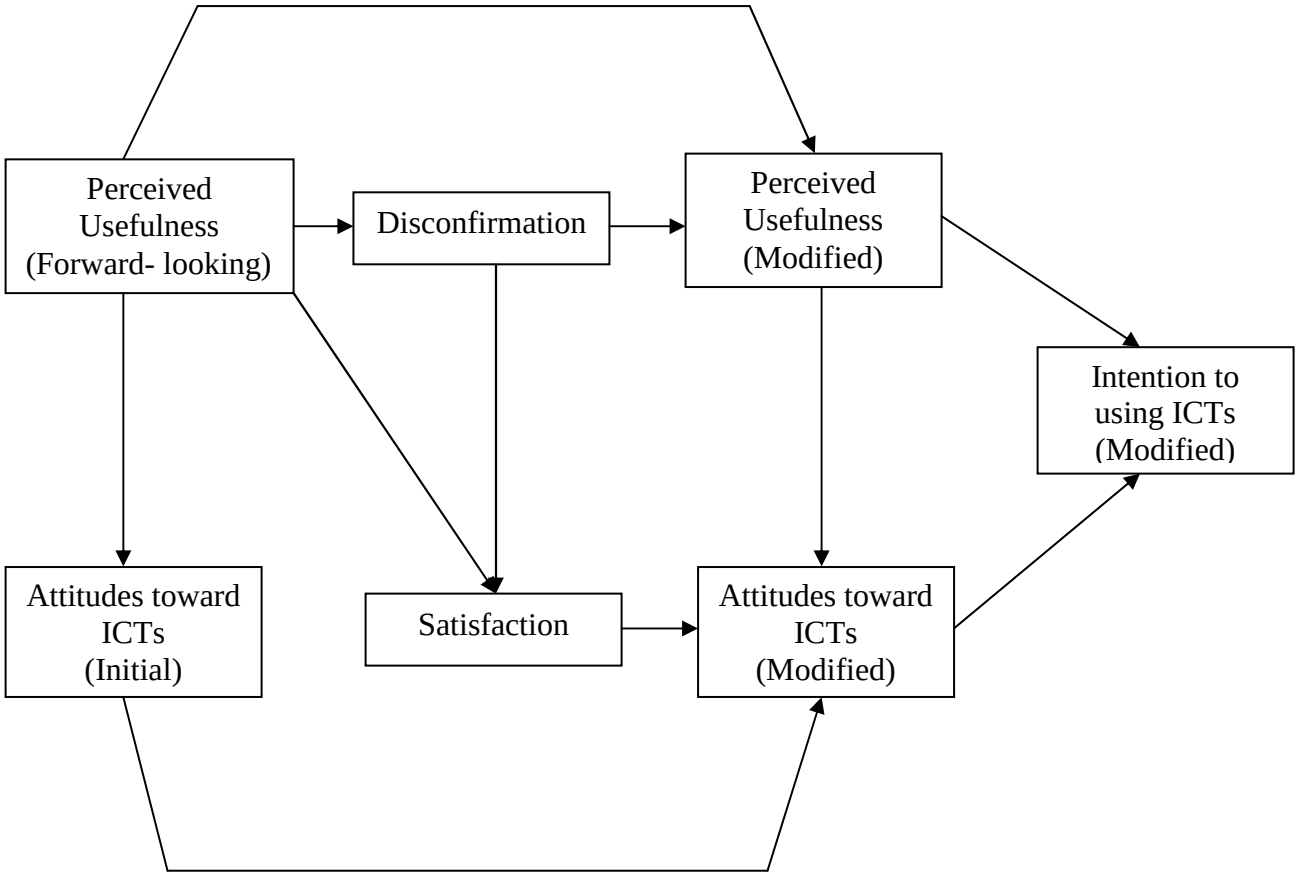


EXPECTATION-DISCONFIRMATION THEORY

EDT (Bhattacherjee & Premkumar, 2004), an extension of the Cognitive Dissonance Theory, also focuses on user belief (expectation of perceived usefulness) and attitude, mainly based on the rationale proposed by TAM. However, the strength of the model is its inclusion of a temporal dimension. Bhattacherjee and Premkumar remark that ICT research, for the most part, has been silent on how users form initial attitudes about technologies and how these attitudes are modified over time. Their proposed theory is directed at explicating temporal changes in users' beliefs and attitudes toward ICT usage. Along with its recognition of the possibility of changes in users' beliefs and attitudes, EDT posits that "any change in beliefs or attitudes will likely have a corresponding impact on, and may even reverse users' continuance intention and behavior" (Bhattacherjee & Premkumar, p. 230).

With the explicit recognition of temporality of user belief and attitude, EDT postulates a two-stage model of belief and attitude change, linking perceived usefulness and attitude in the pre-usage stage with those in the usage stage and positing disconfirmation and satisfaction as emergent constructs influencing post-usage usefulness and attitudes (see Figure 4). Thus, the theory suggests that the effect of initial beliefs and attitudes on modified beliefs and attitudes, which jointly determine continuance intention, are mediated by disconfirmation and satisfaction. Bhattacherjee and Premkumar report that the overall model is supported across two distinct ICT usage contexts (i.e., rapid application development tool and computer-based training software) with student samples; but, there is no other empirical study based on EDT since it has been proposed.

Figure 4: A Simplified Model of the Expectation-Disconfirmation Theory.



USES AND GRATIFICATIONS PERSPECTIVE

Overview

Uses and Gratifications (U&G) is a media use paradigm from mass communication research that guides the assessment of users' motivations for media usage and access. However, recently U&G has been employed by ICT researchers in order to explain users' motivation for adoption or post-adoption behavior even though the research focuses on relatively narrow ranges, mainly computer-mediated communication technology including Internet (Atkin, Jeffres, Neuendorf, Lange & Skalski, 2005; Lin, 2003; Zhu & He, 2002) and mobile technology (Leung & Wei, 2000; Kaseniemi & Rautiainen, 2002; Skog, 2002; Taylor & Harper, 2001). U&G postulates that once the technology adoption decision is implemented, whether used in its original, adapted, or invented form, the cumulative use experience will be subject to user evaluation (Lin, 2003). Thus, even if attitudes toward the adopted technology are dependent on the users' expectations or gratifications sought, it can be further mediated by the users' gratification with their technology use experience.

Compared to U&G, IDT has a relative advantage in dealing with continued use and discontinuance in the sense that IDT is concerned with how people come to learn of and choose to initially use an innovation; however, IDT cannot explain the motivations related to continued and increased use. Unlike IDT, U&G presupposes adoption of an innovation much as technology acceptance presupposes organizational adoption of an innovation in the study of continued acceptance and use. Thus, U&G is theoretically similar to TAM insofar as it explains continued use of something already chosen. Yet U&G's identification of motivations goes beyond the instrumentality of usefulness, which is TAM's main construct. For instance, fashion/status (Leung & Wei, 2000; Ling, 2001) and enjoyment/playfulness appear to be consistently identified in U&G research. Those motivations have been categorized into intrinsic motivations or extrinsic motivations by TAM researchers and become subjects of integration into the TAM framework (Davis et al., 1992; Lin, 2001; Pederson & Nysveen, 2003; Venkatesh & Speier, 1999).

Research on Discontinuance (or Continuance) and Suggested Directions

Recently, there have been efforts to explain and predict ICT continuance by extending TAM in a longitudinal setting and employing the same set of acceptance variables to explain discontinuance (e.g., Karahanna et al., 1999; Venkatesh et al., 2000). One of the empirical studies in this tradition that is relevant to discontinuance is provided by Bhattacherjee (2001). Although the dependent variable of the study is the intention to continue using an e-commerce service, his scale for continuance intention, which consists of three items, includes one discontinuance intention question: "if I could, I would like to discontinue use of my online brokerage service (OLB)." Thus, he conceptualizes discontinuance as the opposite of continuance and suggests that dissatisfaction and lack of perceived usefulness might be related to the intention to discontinue the service. Based on the empirical data collected via a survey of online brokerage users, he found that satisfaction and perceived usefulness were significantly and positively related to intention to continue OLB; thus it infers the opposite relationship of those antecedents to discontinuance. In a similar vein, based on Bhattacherjee's continuance model, Sorebo and Eikebrokk (2008) tested the relationship between perceived usefulness, ease of use, and satisfaction to ICT continuance in a mandatory usage context and verified the validity of the proposed relationships and reversed relationships to ICT discontinuance.

Based on EDT, Doong and Lai (2008) investigated the factors influencing the usage continuance intention of e-negotiation systems (ENSs). Using two web-based ENSs they found that satisfaction was more significant than usefulness in determining the intention for usage continuance of ENSs. They also found that positive disconfirmation, defined as the actual experience or perceived performance being better than the initial expectation, played a crucial role in shaping the intentions of users to continue using an ENS. The research results verify that it is of importance to consider user experience factors when attempting to elucidate the decision-making that underlies discontinuous/continuous use of ICTs.

The contribution of U&G to the study of continuance/discontinuance is its identification of intrinsic gratifications (e.g., enjoyment, playfulness, etc.) and social gratifications (e.g., status, sociability, etc.) that go far beyond the instrumentality of usefulness, flexibility and availability suggested by rational ICT theories such as TAM, TRA, and IDT. For instance, Leung and Wei (2000) found that sociability, relaxation, and enjoyment were positively related to the level of cellular phone use. In a similar vein, Pedersen and Nysveen (2005) studied the continuance intention of 459 mobile parking services in Norway and found that expressiveness[1] was as important in predicting continuance intention as was usefulness.

Overall, TAM and EDT suggest that evaluative beliefs such as perceived usefulness and ease of use, which play a role in encouraging acceptance and use, may result in discontinuance. EDT adds one affective construct, dissatisfaction, and suggests that users' affective evaluations of their usage experience directly relate to intention of discontinuance as well as actual discontinuance. U&G also helps researchers account for intrinsic and social gratifications when exploring continuance/discontinuance. However, at least three areas for further development can be identified from the recent studies oriented from cognitive-motivational tradition.

First of all, the assumption of the consistent effect of TAM variables on acceptance as well as continuance/discontinuance has been questioned. Even though EDT points out the possibility of belief and attitude change over time, it still preserves the same variables to predict both acceptance and continuance (Bhattacherjee & Premkumar, 2004). In fact, Venkatesh and Davis (2000) found that the explanatory power of TAM decreases over time. This finding points out the possible variability of factors driving ICT acceptance and ICT continuance/discontinuance. The weakened effects of usefulness and, particularly, ease of use, suggests that the variables, which have been proven to be a consistent predictor of initial adoption, may not be strong when they are employed for explaining post-adoption behaviors.

[1] Expressiveness was defined in the study as "individual general ability to express their emotion and identity." Pedersen and Nysveen (2005) posit that this construct covers gratification of prestige, fashion, and pride in addition to the expression of social identity.

Second, the assumption that users' positive perceptions can be both enablers of continuance and inhibitors of discontinuance appears to be problematic. For instance, Zhang and von Dran (2000) argue that Internet users take for granted that a system will accept their data entry and thus do not perceive this feature as critical. However, when a system does not perform this basic function, the presence of this issue becomes salient. This example suggests that factors that induce discontinuance may not be prominent when explaining continuance. Hypothetically, it is possible that a negative experience might induce a user to discontinue regardless of the objective attributes that a system may have. For instance, effort redundancy[2], information overload, or irrelevant requests for information might trigger users to re-evaluate their use of a system, and become salient when they decide to stop using it.

Third, as pointed out by several researchers (e.g., Davis, 1989; Davis, Bagozzi & Warshaw, 1989; Hufnagel & Conca, 1994), cognitive-motivational theories, mainly TAM, are incomplete in one important respect: they do not account for social influences in the model. That is, the relationship between social influences or social norms and behavioral intention has not been observed to be strong in cognitive-motivational theories. In each of the theories noted above, the adoption of or the use of an innovation is viewed as a result of a set of beliefs about technology and a set of affective responses to the behavior. The beliefs are represented by perceived usefulness and perceived ease of use in TAM and TRA, the congruence between gratifications sought and gratification fulfilled in U&G, and dissonance between expectations and outcomes in EDT. Thus, these theories fail to incorporate important variables such as organizational interventions, network externality, or social influences that might influence behavior, independent of perceived outcomes.

[2] Effort redundancy is understood in this context as "a system requires unnecessary repetition of already performed step (Cenfetelli, 2004, p. 159)."

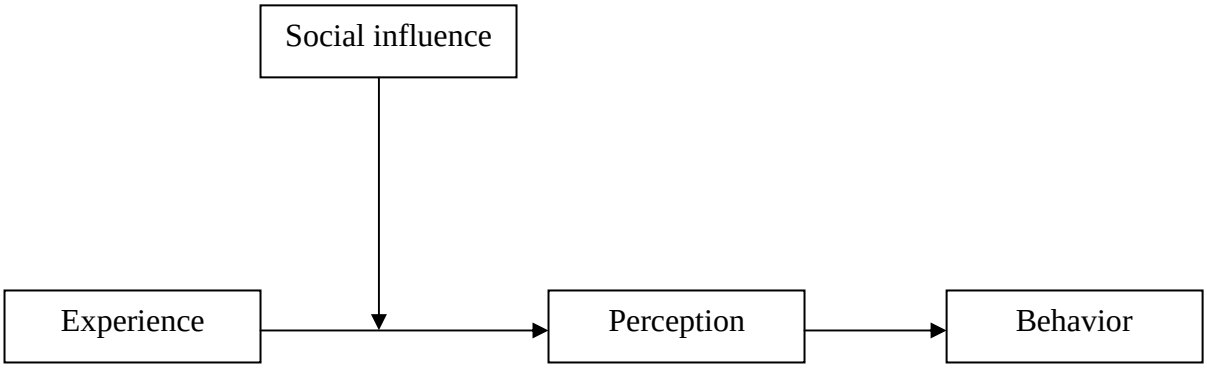
SOCIAL INFLUENCE THEORY

An Overview of the Social Influence Theory

TRA, which is TAM's referent theory, includes social influence via a construct called subjective norms. However, TAM excluded this construct due to theoretical and measurement problems (Davis et al., 1989). Although subjective norms can be expected to be important in determining technology acceptance and usage based on TRA and TPB, empirical evidence supporting the role of the construct has been somewhat mixed. Some studies have omitted the construct completely (e.g., Adams, Nelson & Todd, 1992). Others have found the construct to be non-significant (e.g., Davis et al., 1989; Mathieson, 1991). Still others have found the construct to be significant (e.g., Talyor & Todd, 1995). Nonetheless, given that other theoretical perspectives emphasize the importance of social aspects of technology use, including social influence (Fulk et al., 1987, 1990), critical mass (Markus, 1990, 1996), structuration (Orlikowski, 1992), adaptive structuration (Poole & DeSanctis, 1990, 1992), hermeneutic interpretation (Lee, 1994), and critical social theory (Ngwenyama & Lee, 1997), social influence should be integrated into the frameworks that aim to explain technology acceptance as well as usage.

Fulk et al. (1990) proposed the Social Influence Theory (SIT) as a model for technology use that might help to resolve apparent contradictions associated with contingency approaches (see Figure 5). SIT suggests that media perceptions and use are: (a) correlated with each other; (b) affected by social influence; (c) subjectively, intersubjectively, and retrospectively rationalized; and (d) may not be efficiency-motivated (Fulk et al.). SIT also suggests that, in addition to media and task features, media use is affected by social influence in the form of direct statements by coworkers, vicarious learning, group behavioral norms, and social definitions of rationality.

Figure 5: Simplified Social Influence Theory



Therefore, social influence theorists disagree with IDT or other cognitive-motivational theories those accept relatively objective characteristics of an innovation and contingent relationship between those innovation characteristics and rational evaluations of the performance of the innovation. Fulk et al. (1987) argue that innovation characteristics as well as performance evaluations are largely subjective and determined by the social context of the users. They also reject the idea of rational choice, since choices are made within a historical and social context and rationalized after they have been made.

In the empirical studies of acceptance and use of an innovation, many types of social influence constructs, including peer influence, coworker's and supervisors' attitudes, coworkers' use, management support, network externality, network positions, social pressure, etc. have been identified and utilized (Burkhardt, 1994; Compeau & Higgins, 1995; Fulk, 1993; Igbaria, 1990; Igbaria et al., 1997; Kraut et al., 1999; Thompson & Higgins, 1994; Trevino, Webster & Stein, 2000). IDT and cognitive-motivational theorists have also included certain social influence constructs; subjective norms and images are the most frequently used constructs in their theories or models (Fishbein & Ajzen, 1975; Moore & Benbasat, 1991 Rogers, 1995; Taylor & Todd, 1995; Venkatesh & Davis, 2000; Venkatesh et al., 2003). Similarly, subjective perceptions of usage contexts, such as voluntariness of use, have been also considered important social factors that influence acceptance and use of ICTs, although they have not been frequently used in empirical tests (Agarwal & Prasad, 1997; Karahanna et al., 1999; Moore & Benbasat, 1991; Venkatesh et al., 2003).

Research on Discontinuance (or Continuance) and Suggested Directions

In support of SIT, a study by Fulk (1993) found that a work group's use of an electronic mail system was the most significant predictor of an individual's continuous use of the system, and that this 'compliance effect' increased with an individual's level of commitment to the work group. Burkhardt (1994) also reported that individuals' attitudes and their use of a data processing computer network were strongly affected by the attitudes and use of others in their

communication networks. Kraut, Rice, Cool, and Fish (1998) investigated the adoption and use of two competing video telephone systems in a company. By using seemingly identical systems, this quasi-experimental study controlled for other possible explanations for the dominance of one system over the other. They found a positive and very strong effect for network externality to adoption and continuance, and a reversed effect on discontinuance. Trevino et al. (2000) found that perceptions of coworkers' and supervisors' attitudes were positively associated with reported usage of media. They also found that perceptions of coworkers' and supervisors' attitudes were related to positive attitudes toward media. Campbell and Russo (2003) reported that different personal communication networks had different perceptions and usage patterns of mobile telephones.

Myers (1994) provides an interesting case study using a qualitative method that investigates the failed implementation of a centralized payroll system for the New Zealand Education Department. He found that participants in different departments had conflicting interpretations of the system and argued that the various interests of the parties involved were embedded in the unique historical context of New Zealand. The various interests became the basis of competing interpretations of the system and resulted in implementation failure. This study helps us to understand the nature of disagreements, contradictory interpretations of the same phenomenon, and consistency of prejudice across different groups within a given organization.

Overall, SIT of media choice and use emphasizes the important role of individuals' communication networks in shaping their perceptions and uses of media. The empirical studies summarized above collectively suggest that individual adopters' perceptions of the role and functions of ICT innovations in a social or organizational setting can be shaped by a set of social factors. Social influence can derive from such structural sources as opinion leaders, network position, group membership in an organizational setting, and the availability of a critical mass of users. In addition, social influence also stems from other sources that reflect how the social

meanings attached to ICTs are perceived. Although there have been few studies that focus directly on discontinuance social influence, research implies that various social factors may affect discontinuance decision making of members of a social group or an organization as it does adoption and continuance.

DIFFERENT TYPES OF TECHNOLOGY AND ITS ACCEPTANCE/USE

The Problem of Undifferentiation among Different Types of Technologies

Despite the apparent maturity of the research stream, a comprehensive comparison of the key constructs has not been conducted in a single study except Venkatesh et al.'s (2003). In addition, the technologies that have been examined in many of the theory development and comparison studies have been relatively simple, individual-oriented information technologies, as opposed to more complex and sophisticated organizational technology (Venkatesh et al.) that are the concern of this dissertation. Moreover, many empirical studies treat technologies in an undifferentiated faction and do not consider the effects of specific features of the technologies on individual workers (Jasperson et al., 2003). In fact, we have witnessed confounding effects of the same variables across different technologies, especially with regard to the effect of social influence factors (Davis, 1989; Davis et al., 1989; Jasperson et al.; Venkatesh). Combining the acknowledgement of the undifferentiated treatment of different types of technology and the confounding results in ICT research, I tentatively hypothesize that the confounding results are partially due to indiscrimination of technological types, and that the adoption or use of ICTs might be led by factors that have minimal impact on the adoption and use of simple stand-alone technologies. In order to empirically verify the above assertions, which are of importance to understand the discontinuance as well as continuance of ICT in a different manner from that of stand-alone technology, I conducted a meta-analysis of work in this area. The main purpose of this meta-analysis is to get better understanding of factors identified in the previous section when applying them to sophisticated organizational technologies.

A Meta-Analysis

Studies were collected from the electronic database and indices, *Business Source Complete* and *Communication & Mass Media Complete (CMMC)*, using combinations of the terms "technology," "acceptance," "diffusion," and "adoption" in the studies' titles or keywords. Restricting the search to publications in or after 1990 resulted in over 500 citations. To be included in the meta-analysis, a study had to measure relevant variables quantitatively: a study must measure at least one of five independent variables that have been most employed in ICT acceptance research and diffusion research (perceived usefulness, perceived ease of use, subjective norm, perceived behavioral control, and/or self-efficacy), and one of two dependent variables (intention and/or behavior). In addition, a study must provide enough information about the relationship between independent and dependent variables so as to compute effect sizes. A number of studies failed to meet this criterion. Among them, most studies present only standardized coefficients (β) for the results (e.g., Chan & Lu, 2004; Chau & Hu, 2002; van der Heijden, 2004; Venkatesh, 1999; Yu, Ha, Choi, & Rho, 2005).

Mixed technology is defined as ICT applications that have different functionalities, including communication, data coding, information storage, etc. For instance, Internet, Intranet, and online learning system were identified as mixed technology. E-mail and instant messaging were identified as communication technology. Spreadsheets, accounting software, and Microsoft Word are classified as stand-alone technology. Similar concepts from different perspectives or theories, thus labeled differently, were coded as the same variables. For example, social influence was treated as social norm; relative advantage was coded as perceived usefulness; and complexity was regarded as reversed perceived ease of use. As discussed earlier, the particular technology on which each study focused was classified as stand-alone, communication, or mixed technology. Based on these categories, additional analyses were conducted to see if the characteristics of technology moderate the relationship between independent and dependent variables. Finally, 64 studies were included in the data set. As an estimation of the association

between variables, Pearson's correlation coefficients (r) were used. When shared variances or covariance with standard deviations and sample sizes were reported, r was calculated.

Overall, the relative lack of attention to adoption and use of communication technology or mixed technology is unfortunate. The tentative conclusions from the meta-analysis are:

A. The weak impact of subjective norms on actual use as well as behavior is consistent with the extant research, although the number of studies that measure subjective norm and intention or behavior is relatively small. The overall correlation for intention is .37, and statistically significant. However, as expected, the effect of subjective norms on intention is confounded across different types of technology. The mean correlation for the stand-alone technology is .28, but not statistically significant, whereas communication technology is .39 and mixed technology is .53.

B. The strong effect of usefulness on intention suggested by ICT research is supported. The mean correlation for stand-alone technology was .58. The mean correlation for communication technology is .29, which is rather smaller than others, yet statistically significant. The studies of mixed technology show the largest mean correlation between perceived usefulness and intention ($\bar{r}$ = .61). However, its effect on actual behavior is not verified. The effect of perceived usefulness on use behavior is smaller than on intention. The overall correlation of perceived usefulness and behavior is .33, but it is statistically insignificant.

C. The strong effect of perceived behavioral control on intention to use is consistent with TPB, even though only nine studies include the correlations between perceived behavioral control and intention. The overall correlation is .39, which is moderately strong and statistically significant.

D. The predictive powers of antecedents on intention and behavior fluctuate. The correlation between intention to use technology and use behavior is .33 as a whole and is statistically significant. The association between intention and use in stand-alone

technology is also significant ($\bar{r}$ =.39). However, intention to use communication and mixed technology does not have a significant relation to actual usage.

E. There was virtually no study that made distinctions between implementation and use or rejection and discontinuance.

The meta-analysis supports the initial argument that different types of technologies have different factors to explain adoption and use. Along with inconsistent predictive power of various factors loaded on different types of technologies, the results of the meta-analysis provide important guidance for this research. First, together with the strong effect of subjective norms, the result shows that communication technology may be more vulnerable to social influence. It also suggests that the links between intention to use and actual usage in communication technology are much more strongly mediated by social influence than with stand-alone technology. Therefore, it is safe to include social influence factors, which have not been frequently used by cognitive-motivational theories due to their inconsistent effect on acceptance, to explain adoption/use of an ICT that incorporates communication features. However, along with the effect of social influence factors, we do not know how the factors differently affect discontinuance in comparison to adoption and use due to the lack of studies that focus on discontinuance. For instance, Cooper and Zmud (1990) hypothesize a stronger effect for social-political consideration when individuals make a continued acceptance decision than when making an initial acceptance decision, which tends to rely more on rational assessment. Thus, differential effects of social influence factors on continuance and discontinuance need to be explored.

Second, the inclusion of both intention and actual behavior in a single study appears to be problematic at least for communication technology and mixed technology. The predictive power of intention to actual behavior was found to be insignificant in the studies of communication technology as well as mixed technology in contrast to stand-along technology. In addition, respondents try to avoid psychological dissonance and to maintain consistency when answering

questions, which may result in a biased correlation between intention and actual behavior. Therefore, intention to discontinue will not be included in the current study.

Third, most studies surveyed here used actual behavior as a dependent variable and intention as a mediating variable. Moreover, a few empirical studies have made a distinction between pre-adoption and post-adoption (e.g., Bhattacherjee & Premkumar, 2004; Karahanna et al., 1999), yet their dependent variable was continued use. Because of this exclusive focus on use/continued use we do not know about what kind of other individual and organizational outcomes, such as increased productivity, communication effectiveness and satisfaction, etc., can be obtained from continued use of ICT innovations. Thus, the current study will include a second-level dependent variable, overall communication satisfaction, which might vary with the level of ICT use.

SUMMARY OF THE CHAPTER

The first section of the chapter identifies four new types of discontinuance, which are reserved, discontinuance, indifferent discontinuance, partial discontinuance, and political discontinuance and posits that disenchantment and replacement discontinuance may not be two distinct types of discontinuance. It is also argued that the treatment of discontinuers as a homogeneous group that has opposing characteristics to earlier adopters is problematic. Furthermore, the section questions whether the discontinuance process model can be applied to all types of discontinuance. The second and the third section of the chapter explore the factors that are identified by extant theories and models (see Table 3 for the brief summary). As shown in the table, some factors, such as usefulness and subjective norms, are utilized by various theories. Some factors, such as gratification/satisfaction/motivation, ease of use/complexity, and compatibility/relative advantage, have similar definitions even when they are differently named across theories.

Based on the review, the current study will explore (a) whether the validity of discontinuance classification suggested in this chapter can be empirically sustainable, (b) if so,

how the types of discontinuance are differently affected by various factors, and (c) whether different types of discontinuers share certain individual traits, such as the lack of innovation and the lack of independent decision making ability, or whether there may be a notable variation across different types of discontinuers.

Table 3: A Summary of Discontinuance Factors across Theories and Models

Theories	Core constructs	Definitions
IDT	Relative advantage	The degree to which an innovation is perceived as being better than its precursor (Moore & Benbasat, 1991, p.195)
	Complexity	The degree to which an innovation is perceived as being difficult to use (Moore & Benbasat, 1991, p.195)
	Compatibility	The degree to which an innovation is perceived as being consistent with the existing values, needs, and past experiences of potential adopters (Moore & Benbasat, 1991, p.195)
	Results demonstrability (or Visibility)	The degree to which the results of the innovation are visible to others (Rogers, p. 16)
	Image	The degree to which use of an innovation is perceived to enhance one's image or status in one's social system (Moore & Benbasat, 1991, p. 195)
	Voluntariness of use	The degree to which use of the innovation is perceived as being voluntary, or of free will (Moore & Benbasat, 1991, p.195)
TAM	Perceived usefulness	The degree to which a person believes that using a particular system would enhance his or her job performance (Davis, 1989, p. 320)
	Perceived ease of use	The degree to which a person believes that using a particular system would be free of effort (Davis, 1989, p. 320)
TRA	Attitude toward behavior	An individual's positive or negative feelings about performing the target behavior (Fishbein & Ajzen, 1975, p. 216)
	Subjective norm	The person's perception that most people who are important to him think he should or should not perform the behavior in question (Fishbein & Ajzen, 1975, p. 302)
TPB	Attitude toward behavior	Adapted from TRA
	Subjective norm	Adapted from TRA
	Perceived behavioral control	Perceptions of internal and external constraints on behavior (Talyor & Todd, 1995, p. 149)

EDT	Perceived usefulness	Adapted from TAM
	Attitude toward behavior	Adapted from TRA
	Satisfaction	An individual's emotional state following IT usage experience (Bhattacherjee & Premkumar, 2004, p.237)
	Disconfirmation	The extent to which subjects' pre-usage expectation of technology usage is contravened during actual usage experience (Bhattacherjee & Premkumar, 2004, p.237)
U&G	Intrinsic gratification	Gratification related to the performance of an activity for no apparent reinforcement other than the process of performing the specific activity (Levy, 1978; Rubin, 1983)
	Extrinsic gratification	Gratification related to the performance of an activity that is perceived to be instrumental in achieving valued outcomes that are distinct from the activity itself (Levy, 1978; Rubin, 1983)
Social Influence Theory	Social norm (or subjective norm)	Adapted from TRA
	Personal communication network	Adapted from ego network
	Network externality	(Travino et al., 2000)
	Internalization	The extent to which an individual accepts the influence because it is congruent with her value system
	Compliance	The extent to which an individual adopts the induced behavior not because of her belief in its content but because of the expectation of gaining reward or avoiding punishment.

CHAPTER 3: RESEARCH QUESTIONS AND HYPOTHESES

A General Research Question

Support for the differences between adoption and usage has been provided by consumer behavior research (e.g., Anderson & Weitz, 1992; Dwyer, Schurr, & Oh, 1987) and EDT (Bhattacherjee & Premkumar, 2004) as well as the Cognitive Dissonance Theory (Cummings & Venkatesh, 1976). According to these theories, user experiences of an innovation may change one's perceptions, attitudes, and needs. The ICT research also provides some evidence for differences in the antecedents of adoption and continued use (Davis, 1989; Davis et al., 1989; Mathieson, 1991; Moore & Benbasat, 1996; Talyor & Todd, 1995). For instance, Davis et al. reported from their longitudinal study that ease of use had been a significant predictor for the adoption of ICT, but was not a significant predictor after 14 weeks of usage.

However, most of the research mentioned above has examined changes in continuers' beliefs. It is true that the research helps us to understand that the factors affecting adoption may not have consistent effects and may even have reversed effects (Tornatzky & Klein, 1982) on the continued use of ICT. However, it is not all that useful in understanding how continuance decisions and discontinuance decisions are affected by different factors. One exception is Parthasarathy and Bhattacherjee's (1998) study of online services. Although their study did not extensively test continuance factors against discontinuance ones, it successfully discriminated discontinuers from continuers with six variables: interpersonal influence, usefulness, compatibility, network externality, external influence, and utilization. Discontinuers relied on interpersonal influence more than continuers. Continuers perceived online services as more useful and compatible than did discontinuers. Ease of use was not perceived differently by continuers and discontinuers. Although the study did not test competing models for continuance and discontinuance, it is reasonable to assume that continuers and discontinuers may be

influenced by different factors regarding their decision to continue or discontinue online services. Thus, the present research, with the inclusion of additional sets of factors, tests whether the findings are sustainable in a mandatory usage context. Thus, one of the guiding questions for this study is as follows:

> RQ: Do factors employed in the current study successfully discriminate discontinuers from continuers? If so, how do those factors differently influence the Intranet usage behavior of discontinuers and continuers?

Models of the Hypotheses

Relationship Between Types of Discontinuance and Adopter Categories

In the previous chapter, I argued there might be at least five different types of discontinuance: replacement, reserved, partial, indifferent, and political discontinuance. It was also suggested that disenchantment discontinuance might not be a distinct type of discontinuance, since dissatisfaction is one of the main variables that induces other types of discontinuance, as suggested by U&G and EDT.

Parthasarathy and Bhattacherjee (1998) suggest that distinctions between two categories of adopters, i.e., earlier and later adopters based on their time of adoption within their social system, is theoretically and empirically more sound than Rogers' (1995) initial adopter categories (innovators, early adopters, early majority, late majority, and laggards). The distinction between earlier adopters and later adopters is based on timing of innovation adoption, but the two categories are also delineated by individual characteristics such as risk-taking personality and independent judgmental capacity (Parthasarathy & Bhattacherjee, p. 364). Figure 6 depicts hypothesized links between different types of discontinuance and adopter categories, and the rationales for the links are provided as follows.

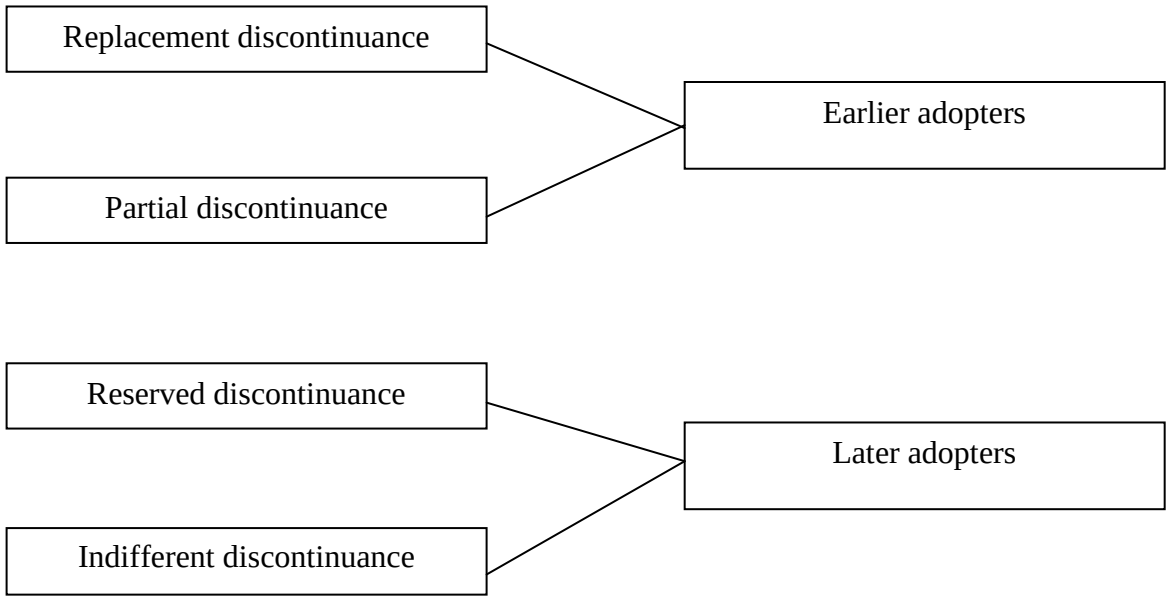
Previous research suggests that replacement discontinuers may possess characteristics similar to those of earlier adopters (Parthasarathy, 1995). The main reason for discontinuance for

earlier adopters is replacement, since they have a greater exposure to external influences and actively seek new innovations. Partial discontinuers are those who actively evaluate the usage context of an innovation and make their decision not to use certain features of the given innovation while continuously utilizing others. Rather than rejecting the innovation as a whole, they tend to selectively choose features that are compatible with their tasks and work routines. Thus, we can assume that their decision making is rational and pro-active and better resembles the characteristics of earlier adopters than later adopters.

In contrast, indifferent discontinuance results from underutilization without reflexive thought or critical incident. Indifferent discontinuers rely less on their own evaluation of the innovation after deciding to adopt; thus, their decision is less rational and deliberate than that of replacement discontinuers. We reasonably assume that indifferent discontinuers are more likely to resemble later adopters than earlier adopters. In addition, reserved discontinuance indicates the temporal cessation of a given innovation without replacing it with other possible alternatives. As Pollard (2004) depicts, reserved discontinuers put aside a given innovation for a while even if they preserve positive attitudes toward the innovation. Rather than searching for alternative innovations in order to complete their current tasks or selectively using certain features that are compatible with their tasks, they tend to ignore the given innovation as a whole. Thus, this research formulates the following hypothesis:

H1: Replacement discontinuers and partial discontinuers resemble earlier adopters more so than do indifferent discontinuers and reserved discontinuers.

Figure 6: The Hypothesized Relationship Between Types of Discontinuance and Adopter Categories (H1)



RELATIONSHIP BETWEEN DISCONTINUANCE AND ANTECEDENTS

Factors influencing discontinuance are categorized in this dissertation under five headings: (a) user attributes; (b) perception of technology attributes; (c) use-related perception; (d) social influence; and (e) organizational intervention. These factors are depicted in the following models. Figure 7 presents the simplified model of the hypotheses.

Figure 8 presents the detailed model. These models are explained in the following section. In this section, the relationship between antecedents and overall discontinuance will be initially discussed. The relationship between user attributes and types of discontinuance will only be simultaneously addressed right after the discussion of each variable's relation to overall discontinuance as its relationship to types of discontinuance are not straightforward. The relations between other antecedents and types of discontinuance will be addressed separately. A discussion on the relationship between discontinuance and organizational communication satisfaction will follow.

Previous research demonstrates that user attributes can help determine why, how, when, and which innovation may be adopted (Hubona & Cheney, 1994; Lin, 2003). User attributes can include predisposed personality traits that make an individual receptive to the idea of innovation adoption as well as beliefs about one's ability to adopt and use an innovation (Bandura, 1977; Moore & Banbasat, 1991). Recent studies also suggest that gender might be an important factor in explaining innovation adoption (Gefen & Straub, 1997; Venkatesh & Morris, 2000).

Figure 7: A Simplified Model of the Hypotheses

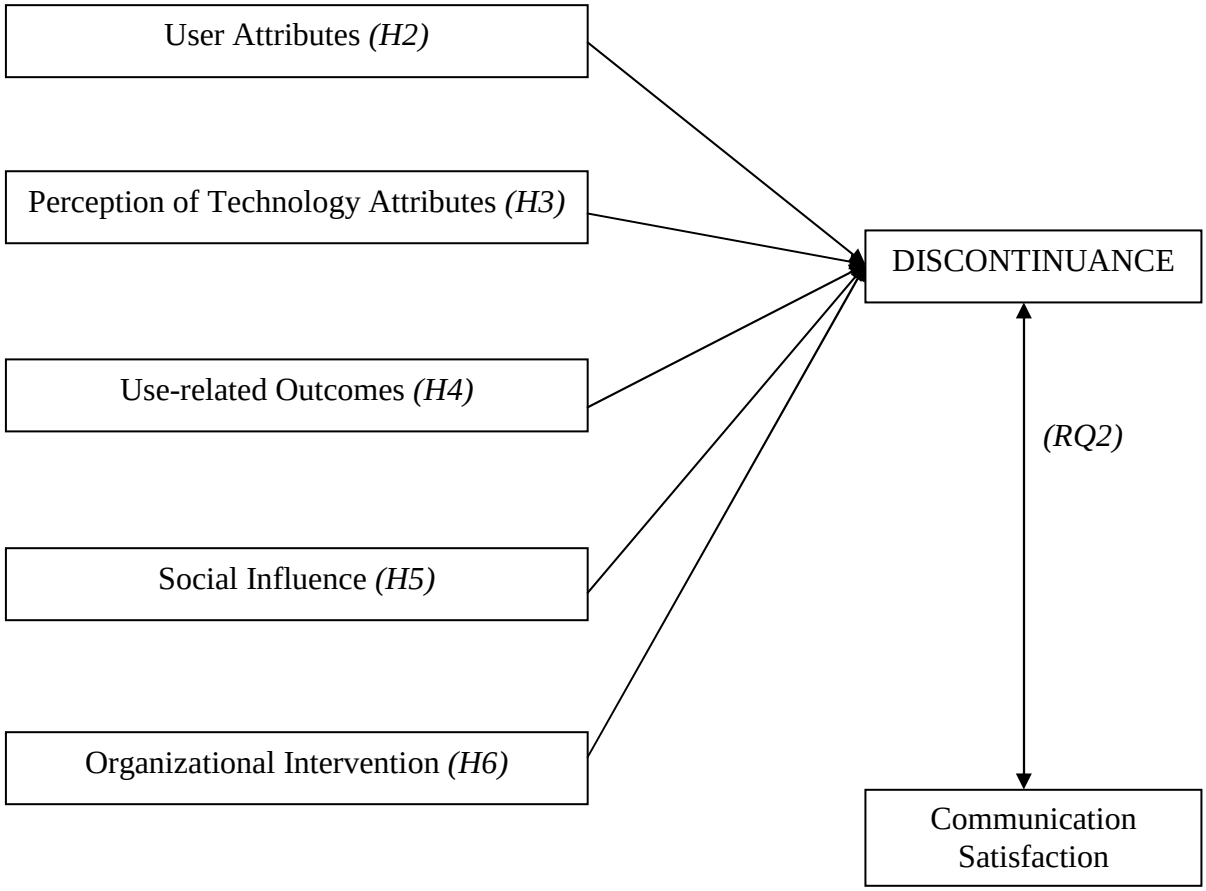
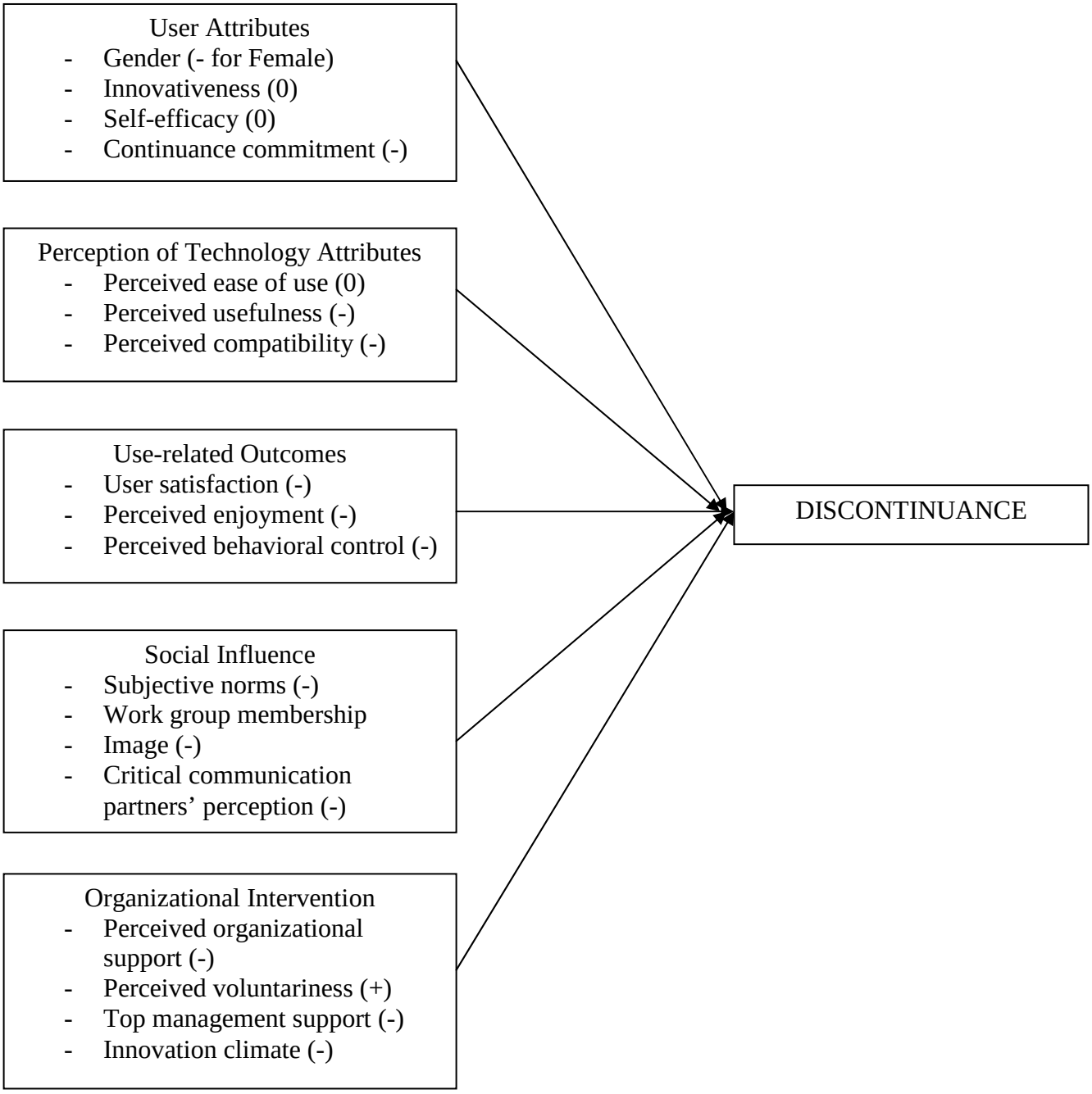


Figure 8: A Detailed Model of the Hypotheses[3]



[3] The figure includes directional signs right next to each variables except work group membership since it is unknown about which work groups support discontinuance or continuance of their members more than other work groups. Personal innovativeness, self-efficacy and perceived ease of use are speculated to be insignificant in the current study.

User Attributes

There has been consistent interest in the influence of individual differences or user attributes on the adoption or acceptance of ICT. User attributes usually refer to the factors such as personality and demographic variables that influences users' beliefs about and use of ICT (Agarwal & Prasad, 1999). Researchers have found that user attributes such as personal innovativeness (Agarwal & Prasad; Rogers, 1995), computer self-efficacy (Compeau & Higgins, 1995), and gender (Gefen & Straub, 1997; Moore & Benbasat, 1991) influence how individuals perceive a given ICT.

Although mounting evidence suggests individual differences influence the initial perceptions of ICT and its adoption, the relationships between those individual differences and post-adoption behaviors have not been established. In addition, some researchers suggest that certain personalities such as personal innovativeness are stable but others are constantly changing depending on user-experience or usage contexts (e.g., Thatcher & Perrewe, 2002). Others also speculate that the effect of self-efficacy may diminish as individuals gain knowledge about a given innovation (e.g., Bandura, 1975). These imply that the influence of those variables may vary across different diffusion stages, i.e., initial adoption stage and post-adoption stage. In this section the relationships between user attributes (i.e., personal innovativeness, self-efficacy, gender, and continuance commitment) and post-adoption behavior (i.e., discontinuance) are explored.

Personal innovativeness

Personal innovativeness, the willingness of an individual to try out new ideas or innovations, has been derived from IDT. Rogers (1995) strongly suggests that individuals high in technology innovativeness or novelty seeking have stronger intrinsic motivation to use new technologies and enjoy the stimulation of trying new technologies. Compared with less innovative individuals, innovative individuals would not be greatly concerned about whether new technologies are easy to use and may still intend to try and use them despite the potential

difficulties (Dabholkar & Bagozzi, 2002; Rogers). In empirical research, personality traits that reflect individual innovative attributes tend to include such characteristics as venturesomeness (Foxall & Bhate, 1991), novelty seeking (Hirschman, 1989), and willingness to take risks (Feldman & Armstrong, 1975).

The construct of personal innovativeness has been employed to predict individuals' tendencies to adopt an innovation and has enjoyed empirical support across a wide variety of technological innovations (Hirshman, 1980; Venkatraman & Price, 1990, Wood & Swait, 2002, Yang, 2005). For instance, Lu et al, (2005) found that personal innovativeness along with social influences and instrumental beliefs was important determinants of the adoption of wireless Internet services via mobile technology (WIMT). Karahanna et al. (2002) also reported that personal innovativeness affected the adoption of GSS through the perceptions on relative advantage. Greater innovative thinking ability is also found to be predictive of personal computer adoption decision (Dickerson & Gentry, 1983). Similarly, grounded in IDT, Agarwal and Prasad (1998) differentiated domain-specific innovativeness from global innovativeness and found that domain-specific innovativeness moderated the relationship between compatibility of WWW and individuals' intention to use WWW. Citrin et al. (2000) also report that innovativeness predicted individuals' adoption of Internet shopping. In a similar vein, Yang (2005) found an indirect effect on individuals' adoption of mobile commerce through perceived usefulness.

However, it is questionable if personal innovativeness consistently affects post-adoption behaviors after the initial adoption stage. In fact, Bhattacherjee (2001) found that even if earlier adopters differed from later adopters on personal innovativeness, such differences did not appear to influence their continuance intention significantly. In addition, the current study challenges the IDT's proposition that the probability of discontinuance may be, in part, a function of adopters' characteristics. Put differently, the current study argues that the differences between earlier adopters and later adopters with respect to individual characteristics (i.e., innovativeness, risk-taking personality) may not be applicable to explain the difference between continuers and

discontinuers. Thus, this research proposes a non-relationship between personal innovativeness and discontinuance:

H2-1a: Personal innovativeness will not be related to individual discontinuance[4].

However, even if we accept the non-relationship between innovativeness and discontinuance, it is unknown whether all types of discontinuers are less innovative than continuers. More specifically, replacement discontinuers might be more innovative than other discontinuers (or even continuers) in a sense that innovative individuals tend to actively seek new innovations, which results in a higher possibility of discontinuance (Rogers, 1995; Parthasarathy; 1995). In addition, partial discontinuers might vigorously evaluate usage contexts as well as various features of a given technology and take risks to discontinue its certain features. In contrast, indifferent discontinuers and partial discontinuers might be similar to the traditional understanding of later adopters. Thus, this research formulates the following hypothesis:

H2-1b: Replacement discontinuers and partial discontinuers will be more innovative than indifferent discontinuers and reserved discontinuers.

Self-efficacy

The Social Learning Theory (Bandura, 1975) and the Social Cognitive Theory (Compeau & Higgins, 1995) give prominence to the concept of self-efficacy, defined as "beliefs about one's ability to perform a specific behavior" (Compeau & Higgins, 1999, p. 146). Those theories suggest that our expectations of positive outcomes will be meaningless unless we believe our capability to successfully execute the behavior. ICT research has demonstrated a strong link between self-efficacy and individual behaviors in terms of adoption and use of technology. Our beliefs about our capabilities to use technology successfully are related to our decisions about whether to use technology.

[4] Even though it is not typical to predict the suggested non-relationship, it is valuable to test the relationship since we have not seen much research on the relationship between personal innovativeness and post-adoption behaviors.

Similarly, computer self-efficacy has been defined as the judgment of one's ability to use a computer and found to be an important predictor of ICT usage (Compeau & Higgins, 1995, 1999; Hong et al., 2002). Compeau et al. (1999) found that self-efficacy was a strong predictor of affect, anxiety, and use of computers. In addition, through TAM, Venkatesh and Davis (2000) found that computer self-efficacy significantly influences perceived ease of microcomputer use both before and after hands-on experiences. Agarwal and Prasad.'s (2000) study also found computer self-efficacy to be a key antecedent of perceived ease of use. Similarly, Igbaria and Livari (1995) demonstrated that computer self-efficacy has a direct effect on perceived ease of use; however, they failed to find its connection to perceived usefulness.

However, the effect of self-efficacy is usually mediated by the effect of ease of use, and we have seldom seen a direct effect of self-efficacy on intention or actual use (Parthasarathy & Bhattacherjee, 1998). In addition, several studies have suggested that the effect of ease of use tend to diminish over time (e.g., Davis et al., 1989; Parthasarathy & Bhattacherjee; Venkatesh, 2000). That is, the main source of self-efficacy is experience gained through direct use or past usage. In the present study, I conceptualize discontinuance as a cessation of a previously adopted innovation after its routinized use. Thus, it is assumed that discontinuers have sufficient experience to use an adopted technology unconsciously, and the effects of self-efficacy fade away. Therefore, the following is proposed:

H2-2a: Self-efficacy will not be related to individual discontinuance[5].

Again, although the current study posits a non-relationship between self-efficacy and discontinuance, self-efficacy may relate to different types of discontinuance in discernible ways. Although Parthasarathy (1995) and Rogers (1983) posit that discontinuers are similar to later adopters who have a lower level of self-efficacy in comparison to earlier adopters, it is reasonable to assume that specific types of discontinuers have a higher level of self-efficacy than

[5] Again, the observed confounding effects of ease of use on continuance provide the support to test the non-relationship. In addition, this study is trying to show, in part, that some variables that relate to continuance do not relate to discontinuance, so the inclusion of the hypothesis is justifiable.

others. For instance, replacement discontinuers may have higher confidence in their ability to apply their skills to test new ideas and innovations than indifferent or partial discontinuers. Partial discontinuers may have fewer doubts about their judgment of which features are compatible with their tasks and which features are not than indifferent and reserved discontinuers do. Hence, the following is proposed:

H2-2b: Replacement discontinuers and partial discontinuers will be more self-efficacious than indifferent discontinuers and reserved discontinuers.

Gender

In general, the studies of ICT diffusion processes, acceptance, and outcomes initially make no reference to gender differences (Davis et al., 1989; Moore & Benbasat, 1991). Gefen and Straub (1997), however, contend that gender should be included in the research of IT use as one important aspect of cultural differences, since men and women use and understand language different ways. They further argue that there is a strong possibility of gender-based communications media perception, choice, and use. In fact, they found that women perceived the social presence of and usefulness of email to be higher than did men. Even though they failed to find differences in actual use, the finding suggests that researchers should include gender along with other cultural effects in diffusion models.

Grounded in IDT, Van Slyke et al. (2002) found that gender is a significant predictor of an individual's intention to make purchases over the web, and the perception of complexity, compatibility, relative advantage, and trust significantly differs by gender, while perception of image did not. Similarly, Venkatesh and Morris (2000) found that gender had a significant effect on the perception of perceived usefulness and ease of use of an ICT: men considered perceived usefulness more important than did women in making their adoption decision, while women perceived ease of use to be more important than did men. Yang (2005), based on TAM, also found that gender affected individuals' attitude toward using mobile electronic commerce through its effect on perceived usefulness and ease of use.

Several studies also indicate that women are more likely to conform to a majority opinion (e.g., Roberts, 1991; Venkatesh et al., 2000). Roberts (1991) suggests that women are more responsive to others' evaluations, while men adopt a competitive attitude and a self-confident approach. Furthermore, research has suggested that women may be more likely to retain nonproductive employees for social reasons, whereas men are more likely to terminate them (Barnett & Karson, 1989; Venkatesh et al., 2000). Overall, women are likely to make decisions that are likely to be approved by others, and this implies that women will be more sensitive to others' informational input about ICT innovations. The above literature all together suggests that gender effect on perceptions of and attitudes toward a given innovation is mediated by compliance effect. Hence, the following is proposed:

H 2-3: The relationship between gender and discontinuance will be mediated by the compliance with a majority opinion.

Continuance commitment

Commitment is a “force that binds an individual to a course of action” (Meyer & Herscovitch, 2001, p. 301) and is experienced by an individual as a mindset, “a frame of mind or psychological state that compels an individual toward a course of action” (Meyer & Herscovitch, p. 303). Several researchers argue that commitment can influence behavior independently of motivations and attitudes (Allen & Meyer, 1990; Meyer & Herscovitch). It is also suggested that a decision maker continues a line of action to reflect an affective bond with the action, to avoid losing various investments associated with earlier actions, and to justify that his or her earlier decision was right regardless of whether an objective observer would judge it right or wrong (Allen & Meyer; Venkatesh et al., 2003). Thus, the notion of commitment captures a broader view of forces driving an individual’s continuous actions.

The construct of commitment was originally developed in the study of organizational commitment. Meyer and Allen (1984) initially proposed that commitment consists of two dimensions, i.e., affective commitment and continuance commitment. Affective commitment

denotes an emotional attachment to, identification with, and involvement in the organization, while continuance commitment denotes the perceived costs associated with leaving the organization. However, the construct, especially continuance commitment, is relevant to the study of post-adoption behaviors. The underlying premise it that individuals tend to persist in activities in which they have already invested considerable resources, i.e., such irretrievable investments act as barriers to discontinuance of use of the system. In this vein, Schultz and Liedner (2002) have observed in their literature review that individuals are likely to exhibit continuance intention after making irretrievable investments. In a similar vein, Tiwana and Bush (2005) also reports that users invest considerable time and effort in developing interpersonal relationships with other users of the expertise-sharing network system, building a reputation among them, and customizing the system to their personal preference. As a result, continuance commitment emerges through irretrievable investments by individual users after initial adoption and become an important element in deciding whether to continue using the system. Therefore, perceptions of post-adoption investment of time and effort by individual users act as discontinuance barriers for individual users. Hence, the following is suggested:

H2-4: Continuance commitment will be negatively related to individual discontinuance.

Perceptions of Technological Attributes

In the past several decades, many studies have attempted to explain and predict user acceptance of ICTs by using perceived innovation attributes based on different theoretical approaches. For example, IDT suggests that users' perception about an innovation's characteristics, such as relative advantage, complexity, compatibility, trialability, and visibility, affects adoption (e.g., Moore & Benbasat, 1991; Plouff, Vandenbosch & Hulland, 2001; Rogers, 1995). The cognitive-motivational theories of ICT adoption, i.e. TAM (e.g., Davis et al., 1989; Venkatesh & Davis, 1996; 2000) and TPB (e.g., Mathieson, 1991; Taylor & Todd, 1995; Venkatesh & Brown, 2001), have shown that user adoption and usage of an ICT are mainly determined by his/her beliefs and attitudes toward the ICT.

Although the construct of perceptions of technological attributes originated in different disciplines, it has received empirical support across different theories. For instance, the constructs employed in TAM are basically a subset of the perceived innovation characteristics developed in IDT. Specifically, perceived usefulness and perceived ease of use of TAM are conceptually similar to relative advantage and complexity in IDT (e.g., Agrawal & Prasad, 1997; Compeau & Higgins, 1995; Davis, Bagozzi, & Warshaw, 1989; Fulk et al., 1990; Markus, 1987; Rogers, 1995). Thus, IDT and TAM partially reconfirm each other's findings. Thus, we can assume that if ICT can be thought of as a specific innovation, those theories share the view that the adoption of a particular technology is determined by its perceived attributes.

In this research, perceived ease of use (complexity), perceived usefulness (relative advantage), and compatibility will be considered as technological attributes that might affect discontinuance. Those three attributes have been consistently related to adoption and utilization (Karahanna et al., 1999; Tornatzky & Klein, 1982). Those attitudes are explored as follows.

Perceived ease of use (complexity)

While complexity (or perceived ease of use) in IDT has an independent effect on adoption decision making, the effect of perceived ease of use on technology acceptance in TAM is suggested to be mediated by perceived usefulness. Empirical tests for the effect of perceived ease of use suggest that its effects tend to decrease over time. For instance, Davis et al. (1989) found that perceived ease of use had a significant effect on behavioral intention at the time a technology was introduced, but the effect disappeared as adopters become accustomed to a technology. Though perceived ease of use, along with perceived usefulness, are prior and fairly general constructs to predict user acceptance of different types of information technology, the explanatory power decreases along with users' assimilation to the technology (Davis et al.). In addition, they found a low correlation between initial perceived ease of use and perceived ease of use after direct experience. Similarly, Parthasarathy and Bhattacherjee's (1998) study of online services did not find ease of use to be significant predictor of post adoption behavior. They

explained this unexpected finding by speculating that the effect of the initial ease of use on user behavior become inconsequential as the services become easier to use. Later, Venkatesh (2000) found that perceived ease of use was a consistent and direct predictor of intention over time, the size of effect, however, decreased. Therefore, even if there is some evidence that suggests the minimal effect of perceived ease of use on intention to use (e.g., Venkatesh), it is safe to argue that the size of effect tends to be minimal. In addition, based on our conception of discontinuance that presupposes routinized and habitual use of an innovation, it is suggested that perceived ease of use does not correlates with discontinuance. Hence, the following is proposed:

H 3-1: Perceived ease of use will not be related to individual discontinuance.

Perceived usefulness (relative advantage)

Perceived usefulness is one of the most utilized constructs to predict behavioral intention as well as actual usage. From the previous research grounded on TAM, TPB as well as IDT confirmed the strong effect of perceived usefulness on IT adoption and continued use (Bhattacherjee, 2001; Davis et al., 1989; Gefen & Straub, 1997; Igbaria et al., 1996; Karahanna et al., 1999; Talyor & Todd, 1995; Venkatesh, 2000; Venkatesh & Davis, 2000; Venkatesh et al., 2002). For instance, Davis et al. found that perceived usefulness had a significant effect on intention to use a word processor by using student samples. Taylor and Todd also reported a significant effect of perceived usefulness on intention to use a computing resource center with student samples.

Similarly, Thompson et al. (1991) conceptualized perceived usefulness to include "near-term job fit" and "long-term consequences of use." They defined job fit as the "extent to which an individual believes that using a personal computer can enhance his job performance" and long-term consequences as "outcomes that have a high pay-off in future" (Thompson et al., p. 129). They found that job fit and long-term consequence had a significant effect on the utilization of personal computers by assessing knowledge workers in nine divisions of a multi-national firm. Later, Goodhue and Thompson (1995) argue that individual perceptions of task-

technology fit affect utilization of information systems, but they did not find supporting evidence from their empirical study of company workers' utilization of computer systems and user support services. Venkatesh and Davis (2000) also introduced "job relevance" in the consideration of what tasks a system is capable of and the degree to which those tasks match job goals. They collected longitudinal data regarding four different systems at four different organizations and found a significant effect of job relevance on usage intention through perceived usefulness. However, since the effect of job relevance or job fit is conceptualized as mediated through the effect of usefulness (Venkatesh & Davis; Venkatesh et al., 2002), the present study proposes to only include perceived usefulness as a direct antecedent of discontinuance.

H3-2: Perceived usefulness will be negatively related to individual discontinuance.

Compatibility

Compatibility derived from IDT captures the fit between technological condition and task (Moore & Benbasat, 1991; Venkatesh et al., 2003). Compatibility has been utilized by several studies and shown to have a significant effect on adoption decision and current usage (Agarwal & Prasad, 1997; Karahanna et al., 1999; Moore & Benbasat, 1996; Talyor & Todd, 1995; Xia & Lee, 2000). For instance, Moore and Benbasat's study showed compatibility along with perceived usefulness and ease of use to be most influential on continued usage decisions about personal computers. Agarwal and Prasad examined current usage behavior and continued usage intentions for the web. They reported that compatibility is the most important predictor of current usage level of the Web, but not related to continued usage intentions. Taylor and Todd (1995) also reported that compatibility affected the current usage of computing resource centers through the mediation of behavioral intention. Thus, this study proposes the following:

H 3-3: Compatibility will be negatively related to individual discontinuance.

Use-Related Outcomes

Once an adoption/acceptance decision is made and an innovation is installed in a certain context, the cumulative use experience is subject to adopter evaluation (Lin, 2003; Rogers, 1995). This evaluation of cumulative use experience, referred to as "use factor," encompasses a range of adopter responses including whether the expected outcomes were realized through the use of an adopted innovation, the level of intrinsic gratification received through the use, and the perceived ability to control the use experience (Lin). In fact, the overall outcomes of use experience can be understood as a feedback mechanism -- interaction between adopters and an innovation -- for subsequent decisions of discontinuance as well as continuance. The favorable perceptions of technological attributes can be changed if the use experience fails to meet those predispositions. Thus, this feedback mechanism may reinforce, reconfigure, or alter adopters' positive attitudes toward the innovation, and in turn impact further decisions and usages.

User satisfaction

It has been suggested that an individual's intention to continuously use previously adopted innovation results from satisfaction (Bhattacherjee, 2001; Rogers, 1995; Shih & Venkatesh, 2004). Parthasarathy and Bhattacherjee (1998) posit that satisfaction is an extremely important element of long-term usage, and dissatisfaction often triggers discontinuance behavior. EDT also suggests a high correlation between adopter satisfaction and usage. That is, adopters tend to compare actual usage and their initial expectation, and when the comparison is favorable, satisfaction and intention for continuing use increase. Slightly different from EDT's main focus on the gap between expectation before actual adoption and actual usage, U&G posits that continuing use is a direct consequence of the evaluation of use experience (Lin, 2003). Thus, although we have seen few empirical studies that actually utilize satisfaction as an explanatory factor for continuance or discontinuance, the suggested correlation between satisfaction and discontinuance seems to be reasonable. Thus, the following hypothesis is advanced:

H 4-1: User satisfaction will be negatively related to individual discontinuance.

Perceived enjoyment

As discussed previously, much of the prior research on the issues of ICTs has focused on the utility, usefulness, and extrinsic motivations as the principle determinants of adoption and use. This implies that the decision to use ICTs is based largely on a rational calculation of the benefits to be derived relative to the costs incurred. Relatively little attention has been given to recreational and emotional bases of ICT usage. In fact, several studies confirmed that perceived enjoyment and fun could be an intrinsic motivation for the use of ICTs (Agarwal & Karahanna, 2000; Davis et al., 1898; Igbaria, 2001; Pedersen, 2002; Vallerand, 1997; Venkatesh, 2000). For instance, Vallerand (1997) argues that there are two main dimensions of motivation: extrinsic motivation relates to the drive to perform a behavior to achieve specific goals/rewards, whereas intrinsic motivation relates to the perception of pleasure and satisfaction from performing the behavior. Extrinsic motivation is well anchored in the concepts of task-fit functionality and usefulness. Venkatesh (2000) included playfulness as an intrinsic motivation in the TAM model. In a similar vein, based on U&G, Pedersen (2002) suggests that perceived enjoyment has direct and indirect effects on intention to use mobile service.

Empirically, several studies have verified the suggested relationship between perceived enjoyment and continuance intention (Igbaria et al., 2001; Qin & Xu, 2007; Roca, Chiu, & Martinez, 2006; Thong et al., 2006). Igbaria et al. found that perceived enjoyment was positively associated with the usage of microcomputers. Thong et al.'s study of 811 users of mobile Internet services also found that perceived enjoyment, along with perceived usefulness, were positively related to satisfaction with the service and continued intention to use. Roca et al. also reported the same relationships between perceived enjoyment and satisfaction and continuance intention from the study of an e-learning course in four different organizations. Thus, this study includes perceived enjoyment as an intrinsic motivation in predicting discontinuance and the following hypothesis is advanced:

H 4-2: Perceived enjoyment will be negatively related to individual discontinuance.

Perceived behavioral control

TPB, as discussed by Ajzen (1985, 1989), proposes that perceived behavioral control has a direct influence on behavior. Perceived behavioral control is suggested to be associated with the beliefs about the presence of control factors that may facilitate or hinder the performance of the behavior (Ajzen, 2002). Thus, control beliefs about resources and opportunities are associated with an underlying perceived behavioral control.

Perceived behavioral control, mainly used in the tradition of TPB, has been successfully applied to the understanding of individual acceptance and usage of many different technologies (Harrison et al., 1997; Mathieson, 1991; Taylor & Todd, 1995; Venkatesh et al., 2000). For example, Taylor and Todd (1995) argued that usage behavior is a direct function of behavioral intention and perceived behavioral control, and they verified the suggested relationship through the study of student usage of a computing resource center. Venkatesh et al. also reported that sustained usage of computer software was directly affected by perceived behavioral control. Hsu and Chiu (2004) studied continuance intention of Information system managers who were currently using Web-based tax filing service, and verified the hypothesized relationship between the perceived behavioral control and continuance intention. Hsu, Yen, Chiu, and Chang (2006) also found that the perceived behavioral control affected online shopping users' continuance intention as well as their use frequency.

Although the studies have not directly tested its relationship to discontinuance, overall the perceived behavioral control is found to be related to current usage level and continuance intention. The findings imply that the perceived behavioral control has direct and indirect effects on behavioral intention and actual behavior. If a person perceives that he or she does not possesses the requisite resources and opportunities necessary to adequately use a particular ICT innovation, the person is more likely to discontinue it. Thus, the following is proposed.

H4-3: Perceived behavioral control will be negatively related to individual discontinuance.

Social Influence

Existing theories such as IDT and TAM invariably assume that an individual goes through a sequence of steps or stages that parallel awareness, information collection, and information evaluation before a decision to adopt is made. That is, it is presumed that an individual actively seeks out information about a product, and then, based on his or her existing predisposition (affection or expectation), decides whether the innovation is suited to his or her needs. However, this presumption is an unnecessarily limited one, and several studies demonstrate that most adopters are imitators who rely largely on interpersonal interactions before making an adoption decision (e.g., Fulk 1993; Lin, 2003; Rice, 1993; Trevino et al., 1987). Rogers also contends that most individuals evaluate an innovation not on the basis of scientific research by experts, but through the subjective evaluation of near-peers who have adopted the innovation (p.36). In fact, researchers have recognized that communication is often the most important source of information and influence, but it has been also true that communicative factors such as interpersonal influence, symbolic image, etc. have not been rigorously incorporated into existing ICT acceptance and use models (Lin, 2003; Venkatesh et al., 2003).

Work group membership

Research in social psychology has demonstrated that formal work groups are the site of important social influences and reality construction processes (Fulk, 1993). Social influence is likely to be highly dependent on one's position in a social structure, because position shapes exposure to influence attempts and their effectiveness. In addition, a group can be understood as a unit of collective action that shares commitment to certain activities and resources of many kinds to achieve common goals (Clarke, 1991). Group members build shared ideologies about how to act properly, and thereby produce behavioral consonance.

The effect of work group membership on an intra-organizational adoption has been tested and verified across various technologies. For instance, Fulk (1993) presented data to show that a work group's use of an electronic mail system was the best predictor of a focal individual's use of

the system. Mark and Poltrock (2004) found that groupware adoption was affected by memberships of different work groups that have conflicting views of the value of collaboration, different amounts and needs for resource, and different attitudes toward technology. Others have also suggested that organizational adoption of an innovation can lead to adoption resistance among some work groups but not others in the same organization (Markus, 1983; Orlikowski, 1993). Therefore, a work group may distribute attitudes and a set of possible usage norms that result in common patterns of adoption and use within the group, even if individuals are not the unconscious followers of salient others' behavior.

In addition to the compliance effects of formal group membership, different work groups have different sets of tasks in an organization and thus have different perceptions of task-technology fit (Goodhue & Thompson, 1995). This implies that members of a certain work group develop a more positive perception of an ICT innovation than other group members and in turn may be encouraged to continue the ICT innovation. Even if there has been no empirical research on discontinuance, it is plausible to assume that with the mutual reinforcement between social pressure and varied perception of task-technology fit across work groups, formal work group membership may influence group members' continued use as well discontinuance of an ICT innovation. Thus, the following is proposed:

H 5-1: The rate of individual discontinuance will vary across different work groups

Subjective norms

Subjective norms or social norms are developed through external and interpersonal influences. Within TRA, a subjective norm has been defined as a "person's perception that most people who are important to him think he should or should not perform the behavior in question" (Fishbein & Ajzen, 1975, p.302). In other words, subjective norms are the degree to which an individual perceives the demands of others on that individual's behavior (Larsson & Lilja, 2003). The rationale for a direct effect of subjective norms on intention is that people may choose to perform a behavior, even if they are not themselves favorable toward the behavior or its

consequence, if they believe one or more important referents think they should, and they are sufficiently motivated to comply with those the referents (Venkatesh & Davis, 2000).

Even if the TAM model initially downgraded the effect of subjective norms on the intention to use (Davis, 1989; Davis et al., 1989) several studies recognized social influence (denoted as subjective norms, social norms, or social influence) as an important variable to predict the intention to use and actual usage of ICTs. For instance, Lucas and Spitler (1999) found that social norms and the nature of the job are more important in predicting use than are users' perceptions of technology. In addition, Venkatesh and Davis (1996; 2000) also found that social influence processes, such as subjective norms, voluntariness, and image, in combination with cognitive instrumental processes (job relevance, output quality, result demonstrability and perceived ease of use), significantly influenced user acceptance. Differing slightly from TAM, TRA and TBP consider subjective norms as an important antecedent to the behavior from inception.

However, the effect of subjective norms on behavioral intention has exhibited a less consistent effect across studies. For instance, Taylor and Todd (1995) found a direct effect of subjective norms on behavioral intention, but Mathieson (1991) and Davis et al. (1989) did not find the proposed relationship. Recently, Wai-Kit Ma et al. (2005) also reported that student teachers' subjective norms did not have any direct or indirect significant effects on their intention to use instructional computer technology, even if the directionality of its effect on perceived usefulness and intention to use was consistently positive.

However, these confounding findings might be due to contextual setting (mandatory vs. voluntary) and types of technology adopted. For instance, Hartwick and Barki (1994) found that subjective norms had a significant effect on intention in mandatory settings but not in voluntary settings after separating their respondents into mandatory and voluntary contexts. Venkatesh et al. (2003) also found that none of the social influence constructs (such as subjective norms, image, and social factors) were significant in voluntary contexts; however, each becomed

significant when use was mandatory. In addition, the meta-analysis reported as part of this dissertation research shows that the size of effect of subjective norms in explaining the acceptance of communication technology or mixed forms of technology are much greater than in explaining the acceptance of stand-alone technology. In a similar vein, Webster and Trevino (1995) suggest social influence, and thus, subjective norms, to be highly influential in explaining the adoption and use of new media. Thus, different contextual settings and technological types might be true contributors to the reported confounding results of the effect of subjective norms on adoption and use across studies.

Yet, it is unfortunate that there has been only one study on how subjective norms affect discontinuance. Tiwana and Bus (2005) studied expertise-sharing network system continuance through a four-year observation of 418 users in four different organizations, where the system was implemented and its use encouraged by the organizations, and found that subjective norms that formed among peer users diminished discontinuance. The finding suggests that it may be more difficult for users to discontinue the system, as subjective norms fostered by system-mediated relationship are stronger. Thus, in the current study context, a moderately mandatory setting and a complex ICT application, I propose the following.

H 5-2: Subjective norms will be negatively related to individual discontinuance.

Image

Innovation literature suggests that the desire to gain status is an important reason for the adoption of an innovation (Rogers, 1995). Rogers includes image as an aspect of relative advantage and argued that “undoubtedly one of the most important motivations for almost any individual to adopt an innovation is the desire to gain social status” (p. 215). Moore and Benbasat (1991) included the image construct as a four-item subscale of their perceptions of ICT adoption scale. It was found to be different from the relative advantage based on the results of factor analysis.

The effect of image on current usage and acceptance has been tested by several empirical studies (Agarwal & Prasad, 1997; Karahanna et al., 1999; Venkatesh & Davis, 2000). For instance, Karahanna et al. found that image positively affected behavioral intention to continue use through attitudes toward continuing use, while it did not have an effect on attitudes toward adopting. In a similar vein, Venkatesh and Davis (2000) demonstrate the effect of image on perceived usefulness to be significant over time. They argue that higher image leads to higher support from a work group, which makes it easier to achieve goals, resulting in increased productivity and higher performance. Again, these studies did not directly test the influence of image on discontinuance; the studies imply that image may have a reversed effect on discontinuance. Thus, the following is proposed:

H 5-3: Image will be negatively related to individual discontinuance.

Perception of critical communication partner

According to SIT in organizations, social influences on technology-related attitudes and behaviors stem from two different sources: formal structural position and informal/relational communication network (Fulk, 1993). With respect to communication networks, the theory posits that significant others in an individual's communication network influence the individual's attitudes and behaviors. Compatible with the SIT, El-Shinnawy (1993) suggests that social influences on ICT usage can stem from supervisors, peers, or others who are highly regarded. Those significant others exert influence on individual ICT usage by making influential statements about the characteristics of the ICT and the task. Markus (1990) also asserts that media choice is affected by the number of key communication partners who also use the medium. These suggestions are consistent with IDT, where opinions and evaluations of significant others influence a person's adoption of an innovation.

Empirically, Xia and Lee (2000) found that critical communication partners' evaluations and opinions about the innovation affected perceived innovation attributes such as relative advantage and compatibility and intention to use a commercial CASE software. Trevino et al.

(2000) also found that perceptions of coworkers' and supervisors' attitudes were positively associated with reported usage of media. Cambell and Russo (2003) also reported that different personal communication networks tended to developed different perceptions of mobile telephones, which in turn affected individual usage pattern of the technology.

In a similar vein, social network researchers provide evidence that closely interconnected individuals are more likely to share behavioral patterns than loosely connected ones (e.g., Rice & Aydin, 1991; Schmitz & Fulk, 1991). For instance, Rice and Aydin (1991) tested effects with respect to specified others rather than generalizing about salient others; they relied on network-based proximities such as relational, positional, and spatial proximity and their relationships to respondents' attitudes toward a health information system. They found that relational and positional proximity had a significant influence on one's attitude towards the system. Hence, the following is proposed:

H5-4: Critical communication partners' positive perceptions of the Intranet will be negatively related to individual discontinuance.

Organizational Interventions

As Ward et al. (2005) presents, prior research on ICT acceptance and use has largely focused on volitional systems and on individual, rather than organizational, factors that could influence technology acceptance and continued use. However, there are several studies that indicate individual adoption and use may not only depend upon belief but also on organizational actions (e.g., Schillewaert, Ahearne, Frambach, & Moenaert, 2005). For instance, organizational efforts to provide technical support (Igbaria & Chakrabarti, 1990; Schillewaert et al.; Thompson et al., 1991,), organizational training (Davis et al., 1989; Igbaria, 1990; Thompson et al., 1991; Venkatesh, 1999), and top management support (Karahanna & Straub, 1999) have been frequently mentioned as prerequisites for acceptance.

Organizational intervention in the present study refers to *the specific conditionings provided by an organization where the individual works and the investigated technology*

discontinuance or continuance takes place. As discussed previously, a system is usually deployed in an organizational setting; thus individual adoption of that system is a secondary decision (Chin & Gopal, 1995). Thus, organizational adoption does not automatically induce its members' adoption and use. In order to increase the user's acceptance of and use of the system, an organization has to create a favorable environment to support and encourage usage of the system at work. Organizational interventions help its members to find support throughout the organization and thereby remove impediments to sustained usage (Bergeron et al., 1990; Venkatesh & Davis, 2000; Venkatesh et al., 2003).

However, it is still true that research investigating individuals' acceptance and use of IT applications has heavily focused on the relationship between attitudes and the utilization of technologies. Organizational interventions often appear as a set of antecedents whose effects are realized only through perceived usefulness (e.g., Venkatesh & Davis, 2000). Acceptance and usage is still treated as volitional; that is, there are no barriers that prevent an individual from using an ICT if he or she decides to do so. Recognition of the effect of mandatory usage settings compared to voluntary usage setting has been rare. Fortunately, recent research has focused on more complicated adoption scenarios, such as innovations by individuals subject to strong managerial influences or by organizations (e.g., Brown, Massey, Montoya-Weiss, & Burkman, 2002; Rawstorne, Jayasuriya, & Caputi, 1998). The subsections below identify recent conceptual and empirical works relevant to adoption or continuance beyond the classical diffusion model and TAM.

Perceived organizational support

Davis et al. (1991) proposed that perceived usefulness and perceived ease of use were affected by organizational support. Later on, grounded in TAM, organizational support has been emphasized by several researchers as potential determinant of system usage (Fuerst & Cheney, 1982; Igbaria et al., 1995; 2001; Venkatesh, 1999; Venkatesh & Davis, 2000). High levels of organizational support are thought to be associated with favorable beliefs and with greater

system usage; furthermore, lack of organizational support is considered an important barrier to the effective utilization of ICTs (Venkatesh & Davis). In a similar vein, Igbaria et al. (1997) tested the influence of intra-organizational and extra-organizational factors on perceived usefulness, perceived ease of use, and system usage in the context of small firms. They found that external computing support and training—extra-organizational factors—influenced system usage mainly through perceived ease of use, and internal computing training and management support, which are intra-organizational factors, affected system usage through perceived usefulness. Therefore, the following is proposed:

H 6-1: Organizational support will be negatively related to individual discontinuance.

Perceived voluntariness

Voluntariness is defined as the extent to which potential adopters perceive the adoption decision to be non-mandatory and is adopted by several studies that usually utilize TRA (Agawal & Prasad, 1997; Hartwick & Barki, 1994; Iivari, 1996; Karahanna et al., 1999; Moore & Benbasat, 1991; Venkatesh & Davis, 2000; Venkatesh et al., 2003). In the past, ICT research has largely focused on the study of voluntary usage (Hartwick & Barki); since mandatory use is required, it is frequently assumed that there is little variance in usage. However, it is reasonable to assume that users' perception of degree of mandatoriness may vary even when an organization or a superior is requiring the users to use the system. In fact, Moore (1989) found that perceived voluntariness of usage of an innovative technology is not a dichotomous variable (voluntary vs. compulsory), but, rather, it shows a normal distribution. Moreover, the study shows that degree of perceived voluntariness of use affects attitudes toward usage. Similarly, Hartwick and Barki found that perceived voluntariness affects usage in conjunction with the subjective norm; that is, voluntariness appears as a moderating variable between subjective norm and usage. Iivari also found that voluntariness of the technology use within a company is associated with less use in his study of computer-aided engineering software. In addition, Venkatesh et al. (2000) found that perceived voluntariness had a negative and direct effect on continuance intention when the usage

context is mandatory, while perceived voluntariness had no effect on intention over and above what was explained by perceived usefulness and perceived ease of use. Those studies collectively imply that individuals in voluntary-use situations may depend on their attitudes to and experiences of ICT, but in mandated-use situations, subjective norms may become salient and appear to be a barrier to discontinuance. Thus, the following is suggested:

H 6-2: Perceived voluntariness will be positively related to individual discontinuance.

Perceived top management support

Top management support generally exists when the changes are perceived as positive for the organization. There is evidence in the innovation literature that suggests top management support is positively related to the adoption of new technologies in organizations (Eder & Igbaria, 2001; Kwon & Zmud, 1987; Tornatzky & Klein, 1982). Similarly, in the ICT implementation literature, positive relationships have been identified between top management support and ICT implementation success (Bradford & Florin, 2003; Eder & Igbaria; Green, 1995; Kwon, 1990; Thong, Yap, & Raman, 1996). Since a certain ICT, such as Intranet, implementation may represent a change in the old ways of sharing and manipulating information in the organization, top management support may be reflected in the dictate that organizational departments begin to post information electronically on the intranet rather than print it on paper. The more departments deploy the technology, the greater the diffusion of the technology throughout the organization.

There is a greater likelihood of ICT implementation success when positive top management attitudes regarding a new technology have been communicated to users (e.g., Damanpour, 1991). By the communication offered by top management to incorporate an ICT into organizational processes, top management support enhances the likelihood of successful implementation of the ICT. Slightly differently, many studies also verify the role of managers—direct supervisors, middle managers, and senior executive—as important agents who can influence adoption and initial use by organizational members (Bhattacherjee, 1998; Igbaria et al.

1995; Orlikowski, 2000; Orlikowski et al., 1995; Yates et al., 1999). They affect members' attitudes as well as behaviors through sponsoring, providing resources, creating incentive structures, directing modification or enhancement of ICT applications, and so on.

However, there is a paucity of literature focusing on the ingredients for effective top management support of an innovation after implementing ICTs. Most studies have identified top management support as an importance factor for explaining initial adoption and organizational implementation (e.g., Bradford & Florin, 2003; Green, 1995; Kwon, 1990; Thong et al. 1996). Yet, it has been relatively unknown whether top management support lasts after ICT implementations and the presence of top management support has consistent effects on continued usage. In practice, many senior executives argue that they do not see a connection between what ICT does and their tasks as executives (Davenport, 1998; Mintzberg, 2003). They appear to want to receive adequate information for decision making from people rather than computers and thus be less knowledgeable about deployed technologies. It is true that top management or senior executives are constantly being informed of the importance of ICTs in order to maximize organizational effectiveness. However, their perception of the crucial role of ICTs induces them to make decisions to deploy the technology, but not necessarily to utilize or continuously support it. This suggests that the lack of top management support after implementing ICTs could be a reason for underutilization or discontinuance of some organizational members. Thus, the present study proposes the following:

> H 6-3: Organizational members' perception of top management support will be negatively related to individual discontinuance.

Organization's innovation climate

Organizational climate refers to a set of perceptions that reflect how work environments are cognitively appraised and represented in terms of their meaning to and significance for individuals (James, Joyce, & Slocum, 1988; Reichers & Schneider, 1990). Put differently, organizational climate is the property of individuals and represents how individuals in an

organization generally perceive the organization. In a similar vein, Baer and Frese (2001) depict organizational climate as a contingency variable that support innovations being realized to their full potential. Whenever something new is introduced into an organization, smooth adoption can be achieved when the organization provides supportive climate and psychological safety, i.e., formal and informal organizational practices guiding open interactions within the work environment, to its members. It is also true that organizational climate continues to play an important role after an innovation has been implemented. A new ICT introduces a high degree of uncertainty with respect to communicative interactions through the ICT. Thus, the extent to which the work environment is characterized as being open to an active approach toward the system and their tasks is important for continued use of the system.

Along with the long tradition of organizational climate research, Tannenbaum and Bruno (1994) propose the positive relationship between innovation-supportive climates and employee involvement, communications, and team building processes. They also postulate the positive relationship between innovation-supportive climates and innovation adoption. The underlying assumption of their speculations is that innovative climates are likely to facilitate employee's active involvement in organizational processes such as innovation adoption, decision making, teamwork, and communications. Tidd, Bessant and Pavitt (1997) also argue that the successful implementation as well as sustained use of an innovation depends on a supportive and encouraging organizational environment where new ideas can emerge, be tested, and be deployed without psychological threats to its members. Empirically, Klein, Conn and Sorra (2001) found that an organization' innovation climate was positively related to the implementation of an Manufacturing Resource Planning. Baer and Frese (2003) also found the positive relationship between individual perceptions of innovation climate and their enactment of a process innovation. Even if there has been no empirical test about the relationship between innovation climate and discontinuance, it is reasonable to speculate that the probability of

discontinuance will increase if individuals perceive that the climate in the organization has not been favorable to innovations. Hence, the following is proposed:

H6-4: Organization's innovation climate will be negatively related to individual discontinuance.

The Relationship Between Discontinuer Types and Antecedents

IDT suggests that earlier adopters rely on external information and rational evaluations of an innovation when they make a decision to adopt it, while later adopters base their decisions substantially on interpersonal normative influence. Since this research assumes that replacement and partial discontinuers are more likely to resemble earlier adopters, they are suggested to be dependent on independent rational evaluations of their usage of the adopted innovation, as well as their perception of technological features when making a discontinuance decision. Because indifferent and reserved discontinuers share the characteristics of later adopters, they are more influenced by normative interpersonal influence. Thus, I hypothesize the following:

H 7-1: Replacement discontinuers and partial discontinuers are more likely to be influenced by perceptions of technological attributes and use-related outcomes than are indifferent discontinuers and reserved discontinuers.

H 7-2: Indifferent discontinuers and reserved discontinuers are more likely to be affected by social influences and organizational interventions than are replacement discontinuers and partial discontinuers.

Relationship Between Discontinuance and Organizational Communication Satisfaction

We commonly assume that, within organizations, internal knowledge demands drive certain types of ICTs, such as Intranets, that are the concern of the current study. Yet, although a tradition of technology diffusion and acceptance research provides various theories and models, research on individual innovation acceptance and use in organizational environments remains limited. Furthermore, the research conducted in organizational contexts seldom deals with

organizational outcomes of technology acceptance and use, which is in part due to the consideration of the level of individual usage as identical with system success in an organization. Different from technology diffusion and acceptance research, research on ICT implementation failure has noted that implementation failures as well as underutilization of implemented ICTs are common (Cooper & Zmud, 1990; Dalcher & Genus, 2003; Tasi, Chien, Hsu, & Leu, 2005). However, those studies also exclusive focus on antecedent factors of implementation failures and do not deal with how the failures affect organizational outcomes or reactions of the organization. Hence, little is known about what benefits an organization gains from its members' use of an ICT. Moreover, it is also unknown how different degrees of utilization of an ICT cause variations in organizational outcomes.

The above shortcomings identify at least two interesting questions in relation to the current study: whether continuers and discontinuers of an ICT innovation perceive their organizational behaviors differently; and whether there are variations across different types of discontinuers regarding their perception of their behaviors. The current study employs organizational communication satisfaction as a second-order dependent variable that may be influenced by discontinuance and the evel of usage, since communication is one of the most important concerns of organizations when implementing ICTs (Lin, 2003). In addition, empirical studies have well supported the correlations between poor communication and low commitment, reduced productivity, increased absenteeism, and higher turnover (Conner, 2003; DeSantics & Monge, 1999; Hargie et al., 2002). Yet, as there has been no study regarding outcomes of post-adoption behaviors, the following research questions are proposed.

RQ 1: Do discontinuers and continuers differently perceive organizational communication satisfaction?

RQ 2: How do the types of discontinuance affect organizational communication satisfaction?

SUMMARY OF THE CHAPTER

At the beginning of this chapter I outlined a general research question to guide the primary study. Next, I presented the anticipated relationships of five sets of antecedents with a principal dependent variable, discontinuance. The overarching research question and hypotheses allow the researcher to investigate the different effects of various antecedents on discontinuance in comparison with their effects on continuance. My additional concern, however, was to introduce different types of discontinuance and explore their relationships with the antecedents, supplementary hypotheses were proposed to inquire the relationships of the sets of antecedents with types of discontinuance. I then introduced a secondary dependent variable, organizational communication satisfaction, and present two research questions to investigate how the perception of communication satisfaction varies across different types of discontinuers.

CHAPTER 4: METHOD

The purpose of this chapter is to present the measurement of the variables and the data collection procedures used to explore the research questions and to test hypotheses put forth in the previous chapter. First, the results of a pretest conducted to validate some constructs developed for the primary study are presented. Second, the nature of samples and the data collection procedure for the primary study are described. Third, the scales used to measure the constructs for the primary study are delineated, classified in order of newly developed scales and pre-established scales. Ahead of those discussions, however, an overview of Intranets is offered in order to provide a background of the primary study.

Intranet

Definitions of intranets are not abundant, but frequently vary. However, most include a description of an intranet as a network based on the transport control protocols/internetworking protocols (TCP/IP) belonging to an organization, which are located within its firewall and accessible only by the organization's members (Eder & Igbaria, 2001; Horton, Buck, Waterson & Clegg, 2001; Phelps & Mok, 1999; Savaya, Monnickendam & Waysman, 2006). Thus, Intranet is by definition an internally focused application that is currently being used to disseminate information throughout an organization or to facilitate cross-departmental teams. Although an intranet is organizationally bounded, it can be extended to connect key customers, suppliers, and business partners (Passmore, 1996; Phelps & Mok; Vowles, 1996), sometimes referred to as an extranet. In a technical sense, an intranet is a subset of the Internet, and therefore shares all functions that the Internet might be able to provide.

In recent years, the open architecture of Internet technology has become attractive to an increasing number of organizations because it enables the standardization of information system interfaces as well as the connectivity of disparate systems (Eder & Igbaria, 2001). As a result, Internet technology is rapidly being deployed for internal organizational connectivity to

heterogeneous system connectivity, and acts as a single common user interface to many different kinds of applications (Carr, 1996; Taylor, 1996). It is generally accepted that intranets provide benefits by granting immediate access to information that is cost-effective, up-to-date, and versatile. Intranet is acknowledged as the solution to organizational communication across geographically and functionally distributed sites, collaboration through knowledge management, and progress towards the "paperless office." Intranet is supposed to deliver organizations opportunities to create, develop and share knowledge beyond organizational barriers. As a result, the implementation rate for intranets has been rapid (Eder & Lgbaria).

Despite the rapid deployment rate of intranet and growing interest in Intranet implementation, relatively little research has been devoted to understanding Intranet usage by organizational members. For instance, although negative reports have surfaced regarding hidden costs, performance limitations, underutilization, and organizational resistance (Connolly & Thorn, 1990; Constant, Kiesler, & Sproull, 1994; Kalman, Monge, Fulk, & Heino, 2002; Savaya et al., 2006) it is uncertain what contributes to the continuous utilization or underutilization of Intranet technology throughout an organization once the Intranet has been put into place. Additionally, organizational outcomes associated with the integration of Intranet applications have not been clearly identified.

Pretest

Since very little empirical work exists in exploring different types of discontinuance, established scales are not available except for replacement discontinuance and disenchantment discontinuance (Parthasarathy, 1995). Therefore, one of major tasks in this dissertation is to develop reliable scales for newly developed discontinuance types such as reserved, indifferent, and partial discontinuance. This was accomplished and the scales were pretested on a sample of

82 weblog[6] adopters. Though the pretest was conducted within the context of a weblog, it is believed that the results provide a rich source of the primary study[7].

The first step in the data collection procedure was to secure an email list of pre-test participants. For this purpose, the Korean Graduate Student Association at a large public university in the south was contacted and its assistance and permission were sought. The association agreed to provide with an email list that contained information of about 400 Korean graduate students who currently enrolled in the university. In order to collect the data, a survey was hosted as a web page and respondents asked to visit the page to respond to the questions. The first wave of the data collection process consisted of 368 emails after eliminating duplicate or unworkable ones. Seven days later, a reminder was sent to those individuals who had not responded. A total of 93 responses were collected. Yet, a few of them did not complete the survey, which resulted in 82 usable responses consisted of 31 women and 49 men.

Discontinuers were discriminated from continuers based on the dichotomous question - whether he or she is currently using the weblog. On average, the participants had 3.48 years of the weblog experience, yet discontinuers had as much experience as continuers did. The discontinuance rate of the weblog was substantially high (59.5%)[8]. The discontinuance rate for women (55%) was lower than that of man (69.5%) and the difference was statistically significant at $p < .1$ (χ 2= .08).

As Parthasarathy (1995) argues, different types of discontinuance may not be mutually exclusive. For instance, an adopter may discontinue using an innovation due to its contextual inadequacy brought on by the perception of its lack of usefulness in a given context. However, the same reason may also lead the adopter to replace it with another innovation, and therefore

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6 The studies ICT application was Cyworld. It is one kind of weblog that has been very popular in Korea.

7 While the difference in contexts restricts the generalizability of the pretest's results, the value of the pretest can be preserved in testing the validity of new constructs. In addition, the pretest provides with empirical data in limited knowledge regarding discontinuance.

8 This percentage appears as much lower than the percentage shown in Table 6 where full users consisted of only 7.3% of the respondents. It is because partial discontinuers and a small portion of indifferent discontinuers replied that they are still using the technology.

this individual could be characterized as both a reserved discontinuer and a replacement discontinuer. Thus, following Parthasarathy's suggestion, the pretest measured the discontinuance typology both categorically and continuously, and labeled types of discontinuers and types of discontinuance respectively. The categorical items measured the primary reason for discontinuance, while the continuous scales measured the strength of all the various reasons for discontinuance. It was expected that any particular discontinuer category would score significantly higher on its corresponding continuous scale than other scales. Tables 4 and 5 show the items that were included in the pretest. One item each of reserved continuance, indifferent and partial discontinuance scale was discarded due to its low correlation with other items in the scale.

As shown in Table 6, indifferent discontinuers and partial discontinuers made up a relatively large percentage of the population compared to other types of discontinuers. Those who fully utilize all features of the technology only compose of 7.3% of all respondents (n = 82). The crosstab table, categorized by gender, associated with types of discontinuers is given in Table 7. The results of the crosstab analysis indicated that discontinuer types were unevenly distributed across gender, $\chi 2 = 33.60$, $df = 12$, $p < .01$. Women were more likely to be indifferent and partial discontinuers than men while men were more likely to be disenchantment and replacement discontinuers.

For continuous measure of types of discontinuance, a principal component analysis extracted four components (see Table 8). Disenchantment items and replacement items appeared not to discriminate each other. Indifferent discontinuance, reserved discontinuance, and partial discontinuance appeared as distinct components as expected. Reliabilities of newly developed types of discontinuance were acceptable: indifferent discontinuance, $\alpha = .84$; reserved discontinuance, $\alpha = .85$; and partial discontinuance, $\alpha = .74$).

Table 4: Categorical Measure of the Types of Discontinuers

Question	Please check the one scenario that best identifies the main reason that you ended your use of Cyworld.
Replacement Discontinuance	I decided to use another technology (e.g., traditional weblog)
Disenchantment Discontinuance	I become dissatisfied with Cyworld, and have not use similar types of technologies
Indifferent Discontinuance	There is no specific reason or critical incident that induced me to stop using Cyworld
Reserved Discontinuance	I am willing to use Cyworld in the future if my situation changes (e.g., if I come back to Korea, if I have more time)
Partial Discontinuance	I am selectively using certain features of Cyworld but not all features of it

Table 5: Continuous Scales for the Types of Discontinuance

Construct (Operational Definition)		Items
Replacement Discontinuance (The degree to which an individual ended his or her use of the system in order to replace it with an alternative system)	1	I ended my use of the system because I found another service that work better
	2	I ended my use of the system because I found an alternative service that had better features
	3	I ended my use of the system because I found other services had more options than the system
	4	I ended my use of the system because I felt that the functional performance of other services was superior
Disenchantment Discontinuance (The degree to which an individual ended his or her use of the system due to dissatisfaction with it)	1	I ended my use of the system because I was unhappy with its performance
	2	I ended my use of the system because I was generally dissatisfied with it
	3	I ended my use of the system because I was unhappy with one or more features of it
	4	I ended my use of the system because I was unhappy with overall functional performance of it
Indifferent Discontinuance (The degree to which an individual ended his or her	1	I ended my use of the system because I found that I was hardly using it
	2	I ended my use of the system because I became indifferent to it

use of the system without any specific reason)		over time
	3	I ended my use of the system because I lost my interest in it without any specific reason
Reserved Discontinuance (The degree to which an individual reserves the system for future use even if he or she is not using it currently)	1	I reserve my homepage for a better time even if I am not using the system currently
	2	I will resume my use of the system if I have more time than I do now
	3	I will reuse the system if my friends ask me to do
Partial Discontinuance (The degree to which an individual selectively discontinues certain features of the system)	1	I am using the system currently but I closed some features such as bulletin board, photo gallery, or others
	2	I often visit homepages of my friends to leave messages without maintaining my own homepage
	3	I perceive some features of the system are useful but some are not

Table 6: Frequencies of Different Types of Discontinuers

Categorical Differentiation	N	%
Disenchantment discontinuers	9	11.0
Replacement discontinuers	7	8.5
Indifferent discontinuers	23	28.0
Reserved discontinuers	6	7.3
Partial discontinuers	22	26.8
Full user	6	7.3

Table 7: Frequency Distribution of Discontinuer Types Categorized by Gender

Discontinuer Types	1	2	3	4	5	Total
Women	2	12	2	2	11	29
Men	7	11	4	5	11	38

1 = disenchantment discontinuers; 2 = indifferent discontinuers; 3 = reserved discontinuers; 4 = replacement discontinuers; 5 = partial discontinuers.

Table 8: Principal component analysis

	Components			
	1	2	3	4
Replacement Discontinuance1	*.947*	.057	.055	-.073
Replacement Discontinuance 2	*.909*	.062	.108	-.093
Replacement Discontinuance 3	*.863*	-.021	.016	.072
Replacement Discontinuance 4	*.909*	.115	.073	.146
Disenchantment Discontinuance 1	*.864*	.148	-.215	-.128
Disenchantment Discontinuance 1	*.763*	.274	-.176	.009
Disenchantment Discontinuance 1	*.736*	.214	-.366	.164
Disenchantment Discontinuance 1	*.778*	.210	-.356	.202
Indifferent Discontinuance 1	.141	*.851*	-.034	-.069
Indifferent Discontinuance 2	.196	*.835*	.185	-.101
Indifferent Discontinuance 3	.262	*.609*	-.201	.334
Reserved Discontinuance 1	-.241	.049	*.799*	.172
Reserved Discontinuance 2	.055	.062	*.909*	.115
Reserved Discontinuance 3	-.093	.106	*.845*	.157
Partial Discontinuance 1	-.084	.041	.142	*.831*
Partial Discontinuance 2	.351	.027	.033	*.751*
Partial Discontinuance 3	-.075	.000	.286	*.796*

Table 9: MANOVA Result of the Comparisons among Different Types of Discontinuance

	Replacement Discontinuer (n = 5)		Indifferent Discontinuer (n = 12)		Reserved Discontinuer (n = 6)		Partial Discontinuer (n = 8)		F
	M	SD	M	SD	M	SD	M	SD	
Replacement Discontinuance	*5.20*	1.43	2.82	1.07	2.38	1.36	2.56	1.34	3.82*
Indifferent Discontinuance	4.40	1.36	*5.02*	.65	3.75	1.40	3.43	1.55	2.69*
Reserved Discontinuance	3.73	1.19	3.91	.90	*5.17*	.46	3.79	1.47	6.94*
Partial Discontinuance	3.00	.74	3.53	1.01	2.44	.85	*3.96*	1.13	2.53*

* Overall MANOVA significant at $p < .001$ (for Pillais, Hotellings, Roy, or Wilks tests).

As can be seen from Table 9, the overall MANOVA, where types of discontinuers was a dependent variable and types of discontinuance were independent variables, was highly significant, irrespective of which methods were used. Also, the between group *F* tests were all significant at $p < .05$. This suggests that there were strong differences between the four groups with respect to scores on the continuous items. The results also showed that each type of discontinuer scored higher on the continuous measure for each discontinuance type (e.g., replacement discontinuers scored higher on the replacement scale that did other categories of discontinuers).

Primary Study

This section aims to provide the description of the primary study context and potential respondents. This is followed by a presentation of the various scales that are used for the primary study. The developmental processes for newly created constructs and the selection and modification procedures for established constructs will be also described.

ORGANIZATIONAL CONTEXT

This research investigates an information communication technology, the Intranet[9], implemented at an organization, A&P,[10] in Korea. A&P is a non-profit organization operated through donations and annual membership fees. The organization is formed for various political activities including supporting politicians whose political views are consistent with those of A&G. My first contact with the organization was during the initial forming stage of the organization. At that moment, I was working for a presidential candidate as a communicative strategy consultant, and for about a year my contact with the organization continued. I

[9] A&P did not give a specific name to its intranet. In order to avoid confusion, A&P Intranet is used whenever the researcher denotes the Intranet implemented in the organization.

[10] A&P is a pseudonym of the organization since the organization asked the researcher not to reveal the name of the organization due to the consideration of its public image.

participated in important meetings of the organization and also had formal and informal conversations with its members. In addition, I was permitted to access the Intranet and had a chance to monitor the activities that occurred within the system. Some of my initial recognition of underutilization and the seemingly high rate of discontinuance stemmed from my own observation and informal conversations with its users.

The Intranet in A&P was implemented in April 2007. A&P Intranet had several features, such as organizational announcement, individual email, group mail, discussion group, and search function within and outside of the Intranet. The implementation decision was made by top managerial people who were persuaded by the Cyber-network team of the organization. There was only one official meeting concerning the implementation of the Intranet, and I was invited to participate in it. The meeting took about thirty minutes and the number of participants was less than ten. There was a presentation made by the Cyber-network team regarding its features and potential benefits. The implementation decision was made quickly and verbally, apparently because participants were already informed on the issue and persuaded by the Cyber-network team. The head of the Cyber-network team reported that the team would select members who could access the system, and prepared a small booklet in order to facilitate proper usage of the system. Unlike other Intranet usage contexts, where all employees or organization members are permitted to use the system, this organization set the limit for connection to the Intranet with the support of the Cyber-network team. This was due to security concerns, as the organization had been rapidly expanded during the election campaign and it needed a high degree of control of delicate and important information in order to avoid information spillage. During the next week after the meeting, an official announcement of the intranet implementation was made by the president of A&P.

THE CHARACTERISTICS OF A&P INTRANET USERS

This initial characterization of the Intranet users is based on the database file provided by the Cyber-network team and my own observation. At the moment of the intranet implementation,

the total membership of A&P was about 30,000; at the end of 2007 the number had increased to over 40,000. A&P had over 30 local branches nationwide. About 400 members of the organization were authorized for intranet usage, and the number remained relatively stable during the time. They typically occupied higher positions of the organizational charter, such as leaders or senior members of each team, local leaders, senior consultants, etc. They were highly educated and their average age was 39. They usually had highly respected job experiences (e.g., government employees, newspaper reporters, professors, lawyers, etc.) before joining the organizations, and a small portion of them kept their position in other organizations as primary jobs. They were highly motivated by liberalistic political ideas. They were a relatively homogenous population in comparison to other organizational members whose composition reflected the general Korean population with regard to age, education, occupation, gender, etc. Therefore, it is fair to say that those who were authorized to use the Intranet were a special subset of the organization.

In addition, based on the Cyber-network team's preliminary research on potential users, they had previous experiences with using intranets, averaging over 3 years and ranging from 1 to 18 years. Based on this, the Cyber-team reported during the implementation decision meeting that it would not be necessary to provide an official training except for a small instruction guide, and users would easily figure out the features provided by the Intranet. The Cyber-team's confidence in potential users' ability to use the Intranet proved adequate. The Cyber-team confirmed that after distributing an access code to each individual through his or her email, almost everyone logged into the Intranet in three days after the implementation, yet the team got virtually no calls or emails regarding how to use certain features.

MEASUREMENT

In what follows, the various steps used in the measurement process are first identified. Next, scales for the primary study are presented. In describing the scales, a brief account is given

on how the scale was created or changed based on the results of the pretest (if a newly developed scale), or its previous reliability and how the scale was modified (if an existing scale).

The measurement process can be divided into the following logical steps in order to determine: (a) whether an organizational member is a continuer or discontinuer, (b) if a discontinuer, what types of discontinuer, (c) the overall duration of adoption of intranets,
the overall level of utilization of the Intranet, (d) the overall levels of perceived usefulness, ease of use, and compatibility, (e) the overall levels of perceived enjoyment, satisfaction, and behavioral control, (f) the overall levels of perceived subjective norm and image, (g) the overall levels of perceived organizational and top management support, and voluntariness, (h) demographic factors, e.g., age, gender, and departmental affiliation, and (i) other individual characteristics e.g., whether risk taking and independent.

Based on this structure, the relevant constructs were identified. In what follows, the constructs that will be used for the primary study are identified and explained, organized by the order of newly developed and pre-established scales. Pre-established scales are minimally modified to suit the situation at hand. Unless indicated otherwise, all items are measured with reference to a seven-point Likert scale with higher scores indicating stronger presence of the construct in question. The final items used to measure the constructs are included in the Appendix D.

Scales Developed for the Primary Study

The scales developed in this research fall into the following general categories: (a) scales developed specific to behavior with regard to the Intranet e.g., utilization level, duration of experience, (b) scales developed to identify different types of discontinuance, e.g., replacement, , disenchantment, reserved, indifferent, partial, and political and (c) other miscellaneous measures, e.g., age, gender, departmental affiliation.

Utilization level

For the primary study, the overall level of utilization will be measured using two different measures, the frequency of use and the scope of utilization. The frequency of use is measured using a seven-point item ranging from "never" to "more than once a day". The development of the scale for the scope of utilization is supported by some empirical studies that indicate that measuring the frequency only may not adequately capture the usage behaviors of organizational members. For instance, Saga and Zmud (1994) found that organizational members differently utilize a technology's features. For instance, some members used more of the features in order to accommodate a more comprehensive set of work tasks. Researchers also found that users often struggle with utilizing certain features to support their jobs (Robey et al., 2002; Saga & Zmud). The scope of utilization for the primary study is defined as *the degree to which the Intranet was used by an organizational member for a variety of purposes*. The scope of utilization is operationalized by six-items ranging from "never" to "more than once a day." The items are developed in relation to the specific features that the A&P Intranet provides; such as send email, read email, send information, read announcements, participate in discussion groups, and browse the news (from internal and external sources).

Scales for types of discontinuance

The six types of discontinuance are crucial to this dissertation since many of hypotheses and research questions are concerned with them. Five types of discontinuance, namely replacement, disenchantment, reserved, indifferent, partial discontinuance were extensively pretested following which a few items were discarded. For instance, reserved, indifferent and partial discontinuance were originally measured by four items for each construct. However, the pretest warranted the exclusion of one item for each construct. For the primary study, one item for reserved, indifferent, and partial discontinuance is subsequently added, leading to a four total items for each construct, as contained in the Appendix D. Replacement and disenchantment discontinuance in the pretest were separately measured by four items for each construct. Even if

these two scales were found to load unidimensionally in the pre-test, it is reasonable to separate them since these two types of discontinuance have been continuously referred in diffusion literature. Thus, disenchantment and replacement discontinuance are included in the main study. All items used in the pretest to measure discontinuance types were minimally revised to make them the A&P Intranet specific. In addition, political discontinuance is newly introduced into the primary study in order to capture the relationship between political and power structure of the organization and post-adoption behavior. The continuous measure for political discontinuance consists of five items (also see Appendix D).

Through the pretest, the categorical measure for types of discontinuers was validated against continuous measures of discontinuance types. However, the items were also needed minimal adjustments for the primary study context. The categorical measure for political discontinuer is created for the primary study. In addition, the pretest showed that there were a substantial number of respondents (over 10%) who did not answer to the categorical question that required respondents to identify their major reason for discontinuance. This indicates that the categories provided by the pretest might not correspond to their primary reason for discontinuance. Therefore, 'other' category, including the request for the specification of their primary reason for discontinuance, was subsequently included. Please refer to the Appendix A for the specific items that will be used in the primary study.

Miscellaneous items

In addition to the constructs indicated above a few single-item measures are included for the primary study to ascertain the following: (a) overall duration of Intranet adoption, (b) departmental affiliation (10 categories), (c) age and gender. These items are contained on the last part of the questionnaire except the overall duration of Intranet adoptions (See Appendix E).

Established Scales Used

Several constructs will be measured in the primary study using pre-established, multiple-item perceptual scales. The established scales included in the primary study fall into the following general categories: (a) scales for user attributes e.g., individual innovativeness, self efficacy, and continuance commitment, (b) scales for perceived technological attributes, e.g., usefulness, ease of use, and compatibility, (c) scales for social factors e.g., subjective norm and image, (d) scales for organizational intervention e.g., organizational support, top management support, voluntariness and organization's innovation climate, and (e) other constructs, e.g., organizational communication satisfaction, risk taking, and independent judgment making. Initial scale items were taken from previously validated measures in ICT research and reworded to relate specifically to the study context - continuance/discontinuance of the Intranet system for managing internal communication in the organization.

User attributes

Researchers have proposed several alternative methods to measure personal innovativeness (Agarwal & Prasad, 1998; Hurt, Joseph, & Cook, 1977; Goldsmith & Hofacker, 1991; Leavitt & Walton, 1975; Rogers, 2003), yet there are at least two distinct understandings of innovativeness. First, as suggested by Rogers, innovativeness is defined as "the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a social system" (p. 280). Second, opposing to the approach of operationalizing innovativeness as the time of adoption, many researchers understand innovativeness as an inherent individual trait. Based on the latter understanding, Agarwal and Prasad developed the scale of personal innovativeness in the domain of information technology (PIIT). The scale was consisted of four items and the reported Cronbach's alpha for the scale was 0.84 in their original study. The primary uses PIIT to measure personal innovativeness with a replacement of the phrase 'information technologies' with the phrase 'information communication technologies.'

Compeau and Higgins (1995) applied Bandura's (1986) Social Cognitive Theory to the context of computer utilization and developed the computer self efficacy scale, consisting of ten items measured with ten-point scale. Later, Venkatesh et al. (2003) selectively adapted the scale for the context of general ICTs. Their scale consisted of four items and each items had loadings greater than .80[11]. The current study uses Venkatesh et al.'s self-efficacy scale without modification. Continuance commitment scale was developed by Allen and Meyer (1990) as a part of organizational commitment scale. This scale consisted of nine items and the reported reliability was .76. Due to the length of the questionnaire, four items, which seem to be most applicable to the primary study, were selected and included with the replacement of the phrase 'the organization' by the phrase 'the Intranet.' The four selected items are included in the Appendix D.

Technological attributes

Technological attributes consisted of perceived ease of use, perceived usefulness, and compatibility. Originally, the perceived ease of use and the perceived usefulness scale were developed by Davis (1989) in the context of PROFS email and the XEDIT file editor. Each scale consisted of six items and its reported Cronbach's alpha ranged from .86 to 93 for the perceived ease of use scale, and .97 for the perceived usefulness scale. For the primary study, two items of each scale were dropped based on their loading scores reported in Davis's study, which resulted in four items for each construct.

The construct of compatibility was conceptualized by Rogers (1983) and operationalized by Moore and Benbasat (1991). The original scale developed by Moore and Benbasat consisted of four items and the Cronbach' alpha for the scale ranged from .83 to .88 in their study. However, one item was excluded for the primary study since its loading score was below .60, which resulted in three items to measure the construct of compatibility.

[11] They did not report the overall reliability figure of the scale.

Use-related outcomes

Use-related outcomes are made up of three constructs for the primary study: satisfaction, perceived behavioral control and perceived enjoyment. The satisfaction scale for the primary study was selectively adapted from Olaniran's (1996) seven-item satisfaction scale of a computer-mediated communication system whose reliability figure was .86. His original scale captures four different dimensions such as information relevance, information generation, information evaluation, and participation in decision making. Among those dimensions participation in group decision making was discarded due to its weak pertinence to the technology that the primary study is exploring. In addition, information relevance was subdivided into information accuracy and information timeliness. One global satisfaction item, satisfaction with overall experience, was added following the suggestion Bailey and Pearson (1983) and Keyton (1991), which resulted in five items to measure the construct of satisfaction.

Perceived behavioral control was initially conceptualized by Ajzen (1991) and operationalized by Taylor and Todd (1995). Taylor and Todd's original scale made up of three items and the reported reliability figure was .70 in their study. For the primary study, one item of the original scale, which apprehended the possession of necessary resources and knowledge simultaneously, was split into two separate items. The perceived enjoyment scale was adapted from Davis et al. (1992). The scale consisted of three items and had a Cronbach's alpha of .90. The primary study uses those items with the replacement of the phrase 'the system' by the phrase 'the Intranet.'

Social influences

For exploring social influences on discontinuance, the constructs of subjective norm, image, and perception of critical communication partner were included in the primary study. The construct of image was conceptualized by Rogers (1983) and operationalized by Moore and Benbasat (1991). Moore and Menbasat's scale consisted of five items and had a Cronbach's alpha of .87. Later, Venkatesh et al. (2003) selectively adapted three items from the original

scale. The primary study uses Venkatesh et al.'s three-item scale with the replacement of the phrase 'the system' by the phrase 'the Intranet.'

Subjective norm is measured with three items: two items from Davis et al. (1989) and one from Taylor and Todd (1995). Though Davis et al.'s two-item scale obtained the reliability coefficient of .79 it is reasonable to add one more item in order to eschew the possible disadvantage of the low factor loading of a certain item. The items were minimally revised to meet the primary study context, e.g., replacement of 'people' with 'organizational members' and replacement of 'the system' with 'the Intranet.' In addition, perception of critical communication partner is measured with two items. The scale was developed by Trevino et al. (2000) and its reported reliability was .73. The two items are included in the primary study with minimal revisions such as the replacement of the phrase 'the system' by the phrase 'the Intranet.'

Organizational intervention

Organizational intervention consists of three constructs: perceived voluntariness, organizational support and top management support. The perceived voluntariness scale was adapted from Moore and Benbasat's (1991) two-item scale. The obtained reliability coefficient in their study was .82. However, with the same scale Agarwal and Prasad (1997) reported a Cronbach's alpha of .45. Thus the primary study adds one more item - "my use of the Intranet was voluntary" - to the original scale.

The scale for the construct of top management support is adapted from Grover (1993). The scale consisted of three items and had a Cronbach's alpha of .95. The primary study uses all three items to measure the construct with the replacement of 'a customer based inter-.organizational system' with 'the Intranet.' The scale for the construct of organizational support is adapted from Igbaria et al. (1995). Their original scale for organizational support encompassed two broad categories of support with eight items, Cronbach's alpha = .82: (a) end-user support such as the availability of assistance, specialized instruction and guidance in using ICT applications; and (b) top management support. Later, Igbaria, Cragg and Cavays (1997) labeled

the end-user support category ‘intra-organization support’ separately from top management support, and reported that the ‘intra-organizational support’ scale had a Cronbach’s alpha of .92. Without modification three end-user support items are included in the primary study apart from the scale of top management support.

Tannnebaum and Dupuree-Bruno (1994) developed HR department’s innovation climate scale that intended to assess members' perception of department's flexibility and adaptiveness, willingness to take risks, tolerance of failure in trying new ideas, and recognition of and reward for new ideas. The scale consisted of four items and the obtained reliability from their original study was .86. With minor modifications such as the replacement of the phrase ‘department’ by the phrase ‘organization’ all four items are included in the primary study.

Organizational communication satisfaction

The organizational communication satisfaction scale, as operationalized by Downs and Hazen (1977), will be used in part. They conceptualized organizational communication satisfaction as multidimensional and the primary dimensions include (a) general organizational perspective, (b) organizational integration, (c) personal feedback, (d) relation with superiors, (e) horizontal-informal communication, (f) relation with subordinates, (g) media quality, and (h) communication climate. However, their scale consisted of 40 items and it is necessary to reduce the number of items on the scale given the length of the questionnaire. Thus one item for each dimension that seems to be most applicable to the primary study was selected and included. The eight selected items are included in the Appendix A.

Other Constructs Used in the Current Research

The scale for risk taking behavior and the scale for independent judgment making are included into the primary study in order to compare discontinuers with continuers as well as across different types of discontinuers. The items for risk taking behavior were selected from the scale developed by Raju (1980) and its reported reliability figures were ranged from .80 to 0.83

in his study. One point of note is that the original scale had eight items. However, given the length of the questionnaire, it was necessary to reduce the number of items from this scale without losing its properties, resulting in two items out of four positively worded and two items out of four negatively worded items. The independent judgment making- discontinuance scale (IJMD) was conceptualized and operationalized by Parthasarathy (1995). The items are specific to the discontinuance decision making independent of the communicated beliefs of others. Lower scores on the construct indicate greater propensity to make judgment independently. The scale had satisfactory metric qualities as demonstrated by a reliability coefficient alpha of .95. The primary study contains all items of IJMD with the replacement of the phase 'this service' with the phrase 'the Intranet.'

DATA COLLECTION

From the consideration of the purpose of this dissertation, the primary study utilizes a survey as an efficient method of data collection. The purpose of this dissertation is twofold; description and explanation. For the description purpose this dissertation concerns about the distribution of the phenomenon of discontinuance in the study population and among subgroups of the population. For the purpose of explanation this dissertation aims to test relationships between variables, which requires clearly defined variables and a specific model of the expected relationships. Most variables employed in the primary study have been proven to be reliable and the proposed relationships are theoretically grounded expectations about how and why the variables ought to be related. Moreover, the primary study not only assumes that relations exists between the variables, but assumes directionality. Overall, survey research is well suit for the primary study in order to gather information about the characteristics, behaviors and perceptions of a relatively large group of people and to answer questions about how and why discontinuance is occurring.

As mentioned, the participants for the primary surveys were recruited from email lists of A&P. It was explained to the organization that the email addresses or names of participants are

not needed. As a result, a message announcing the survey and the website link to the survey was sent through the email mailing list by the organization on behalf of the researcher. These emails described the project and contain a website link for participants to retrieve the survey and participate voluntarily, as well as anonymously. Any organizational members who have a right to access to the A&P Intranet were eligible to participate. No incentives were given to the participants for completing the survey. Participants were asked to complete the survey within one week. A reminder was sent out to those who had not filled out the survey in order to increase the total member of responses from the population. The submitted surveys were automatically collected on a commercial web server rather than the organizational server on order to reduce participants' potential risks.

CHAPTER 5: ANALYSIS AND RESULTS

This chapter is divided into four parts. The first part discusses statistical analysis and the logic of the methods used to test the hypotheses and to answer the research questions. The second part presents the sample characteristics and statistics for independent as well as dependent variables. The third part offers the results of the analyses that directly access the various questions and hypotheses The last part presents additional findings that can be relevant to the discussion of barriers to continued use of the Intranet and post-adoption behaviors with respect to various modes of Intranet use such as interacting sending and reading emails, sending information to a certain group or groups, participating in discussion groups, and searching for organizational information via an internal search engine.

Analysis[12]

Three forms of statistical analyses were mainly used to test the hypotheses and explore the research questions. These are: Multivariate Analysis of Variance (MANOVA) with univariate post-hoc comparison tests, Binary Logistic Regression, and Linear Regression and Binary Correlation. Research questions that involved either discriminating between discontinuers and continuers or among different types of discontinuers were tested using one-way MANOVAs followed by post-hoc univariate *F* tests. MANOVA, with post-hoc multiple comparison tests, is useful to test hypotheses or research questions that are concerned with means and when the sample can be divided into independent categories (e.g., continuer vs. discontinuer, types of discontinuers), facilitating the comparisons of means and variances between cells. Two different MANOVA analyses were run; the first involved distinctions between continuers and discontinuers (this included RQ1 and RQ2), the second concerned the typology of discontinuers (this included H1 and RQ3).

[12] Results of the current study reported the significance at $p < .10$ level whenever possible, since the sample size of the study is moderate or small when the total sample is divided into sub groups.

A MANOVA test was considered a superior test to several univariate analysis of variance (ANOVA) tests or multiple *t*-tests since by including all variables in the statistical test performed, the chances of Type-1 error are greatly reduced. Each of the MANOVA equations was tested using three different established testing methods: the Pillais test, the Hotellings test, and the Willks test. Once it was determined if the overall MANOVA was significant, one-way post-hoc univariate *F*-tests were conducted to find the variables that caused the variance.

Hypotheses concerned with the predictive power of various independent variables on the presence of discontinuance were tested using Binary Logistic Regression. Binary Logistic Regression is useful for situations to test hypotheses that aim to predict the presence or absence of an outcome or a phenomenon (e.g., discontinuance vs. continuance) based on values of a set of independent variables. A Binary Logistic Regression was used to test most of the hypotheses (this included H2 though H6). Logistic regression coefficients were included to estimate odds ratios for each of the independent variables in the model.

Research Question RQ1 and Hypothesis H7 were concerned with the estimations of the coefficients and tests for significance of various independent variables. Two different linear regression analyses were performed; the first involved significance tests of regression coefficients of independent variables when predicting the frequency of the Intranet use of discontinuers as well as continuers (RQ1); the second involved significance tests of regression coefficients of variables when predicting the frequency of the Intranet use of replacement/partial/ disenchantment discontinuers and indifferent/reserved discontinuers (H7). Additionally, correlation tables for discontinuers and continuers were provided to explore the associations among variables (RQ1).

For the other open-ended questions, such as participants' descriptions of the causes of discontinuance, all responses were reviewed and the categories were created. The data obtained from those open-ended questions were transcribed and subjected to thematic analysis, using a constant comparative method (Lindolf & Talyor, 2002). Qualitative research is largely inductive;

however, several concepts already identified by the review of the current study influenced the direction of the theoretical focus of obtained qualitative data. Based on this theoretical underlay, the written transcripts of the data were analyzed for over-arching themes to be examined. In addition, the themes were used to cross-check the validity of the results of the suggested quantitative analyses.

Descriptive Statistics for the Sample and Variables

In this section, a summary of the characteristics of the sample and statistical information about the variables used in hypotheses testing are presented. Prior to the presentation of the statistics, the management of missing data is briefly discussed.

MISSING DATA

Coping strategies for missing data are necessary to capitalize on the interpretive power of the available data. A two-step process was used to minimize the impact of missing data in the research. A total of 381 responses were collected by a web-based survey. Prior to the composition of the data set used in analysis, several responses (n = 8) were completely dropped from the data set due to skipped pages, blank major sections, and other anomalies associated with incorrect survey completion. Of this number, there were 3 discontinuers and 5 continuers dropped. This procedure resulted in a remaining group of 373 usable responses. Within the group of 373 acceptably completed surveys, missing data occurrences were minimal (resulting when the respondent failed to answer an individual question).

A second step was taken to approach the problem of missing data: imputation of missing values. Because the data set was of modest size, the researcher felt the necessity of maximizing the benefit of each participant's contribution. It was judged to be counter-productive to allow the statistics program to exclude a case in a multivariate analysis, simply for the lack of responses in one scattered predictor. This exclusion would have resulted in the exclusion of up to 34 cases across the entire data set in a complete multi-variable analysis. Hence, the choice was made to

impute missing data based on the 'linear trend at point' routine available in SPSS 16. This procedure uses a regression formula to replace missing values (see Little & Rubin, 2002, pp. 62-63). It should be also noted that the missing data were not imputed for demographics items such as gender and age.

CHARACTERISTICS OF THE SAMPLE

In this section, basic information about the sample characteristics is presented. These items of information were collected in the survey but were not all intended for use in hypotheses testing. Tables 10 though 13 include information about gender, age, work group membership and employment types. Table 14 shows the composition of discontinuers in the respondents.

STATISTICAL INFORMATION ABOUT VARIABLES

Statistical Verification of Discontinuer Types

One of the particular interests of the current study is to identify different types of discontinuers. Similar to the pretest, the main study also measured the discontinuance typology both categorically and continuously. Table 15 shows discontinuer types offered in the survey, of which any number could be checked by the respondents.

For continuous measures of types of discontinuance, a principal component analysis extracted five components. The results are similar to those of the pretest. Disenchantment discontinuance items and replacement discontinuance items appear not to discriminate each other. Indifferent discontinuance, reserved discontinuance, and partial discontinuance appear as distinct components as expected. In addition, political discontinuance, which was not included in the pretest, is also revealed as a discrete component (also see Table 16) of discontinuance.

Reliabilities of types of discontinuance are all acceptable: replacement discontinuance, α = .76; disenchantment, α = .72; partial discontinuance, α = .77; reserved discontinuance, α = .82; indifferent discontinuance, α = .85; and political discontinuance, α = .83. As can be seen from

Table 10: Frequency for Gender of Respondents

Category	Frequency	%	Valid %	Cumulative %
Male	252	67.6	69.0	69.0
Female	113	30.3	31.0	100.0
Missing	8	2.1		
Total	373	100.0	100.0	

Table 11: Descriptive Statistics for Age of Respondents

	N	Min.	Max.	Mean	Std. Dev.
Age	367	22.0	61.0	34.6	6.3

Table 12: Frequency for Work-group Membership of Respondents

Category	Frequency	%	Valid %	Cumulative %
Cyber	18	4.8	4.8	4.8
Strategy	33	8.8	8.8	13.7
Organizing	53	14.2	14.2	27.9
Policy	54	14.5	14.5	42.4
Public Release	28	7.5	7.5	49.9
Planning	46	12.3	12.3	62.2
Public Relations	25	6.7	6.7	69.9
General Affairs	45	12.1	12.1	81.0
Secretarial	32	8.6	8.6	89.5
External Cooperation	39	10.5	10.5	100.0
Total	373	100.0	100.0	

Table 13: Frequency for Employment Types of Respondents

Category	Frequency	%	Valid %	Cumulative %
Regular	340	91.2	91.2	91.2
Part-Time	8	2.1	2.1	93.3
Volunteer	25	6.7	6.7	100.0
Total	373	100.0	100.0	

Table 14: Frequency for Discontinuers of Respondents

Category	Frequency	%	Valid %	Cumulative %
Discontinuer	171	45.8	45.8	45.8
Continuer	202	54.2	54.2	100.0
Total	373	100.0	100.0	

Table 15: Frequency for Discontinuer Types of Respondents

Category	Frequency	%	Valid %	Cumulative %
Replacement discontinuer	11	2.9	6.4	6.4
Indifferent discontinuer	35	9.4	20.5	26.9
Reserved discontinuer	61	16.4	35.7	62.6
Partial discontinuer	45	12.1	26.3	88.9
Disenchantment discontinuer	10	2.7	5.8	94.7
Political discontinuer	9	2.4	5.3	100.0
Total	373	45.8	100.0	

Table 16: Results of a Principle Component Analysis for Types of Discontinuance

	Components				
	1	2	3	4	5
Replacement discontinuance1	*.723*	-.148	-.057	-.031	.020
Replacement discontinuance2	*.574*	-.053	-.022	-.092	-.173
Replacement discontinuance3	*.721*	.009	.056	.054	-.027
Replacement discontinuance4	*.739*	-.103	.115	.065	-.051
Disenchantment discontinuance1	*.677*	.188	-.002	-.080	.082
Disenchantment discontinuance2	*.634*	-.039	-.060	-.075	.019
Disenchantment discontinuance3	*.706*	-.026	-.100	-.099	.027
Disenchantment discontinuance4	*.621*	.114	.171	-.050	.114
Partial discontinuance1	-.002	.005	.012	-.036	*.826*
Partial discontinuance2	.014	-.019	.037	.008	*.810*
Partial discontinuance3	-.045	.004	.112	.089	*.715*
Partial discontinuance4	.034	.018	.032	-.030	*.734*
Reserved discontinuance1	.029	-.003	.002	*.811*	-.012
Reserved discontinuance2	-.107	-.029	-.042	*.823*	.025
Reserved discontinuance3	-.072	.113	.017	*.788*	.023
Reserved discontinuance4	-.101	.038	.053	*.775*	-.012
Indifferent discontinuance1	-.023	.105	*.817*	-.145	.108
Indifferent discontinuance2	-.015	.051	*.866*	.005	.028
Indifferent discontinuance3	.010	.060	*.811*	.162	.033
Indifferent discontinuance4	.075	.132	*.799*	.009	.033
Political discontinuance1	.006	*.835*	.103	.042	.004
Political discontinuance2	.000	*.750*	.046	.001	-.017
Political discontinuance3	-.019	*.832*	.048	.007	.029
Political discontinuance4	-.046	*.808*	.080	-.076	.046
Political discontinuance5	-.033	*.766*	.092	.147	-.039

* Rotation method: Varimax with Kaiser Normalization.

* One of the political discontinuance items was dropped.

Table 17, the overall MANOVA is significant at the $p < .001$ level irrespective of whether the Pillais, the Hotellings, or the Wilks test was used. Having confirmed the significance of the overall MANOVA, post-hoc univariate *F* tests were conducted as a subset of the MANOVA procedure. Table 17 also shows significant difference in responses between five discontinuer categories with respect to scores on the continuous items for discontinuance types.

In order to demonstrate the validity of the categorical measure, however, it is necessary to demonstrate consistency between groups (e.g., replacement discontinuers scored significantly higher on the continuous replacement scale than did other categories of discontinuers) and within groups (e.g., replacement discontinuers scored significantly higher on the replacement scale than they did on the other scales). In order to demonstrate between-group consistency, mean comparison tests using the Scheffe S test method as a post-hoc test of the MANOVA were performed. The results of the Scheffe S test, presented in Table 18, demonstrate the validity of the categorical measure. Replacement discontinuers scored significantly higher on the continuous replacement scale than other types of discontinuers. Similarly, indifferent discontinuers scored significantly higher on the indifferent discontinuance scale than any other types of discontinuers. These results demonstrate that the categorical measure of discontinuer types held fairly well as far as between-group consistency is concerned.

In order to demonstrate within-group consistency, paired t-tests were performed, the results of which are summarized in Table 19. Every *t*-test except the two comparisons for political discontinuers was significant. Thus, it was demonstrated that replacement discontinuers scored higher on the continuous replacement scale than on other scales. In a similar vein, indifferent discontinuers scored significantly higher on the continuous indifferent discontinuance scale than on other scales, disenchantment discontinuers scored higher on the disenchantment continuous scale than on other scale, and partial discontinuers scored higher on the continuous partial discontinuance scale than any other scale. Political discontinuers also scored higher on the continuous political discontinuance scale than any other types of discontinuers except indifferent

Table 17: MANOVA Results of the Comparison among Different Types of Discontinuance

	Replacement		Disenchantment		Partial		Reserved		Indifferent		Political		F
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	
Replacement	20.0	3.8	11.9	1.5	16.1	.8	13.1	2.4	13.9	3.6	13.9	3.3	14.74**
Disenchantment	17.5	1.9	21.0	1.9	15.6	2.4	13.8	1.8	14.9	3.4	14.3	3.0	17.48**
Partial	16.4	2.2	14.6	2.9	18.7	3.8	15.5	2.5	15.3	2.0	12.7	3.4	11.29**
Reserved	15.7	2.4	15.8	2.9	15.1	3.6	18.3	2.9	14.9	3.4	12.4	1.6	10.25**
Indifferent	14.6	3.9	15.8	4.2	14.4	3.4	14.6	2.2	19.4	3.0	13.8	2.5	12.36**
Political	15.4	3.6	17.2	2.9	16.6	3.9	16.9	3.8	17.0	4.1	21.9	8.2	2.75*

Overall MANOVA significant at $p < .001$ irrespective of whether Pillais, Hotellings, or Wilks test was used. ** MANOVA significant at $p < .01$, * MANOVA significant at $p < .05$

Table 18: Results of the Between-Group Comparison Tests for the Types of Discontinuance

Dependent Variable	Discontinuer Groups Compared	*p*
Replacement discontinuance	Replacement > Disenchantment	.00**
	Replacement > Partial	.06
	Replacement > Reserved	.00**
	Replacement > Indifferent	.00**
	Replacement > Political	.00**
Disenchantment discontinuance	Disenchantment >	.00 **
	Replacement	.00**
	Disenchantment > Partial	.00**
	Disenchantment > Reserved	.00**
	Disenchantment > Indifferent	.00**
	Disenchantment > Political	.00**
Partial discontinuance	Partial > Replacement	.31
	Partial > Disenchantment	.09
	Partial > Reserved	.00**
	Partial > Indifferent	.00**
	Partial > Political	.00**
Reserved discontinuance	Reserved > Replacement	.28
	Reserved > Disenchantment	.36
	Reserved > Partial	.00**
	Reserved > Indifferent	.00**
	Reserved > Political	.00**
Indifferent discontinuance	Indifferent > Replacement	.00 **
	Indifferent > Disenchantment	.11
	Indifferent > Partial	.00**
	Indifferent > Reserved	.00**
	Indifferent > Political	.00**
Political discontinuance	Political > Replacement	.04 *
	Political > Disenchantment	.46
	Political > Partial	.05*
	Political > Reserved	.04*
	Political > Indifferent	.32

**Scheffe test significant at $p < .01$, *Scheffe test significant at $p < .05$.

Table 19: Results of the Within Group Paired _T-Tests for the Types of Discontinuance

Discontinuer Category	Within Group Comparison	*t*-value (*df*)
Replacement discontinuer	Replacement > Disenchantment	2.79 (10)*
	Replacement > Partial	2.75 (10)*
	Replacement > Reserved	3.81 (10)**
	Replacement > Indifferent	2.96 (10)*
	Replacement > Political	4.69 (10)**
Disenchantment discontinuer	Disenchantment >	8.06 (9)**
	Replacement	6.16 (9)**
	Disenchantment > Partial	4.36 (9)**
	Disenchantment > Reserved	4.05 (9)**
	Disenchantment > Indifferent	7.25 (9)**
	Disenchantment > Political	
Partial discontinuer	Partial > Replacement	7.63 (44)**
	Partial > Disenchantment	4.69 (44)**
	Partial > Reserved	4.35 (44)**
	Partial > Indifferent	6.28 (44)**
	Partial > Political	8.20 (44)**
Reserved discontinuer	Reserved > Replacement	9.97 (60)**
	Reserved > Disenchantment	10.13 (60)**
	Reserved > Partial	6.64 (60)**
	Reserved > Indifferent	6.78 (60)**
	Reserved > Political	6.43 (60)**
Indifferent discontinuer	Indifferent > Replacement	6.42 (34)**
	Indifferent > Disenchantment	5.26 (34)**
	Indifferent > Partial	9.61 (34)**
	Indifferent > Reserved	6.67 (10)**
	Indifferent > Political	7.33 (34)**
Political discontinuer	Political > Replacement	2.29 (8)*
	Political > Disenchantment	1.37 (8)
	Political > Partial	2.31 (8)*
	Political > Reserved	2.61 (8)*
	Political > Indifferent	1.69 (8)

**paired *t*-test significant at $p < .01$, *paired t-test significant at $p < .05$.

discontinuers. Overall, the categorical measure of discontinuer types appears to be consistent when analyzed both between groups and within groups. Therefore, it is statistically sound to use discontinuer types as a distinct variable for further tests.

Descriptive Statistics for Independent Variables

This section presents basic statistical information about the independent variables used in hypotheses testing along with descriptive information about gender, age, employment types (regular, part-time, and volunteer) and work-group membership. Table 20 to 23 present frequency information or independent group means (continuers vs. discontinuers) with respect to gender, age, employment types and work-group membership. Table 24 includes information about means and standard deviations for the total sample, means and standard deviations for discontinuers and continuers, and independent sample t-test results of group mean comparisons between continuers and discontinuers.

Checks for Multicollinearity and Correlations

Multicollinearity leads to unstable parameter estimates, and hence, unreliable conclusions. Three tools are commonly used to inspect for evidence of multicollinearity. First, strong correlations among variables ($R^2 > .80$) are a cause of concern (Menard, 2000). Second, tolerance should exceed .40 (Allison, 1999). Tolerance is 1- R^2 for the regression of an independent variable on all the other independents, ignoring the dependent variable. The higher the intercorrelation of the independent variables, the more the tolerance approaches zero. Variance Inflation Factor is the inverse of tolerance and by this standard should be 2.5 or less. A third warning sign of multicollinearity is the appearance of very large coefficients and standard errors (Hosmer & Lemeshow, 2000). As shown in the results for hypotheses testing later in this chapter, the coefficients and standard errors of variables display no evidence causing concern.

Table 20: Results of Crosstab Analysis for the Association between Gender and Discontinuance

	Discontinuer	Continuer	Chi-Square
Female	42	73	5.82*
Male	129	129	

*significant at $p < .05$ level

Table 21: Results of Independent Sample t-test for the Association between Age and Discontinuance

	Mean	Std. Dev.	F	*p*-value
Discontinuer	35.07	6.35	.01	.92
Continuer	34.29	6.25		

Table 22: Results of Crosstab Analysis for the Association between Employment types and Discontinuance

	Discontinuer	Continuer	Chi-Square
Regular	155	185	.11
Part-Time	4	4	
Volunteer	12	13	

Table 23: Results of Crosstab Analysis for the Association between Work Group Membership and Discontinuance

	Discontinuer	Continuer	Chi-Square
Cyber	3	15	50.46**
Strategy	5	28	
Organizing	32	21	
Policy Development	34	20	
Public Release	20	8	
Planning	22	24	
Public Relations	14	11	
General Affairs	18	27	
Secretary	5	27	
External Cooperation	18	21	

**significant at $p < .01$ level

Table 24: Descriptive Statistics for Predictors

Variable	Reliability	Total Sample		Discontinuer		Continuer		t
		M	*SD*	*M*	*SD*	*M*	*SD*	
Innovativeness	.82	4.47	1.24	4.43	1.21	4.91	1.26	.70
Self-efficacy	.79	4.59	1.05	4.55	1.08	4.61	1.03	.74
Ease of use	.83	5.03	.78	5.00	.79	5.05	.77	.56
Usefulness	.92	3.29	.68	2.97	.60	3.56	.74	8.39***
Compatibility	.91	3.76	.78	3.23	.79	4.12	.78	12.05***
Satisfaction	.74	3.07	.63	2.98	.56	3.15	.69	2.51**
Behavioral control	.76	4.28	.77	4.21	.72	4.36	.82	1.82*
Enjoyment	.76	2.77	.77	2.73	.75	2.81	.78	.97
Subjective norm	.78	3.72	.84	3.20	.77	4.17	.90	12.94***
Image	.75	3.81	.83	3.36	.82	4.19	.84	9.60***
Voluntariness	.67	5.25	.73	5.62	.75	4.94	.71	-8.95***
Organizational support	.83	3.76	.83	3.24	.80	4.20	.86	10.95***
Top management support	.92	2.59	.67	2.25	.51	3.83	.83	10.23***
Communication partners	.65	4.19	.79	3.86	.90	4.47	.69	7.48***
Continuance commitment	.70	3.74	1.08	3.61	1.05	3.83	1.10	3.07**
Organization's innovation climate	.88	4.12	.85	4.08	.86	4.14	.83	1.07

*** Independent sample t-test significant at $p < .001$; ** significant at $p < .05$; * significant at $p < .10$. All *df*s for the t-tests are 317.

Checks for multicollinearity among independent variables were made using the SPSS linear regression routine. This approach is valid since correlations are measured among the predictors; thus any continuous variable is suitable for use as the dependent variable (Allison, 1999, p. 48-50). Presented in Table 25 are the correlations and collinearity statistics for all continuous predictors where 'frequency of use' is used as a dependent.

RESULTS OF ANALYSES

Discontinuers versus Continuers

The primary research question (RQ1) of the main study has two separate inquiries: (a) whether the predictors employed in the main study are able to discriminate discontinuers from continuers, and (b) how the predictors affect the Intranet usage behaviors of discontinuers and continuers.[13] In order to answer the first question Multiple Discriminant Analysis (MDA) and MANOVA were used. MDA identifies how well independent variables can collectively predict membership in the dependent classification (i.e., discriminate between dependent groups). MANOVA determines whether discontinuers and continuers differ with regard to variables employed in the study. Both techniques are appropriate statistical techniques when the dependent variable is categorical and independent variables are continuous.

For the first part of RQ 1, the categorical dependent variable consisted of discontinuers and continuers as its classification. The independent variables were gender, experience, personal innovativeness, continuance commitment, self-efficacy, ease of use, usefulness, compatibility, satisfaction, behavioral control, enjoyment, work-group membership, subjective norms, image, critical communication partners' perceptions, organizational support, between discontinuers and continuers (the dependent classification). The multivariate discriminant functions were statistically significant, Box's $M = 356.34$, $p < .001$; Wilks' Lambda = .471, $p < .001$.

[13] Respondents' utilization of the Intranet was operationalized as a function of 'frequency of use.' Frequency of use was measured with a 7 point-scaled question that reflects the average number of times respondents used the Intranet per week. Discontinuers were asked to remember their average Intranet use when they had been using it.

Table 25: Results of Multicollinearity Test among Independent Variables

	Correlations			Collinearity Statistics	
	Zero-order	Partial	Part	Tolerance	VIF
Innovativeness	.122	.005	.004	.764	1.308
Self-efficacy	.199	.163	.130	.699	1.430
Ease of use	.155	.086	.068	.797	1.255
Usefulness	.251	-.015	-.012	.589	1.697
Compatibility	.350	.138	.110	.513	1.948
Satisfaction	.362	.234	.190	.808	1.238
Behavioral control	.237	-.060	-.048	.714	1.400
Enjoyment	.364	.165	.132	.738	1.354
Subjective norm	.244	.004	.003	.569	1.759
Image	.159	-.084	-.066	.640	1.562
Voluntariness	-.306	-.162	-.130	.736	1.359
Organizational support	.267	.001	.000	.535	1.868
Top management support	.233	.038	.030	.561	1.783
Perceptions of critical communication partners	.292	.175	.141	.721	1.386
Continuance commitment	.346	.206	.166	.786	1.273
Organization’s innovation climate	.146	.059	.047	.869	1.151

Table 26 shows the contribution of each variable to the model. Wilks' lambda is a measure of a variable's potential to discriminate between groups. Smaller values indicate the variable is better at discriminating between groups. The standard coefficients in the table allow comparing variables measured on different scales. Coefficients with large absolute values correspond to variables with greater discriminating ability. As seen from Table 26, compatibility is best to discriminate discontinuers from continuers, followed by subjective norm, voluntariness, work-group membership, top management support and organizational support.

Results of the MANOVA, presented in Table 27, suggested that continuers perceived the Intranet to be more useful and more compatible with their tasks. Continuers were more satisfied with the Intranet and enjoyed using it. Continuers also perceived others' demand for the Intranet use to be stronger than did discontinuers. However, discontinuers more strongly perceived that the Intranet use in the organization was not mandatory. Continuers and discontinuers differed with respect to their perceptions of organizational and top management support for the Intranet use. However, continuers did not perceive the Intranet to be significantly easier to use than discontinuers. In addition, continuers were not more innovative or self-efficacious than discontinuers.

However, the above results did not explain which factors are more influential to discontinuers' Intranet usage behavior. For instance, the *F* statistics shown above only indicates relative importance of a variable in discriminating between discontinuers and continuers. Thus, the researcher decided to do separate linear regression analyses for continuers and discontinuers by using 'Frequency of use' as an indicator of their Intranet usage behavior since many studies have supported that 'frequency of use' is a crucial predictor of continuance intention (Davis et al., 1991; Parthasarathy & Bhattacherjee, 1998; Venkatesh, 1999; Venkatesh & Davis, 2000). A preliminary test of one-way MANOVA confirmed that frequency of use significantly differed between continuers and discontinuers, $F = 19.13$, $p < .01$.

Table 26: Result of Multiple Discriminant Analysis *

Independent variables	Wilks' Lambda	Standardized Discriminant Function Coefficient
Gender	.98	.06
Experience	1.00	.04
Personal innovativeness	.99	.01
Self-efficacy	.99	.05
Continuance commitment	.97	.18
Ease of use	.99	.10
Usefulness	.84	.12
Compatibility	.72	.48
Satisfaction	.98	.15
Behavioral control	.99	.08
Enjoyment	.99	.09
Work-group membership	.99	-.25
Subjective norm	.69	.38
Image	.80	.13
Critical communication partners	.87	.04
Voluntariness	.82	-.34
Organizational support	.76	.20
Top management support	.78	.21
Organization's innovation climate	.99	.15

*Dependent variable of the analysis is the post-adopter category (continuer vs. discontinuer).

Table 27: Result of MANOVA for Continuers vs. Discontinuers

Independent variables	Group Means		F-statistics
	Continuers	Discontinuers	
Gender			5.28**
Experience			.19
Personal innovativeness	4.49	4.43	.21
Self-efficacy	4.61	4.55	.27
Continuance commitment	3.83	3.61	9.76***
Ease of use	5.05	5.00	.22
Usefulness	3.56	2.97	67.41***
Compatibility	4.21	3.23	137.68***
Satisfaction	3.15	2.98	6.69***
Behavioral control	4.35	4.21	3.17*
Enjoyment	2.81	2.73	1.05***
Work-group membership			5.45**
Subjective norm	4.16	3.20	168.45***
Image	4.18	3.36	90.36***
Critical communication partners	4.48	3.86	54.95***
Voluntariness	4.94	5.62	78.62***
Organizational support	4.19	3.24	114.58***
Top management support	2.87	2.25	99.79***
Organization's innovation climate	4.14	4.09	.05

Nominal and ordinal variables do not provide information of group mean.

Overall MANOVA was significant at $p < .001$ for Pillais, Hotellings, and Wilks' tests.

*** significant at $p < .001$, ** significant at $p < .05$, * significant at $p < .10$

As can be seen from Table 28, the results of the linear regression analyses showed that the frequency of use of discontinuers were significantly affected by some of individual attributes (self-efficacy, β = .15, p < .05), technological attributes (usefulness, β = .12, p < .10), and social influence factors (subjective norm, β = .13, p < .10; communication partner, β = .21, p < .05). The results also suggested that all organizational intervention factors except organizational innovation climate affect discontinuers' use of the Intranet: voluntariness, β = -.16, p < .05; organizational support, β = .12, p < .10; and top-management support, β = .16, p < .05. The frequency of the Intranet use of discontinuers, however, was not affected by any of the use-related outcomes such as satisfaction, behavioral control or enjoyment. In contrast, the frequency of the Intranet use of continuers was strongly affected by technology attributes such as usefulness, β = .37, p < .01, and compatibility, β = .43, p < .01. With the exception of technology attributes, only two variables influenced the frequency of the Intranet use of continuers: satisfaction and subjective norm were significant at p < .10 level.

Post-hoc simple correlation analyses[14] provided slightly different results (see Appendix for the correlation tables). The results of the correlation analyses show that the frequency of use of discontinuers was significantly related to some of the technological attributes, social factors, as well as organizational factors: usefulness, r = .28, p < .01; compatibility, r = .42, p < .01; enjoyment, r = .22, p < .01; behavioral control, r = .17, p < .05; satisfaction, r = .33, p < .01; subjective norm, r = .39, p < .01, image, r = .24, p < .01; communication partners' perceptions, r = .37, p < .01; perceived voluntariness, r = -.38, p < .01; organizational support, r = .33, p < .01; top management support, r = .30, p < .01; and organization's innovation climate, r = .17, p < .05. The frequency of the Intranet use of discontinuers, however, was not associated with the duration of experience, innovativeness, self-efficacy, ease of use, and continuance commitment.

[14] Rather than focusing on the linear functions of predictors on dependent variable, tests of simple correlations can provide more rich information about the relations of various variables.

Table 28: Results of Linear Regression Analysis for Frequency of Use of Discontinuers and Continuers

Category	Independent variable	Standardized Coefficient (B)	
		Discontinuer (n = 171)	Continuer (n = 202)
Individual attribute	Innovativeness	-.01	-.04
	Self-efficacy	.15**	.02
	Continuance commitment	.06	.07
Technology attributes	Ease of use	.08	.06
	Usefulness	.12*	.37***
	Compatibility	.24**	.43***
Use-related outcomes	Satisfaction	.08	.11*
	Behavioral Control	.03	.05
	Enjoyment	.01	.04
Social influence factors	Subjective norm	.13*	.14*
	Image	.05	.02
	Communication partner	.21**	.08
Organizational intervention factors	Voluntariness	-.16**	-.08
	Organizational support	.12*	.04
	Top-management support	.16**	.02
	Organization's innovation climate	.02	.06
R^2		.44***	.58***

The dependent variable is frequency of use. *** $p < .001$, ** $p < .05$, * $p < .10$

The frequency of use of continuers was related to ease of use (r = .14, p < .05), usefulness (r = .61, p < .01), compatibility (r = .65, p < .01), satisfaction (r = .25, p < .01), and behavioral control (r = .25 p < .01). These results indicate that the frequency of the Intranet use of discontinuers was associated with various factors such as technological attributes, use-related experience, social influence factors and organizational intervention factors. On the contrary, the frequency of Intranet use of continuers was related to technological attributes and use-related outcomes, but not to social influence factors and organizational intervention factors.

Hypotheses H1 through H7 except H2-1b, H2-2b[15], and H5-1[16] tested whether independent variables adequately predicted the presence of discontinuance in the sample; these hypotheses were tested using logistic regression analysis. Logistic regression analysis is useful for situations in which the presence or absence of an outcome is predicted based on values of a set of predictor variables. The analysis was conducted with eighteen independent predictors. As Long (1997) argues, maximum likelihood models such as logistic regression require that for each variable included in the model, the data set should have a minimum of 10 observations. Given the number of observations in this data set (n = 373), it appears to be sufficient to support analysis on a reasonable number of variables (see also Pampel, 2000).

The results of the logistic regression test are presented in Table 29. The hypotheses tested by are as follows; H2-1a, H2-2a, H2-3, H2-4, H3-1, H3-2, H3-3, H4-1, H4-2, H4-3, H5-1, H5-2, H5-3, H5-4, H6-1, H6-2, H6-3, and H6-4. Put differently, the dependent variable for this logistic regression analysis was the categorical variable classified as discontinuer or continuer. The independent variables were personal innovativeness, self-efficacy, gender, continuance commitment, perceived ease of use, perceived usefulness, compatibility, satisfaction, enjoyment, behavioral control, work-group membership, subjective norm, image, perceptions of important

[15] H2-1b and H2-2b explored whether replacement and partial discontinuers are more innovative and self-efficacious than reserved and indifferent discontinuers. The hypotheses will be dealt in the following section, 'different types of discontinuers.'

[16] Work-group membership is a categorical variable that cannot be recoded to binary (dummy) variables or other types of contrast variables. Therefore, it is impossible to include the variable into the linear regression analysis.

communication partners, organizational support, voluntariness, top-management support, and organizational innovation climate.

As can be seen from Table 29, most of the hypotheses were supported at $p < .05$ or $p < .10$. With respect to individual attributes, personal innovativeness, self-efficacy and gender were included in the logistic regression analysis. As indicated, H2-1a and H2-2a were not significant; that is, personal innovativeness and self-efficacy have no statistical relationship with the presence of discontinuance. H2-3 suggested that gender had a statistically meaningful relationship[17] with the presence of discontinuance (at the level of $p < .10$).

Regarding the technological attributes such as perceived ease of use, usefulness and compatibility, all hypotheses were supported. H3-1 postulated no statistical relationship of perceived ease of use with discontinuance and the results verified this nonrelationship. H3-2 and H3-3 were both supported at $p < .01$ level, lending strong support to the hypotheses that the presence of discontinuance is negatively associated with usefulness and compatibility. H4-1 is also supported at $p < .01$ level in that satisfaction has a negative relationship with the presence of discontinuance. H4-2 and H4-3 were, however, not supported although in the expected direction. That is, though perceived enjoyment and perceived behavioral control have negative relations to the presence of discontinuance, the relationships were not statistically significant.

As shown in Table 29, all social influence variables were found to be statistically significant and had negative relationships with the presence of discontinuance. Subjective norm was significant at $p < .01$ level, which suggests that the chance to be a discontinuer increases as the subjective norm becomes weaker. Image and the influence of critical communication partners were also significant at $p < .05$ level. The results suggest that positive image and critical

[17] However, since H2-3 posits that the effect of gender will be mediated by the perception of dominant tendency with regard to Intranet use, a relationship between gender and discontinuance only provides a necessary condition to test H2-3. Put differently, it is unknown from the table if the relationship of gender with the presence of discontinuance persists when the perception of dominant tendency is included in the model. This additional test is performed in the last part of the section, but in the meantime H2-3a is denoted as 'undecided' in the table

communication partners' positive perceptions about the Intranet make it difficult to discontinue the Intranet.

Organizational intervention variables except organization's innovation climate were also significant and negatively related to the presence of discontinuance[18]. As users perceived the Intranet use was not mandatory they had a stronger chance to be discontinuer (H6-2). In addition, users who more strongly perceived that top management supported the Intranet use had a lower chance to be discontinuers (H6-3). Also, users who perceived that top management was supportive to the system were less vulnerable to Intranet discontinuance (H6-4). However, as indicated in H6-1, organization's innovation climate was not statistically significant, although it was in the direction predicted.

In order to test the H2-3[19], which was temporarily undecided in the previous tests, the main study asked respondents' perception of prevalence of discontinuance phenomenon in the organization with a seven-point scaled question. One-way MANOVA indicated that the perception of discontinuance prevalence significantly differed between continuers and discontinuers, $F = 66.58$, $p < .001$. An independent sample *t*-test showed that males more so than females strongly perceived that the discontinuance phenomenon was prevalent in the organization (see Table 30). In addition, when the perception of discontinuance prevalence variable was included in conjunction with gender in a logistic regression, the effect of gender on the presence of discontinuance disappeared, $-2LL = 192.43$, $p = .56$. That is, the effect of gender on discontinuance was mediated by the perception of discontinuance prevalence. Therefore, H2-3 was supported. In the organization, females were more likely to be continuers because they more strongly perceived continuance as a dominant norm than males.

To test H5-1, the effect of work-group membership on discontinuance, a crosstab analysis was performed. Measures of association in Table 31 indicate that work-group membership was

[18] Perceived voluntariness (H6-2) and top management support (H6-3) were statistically significant at $p < .01$ level. Organizational support (H6-1) was statistically significant at $p < .05$ level.

[19] Since gender is a dummy variable, it is safe to include the variable into the linear regression model.

Table 29: Results of Logistic Regression Analysis for Discontinuance

	Independent Variable	β	-2LL of Reduced Model	Chi-Square	*df*	*p*	Result
H2-1a	Innovativeness	-.21	194.21	.82	1	.36	SUPPORTED
H2-2a	Self-Efficacy	-.14	193.53	.15	1	.70	SUPPORTED
H2-3	Gender		196.34	3.22	1	.08	UNDECIDED
H2-4	Continuance commitment	-.53	196.87	2.47	1	.07	WEAKLY SUPPORTED
H3-1	Ease of use	-.34	195.74	1.36	1	.14	SUPPORTED
H3-2	Usefulness	-.98	199.74	5.90	1	.01	SUPPORTED
H3-3	Compatibility	-1.13	210.69	17.31	1	.00	SUPPORTED
H4-1	Satisfaction	-.67	198.33	5.95	1	.02	SUPPORTED
H4-2	Enjoyment	-.19	193.39	.52	1	.42	NOT SUPPORTED
H4-3	Behavioral control	-.22	193.41	.63	1	.38	NOT SUPPORTED
H5-2	Subjective norm	-1.23	209.42	16.03	1	.00	SUPPORTED
H5-3	Image	-.65	199.03	5.65	1	.01	SUPPORTED
H5-4	Communication partner	-.56	197.22	3.42	1	.05	SUPPORTED
H6-1	Organizational support	-.55	197.05	3.42	1	.05	SUPPORTED
H6-2	Voluntariness	1.09	201.36	7.98	1	.00	SUPPORTED
H6-3	Top-management support	-1.62	207.88	14.05	1	.00	SUPPORTED
H6-4	Innovation climate	-.29	194.17	1.21	1	.27	NOT SUPPORTED

-The chi-square statistic is the difference in -2 log-likelihood between the final model and a reduced model (the reduced model is formed by omitting an effect from the final model).

significantly associated with the distribution of discontinuance (as well as continuance). This result suggested that certain work-groups had stronger presence of discontinuers than others; therefore, hypothesis H5-1 was supported.

Table 30: Results of Independent Sample -test for the Perception of Discontinuance Prevalence

Category	Frequency	Mean (*SD*)	*F*	*Sig*.
Female	114	3.64 (1.12)	7.69	.005
Male	227	4.29 (1.36)		
Total	371			

Table 31: Results of a Crosstab Analysis of the Association between Work Group Membership and the Distribution of Discontinuance

Category	Total	Discontinuer	Continuer
Cyber	18	3	15
Strategy	33	5	28
Organizing	53	32	21
Policy	54	34	20
Public Release	28	20	8
Planning	46	22	24
Public Relations	25	14	11
General Affairs	45	18	27
Secretarial	32	5	27
External Cooperation	39	18	21
Pearson *Chi-Square*		50.46***	
Likelihood Ratio		54.23***	
PHI & Cramer's *V*		.368***	

*** significant at $p < .001$ level, ** significant at $p < .01$, * significant at $p < .05$

Different Types of Discontinuers

Hypotheses H1, H2-1b, H2-2b and H7 discriminated among different types of discontinuers; that is, certain types of discontinuers differ from other types of discontinuers in terms of individual characteristics and factors affecting their behaviors. More specifically, H1 posited that replacement and partial discontinuers might resemble characteristics of earlier adopters more than indifferent and reserved discontinuers. H2-1b and H2-2b postulated that replacement and partial discontinuers will be more innovative and self-efficacious than indifferent and reserved discontinuers, respectively. H7 suggested that replacement and partial discontinuers' Intranet use would be more affected by technological attributes and use-related outcomes, while indifferent and partial discontinuers might be more affected by social influence and organizational intervention factors.

MANOVA and post-hoc tests were used for testing H1 and H2-1b as well as H2-2b. The dependent variables were experience with Intranets,[20] independent judgmental capacity, risk-taking personality (H1), personal innovativeness (H2-1b), and self-efficaciousness (H2-2b), while the independent variable was discontinuer type. Table 32 presents the results of the MANOVA involving various types of discontinuers. The overall MANOVA was significant at the $p < .001$ level. The post hoc F tests also indicated significant difference in responses between the six independent groups (replacement, indifferent, reserved, partial, disenchantment, and political discontinuer) with respect to all the dependent variables except Intranet experience: risk-taking tendency, $F = 44.50$, $p < .001$; independent judgmental capacity, $F = 20.24$, $p < .001$; innovativeness, $F = 9.22$, $p < .001$; self-efficacy, $F = 5.11$, $p < .001$; and intranet experience, $F = .37$, $p = .84$, *ns*. Put differently, the F tests indicate that the six independent groups differed with respect to innovativeness, self-efficacy, risk-taking personality, and independent judgment capacity while they were not differentiated with regard to Intranet experience. However, the F tests only indicate that substantial difference exists among the discontinuance categories with

[20] Since the Intranet has been used only for less than one-year in the organization, this study asked the overall experience of any Intranets of respondents using a seven-point scaled question.

Table 32: Results of the MANOVA and Post Hoc Univariate F Tests for Discontinuer types

Dependent Variable	Replacement		Indifferent		Reserved		Partial		Disenchantment		Political		F
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	
Intranet Experience	5.36	1.43	5.52	1.30	5.46	1.21	5.37	1.26	5.20	1.46	5.55	1.33	.37
Innovativeness	5.45	.48	4.26	.73	4.24	.59	4.69	.65	4.35	.49	4.25	.57	9.22*
Self-efficacy	5.23	.65	4.44	.48	4.50	.71	4.73	.68	4.15	.62	4.14	.56	5.11*
Risk Taking	5.50	.45	3.77	.38	3.99	.47	4.59	.39	4.35	.33	4.02	.35	44.50*
Independent Decision Making	5.39	.46	4.16	.42	4.25	.46	4.67	.47	4.28	.38	4.13	.37	20.24*

*significant at $p < .001$ level.

respect to those four dependent variables; it does not specify which one of the six independent groups scored highest, which one the lowest, and how the groups compared with one another with respect to any given dependent variable. Therefore, in order to accomplish this task, group mean tests were run, once again using the Scheffe S test. The results of this analysis are presented in Table 33.

Mixed support is found for H1 (please also refer to Table 24 for means and standard deviations). H1 postulates that replacement and partial discontinuers more resemble the characteristics of earlier adopters than do indifferent and reserved discontinuers with respect to Intranet experience, risk-taking personality and independent judgmental capacity. As can be seen from Table 34, replacement and partial discontinuers are much more likely to be risk-taking than those who discontinue based on indifference and reservation. In addition, replacement and partial discontinuers are more likely than indifferent and reserved discontinuers to make independent judgments. However, Intranet experience did not differ across different types of discontinuers.

Support is also found for H2-1b, which speculates that replacement and partial discontinuers are more innovative than indifferent and reserved discontinuers. However, the analysis for H2-2b had mixed results. H2-2b posits that replacement and partial discontinuers are more likely to be self-efficacious than indifferent and reserved discontinuers. The part of the hypothesis concerning replacement discontinuers was statistically supported. Replacement discontinuers are more likely to be self-efficacious than are indifferent and reserved discontinuers. However, the same cannot be said with respect to partial discontinuers. Even if the mean difference information indicates that partial discontinuers were likely to be more self-efficacious than indifferent and partial discontinuers, the differences were not statistically significant.

Table 33: Results of Discontinuer Group Comparison Tests

Dependent Variable	Discontinuer Groups Compared	Mean Difference	*P*-value
Risk-taking Personality	Replacement > Reserved	1.51	.00***
(H1)	Replacement > Indifferent	1.73	.00***
	Partial > Reserved	.60	.00***
	Partial > Indifferent	.82	.00***
Independent Decision	Replacement > Reserved	1.15	.00***
Making	Replacement > Indifferent	1.24	.00***
(H1)	Partial > Reserved	.43	.00***
	Partial > Indifferent	.39	.00***
Innovativeness	Replacement > Reserved	1.21	.00***
(H2-1b)	Replacement > Indifferent	1.19	.00***
	Partial > Reserved	.43	.07*
	Partial > Indifferent	.45	.02**
Self-efficacy	Replacement > Reserved	.73	.05**
(H2-2b)	Replacement > Indifferent	.79	.03**
	Partial > Reserved	.23	.62
	Partial > Indifferent	.29	.46

***significant at $p < .01$. **significant at $p < .05$. *significant at $p < .10$.

H7 was tested using linear regression analysis. The purpose of the hypothesis was to explore if the Intranet usage of the two independent discontinuer groups (replacement and partial discontinuers vs. indifferent and reserved discontinuers) differs with respect to various independent variables. The dependent variable was frequency of use, while the independent variables were ease of use, usefulness, compatibility, satisfaction, behavioral control, enjoyment, subjective norms, image, perceptions of critical communication partners, voluntariness, organizational support, and top-management support. The analysis found mixed support for H7 as can be seen from Table 34. As expected, replacement and partial discontinuers' Intranet use was affected by technology attributes except perceived ease of use and one of the use-related outcomes, satisfaction. In addition, their Intranet use was not affected by social influence factors or organizational intervention factors. Indifferent and reserved discontinuers' Intranet use was affected by all social influence factors: all factors were significant at $p < .10$ level. In addition, the Intranet use of indifferent and reserved discontinuers was affected by organizational intervention factors except top management support. Overall, the findings suggest that replacement and partial discontinuers' Intranet use tends to be affected by technological attributes and satisfaction, while indifferent and partial discontinuers' intranet use are more strongly affected by social influence factors and organizational intervention factors.

Communication Satisfaction

The final two research questions explore how continuers and discontinuers differ with regard to organizational communication satisfaction (RQ2) and how various types of discontinuers differently perceive organizational communication satisfaction (RQ3). In order to answer the questions, an independent sample t-test for RQ1 and one-way ANOVA for RQ2 were used.

Table 34: Results of Linear Regression Analysis for the Independent Groups of Discontinuers

Independent variable	Standardized Coefficient	
	Replacement/ partial discontinuers (n = 70[21])	Indifferent/ reserved discontinuers (n = 82)
Ease of use	-.15	.09.
Usefulness	.21*	.23*
Compatibility	.27**	.08
Satisfaction	.19*	.16
Behavioral Control	.05	.14
Enjoyment	.04	.07
Subjective norm	-.10	.21*
Image	-.03	.22*
Communication partner	.05	19*
Voluntariness	-.06	-.32***
Organizational support	.10	.27*
Top-management support	.12	.15

***significant at $p < .001$, **significant at $p < .05$, *significant at $p < .10$

[21] It should be noted that the sample size for each linear regression analysis is smaller than a desirable size. Therefore, the results should be cautiously interpreted.

As seen from Table 35, continuers perceived organizational communication more positively than discontinuers, $F = 12.74$, $p < .001$. Results of the ANOVA were presented in Table 26. The overall ANOVA was significant at p <. 001, $F = 18.64$. This confirmed that the six discontinuer groups were significantly different with respect to organizational communication satisfaction. The post-hoc Sheffe tests (see Table 36) found that reserved discontinuers were more likely to be satisfied with organizational communication than indifferent discontinuers (mean difference = .96, p < .01), disenchantment discontinuers (mean difference = 1.01, p < .01), and political discontinuers (mean difference = 1.89, p < .01). Political discontinuers were more likely to be dissatisfied with communication in the organization than other types of discontinuers: replacement discontinuers (mean difference = -1.47, $p < .01$), indifferent discontinuers (mean difference = -.93, $p < .05$), reserved discontinuers (mean difference = -1.89, $p < .01$), and partial discontinuers (mean difference = -1.69, $p < .01$). Although the results suggested that political discontinuers were more likely to be dissatisfied with organizational communication than disenchantment discontinuers, the difference was not statistically significant (mean difference = -.86, $p = .16$).

Table 35: Results of Independent Sample t-test for Discontinuers vs. Continuers with Respect to Organizational Communication Satisfaction

Category	N	Mean (*SD*)	*F*	*p*
Discontinuer	171	4.00 (.84)	12.74	.000
Continuer	202	4.53 (.87)		

Table 36: Results of the ANOVA for Different Types of Discontinuers with Respect to Organizational Communication Satisfaction

Category	N	Mean (*SD*)	*F*	*p*
Replacement discontinuer	11	4.01 (.64)	21.26	.000
Indifferent discontinuer	35	3.47 (.63)		
Reserved discontinuer	45	4.43 (.66)		
Partial discontinuer	61	4.25 (.73)		
Disenchantment discontinuer	10	3.40 (.54)		
Political discontinuer	9	2.54 (.59)		
Total	171	4.00 (.83)		

ADDITIONAL FINDINGS

This section deals with two distinctive sets of findings: barriers (or enablers) of continued Intranet use; and the relations between discontinuer (and continuer) types and Intranet use modes. The first set of findings in the section reports on responses to the following questions: for discontinuers, "what factors are perceived as discouraging your use of the Intranet (or inducing you to stop using the Intranet); for continuers, "what factors are perceived as encouraging your use of the Intranet?" 63 out of 171 discontinuers and 69 out of 202 continuers provided comments to the questions. The answers ranged from one word entries, through multiple keyword answers, to several sentences. The analysis of the responses went through multiple passes where keywords were identified, then grouped into broader categories. When the answer to the question contained more than one category, those were counted separately. The second set of findings in the section presents MANOVA results that include mean scores of different types of discontinuers (and continuers) with respect to various Intranet use modes. The findings based on host-hoc tests also provide the information about which groups of discontinuers (continuers) mainly contribute to variations.

Barriers to Continued Use of the Intranet for Discontinuers

Table 37 summarizes the responses given as categories acting as barriers to continued use of the Intranet. The first column shows the broad categories used to summarize the issues. The frequencies and percentages of the categories also appear in the first column. The second column shows the sub-categories extracted from an analysis of the keywords and statements used by respondents. The third column offers some samples of actual wordings used. The last columns show the frequencies and percentage of the sub-categories (n). Results of the analysis indicated that there were seven broad categories being perceived by discontinuers as barriers to continued use: lack of organizational intervention, communication, information, innovation attributes, technical inferiority, lack of understanding, and status change. The percentage showed that the proportion of the discontinuers' comments could be mapped onto five major categories, which

Table 37: Barriers to Continued Use of the Intranet for Discontinuers

Category N (%)	Sub-Category	Sample of Actual Comments	n (%)
Lack of Organizational Mediation 23 (21.1)	Leadership	Lack of leadership by example Lack of encouragement from top management Lack of senior management commitment	13 (56.5)
	Managerial efforts	Lack of encouragement from the management Lack of formal procedures regarding the Intranet use Lack of understanding and commitment of managerial staff	7 (21.7)
	Reward	Time-consuming, but no reward Lack of processes that provide official recognition	3 (13)
Communication 22 (20.2)	Communication	Lack of reciprocity (in bulletin boards or discussion groups) Lack of timely response to information requests (or feedback) Preference to face-to-face comm. for dealing with urgent or delicate information Little effect of the Intranet on actual decision making	12 (54.5)
	Sharing (Trust)	Wariness of sharing a competitive advantage Unwillingness to share critical information Lack of formal processes that encourage members to share Perceptions of threat when in-house knowledge is made public Distrust Opportunistic	10 (45.5)

Information 17 (15.6)	Usefulness	Incomplete or wrong information; Outdated or obsolete information The information I need, I can't get; Redundant information (replication of news)	13 (76)
	Expertise	No way to configure if the information is credible No filtering authority	4 (24)
Innovation Attributes 16 (14.7)	Compatibility	Not fit with my job responsibilities Spending much time outside the organization Not much useful in the volatile political environments	9 (56)
	Accessibility	Impossible to reach all organizational members; limited accessibility No assurance of passing information to intended person(s) or group(s)	7 (44)
Technical Inferiority 15 (13.8)	Email	Passing through the authentication process twice to check emails Difficult to manage the address book Take longer than other services to send out group mails No alarming system for incoming emails No organizing tool for emails	11 (73)
	Other	Sometimes (internal) information searching does not properly work No existence of (external) web-browsing function (or unsophisticated)	4 (27)
Lack of understanding 4 (3.7)		Unclear about how the Intranet fit to organizational work flow Uncertain about what kind of information is permitted to be posted	
Status 3 (2.8)		Changing status from full-time (or part-time) positions to volunteer	

comprised about 94 % of all comments: lack of organizational intervention (21%), communication (20%), information (17%), innovation attributes (15%), and technical inferiority (14%). The second column showed the main breakdown within each category. For example, of the responses that can be categorized as relating to the lack of organizational intervention, 57 percent of those mentioned leadership, or wrote words or phrases judged to be equivalent to the concept.

Interestingly, four out of seven categories such as organizational intervention, communication, information, and lack of understanding, which consisted of 69 % of all comments, were related to internal organizational aspects. Accessibility in the categories of innovation attributes could also be judged to be related to organizational aspects, since this sub-category reflected the phenomenon that a small portion of organizational members were permitted to use A&P Intranet.

As can be seen from Table 38, lack of organizational mediation was one of the largest issues mentioned as a barrier to continued use, with 21 % of respondents citing aspects of it. This category includes three sub-categories: leadership (57 %), managerial efforts (22 %), and reward (13 %). Those responses classified as leadership used phrases such as 'leadership,' 'top management,' and 'senior management.' Managerial effort was also identified within the organizational mediation category. This sub-category was less focused on upper-level managers, but more on 'formal procedure' and 'managerial staff.' The sub-category, reward, was identified by phrases such as 'reward' and 'formal recognition.' The following responses exemplify the category of organizational mediation: "I don't think top managers in the organization seriously concern about the Intranet and their lack of use killed the initial enthusiasm." and "Many complain there is no formal recognition procedure. Nobody cares about who publish or what kind of information is published on the Intranet."

Communication was another main barrier to continued use of the Intranet and consisted of two sub-categories: interactivity (56 %) and sharing (44 %). The phrases such as

‘reciprocity,’ ‘feedbacks,’ ‘effects on decision making,’ or ‘preferred communication modes’ made it clear that communicative behaviors occurring or not occurring with respect to the Intranet could be barriers to continued use of it. The sub-category ‘sharing’ (trust), contained phrase such as ‘sharing,’ ‘opportunistic,’ or ‘(dis)trust’ and suggested that the perception of other members’ unwillingness to share competitive information and the lack of trust in other members or work-groups could discourage Intranet use. The following response illustrates the category of communication: “I think many people including me do not want to share or give away critical information via the Intranet.”

The category of information consisted of two sub-categories: information usefulness (76 %) and information expertise (24 %). The issues identified here showed that the respondents were aware of the value of information to them, and that much of it was not being managed properly. The usefulness of information was the major concern with ‘incomplete information,’ ‘redundant information,’ and ‘insufficient information’ mentioned as the cause of underutilization or discontinuance. The sub-category of expertise showed that the perceived absence of oversight authority could reduce the credibility of information and result in underutilization. Table 37 gives samples of the actual wording used by respondents.

Innovation attributes, which was made up of two sub-categories labeled compatibility and accessibility, were identified in less than 15 % of responses as a barrier to continued use. Compatibility, containing the phrases such as ‘responsibility’ or ‘useful,’ was identified in 56 percent of responses within the technological attributes category. The sub-category accessibility contained phrases such as ‘reach,’ ‘accessibility,’ or other similar words, and showed that respondents were aware that a small portion of members were permitted to access to the Intranet. The concern of limited accessibility to the Intranet seemed to become a barrier to continued use of it. The actual wording included in the category of innovation attributes is shown in Table 37.

The category of technical inferiority concerned technical problems or inferiority to other technologies. There were two sub-categories within the category: email (73 %) and others

(27 %). The phrases mentioned by the respondents such as ‘double authentication,’ ‘alarming system,’ and ‘organizing tools’ indicated that they were aware of what kinds of functionalities or designs were included in other services. The responses showed that perceived inferiority of a certain component of A&P Intranet relative to other services (or technologies) could be an important barrier to continued use. Again, Table 37 shows the words classified into the category of technical inferiority.

Other minor issues identified by the respondents were the lack of understanding of the Intranet with respect to its proper use and respondents’ status changes. Even if it was identified in a small number of responses, there were the uncertainties of the fit between the Intranet and organizational work procedures and the ambiguity about what kind of information (or discussion) was appropriate to be disclosed through the Intranet.

Enablers of Continued Use of the Intranet for Continuers

While the most significant barriers to continued use of the Intranet for discontinuers are seen as relating to organizational aspects, the single most significant enabler of the Intranet use for continuers is technological attributes. Table 38 shows enabling factors that are most frequently mentioned by respondents. More than half of the responses identified some form of technological attributes as being the enabler of the Intranet in the organization. The other significant enabler was information (36 %).

Within the innovation attributes category, two sub-categories were identified: compatibility (usefulness) and ease of use. Compatibility was identified in 73 % of the responses. These used phrases such as ‘responsibility,’ ‘compatible,’ ‘useful,’ ‘tasks,’ or other words or sentences that indicated usefulness of the Intranet. Ease of use was identified in 27 % of the responses within the technological attributes category. The phrases identified as ease of use were ‘simple,’ ‘plain,’ ‘ease,’ or other similar words. Table 38 shows samples of the actual wordings used by respondents.

Table 38: Enablers of Continued Use of the Intranet for Continuers

Category N (%)	Sub-Category	Sample of Actual Comments	n (%)
Innovation attributes 56 (57)	Compatibility (Usefulness)	Job responsibility / Compatible to tasks Saving time / Reducing paper works Easier to do tasks / Easier to sending information to selected groups or individuals Helpful to form discussion groups regarding specific issues	41 (73)
	Ease of use	Ease (plain) Simple (uncomplicated)	15 (27)
Information 36 (37)	Organizational information	Information about the organization Information about other teams (or other regions) Information about the current situations and future directions Directory	29 (80)
	Information assets	Existing information Previous events (previous procedures) Tracking information flows (discussion groups or bulletin board)	7 (20)
Indifference 5 (5)		No important reason Routine; Habitual	
Other 2 (2)		Instruction of supervisor Empowering	

The category of information included two sub-categories: organizational information (80 percent) and information assets (20 percent). Organizational information contained phrases such as ‘information about the organization,’ ‘information about other teams,’ ‘information about future,’ or ‘information about other regions.’ The sub-category of information assets was less focused with no exact duplicates in the phrasing, but ‘existing information,’ ‘previous events,’ ‘flows in discussion groups,’ and ‘information in the bulletin board’ made it clear that a function as a repository of information assets appeared to be a significant factor that could affect the degree of Intranet utilization (also refer to Table 38 to see the actual wordings).

Interestingly, some responses included such phrases as ‘no reason,’ ‘never thought,’ ‘routine,’ or ‘habitual.’ These responses were classified into the category of indifference. Though supervisor’s instruction and sense of empowerment were identified, these were classified into the category of others due to their very low frequencies.

The Relations Between Discontinuer Types and Intranet Use Modes

Even if the previous testing of some hypotheses included the frequency of use as a dependent variable, the variable did not provide the information about how discontinuers and continuers differently utilized the modes of Intranet technology. Damsgaard and Scheeper (1999) suggest that Intranet technology use modes tend to be made up of five components, which are publishing, transacting, interacting, recording, and searching. However, Intranet technology use modes can vary with specific Intranet configurations depending on organizational contexts and the resource availability. The current research asked respondents to answer their average weekly use with respect to different use modes realized in the Intranet such as sending email, reading email, sending information to a group or the overall organization, reading organizational announcements, participating in (or forming) discussion groups, and internal browsing.

Table 39 shows that for discontinuers, there are significant differences with respect to all of the intranet use modes except internal browsing. More specifically, replacement and partial discontinuers more frequently used the Intranet for sending and reading emails than did other types of discontinuers.[22] With regard to sending information to a certain group or the organization, the mean score of partial discontinuers was significantly higher than indifferent discontinuers (mean difference =.51, $p < .01$), reserved discontinuers (mean difference = .34, p. =.04), and political discontinuers (mean difference = .84, p =.01). Partial discontinuers more frequently read organization announcements than all other types of discontinuers: replacement discontinuers (mean difference = 1.59, $p < .01$), indifferent discontinuers (mean difference = 1.61, $p < .01$), reserved discontinuers (mean difference = 1.14, $p < .01$), disenchantment discontinuers (mean difference = 1.86, $p < .01$), and political discontinuers (mean difference = 1.07, $p < .01$). Regarding internal browsing, even if the F statistic indicated that there were no significant differences across discontinuer groups, host-hoc tests revealed that certain types of discontinuers utilized the internal browsing mode more often than did other types of discontinuers. For example, the mean score of replacement discontinuers was higher than indifferent discontinuers (mean difference = .70, p = .02) and partial discontinuers (mean difference = .68, p = .02). With respect to discussion group participation, indifferent discontinuers and disenchantment discontinuers less frequently participated in discussion groups than did other types of discontinuers.

[22] Host-hoc mean comparison tests indicated that mean differences between replacement and partial discontinuers and other types of discontinuers were statistically significant.

Table 39: Results of MANOVA for Independent Discontinuer Groups with Respect to Intranet Use Modes

	Discontinuer Types (Group Mean)							F
	1	2	3	4	5	6	Total	
Send Email	3.73	2.80	2.91	3.71	2.60	2.33	3.10	8.56***
Read Email	3.73	2.86	2.95	3.80	2.50	2.67	3.16	8.53***
Send Information	2.36	2.11	2.28	2.62	2.20	1.78	2.31	2.49**
Read Announcement	3.36	3.34	3.82	4.96	3.10	3.89	3.93	20.06***
Internal Browsing	2.73	2.09	2.28	2.04	2.10	2.56	2.19	1.83
Discussion Groups	2.09	1.34	1.82	1.96	1.30	1.89	1.75	4.17***

1= replacement discontinuers; 2= indifferent discontinuers; 3 = reserved discontinuers; 4 = partial discontinuers; 5 = disenchantment discontinuers; 6 = political discontinuers.

Pillais', Wilks', and Hotellin's tests were all significant at $p < .001$ level.

*** significant at $p < .001$, ** significant at $p < .05$, * significant at $p < .10$.

The Relations between Different Types of Continuers and Intranet Use Modes

It is reasonable to speculate that there might be different types of continuers if there are various types of discontinuers. However, there has been no theoretical attempt or empirical study to identify different types of continuers even if some studies suggest that continuers differ in their level of utilization of ICTs (Davis, 1983; Venkatesh & Davis, 2000). In order to explore the existence of different types of continuers, the current research creates five types of continuers in parallel with discontinuer types: comparative superiority continuer, satisfactory continuer, partial continuer, indifferent continuer, and political continuer. Comparative superiority continuers are those who continuously use the previously adopted ICT because they perceive the technology is functionally superior to other ICTs. Satisfactory continuers decide to use the previously adopted ICT continuously because of satisfaction with its performance. Partial continuers are those who continuously use certain features of the adopted ICT but stop using other features[23]. Indifferent continuers are those who habitually use the previously adopted ICT without any reflective thought on their continued use of it. Political continuers mainly consider political benefits and costs when they make their continuance decisions[24].

Results of the MANOVA were presented in Table 40. The overall MANOVA was significant at $p <$ .001 irrespective of whether Pillais', Hotellings', or Wilks' tests were used. This confirmed that five continuer groups were significantly different with respect to Intranet use modes. The biggest *F* score (mean score difference across groups) was

[23] It is true that both partial continuers and partial discontinuers are those who utilize certain features of a given system. However, partial discontinuers are likely to feel that the system has not been incorporated into their work routines. On the contrary, partial continuers are likely to perceive that the system has been assimilated into their work routines. A comparison between continuers' and discontinuers' Intranet use reinforces this speculation since partial continuers more frequently utilized certain features of the system than did partial discontinuers (see Table 41 and 42).

[24] Similar to the validation of discontinuer types, continuance typology are also measured both categorically and continuously in the research. A principal component analysis and other tests for between- and within-group consistency are also performed and the results are included in the Appendix C.

found in sending information to a certain group or the overall organization in the group of continuers, $F = 11.43$, $p < .001$; conversely, reading organizational announcements produced the biggest F score in discontinuers.

As seen from Table 40, comparative superiority continuers and satisfactory continuers used all Intranet use modes more than other types of continuers. For example, the mean score of the average frequency of sending emails for comparative superiority continuers was significantly higher than indifferent continuers' (mean difference = .57, $p = .04$), partial continuers' (mean difference = .77, $p < .01$), and political continuers' (mean difference = 1.35, $p < .01$). Comparative superiority continuers also sent email more than indifferent continuers (mean difference = .62, $p = .02$), partial continuers (mean difference = .72, $p < .01$), and political continuers (mean difference = 1.15, $p < .01$). Satisfactory continuers used the internal browsing function more than indifferent continuers (mean difference = .75, $p < .01$), partial continuers (mean difference = .90, $p < .01$), and political continuers (mean difference < 1.02, $p < .01$).

The table also showed that the mean scores of participation in discussion groups, internal browsing and sending information were much lower than those of sending/reading emails and reading organizational announcements. These findings suggest that participation in discussion groups, internal browsing, and sending information through the Intranet were not a key aspect of work routines for many continuers.

Table 40: Results of MANOVA for Independent Continuer Groups with respect to Intranet Use Modes

	Continuer Types (Group Mean)						F
	1	2	3	4	5	Total	
Send Email	5.60	5.03	4.83	5.19	4.25	5.06	4.61***
Read Email	5.65	5.03	4.93	5.23	4.50	5.13	3.86***
Send Information	4.07	2.22	2.85	3.14	2.00	3.01	11.43***
Read Announcement	5.35	4.44	4.50	4.51	4.08	4.65	5.52***
Internal Browsing	2.81	2.51	2.37	3.27	2.25	2.82	5.01***
Discussion Groups	2.74	2.31	2.18	2.73	2.67	2.46	2.52**

1= comparative superiority continuers; 2= Indifferent continuers; 3 = partial continuers; 4 = satisfactory continuers; 5 = political continuers[25].

Pillais', Wilks', and Hotellings' tests were all significant at $p < .001$ level.

*** significant at $p < .001$, ** significant at $p < .05$, * significant at $p < .10$.

[25] Similar to the tests for discontinuer types, categorical items for continuer types and continuous scales for continuance types were included in the survey for continuers. Results of factor analysis and MONOVA were included in the Appendix.

CHAPTER 6: DISCUSSION

In this chapter, the results presented in the previous section are examined and the implication of these results to both theory and practice discussed. Finally, some limitations and possible future research directions are discussed. I begin with a brief summary of findings in this research.

Summary of Findings

1. Discontinuers vs. continuers
   A. Discontinuers were discriminated from continuers with respect to the relationships between A&P Intranet use and several independent variables. However, inconsistent with the diffusion literature, discontinuers did not differ from continuers with respect to experience, personal innovativeness and self-efficacy.
   B. The frequency of A&P Intranet use of discontinuers was associated with all sets of independent variables such as technological attributes, use-related outcomes, social influence factors and organizational intervention factors. On the contrary, the frequency of A&P Intranet use of continuers was strongly related to technological attributes and use-related outcomes, but not to social influence factors and organizational intervention factors.
   C. The presence of discontinuance was positively associated with perceived voluntariness but negatively associated with technological attributes (i.e., usefulness and compatibility), use-related outcomes (i.e., satisfaction), social influence factors (i.e., subjective norm, image, and critical communication partners' perceptions), and organizational intervention factors (i.e., organizational support and top management support).

D. There was a negative relationship between discontinuance and organizational communication satisfaction. Discontinuers were more likely to be dissatisfied with communication in the organization than continuers. Among discontinuer categories, political discontinuers were the least satisfied, while reserved discontinuers were the most satisfied with communication in the organization.

2. Types of discontinuance

   A. There were different types of discontinuance and therefore, of discontinuers. The category system proposed, i.e., that of replacement, partial, reserved, indifferent, and political discontinuance, was empirically supported. Though disenchantment discontinuance was not discriminated from replacement discontinuance as speculated,[26] disenchantment discontinuance was successfully discriminated from other discontinuance categories.

   B. Inconsistent with the diffusion literature, discontinuers appeared not to be a homogeneous group that resembles the individual characteristics of late adopters or laggards. Replacement and partial discontinuers were discriminated from reserved and indifferent discontinuers with respect to individual characteristics such as risk-taking personality, independent judgment capacity, innovativeness and self-efficacy. The former groups were more likely to take risks and have independent judgment capacity than the latter groups. Replacement and partial discontinuers were also likely to be more innovative and self-efficacious than reserved and partial discontinuers.

[26] A factor analysis of replacement and disenchantment discontinuance items failed to separate the items into two different factors. However, between- and within-group comparisons showed that the scores of continuous measures between replacement and disenchantment discontinuers significantly differed. Thus, the researcher did not aggregate these two groups of discontinuers into a same category following Rogers' conceptualization.

C. Replacement and partial discontinuers differed from reserved and indifferent discontinuers with respect to the relationships between their use of A&P Intranet and sets of independent variables. Reserved and indifferent discontinuers' use of A&P Intranet was related to social influence factors and organizational intervention factors that were not associated with replacement and partial discontinuers' use of A&P Intranet.

3. Barriers to continued use (from additional findings)
   A. Lack of organizational mediation (i.e., leadership, managerial efforts, and reward), communication (i.e., interactivity and sharing), information (i.e., usefulness and expertise), innovation attributes (i.e., compatibility and accessibility), and technical inferiority were likely to cause underutilization and discontinuance of A&P Intranet. Conversely, positive perceptions of innovation attributes such as compatibility and ease of use, and enhanced opportunity to gain organizational information tended to encourage the continued use of A&P Intranet.

DISCONTINUERS VERSUS CONTINUERS

Discrimination of Discontinuers from Continuers

As evidenced from the results of MDA and MANOVA for discontinuers and continuers (RQ 1), these two groups were well discriminated by the independent variables employed in this study. The results suggest that continuers are more likely to have a higher level of system use than discontinuers. It is also suggested that continuers are more likely to have positive perceptions than discontinuers with respect to technological attributes, their experience of the Intranet use, and organizational interventions. Continuers are more likely to view using Intranet as being useful and

compatible with their current tasks and organizational processes than are discontinuers. Continuers are more likely to be satisfied with their experiences of the Intranet use, are more likely to perceive Intranet as being enjoyable, and are more likely to perceive that they have control over using Intranet than discontinuers. In addition, continuers are more likely to perceive that the organization as well as top management has supported their Intranet use, and are less likely to perceive that their Intranet use has been voluntary.

These preliminary findings are consistent with the scant literature on discontinuance (e.g., Parthasarathy, 1995; Parthasarathy & Bhattacherjee, 1998). For instance, Parthasarathy and Bhattacherjee found that continuers had a higher utilization level of online services than discontinuers and that continuers more favorably perceived technological attributes than did discontinuers. However, the findings of the current study challenge the rationale that Parthasarathy and Bhattacherjee as well as the diffusion literature provide in order to explain the different utilization levels as well as different perceptions between continuers and discontinuers with respect to innovation attributes. For instance, Rogers (1995) observes that early adopters differ from late adopters along the adopter properties such as knowledge, skill and risk-taking behaviors. Rogers, Parthasarathy and Bhattacherjee also suggest that discontinuers and later adopters (late adopter and laggards) might share certain characteristics that can be used to explain the different post-adoption behaviors between continuers and discontinuers. More specifically, discontinuers are less likely to be innovative and self-efficacious, and are more likely to perceive the innovation as being risky. These characteristics make discontinuers more reliant on interpersonal influence than a rational assessment of a given innovation while forming their initial adoption decisions. Discontinuers' inferior cognitive and technological skill and their severe dependence on interpersonal influence

enlarge the expectation-reality gap, i.e., inability of adopters to achieve expected levels of benefits from the innovation, which results in negative perceptions of the innovation.

However, the results of the current study indicate that discontinuers may not differ from continuers with respect to individual characteristics (or adopter properties). For instance, the MANOVA results revealed that discontinuers were neither less innovative nor less self-efficacious than were continuers. A post-hoc independent sample t-test for risk-taking personality also found that discontinuers were not less receptive than continuers to new ideas. Moreover, the current study also found that continuers did not have a longer experience of Intranet use than discontinuers. These findings collectively denote that it might be problematic to identify discontinuers with later adopters based on individual characteristics and time of adoption. Apparently, these findings do not rule out the possibility that a certain portion of discontinuers are more likely to depict the characteristics of later adopters. However, it is equally plausible to argue that some continuers may resemble later adopters more than discontinuers do.

Perhaps the unsupported link between post-adopter classification, i.e., continuer vs. discontinuer, and individual characteristics may be accounted for by the contextual difference between the current study and others. The respondents of the current study were the members of an organization and their individual decision making for adoption followed the organization's decision to adopt the system. After the organizational implementation and individual adoption of the system, they made choices to discontinue (or continue) the system. On the contrary, most diffusion studies have been done within contexts where an initial adoption decision as well as post-adoption decision is made by an individual (e.g., Bhattacherjee, 2001; Parthasarathy & Bhattacherjee, 1998). That is, it is hardly sustainable to argue that individuals who discontinue an organizationally implemented system are more likely to have a risk-avoiding personality than continuers.

In a similar vein, discontinuers may be equally aggressive as continuers in searching for other available innovations beyond the organizationally implemented innovation in order to accomplish their tasks. In addition, some studies suggest that the capability to utilize an innovation corresponds with the experience of using it (Compeau & Higgins, 1999; Venkatesh & Davis, 2000). That is, individual differences in abilities to perform a specific behavior using the innovation diminish as familiarity with the innovation increases over time. The participants of the current study had more than three years of Intranet use experience on average regardless of post-adopter classification. Therefore, with respect to self-efficacy the increased familiarity may counter the less technical sophistication on the part of discontinuers suggested by the diffusion literature.

Different Relations of Independent Variables to Continuers' and Discontinuers' Intranet Use

The diffusion literature has not explicitly discussed or empirically tested the differential effects of the same set of variables on continuers' versus discontinuers' post-adoption behavior. Though, it is implicitly suggested that continuers are more likely to rely on a rational assessment of innovation attributes and are less likely to be dependent on interpersonal communication networks for using the previously adopted innovation as compared to discontinuers (Bhattacherjee, 2001; Parthasarathy & Bhattacherjee, 1998; Rogers, 1995). Again, these speculations are based on the empirically unsupported link of discontinuers to later adopters with respect to individual characteristics. For instance, Parthasarathy and Bhattacherjee argue that since discontinuers share certain characteristics of later adopters, discontinuers generally do not have cognitive, intellectual and technical abilities to form informed judgment about an innovation independently; conversely, continuers possess skills and resources required to evaluate an

innovation and their experience with it and form rational judgment of the innovation independently of the influences of others.

The results of the linear regression analyses indicate that discontinuers and continuers are likely to have different relationships with the same independent variables. Discontinuers as well as continuers can be affected by technological attributes such as compatibility and usefulness of the Intranet. However, the results (see the standard coefficients in Table 17) also indicate that continuers tend to place much more weight on technological attributes for using the Intranet than do discontinuers. This conclusion is reinforced by the finding that, apart from the technological attributes, only satisfaction and subjective norm marginally affected continuers' system use. The results also suggest that social influence factors (e.g., critical communication partners' perceptions of the Intranet and subjective norms) and organizational intervention factors (e.g., perceived voluntariness, organizational support, and top management support) can be significant predictors of discontinuers' system use. These findings seemingly support the speculations suggested by the diffusion literature that continuers and discontinuers may be influenced by different factors regarding their use of a previously adopted innovation. However, again, the rationale suggested by the diffusion literature to explain the found relationships between the independent variables and post-adopter categories (continuers vs. discontinuers) appears to be untenable. As discussed previously, the diffusion literature suggests that discontinuers are more vulnerable to the influences of others (or an organization) due to their cognitive and technical deficiency; continuers are more likely to rely on independent evaluations of innovation attributes as well as their experiences of the innovation because they have sufficient knowledge, intellectual capability and prior experiences. Yet, the current study did not find the differences

between continuers and discontinuers with respect to personal innovativeness, self-efficacy, risk-taking personality and Intranet experience.

Given the limited amount of research examining post-adoption behaviors, especially the comparisons between continuers and discontinuers, it is difficult to provide rich interpretations about the inconsistency of the current study and the diffusion literature. However, a plausible explanation might be drawn from the post-hoc correlation analyses of continuers and discontinuers (see Appendix A and B for the tables). The results found that, for discontinuers, there were positive correlations between the sets of independent variables such as technological attributes, use-related outcomes, social influence factors and organizational intervention factors. For instance, usefulness and compatibility were positively associated with satisfaction, perceived behavioral control, enjoyment, subjective norms, image and critical communication partners' perceptions (and negative associations with perceived voluntariness). On the contrary, usefulness and compatibility of continuers had positive relationship only with use-related outcomes such as satisfaction, perceived behavioral control and enjoyment. These results[27] seem to suggest that compatibility and usefulness may mean different things or be confirmed by different factors for continuers and discontinuers. In fact, Fulk (1993) and Kraut et al. (1998) suggest that although utility and norms are conceptually separable, in certain groups (or certain settings) the interconnection between individual utility and social norms tends to be enlarged. As evidenced from the results, discontinuers tend to bridge others' use (or perceptions) of an innovation to objective benefits and costs associated

[27]The magnitude of the difference between technological attributes (i.e., usefulness, compatibility) and other sets of variables for continuers vs. discontinuers appeared to be substantial. For instance, discontinuers' perception of compatibility was significantly and positively related to subjective norms (r = .30, p < .01) and image (r = .25, p < .01, while continuers' perception of compatibility was not related to either subjective norms (r = -.03, p = .37) or image (r = .08, p = .26). Thus, the results seemed to show sizable differences in the relationships that are clearly distinct.

with using an innovation. In addition, normative influences and organizational mediations may also shape and change the utility of the innovation for discontinuers more strongly than for continuers.

Relationships between Independent Variables and the Presence of Discontinuance

The results of the logistic regression analysis support the non-relationship between self-efficacy (H2-1a) as well as perceived ease of use (H3-1) and the presence of discontinuance (see Table 41 for the level of support). Given that the extant literature has reported the consistent relationship between these two factors and initial adoption, the current findings suggest that the influence of Intranet self-efficacy and perceived ease of use on post-adoption behaviors (continuance vs. discontinuance) will diminish as users gain increasing experience with the system. The current study also found that continuers and discontinuers did not differ with respect to their Intranet experience, self-efficacy and perceived ease of use. These findings collectively suggest that initial individual differences regarding self-efficacy and perceived ease of use may fade away with the amount of experience respondents have and that they may have accumulated sufficient knowledge from their actual experience about how to use the system in order to perform a specific task. That is, the initial belief in one's ability to perform behaviors using the system become inconsequential as users begin to rely on their actual experience with the system (Bandura, 1975). The same reasoning can also be used to explain the non-relationship between the perceived ease of use and post adoption behaviors because the system becomes easier to use as familiarity increases (Bandura, 1975; Parthasarathy & Battacherjee, 1998; Venkatesh, 2000; Venkatesh & Davis, 2000). Karahanna et al. (1999) also observe that as users gain experience with the system, ease of use concerns may be resolved and displaced by more instrumental considerations such as perceived usefulness.

Table 41: Summary Table of Hypothesis Tests

	Hypothesized Relationship (suggested direction)	Supported Level
H1	Discontinuer types and adopter category[28]	$p < .01$
H2-1a	Innovativeness and discontinuance (nonrelationship)	*ns* ($p = .36$)*
H2-1b	Innovativeness and discontinuer types[29]	$p < .01$
H2-2a	Self-efficacy and discontinuance (nonrelationship)	*ns* ($p = .70$)*
H2-2b	Self-efficacy and discontinuer types[30]	$p < .01$
H2-3	Gender and discontinuance through compliance effect	$p < .10$
H2-4	Continuance commitment and discontinuance (negative)	$p < .10$
H3-1	Ease of use and discontinuance (nonrelationship)	*ns* ($p = .14$)*
H3-2	Usefulness and discontinuance (negative)	$p < .01$
H3-3	Compatibility and discontinuance (negative)	$p < .01$
H4-1	Satisfaction and discontinuance (negative)	$p < .05$
H4-2	Enjoyment and discontinuance (negative)	*ns* ($p = .42$)
H4-3	Behavioral control and discontinuance (negative)	*ns* ($p = .38$)
H5-1	Work group membership and discontinuance	$p < .01$
H5-2	Subjective norm and discontinuance (negative)	$p < .01$
H5-3	Image and discontinuance (negative)	$p < .01$
H5-4	Communication partner and discontinuance (negative)	$p < .05$
H6-1	Organizational support and discontinuance (negative)	$p < .05$
H6-2	Voluntariness and discontinuance (positive)	$p < .01$
H6-3	Top-management support and discontinuance (negative)	$p < .01$
H6-4	Innovation climate and discontinuance (negative)	ns ($p = .27$)

*supported since these hypotheses speculated the nonrelationship.

[28] Replacement/partial discontinuers will resemble earlier adopters more than other types of discontinuers
[29] Replacement and partial discontinuers will be more innovative than other types of discontinuers
[30] Replacement and partial discontinuers will be more self-efficacious than other types of discontinuers

In short, Intranet self-efficacy and perceived ease of use may be important factors during the initial adoption of a system, but these factors become insignificant with increasing experience with the system.

TAM has found perceived usefulness as the most salient belief influencing ICT acceptance (e.g., Davis et al, 1989; Mathieson, 1991; Taylor & Todd, 1995). Compatibility has been also found to be a crucial factor in innovation acceptance contexts (Taylor & Todd, 1995; Venkatesh & Davis, 2000). The current study explored if perceived usefulness (H3-2) and compatibility (H3-3) could be consistently salient in post-adoption contexts and found negative associations with the presence of discontinuance. Therefore, we can conclude that the effect of perceived usefulness and compatibility on initial adoption and post-adoption behaviors attests to their salience across the temporal stages of the diffusion process. However, perceived usefulness and compatibility, which were stronger predictors of acceptance intention in TAM than use-related outcomes and social influence factors, were weaker than top management support and subjective norms in predicting the presence of discontinuance in the current study (see Table 29). The results seem to suggest that even if the effect of perceived usefulness and compatibility appears to be persistent both in initial adoption stage and post-adoption stage, their effect size may decrease over time. With the combination of TAM, the current findings provide some intuition for understanding this change. Users' pre-acceptance attitudes are based predominantly on cognitive beliefs such as usefulness, compatibility, and ease of use (Battacherjee, 2001). These beliefs are largely based on second-hand information from mass media, referent others, or other sources. However, users' first-hand experience with the system makes them adjust potentially inaccurate and unrealistic attitudes toward the system and makes them recognize other contextual

elements that actually affect their system use, which may reduce the prominence of the cognitive beliefs during the post-adoption stage.

EDT postulates the positive influence of user satisfaction on continuance intention. It also suggests that satisfaction may be an important element in explaining the ICT acceptance- discontinuance anomaly (user discontinuance of ICT after its initial acceptance). Consistent with EDT, this study found that user satisfaction with the system was negatively related to the presence of discontinuance (H4-1). The more users are dissatisfied with the system, the more the users are likely to discontinue. However, unexpectedly, this study did not find the relationship between enjoyment and discontinuance (H4-2). The rejection of H4-2 may be of interest because it is inconsistent with the previous studies that verified the consistent effect of intrinsic motivations (i.e., perceived enjoyment, perceived playfulness) on initial adoption and subsequent use. Based on the current findings, what seems to be more accurate is that the effect of intrinsic motivations on user behavior (i.e., discontinuance) may vary depending on technologies and usage contexts. For instance, most studies, which found the significant effect of intrinsic motivations on intention to adopt or to use, were conducted in voluntary usage contexts with the concern of individual technologies such as microcomputers (Igbaria et al, 2001), mobile Internet services (Thong et al., 2006), online games (Hsu & Lu, 2007) and e-learning course (Roca et al, 2006). However, it is likely that users may place more weight on extrinsic motivations (e.g., task-fit functionality, usefulness) in mandatory usage contexts than on intrinsic motivations. Also, users may give relatively little attention to pleasures or excitement when they participate in the communication process through ICT within organizational contexts.

Another unexpected finding is the statistically insignificant relationship between perceived behavioral control and the presence of discontinuance (H4-3). Perhaps this

finding can be accounted for by the relations of perceived behavioral control to other variables such as self-efficacy and perceived ease of use. Perceived behavioral control is a construct that reflects an individual's perception of the availability of knowledge, resources, and opportunities required to perform the specific behavior (Ajzen, 1991). Venkatesh (2000) also observes that the construct consists of two dimensions: internal control that relates to knowledge/self-efficacy and external control that relates to the environment. Therefore, the close relationship between the internal control dimension of the construct and self-efficacy as well as ease of use is highly plausible. In fact, a post-hoc correlation analysis confirmed that the perceived behavioral control was related to self-efficacy, r =.25, p < .01, and ease of use, r = .18, p < .01. As previously discussed, self-efficacy and ease of use in the current study were not related to the presence of discontinuance and they did not make a statistically significant contribution to discriminating discontinuers from continuers. Thus, it is likely that the importance of internal control dimension of the perceived behavioral control, like self-efficacy and ease of use, become inconsequential as familiarity with a given system increases. In addition, regarding the external control dimension, Intranets does not require additional resources rather than Internet connection and computer terminals. Therefore, it is also expected that there may not be much variation among users with respect to the external control of Intranet.

The fact that all the sub-parts of hypotheses concerning social influence factors (H5-1 to H5-5) are confirmed is of note. Formal work group membership is found to be related to the distribution of discontinuers (H5-1). Subjective norms (H5-2), image (H5-3) and critical communication partners' perceptions of the system (H5-4) all appear to be negatively related to the presence of discontinuance. These findings are consistent with the prediction of SIT as well as IDT, which recognize the importance of those factors in

explaining initial adoption as well as subsequent use. The current study verifies that affiliation with formal social group can regulate members' behaviors regarding adopter behaviors. It also confirms that individual use of ICT can be influenced by others with whom one interacts. In addition, informal rules and expectation (e.g., enhanced image), which are mainly invisible, can affect user behaviors. However, caution should be exercised when applying the finding to other contexts. It is true that the effect of social influence on user behaviors has been inconsistent across studies (see Venkatesh & Davis, 2000; Venkatesh, 2001) and the current study speculates that the inconsistency might be due to contextual settings and types of technology adopted. That is, in mandatory usage contexts with the concern of ICTs rather than stand-alone technology users are more likely to be affected by social influence factors. Thus, the current study conditionally confirms the effects of social influence factors on user behaviors.

All parts of H6 except H6-4 that are concerned with organizational intervention factors are supported. Perceived voluntariness (H6-2) is likely to be positively associated with the presence of discontinuance. The negative relations of discontinuance to organizational support (H6-1) and top management support (H6-3) are also confirmed. Put differently, organizational support of continued commitment to an implemented ICT can reduce the probability of discontinuance. There is also a greater likelihood of ICT discontinuance when positive top management attitudes regarding a system have not been communicated to users after its implementation. In addition, as users more strongly perceive that doing their tasks through the system is not mandated in an organization, the chance for user discontinuance tends to increase. Yet, surprisingly, organizational innovation climate did not relate to the presence of discontinuance. There are at least two possible explanations. First, the result indicated that the directionality was congruent with the hypothesis even if the association was not significant. It may suggest that innovation

climate is not sufficient to change user behaviors independently of other incentives or organizational recognition. Second, organizational innovation climate may not be perceived much differently by members. In fact, the current study did not find a statistically significant difference between continuers and discontinuers with respect to their perception of organizational innovation climate (see Table 16).

The Relationship between Organizational Communication Satisfaction and Discontinuance

The second research question explores the difference between continuers and discontinuers with respect to organizational communication satisfaction. The independent sample t-test (see Table 25) found that discontinuers were more likely to be dissatisfied with communication in the organization than were continuers. Even though there has been no empirical study that delves into the relationship between innovation discontinuance and organizational outcomes, some studies suggest that the level of participation in communicative processes may be crucial to satisfaction with organizational communication. For instance, Keyton (1990) argues that participation, which refers to the level of individual contribution to the communicative processes within an organization or a group through ICTs, can enhance members' overall satisfaction with communication. In a similar vein, Bailey and Pearson (1983) suggest that the quantity as well as quality of information transmitted through a medium may increase the sense of inclusiveness, empowerment, unequivocality regarding organization-wide activities, and communication satisfaction. With a newer ICT such as an Intranet, individual members become concerned with how the system allows them to participate in organizational processes and to acquire organizational information (Olaniran, 1996; Sproull & Kiesler, 1986). If users sense that their expectations are not being met, they may begin to reduce

their level of system use and their dissatisfaction with the system may transfer to the dissatisfaction with overall communication in the organization.

The current study found that discontinuers are dissatisfied with the Intranet and less frequently use the system (see Table 16). A post-hoc correlation test for all respondents revealed that the frequency of A&P Intranet use was significantly related to satisfaction with the system, $r = .37$, $p < .01$, and organizational communication satisfaction, $r = .31$, $p < .01$. In addition, the additional findings of the current study showed that a large portion of discontinuers complained about the poor quality of information and the lack of reciprocity on A&P Intranet. It is true that these results cannot establish the directionality of the relationship between the level of participation in the communication processes through the Intranet and organizational communication satisfaction. More specifically, the results cannot rule out the possibility that organizational members may not fully utilize the system due to their dissatisfaction with the overall communication in the organization or that these two variables may mutually reinforce each other. However, the results at least illustrate that there are meaningful relations among satisfaction with the system, the level of participation through an ICT, and organizational communication satisfaction. That is, discontinuers, who are less satisfied with the system than continuers, are less likely to utilize the system after initial implementation and are more likely to be dissatisfied with organizational communication.

The ANOVA results (see Table 36) found a significant difference across six discontinuer categories with respect to organizational communication satisfaction. Among discontinuer categories, reserved discontinuers were the most satisfied and political discontinuers were the least satisfied with communication in the organization. These findings might be also explained by the function of different levels of system satisfaction and of level of system use between discontinuer categories. In fact, post-hoc

Sheffe tests revealed that reserved discontinuers were more likely to be satisfied with the system than were replacement (mean difference = .47, $p < .10$), indifferent (mean difference = .43, $p < .10$), disenchantment (mean difference = .64, $p < .10$) and political discontinuers (mean difference = .93, $p < .05$). In addition, reserved discontinuers' level of system use was higher than indifferent (mean difference = .41, $p < .10$), disenchantment (mean difference = .44, $p < .10$), and political discontinuers (mean difference = .65, $p < .10$). The Sheffe tests also found that political discontinuers were less likely to be satisfied with the system than were replacement (mean difference = -.46, $p < .10$), indifferent (mean difference = -.61, $p < .10$), partial (mean difference = -.76, $p < .10$) and reserved discontinuers. Political discontinuers were also less likely to utilize the system than were partial (mean difference = -.40, $p < .10$) and reserved discontinuers (mean difference = -.65, $p < 10$).

Overall, the findings support the speculated relationships among system satisfaction, level of participation through the system, and organizational communication satisfaction. As expected, reserved discontinuers, who are the most to be satisfied with organizational communication, maintain more positive attitudes toward their use of the system and preserve higher level of system use at the moment of discontinuance than do other types of discontinuers. Conversely, political discontinuers, who are the least to be satisfied with organizational communication, become less satisfied with the system and participate less in communication processes through the system when compared to other types of discontinuers.

TYPES OF DISCONTINUANCE AND DISCONTINUERS

Composition of Discontinuer Categories and Heterogeneous Nature of Discontinuers

The results indicate that there are clearly different types of discontinuance and therefore, of discontinuers. The categories proposed, i.e., that of replacement, partial, reserved, indifferent, and political discontinuance, were empirically supported. Disenchantment discontinuance was not discriminated from replacement discontinuance as speculated. However, disenchantment discontinuance was successfully discriminated from other discontinuance categories. However, the composition of discontinuer categories is somewhat surprising since those who identified themselves as replacement or disenchantment discontinuers only consisted of about 12 % of the discontinuers. In addition, the frequency of disenchantment discontinuers was almost the same as that of replacement discontinuers. Although there have been very few empirical studies that report the composition of different discontinuer types, the diffusion research suggests that users are more likely to discontinue a previously adopted innovation due to the disenchantment (or dissatisfaction) with the innovation rather than the replacement of the innovation with another (Parthasarathy & Bhattacherjee, 1998; Rogers, 1995). For instance, from their study of online service discontinuance, Parthasarathy and Bhattacherjee reported that disenchantment discontinuers were twice as many as the replacement discontinuers. The low frequency of disenchantment discontinuers in the current study suggests that dissatisfaction with an organizationally implemented innovation may not automatically lead to the total abandonment of the innovation. Rather, users in mandatory usage contexts are more likely to continuously use the innovation while ignoring certain features of it with which they are dissatisfied. Or, dissatisfied uses may become less attentive to the innovation or put it aside without giving reflective thought to it.

The current study also indicates, inconsistent with the diffusion literature, discontinuers do not appear to be a homogeneous group (H1 and H2). This study found that replacement and partial discontinuers were discriminated from reserved and indifferent discontinuers based on risk-taking personality, independent judgment capacity, innovativeness and self-efficacy. The former groups were more likely to take risks and have independent judgment capacity than were the latter groups (H1). Replacement and partial discontinuers were also likely to be more innovative (H2-1b) and self-efficacious (H2-2b) than were reserved and partial discontinuers. In addition, the diffusion literature, as mentioned before, suggests that discontinuers may resemble late adopters or laggards while continuers are more likely to resemble early adopters with respect to their individual characteristics. However, this study found that discontinuers did not differ from continuers with regard to those individual characteristics (see Table 24 and 27). Moreover, a post-hoc test revealed that replacement discontinuers were more likely to be innovative (mean difference = 1.03, $p < .01$), self-efficacious (mean difference = .64, $p < .05$), and risk-taking (mean difference = 1.29. $p < .01$) than were continuers. Therefore, it is reasonable to conclude that discontinuers cannot be considered a homogeneous group that shares the individual characteristics of later adopters.

Overall, the findings suggest that people are not passive recipients of innovations even where the innovation implementation decision is made by an organization. Rather than accepting organizational decisions, they experiment with them, evaluate them, develop positive or negative feelings about the innovation, and work around it. Particularly, the diverse list of actions such as replacement, reservation, indifference, partial use, and political discontinuance (as well as various continuance types) highlights the complex nature of post-adoption behaviors as a process and contrasts markedly with

the widely cited adopter categories such as earlier adopters and later adopters, where discontinuers are treated as identical with later adopters.

Relationships between Independent Variables and Discontinuers' System Use

Replacement and partial discontinuers differed from reserved and indifferent discontinuers with respect to the relationships between their use of A&P Intranet and sets of independent variables. The current study found weak support for H7-1, which speculates that replacement and partial discontinuers are more likely to be affected by technological attributes and user-related outcomes than are reserved and indifferent discontinuers. Replacement and partial discontinuers' A&P Intranet use was related to usefulness, compatibility and satisfaction with the system; reserved and indifferent discontinuers' A&P Intranet use was related to usefulness only. Perceived ease of use, perceived behavioral control and enjoyment were not related to either replacement/partial discontinuers' or reserved/indifferent discontinuers' A&P Intranet use. As discussed previously, perceived ease of use and perceived behavioral control tend to be closely related to users' experience with the system. Thus, the statistically insignificant effects of perceived ease of use and perceived behavioral control are not surprising considering that most discontinuers had sufficient experience with the system. In addition, similar to the insignificant effect of enjoyment on user behavior, whether using the system is enjoyable may not be important to discontinuers when deciding their behaviors.

However, the current study found strong support for H7-2. Reserved and indifferent discontinuers' use of A&P Intranet was related to all social influence factors and organizational intervention factors except top management support. On the contrary, neither social influence factors nor organizational intervention factors were associated with replacement and partial discontinuers' use of A&P Intranet. Put differently, reserved

and indifferent discontinuers may be much more vulnerable to social influences and organizational mediations when changing their ICT usage patterns than are replacement and partial discontinuers. Normative influences and organizational efforts for sustained use may have inconsequential influence on replacement and partial discontinuers.

The underlying logic of the different influence of independent variables on discontinuers' ICT use is that certain types of discontinuers are more likely to share the characteristics of earlier adopters. The findings of the current study appear to support this reasoning since this study indicates that replacement and partial discontinuers are more likely to be innovative and self-efficacious, are less likely to perceive innovations as risky, and make judgments independently of the communicated beliefs of others as compared to reserved and indifferent discontinuers. The greater level of innovativeness and the ability to form self-confidence and informed judgment make replacement and partial discontinuers more reliant on technological attributes and their own experiences. On the contrary, reserved and indifferent discontinuers are more likely to rely on the communicated perceptions of others, normative pressures, and organizational interferences in making their post-adoption decisions.

BARRIERS TO CONTINUED USE AND PREVAILED UNDERUTILIZATION

The summary of the open-ended questions (see Table 37 and 38) suggests that lack of organizational mediation (i.e., leadership, managerial efforts, and reward), communication (i.e., interactivity and sharing), information (i.e., usefulness and expertise), innovation attributes (i.e., compatibility and accessibility), and technical inferiority are likely to cause underutilization and discontinuance of the Intranet. Conversely, positive perceptions of innovation attributes such as compatibility and ease of use, and opportunity to access organizational information are likely to encourage the

continued use of the Intranet. In addition, the findings seem to indicate a clear distinction in the factors that discourage and drive the continued use of the system. Those factors that are barriers to the continued use of the system are primarily related to the organizational aspects, including lack of organizational mediation, intra-organizational communication, and the lack of authority to maintain the quality of information exchanged through the system. The enablers of the system, on the other hand, seem to be mainly related to users' perceptual beliefs such as innovation attributes. Thus, the additional findings more or less reinforce the previous finding that continuers' post-adoption behaviors are more likely to be affected by technological attributes and discontinuers' behaviors are more likely to be affected by organizational intervention as well as social influence factors.

The additional findings (see Table 39) suggest that certain Intranet features are more likely to be utilized by certain types of discontinuers. For instance, replacement and partial discontinuers more frequently used the A&P Intranet for sending and reading emails as compared to other types of discontinuers. Partial discontinuers used the A&P Intranet for sending information and reading organizational announcements more so than did other types of discontinuers. These findings seem to provide plausible explanations about why certain users replaced the Intranet with other alternatives (and why certain users selectively utilized certain features rather than stopped using the system). That is, replacement discontinuers' main reason to have adopted A&P Intranet might be for sending and reading emails even if they also used other features. Based on experience with the system, they found its technical inferiority with respect to its email functionality and decided to replace it with other available technologies. In contrast, partial discontinuers might continuously use the system due to its compatibility with their tasks

(e.g., disseminating information to a certain group or an overall organization) or information needs even if they are dissatisfied with other features.

In addition, there was a statistically significant difference between discontinuers and continuers with respect to which features were most frequently utilized by them. More specifically, features for reading announcements (i.e., bulletin boards) were more frequently used by discontinuers than any other features (send email, mean difference = 1.01, $p < .01$; read email, mean difference = .87, $p < .01$; send information, mean difference = 1.73, $p < .01$; participation in discussion groups, mean difference = 2.29; $p < .01$). Conversely, continuers most utilized A&P Intranet for sending and reading email. These findings suggest that discontinuers' main reason to have adopted A&P Intranet might be information needs, while email exchanges through A&P Intranet might be more crucial for continuers.

However, the additional findings (see Table 37 and 38) of this study also revealed that both for continuers and discontinuers, certain Intranet use modes appeared not to be assimilated into users' work routines. Particularly, participation in discussion groups was the least utilized by the organizational members. In addition, many continuers as well as discontinuers did not use A&P Intranet extensively in order to search for information or to publish the information through the Intranet[31]. In short, many of the intended users only interacted with A&P Intranet in a superficial way. Their limited use of A&P Intranet is similar to the low integration level of use described by Saga and Zmud (1994) as well

[31] Post-hoc paired t-test reveals that the underutilization of certain features is equally true of discontinuers and continuers For continuers, the mean differences between participation in discussion groups and other features were all statistically significant (i.e., send email, mean difference = -1.43, $p < .01$; read email, mean difference = -1.49, $p < .01$; send information, mean difference = -.47, $p < .01$; and read information, mean difference = - 2.13, $p < .01$). For discontinuers, the mean differences between participation in discussion groups and other features were also statistically significant (i.e., send email, mean difference = -1.35, $p < .01$; read email, mean difference = -1.42, $p < .01$; send information, mean difference = -.56, $p < .01$; and read information = -2.28, $p< .01$).

as Lassila and Brancheau (1999). These individuals used certain features of the A&P Intranet because of various reasons but they had not assimilated many of its functionalities into their work routines. Rather than considering acceptance and subsequent use in a simplistic way (e.g., time, overall frequency, satisfaction), it is useful to reframe those constructs so as to make them more appropriate to the study of complex technologies such as ICTs. In fact, the literature on the construct of acceptance within the field of ICTs reveals that acceptance (or adoption) has been treated as a wholesale acceptance of an innovation through the models of IDT, TAM, TRA, and TPB. It may be argued that such models are not suited for the study of complex ICT usage behavior as they are most relevant to simple technologies that can only be used in a limited number of ways. In short, by focusing on diverse features or modes provided by a certain ICT, one may better understand what causes some organizational members to use technology in a limited way or extended way.

Implications for Theory

The main implications of this dissertation are in the following areas. First, the study of post-adoption behaviors, especially discontinuance, is fundamental to the study of diffusion as a dynamic process with adopting entities constantly entering, reserving and leaving the process. The diffusion literature has been concerned with individuals or organizations that enter the process and given little attention to those entities that leave the process. This negligence of discontinuance has reinforced the primal assumption of the diffusion research that an adopter will continue to be a continuing user for the entire length of the diffusion process. However, the current study suggests that initial adoption, subsequent use, and discontinuance are all essential to understand the overall diffusion

process of an innovation. Leaving out any one of these procedural components reduces the concept of diffusion to an inert process, rather than the dynamic process that it is.

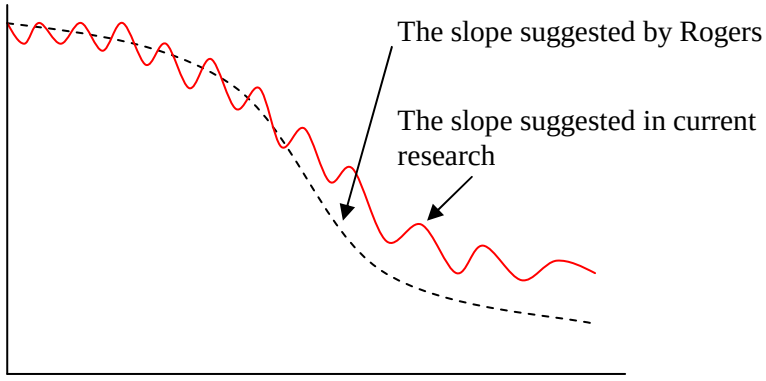
Second, this dissertation verifies that there are different types of discontinuance, and therefore of discontinuers, in addition to replacement and disenchant discontinuance suggested by the diffusion literature. Partial, reserved, indifferent, and political discontinuance identified by this study as distinct types of discontinuance implies that individuals discontinue due to various reasons beyond the explanations suggested by the diffusion literature. In addition, the diffusion literature has acknowledged discontinuers as a homogenous group of people who share the characteristics of later adopters. This dissertation suggests that it is problematic to perceive discontinuers as a single group in contrast to continuers. It also suggests that parallel to discontinuer categories, continuers can be classified into several different independent groups based on their reasoning for continued use.

Third, this dissertation suggests that the S-curve model in IDT may not be realistic in predicting the discontinuance rate. Rogers (1983) introduces the reverse of the traditional S-curve adoption model to explain the rate of discontinuance (see Figure 2). However, the current study indicates that reserved discontinuers consist of a large portion of discontinuers. The same result was also reported by Pollard (2005)[32]. Reserved discontinuers are leaving and re-entering the diffusion process constantly. Thus, as shown in Figure 2, the slope of discontinuance is more likely to show repeated fluctuations rather than a smooth decline. The degree of fluctuations will be related to the number of individuals who leave and re-enter the diffusion process at a given time. That is, the shape of discontinuance is contingent with the complexity of an innovation (Rogers,

[32] She refers to 'stalled users' those who discontinued GSS but had intention to reuse it.

1995), network externality (Markus, 1983), organizational interventions, etc. For instance, the discontinuance of a stand-alone technology in a strong voluntary use context may show more drastic fluctuations than the shape shown in Figure2 since it will be much easier for individuals to leave and re-enter the diffusion process.

Figure 9: Slope of Discontinuance Rate



Fourth, the current study seems to suggest that in order to fully understand post-adoption behaviors in organizational contexts, it is more promising to consider various theoretical perspectives rather than focusing on one theory or model. In this study, several theories and models were utilized to better understand the phenomenon of ICT discontinuance. The preceding analyses show that each theory provides a pertinent explanation, but none of them is actually conclusive with respect to what happened and why. Rather, together they provide an array of explanations for the various outcomes. For instance, with respect to the presence of discontinuance, the current study is consistent with the cognitive motivation theories (i.e., IDT, TAM), which suggest the strong positive association of usefulness and compatibility with continued use as well as acceptance. Nevertheless, compatibility or usefulness alone does not guarantee continued use of a previously adopted ICT. Various social influences and organizational mediations also play an important role to maintain the continued use of the system. In addition, the validity of TAM tends to be preserved for continuers but not quite for discontinuers. Put differently, the social influence theory or the institutional theory that strongly focus on organizational factors appears to be more relevant to explain discontinuers' behaviors.

Fifth, it is apparent that post-adoption behaviors are far more complex than expected when we consider how diverse features of ICT are differently utilized by adopters. The current study indicates that certain features of ICTs may be less frequently utilized than others. However, we still do not know about the patterns of feature adoption, use and discontinuance throughout the diffusion process (the initial adoption and the post-adoption stage). We also do not know the interplay between organizational mediations and the patterns of feature use. It is unclear whether the available theories or models are useful to delve into these micro-processes of diffusion. However, the current study at least demonstrates that feature-centered research is more suitable to explore the

usage patterns of complex innovations such as ICT and the connection between the usage pattern and both individual and organizational outcomes.

As one additional implication, even if this study examined a particular technological innovation, discontinuance should be more broadly relevant to the study of organizational change as the adoption and post-adoption processes of both managerial and technical innovations. For instance, Repenning (2002) points out that the history of management practice is filled with innovations that failed to live up to the promise suggested by their early success. Examples include job enrichment (Hackman, 1975), quality circles (Lawler & Morhman, 1987), Total Quality Management (TQM) (Economist, 1995), Business Process Re-engineering (White, 1996), and high-performance human resource practices (Pfeffer & Sutton, 2000). A paradox is that in many cases the failure of these innovations cannot be attributed to an intrinsic lack of efficacy (Pfeffer & Sutton; Repenning). For instance, the dedicated use of TQM improves quality, productivity, and overall competitiveness (Easton & Harrell, 1988; Hendricks & Singhal, 1996); a survey found that among United States manages TQM is often underutilized or discontinued (Byrne, 1997). Yet, a variety of theories and frameworks speak to the difficulties organizations experience in their attempts to capitalize on the opportunities presented by those administrative advances (e.g., Van de Ven & Poole, 1995), the paradox of useful but unused innovations and failed organizational changes has resisted theoretical and practical resolution.

One of the main arguments of this paper is that the missing piece of the diffusion puzzle is research appropriate to the dynamic nature of the post-adoption stage. In favor of a dynamic view, this study suggests that the success or failure of implemented innovations is largely determined by a complex interaction among variables that includes individual feedback (e.g., reevaluation, formation of social norms, and behavioral

change) and organizational mediations. Therefore, the current study can offer insight into why potentially useful innovations such as TQM often fail to find a permanent home in the organizations that try to secure its use, why organizational members do not incorporate those organizationally introduced innovations into their work routine, and how an organization can reinforce its members' commitment to a given innovation.

Implications for Practice

This study points out managers and practitioners should be attentive to post-adoption behaviors of intended users after the implementation of ICT. Put differently, managers of organizations should realize that retaining adopters and ensuring their continued use are potentially as important as the successful implementation of ICT. The extant literature has reported that implemented ICTs often do not meet organization' expectations due to the underutilization or abandonment of the systems by intended users. Consistent with the literature, this study indicates that the probability of discontinuance is high even in the contexts where ICT use is moderately mandatory. As correctly pointed out by Jasperson et al. (2005) and Ross et al. (2003), active management of the implementation of an ICT and managerial enthusiasm for the system often dissipate soon after the implementation of the system as the key people involved in the implementation are either reassigned to other projects or move on to what they consider more pressing activities. As a result, the post-adoption stage is left without proper management attention and direction. This was the same case in the organization where the current study was conducted. The key developers of A&P Intranet, except one person who was responsible for technical maintenance of the system, were reassigned to other programs right after the implementation. Thus, it is strongly recommended that organizations retain the personnel associated with the implementation process in order to manage challenges during the

post-adoption stage (e.g., system fit to prior expectations, changing environments, changing needs of users, resource reallocation, etc.).

In addition, the researcher was informed by the person who had been responsible for maintaining A&P Intranet that traffic on the Intranet rapidly decreased about seven months after the system implementation. Given the small portion of replacement, disenchantment, and political discontinuance, it is reasonable to believe that a large portion of indifferent and reserved discontinuance was likely to occur seven months after the implementation. This information is of importance because it is relevant to how long organizations have to actively guard against discontinuance (or certain types of discontinuance) or when they most need to worry about it. Unfortunately, we have seen no research about any point at which discontinuance of various types is more likely. At least, the current study suggests that indifferent and reserved discontinuance are more likely to pick up its discontinuance rate after the disappearance of the initial enthusiasm for the system. Therefore, managers or practitioners should be alert to these types of discontinuance when the system becomes familiarized and loses its newness.

Second, it is important to ensure user feedback after the implementation of ICT. End users are in a position to offer valuable information about how and why they use ICTs. They re-evaluate the system and constantly adjust their behavior based upon changed perception of the system as they become familiar with it. In fact, the current study revealed that some members consistently used it, some used it superficially, but some stopped using it. However, it is very difficult to assess current state and the effectiveness of past efforts, and to develop possible adaptations or intervention strategies without having rich data reflecting users' post-adoption behaviors. Therefore, it is recommended that system usage statistics and user evaluation should be periodically obtained over time. More important, the effort to collect data on post-adoption behaviors

should be done at the level of features of the system rather than the system level. More specifically, how various features of the system are differently utilized by intended users and why they use certain features more frequently but ignore others are the crucial questions to be answered in order to realize the expected benefits from the system use. It is only though analyzing the usage patterns at the level of features of the system that the complex user adjustments to the system can be exposed. Thus, it is also recommended that the feedback efforts should focus on usage patterns and user perceptions at the level of features of a given system.

Third, the current study suggests that the effects of organizational inventions and social influences vary with different user groups. There have been few practical recommendations whether organizations should use intervention strategies selectively to different user groups, which strategies should be used for targeted groups, and how organizations should use different intervention strategies within the post-adoption context. The current study found that discontinuers are more likely to be affected by social influences and organizational interventions while continuers are more likely to be affected by innovation attributes. Additionally reserved and indifferent discontinuers are more susceptible to social influence and organizational interventions than are other categories. These findings have strong implications for managerial strategies, because depending on which category of discontinuer an organization wants to address, the organization may choose different strategies. For instance, if the rate of continuance is high but the level of utilization is low, managers should focus on how the compatibility of the system with intended users' task can be enhanced because continuers are more likely to change their behaviors based on rational assessment of the system. However, if the discontinuance rate is high and most discontinuers are indifferent and reserved discontinuers, managers should place more weight on formal training, top management

leadership, or reward and recognition. However, in reality it may be quite difficult to identify potential discontinuers or different types of discontinuers (as well as continuers). At least, the current study indicates that the low level of system use may be one important indicator to identify potential discontinuers. In addition, individual characteristics (i.e., personal innovativeness, self-efficacy, risk-taking personality, independent judgment capacity) can be used to classify different types of discontinuers. Yet, the criteria may vary depending on organizational contexts (e.g., degree of voluntariness), user experience, or demographic compositions (e.g., age, education). Therefore, in order to devise and direct effective interventions managers should be attentive to methods that can help to build up comprehensive and useful profiles of user groups.

Yet, the previous discussion does not imply that organizations can only react to the phenomenon of discontinuance. Organizations can be proactive to reduce certain types of discontinuance that are seen as undesirable. For instance, top mangers' consistent support may be able to reduce the likelihood of indifferent discontinuance. The developments or adjustment of work procedures that are compatible with a given system may minimize the probability of reserved discontinuance. Thus, organizations should engage in the process of reducing the likelihood of certain types of discontinuance even if it is unlikely to identify potential discontinuers.

Fourth, managers should understand the importance of a proper implementation process for the sustained use of ICT. Many studies indicate that the failure to pay sufficient attention to the needs and expectations of intended user during the implementation stage enlarges the uncertainty of the ways the new system is used (e.g., Lewis, 2000; Tyre & Orlikowski, 1994; Weick, 1999). In addition, it is also noted that the implementation of ICT is not only the realization of the physical infrastructure and the installment of the software but also the clarification of the ways that intended users utilize

it (Cooper & Zmud, 1990; Swanson, 1988). As discussed previously, A&P did not have an explicit preparation process for its intended users nor provide a formal training to practice the Intranet. It was true at A&P that most intended users had previous experiences and knowledge of Intranets, however, they had not been provided with the opportunity to build 'technological frame[33]' (Orlikowski & Gash, 1994). It is clear from the additional findings of this study that a certain portion of discontinuers have limited understanding about what kind of information the system is used for and what are the communication tasks for which the system is intended to be used. Thus, the current study, consistent with the extant literature, suggests that rigorous implementation processes aiming at countering uncertainty and reservation are critical to ensure continued use of the system.

Fifth, it is important to keep in mind that the implemented ICT may not match with existing organizational structures and communication flows. That is, the distribution of resources and power and the preference of a certain communication medium prior to system implementation may play a key role not only during the adoption stage but also the post-adoption stage (Lee, 2000; Markus, 1983). In A&P, the organizational distribution of power and resources prior to the implementation of the Intranet was such that the strategy team and the PR team held more power than other teams. Since the organization engaged in many sensitive political and cultural issues, the careful selection of organizational positions regarding those issues and the efforts for media exposures were given the highest priority. Thus, critical information and revenue were concentrated in those teams, while the role of the cyber team was limited to a supporting roles based on other teams' requests. However, the arrival of a new leader of the cyber team changed

[33] Technological frame refers to shared assumptions, expectations, and knowledge individuals use to understand technology in organizations.

the circumstance. In strong alliance with the strategy team, he enthusiastically persuaded top managers to adopt various ICTs such as a video-conferencing system, instant group messaging system called 'bomber,' and A&P Intranet. A&P quickly implemented the systems recommended by him and his reputation had lasted until the abandonment of the video-conferencing system. Interestingly enough, the current study found that the strategy team had a very small number of discontinuers. In contrast, over 70 percent of the PR team discontinued the system. However, the apparent resistance of the PR team started to occur after the failure of the video-conferencing system. These findings suggest that a group of organizational members will be inclined to discontinue a given system if they believe that the power shift implied by the system will be disadvantageous to their own position. Moreover, the negative feelings toward the implemented system or behavioral resistance to it can be latent. Thus, managers should be cautious in judging intended users' initial adoption as the absence of resistance. Managers should be aware of the political structure of the organization and make sure that important players or stakeholders are involved in the implementation process.

In addition, the supplemental findings of this study indicate that the preference for face-to-face communication among members tended to hinder information exchange through the Intranet. It is questionable whether it is realistic for organizations to actively encourage ICT use over face-to-face communication (see Constant et al., 1994). However, to realize the expected benefits from system implementation, managers at least need to understand the current state of communication flows and the media preference of members.

Finally, managers should recognize that not all types of discontinuance are negative. It is true that discontinuance of a given system has been depicted as failure or at least as a problem that should be overcome (e.g., Rogers, 1995; Parthasarathy, 1995;

Parthasarathy & Bhattacherjee, 2000; Wang & Butler, 2006). In addition, it has been assumed that discontinuance occurs due to cognitive and technological inadequacy, unrealistic expectations of, and limited information about a given system. However, the current study shows that discontinuance co-varies with compatibility and usefulness (see Table 29). Some users may learn from their experience that certain features of a given system are not compatible with organizational work routines. Some may perceive that changing environments make certain features of the system impractical. In fact, these partial discontinuers gain benefits from their discontinuance of certain features because they can economize time by ignoring those incompatible features or find better ways to complete their tasks. Yet, it seems unrealistic for organizations to strategically encourage partial discontinuance since members' perceptions of and usage patterns of system features may vary depending upon their tasks.

However, managers may be able to strategically encourage replacement discontinuance. Replacement discontinuance is the outcome of the inferiority of a given system and should be differentiated from rejection. Rejection occurs during the adoption stage (Rogers, 1995), but replacement discontinuance occurs after an innovation has been used for a while. Thus, the occurrence of replacement discontinuance indicates that the innovation is becoming inferior to other innovations or becoming incompatible with the environment. In the current study, the frequency of replacement discontinuers only consisted of 7 percent of all discontinuers. This may indicate that Intranet technology is still new and that there are few alternatives to the technology. However, other innovations show much higher rates of replacement discontinuance (e.g., online services). Therefore, after a certain period time of system implementation organizations can benefit from the strategic encouragement of replacement discontinuance (e.g., incentives or official recognition) by testing newly available systems or preparing for an upcoming

renewal of the extant system. On the contrary, organizational pressure to ensure the continued use of the inferior (or obsolete) innovation can undermine an organization's competitiveness. In short, it is important for managers to keep in mind that discontinuance is not equivalent to failure and that certain types of discontinuance are positive to individuals as well as organizations.

Limitations

Like all dissertations, this one suffers from several limitations. First of all, the design of the current study is in nature cross-sectional research. Scant literature about post-adoption behaviors including the current study postulates that perceptions of and attitudes to ICT may change over time as the experience of adopters and usage context change. Therefore, it is reasonable to believe that the effects of those variables on post-adoption behaviors may differ from the effects on initial adoption. The cross-sectional nature of the current study restricted such temporal comparison since the collected cross-sectional data could not reflect such long-term phenomena. In addition, the current study was conducted about sixteen months after the system implementation. Some questions included in the questionnaire asked how respondents perceived the system when they decided to stop using A&P Intranet. Thus, there are potential sources of error in retrospective reports of experience with the Intranet.

Second, the organization examined in this study is somewhat unique since the organization is a nonprofit one that has a strong political orientation. In addition, the organization is operating in an Asian country that has been acknowledged to have a strong collectivistic culture. The respondents of the study may differ from the general population with respect to individual traits. In addition, the respondents of the study may be more vulnerable to social influences and organizational interventions than the samples

from an individualistic culture. Also, the organization may be more decentralized and lack formal communication flows in other organizations. These possibilities restrict the capacity to generalize the findings of the current study.

In addition, the findings and implications were obtained from a single study that examined a particular technology, an Intranet. Thus, caution needs to be taken when applying the findings to other ICT usage contexts. However, the hypotheses of the current study are rooted in theories that has been validated in the study of ICTs generally; thus, it is expected the discontinuance hypotheses generated in the current study to hold for other ICTs.

Third, it should be also noted that the effects of independent variables on post-adoption behaviors may vary depending on the technology of interest and usage situations of the technology (e.g., voluntary vs. mandatory). The meta-analysis reported previously already indicates that social influences (e.g., subjective norm) may explain a bigger portion of variation in usage of communication technologies than stand-alone technologies, while innovation attributes (relative advantages, compatibility, usefulness) may better account for stand-alone technology use. In addition, in a strong mandatory usage situation, it is expected that dissatisfaction may not lead adopters to discontinue a given technology. Thus, these technology- and context-dependency also tend to limit the applicability of the current study to certain other contexts.

Fourth, the current study suffers from a common method bias, derived from the use of self-reported measures of system usage. Methodological problems associated with self-reported measures of system usage have been the topic of some discussion (see Trice & Treacy, 1986). Comparisons between self-reported measures and objective measures (e.g., connect time, number of queries) have reported discrepancies between the two kinds of measures (e.g., Rice & Rogers, 1984). In addition to the inaccuracy of the self-

reported measures, it should be recognized that there is the possibility of a halo effect since system usage and post-adoption behaviors (continuance and discontinuance) were reported on the same questionnaire used to measure various perceptual variables (e.g., usefulness, compatibility, satisfaction). Nevertheless, the interchangeability of self-report and objective usage measures remains a controversial point in ICT research (Straub et al., 1995; Venkatesh & Davis, 2000) and many researchers has used self-reported measures as substitutes for objective usage measures (Agarwal & Karahanna, 2000; Igbaria et al., 1997; Saga & Zmud, 1994; Venkatesh & Davis).

Last but least, some of the scales developed for this dissertation were not established ones that have been validated over time. Although the scales were thoroughly tested, the fact that they were new and not tested in other contexts may present some problems with respect to their respective validities. In addition, the categories of discontinuers presented in this study may not be exhaustive. Even if the presented categories seem to achieve exhaustiveness in the current study, it does not rule out that there may be other types of discontinuers unacknowledged here in other study contexts.

Future Directions

First of all, some limitations of the current study provide opportunities for future research. As mentioned, the organization used for this dissertation is quite unique in some characteristics. Ideally it would be interesting to see if the contentions proposed in this study would hold for other organizational and cultural contexts. In addition, it is also promising to test whether the proposed relations hold for other ICTs (e.g., instant messaging, video-conferencing, chat room). Comparing the results of the present study to such a proposed study would help researchers understand whether the results of this study

are specific to the context or to the technology under study, or whether they can be generalized to other contexts with different ICTs.

In addition, studies are warranted in different situations such as strong mandatory usage situations where users might find that discontinuance is not be a viable option for them even if they are dissatisfied with the technology in question. How adopters work around the apparent conflicts between their perceptions and the organizationally imposed pressure, how those conflicts affect their usage patterns of the system, and how those conflicts affect individual outcomes (e.g., organizational commitment, productivity, and turnover) may be feasible research questions in this area. Also, as indicated, longitudinal research that can track the relationship between attitudinal changes and changes of usage patterns over time is a promising direction for future post-adoption research.

Second, the feature level analyses of post-adoption behaviors, as discussed briefly, are urgently required. In the post-adoption stage where adopters have acquired sufficient knowledge about a given system through their first-hand experience of a given system, the relative importance and usage patterns of its features likely change over time. Put differently, it is the usage patterns of the specific features that determine whether the expected outcomes can be realized. When working at the feature level of an ICT, it is important to classify a certain feature based on functions such as the Intranet use modes proposed by Damsgaard and Scheepers (1999). Another way is to find the set of features that can be a focus of the study based on the objectives and the level of utilization. Figure 3 provides an example by using the findings of the current study. When A&P decided to implement A&P Intranet, the main purpose presented by the cyber team was ‘active information sharing’ followed by ‘effective dissemination of information about organizational activities and work-team activities.’ Emailing was not mentioned by the team even if the function was incorporated into A&P Intranet.

Regardless of the methodology to classify the features, the feature level analyses help to answer where the variation in individual post-adoption activities resides, why and for what purposes certain features are more frequently utilized, which features are more likely to lead to discontinuance, which features an organization should focus on to devise interventions, and how the system has to be adapted in order to meet expectations.

Third, one of main purposes of the post-adoption research is to detect potential discontinuers in order to prevent the disruption of their system use. It is true that many studies have been undertaken to identify earlier adopters against later adopters using variables such as age, gender, income, education, and individual traits. Yet, except for Parthasarathy and Bhattacherjee's (1998) study of commercial online services, we have seen no empirical study that inquires about who potential discontinuers are. As a result, it has been unknown whether we can detect potential discontinuers by using the same earlier adopter profile in organizational contexts. The findings of this study suggest that the detection of potential discontinuers based on the earlier adopter profile may not be promising in organizational contexts. However, there are many plausible variables for building up potential discontinuer profile in organizational contexts (e.g., tenure, employment types, rank, and organizational commitment or loyalty). Future research in this area would help researchers as well as practitioners identify organizational members who have a high probability of discontinuance before they actually make the discontinuance decision. In addition, appropriate interventions aimed at reducing the likelihood of discontinuance can be developed with the identification of this group.

Figure 10: Identification of the Set of ICT Features

	Main Objective (Information Sharing)	Secondary Objective (Dissemination)	Ancillary Objective
Frequent Use		White Board	Email
	Publication by Users	Group mailing/ publication (organization wide)	
Infrequent Use	Internal Browser Discussion Groups		

Fourth, there has been a paucity of research about how structural and cultural characteristics of an organization relate to discontinuance (or continued use) rather than adoption itself. For this line of research a comparative design is ideal with the incorporation of such variables as degree of centralization or formalization, size, complexity of the organizational structure, internal coherence and resources allocated to a given system. Those structural and cultural variables can also be applicable to the comparison of different departments or work units.

Fifth, from the additional findings of the current study an interesting question arises. A substantial number of discontinuers expressed negative feelings about the information exchanged through A&P Intranet, while a large portion of continuers recognized A&P Intranet as a reliable repository of organizational information. Put differently, discontinuers and continuers tend to evaluate the same information published through Intranet quite differently. This anomaly brings up the questions such as why a certain group of organizational members judge certain information as reliable or valuable but others as unreliable, incomplete or outdated, and whether the discrepancy between different groups is due to their perceptions of the medium itself or due to different criteria they employ to evaluate information. Future research in this area would help researchers understand the dynamic communicative process (i.e., reception – evaluation – use) occurred through ICT.

Finally, another feasible future research area is to identify, compare and contrast the different types of users. When ICTs are used by individuals with different goals and levels of knowledge, an important aspect is to support their continued use and adaptation since different users may be interested in different features of a given technology. However, despite the research efforts developed in ICT acceptance and use, little attention has been paid the problem that different types of users typically utilize the

system with different reasons. The technology adoption research has begun to explore the existence of and identify different groups of system adopters (e.g., adopter classification), but the heterogeneity of continued users based upon their reasons and purposes of system use has not been explicitly discussed. In order to fill the gap, the current study proposes several continuer types. In fact, the findings of the study suggest that continuers, like discontinuers, tend to identify themselves differently with respect to their reason for system use. Put differently, the distinct users of a given technology, or for that matter of a good or service, employ it for different purposes. Consequently, they have different needs (e.g., to accomplish their tasks effectively, to avoid organizational sanctions, to enhance their image or status, etc.) and these needs would be best satisfied by different usage behaviors (e.g., cognitively absorbed use, mindless or indifferent use, partial use, etc.) as well as by different levels of system use (e.g., infrequent use, frequent use, etc.) according to their specific goals and demands. Thus, the identification of different types of users will provide more developed representations of user populations that help organizations mitigate risk, avoid less than optimal results, and balance user experience.

The purpose of this research was to examine post-adoption behavior in the context of ICT use. As presented, in many ways this research can help researchers as well as practitioners to gain insight into the phenomenon of discontinuance. However, the most important lesson learned throughout this study is that individual users are not passive recipients of an innovation. They experiment with it, evaluate it, modify their perceptions of it, work around it, and constantly leave and reenter its diffusion process. This learned lesson highlights that post-adoption behavior including discontinuance moves far beyond the conventional deterministic standpoints of the individual (i.e., solely acquiescing to the technological imperative or solely taking strategic choices), and the deterministic standpoints of the social (submitting to normative pressure or acquiescing to

organizational decisions). Instead, we should recognize that post-adoption behavior is the emergent outcome of the complex interrelationships among user, technology and environments.

APPENDICES

Appendix A: Binary Correlations Between Variables for Discontinuers

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
2	.44**																		
3	-.19*	.08																	
4	-.19*	-.01	.39**																
5	.41**	.08	-.08	-.03															
6	-.21**	.01	.31**	.39**	-.02														
7	.07	.11	.13	.10	.16*	.28**													
8	.03	.05	.12	.12	.03	.21**	.47**												
9	-.04	.10	.12	-.01	.03	.02	.26**	.33**											
10	-.14	.04	.22**	.27**	.08	.19*	.18*	.20**	.21**										
11	.06	.02	-.00	.05	.11	.04	.22**	.23**	.23**	.26**									
12	.06	.03	.07	.10	.04	.19*	.28**	.30**	.16*	.13	.21**								
13	.11	.13	-.02	.08	.09	.12	.16*	.25**	.22**	.20*	.18*	.27**							
14	.08	.20**	-.01	.02	-.07	.06	.16*	.20**	.11	.16*	.21**	.28**	.23**						
15	-.01	.00	.02	.14	-.03	.04	-.15	-.17*	-.17*	-.16*	-.14	-.33**	-.18*	-.27**					
16	.07	-.00	-.04	-.06	.14	.12	.07	.15	.07	.02	.11	.27**	.30**	.14	-.38**				
17	.21**	.07	-.02	-.15	.10	.05	-.05	.11	.13	-.02	.20**	.16*	.28**	.11	-.25**	.35**			
18	.48**	.23**	-.05	-.12	.26**	-.03	.13	.05	-.01	-.13	.14	.07	.05	.02	-.12	.23**	.14		
19	.37**	.14	.02	.10	.15	.01	.13	.20*	.19*	-.02	.22**	.11	.23**	.12	-.13	.20**	.23**	.35**	
20	.08	-.07	.03	.09	.12	.05	.29**	.42**	.20**	.13	.30**	.40**	.23**	.38**	-.39**	.34**	.30**	.17*	.26**

** significant at $p < .01$; *significant at $p < .05$.

1 = age, 2 = Intranet experience, 3 = innovativeness, 4 = self-efficacy, 5 = continuance commitment, 6 = ease of use, 7 = usefulness, 8 = compatibility, 9 = satisfaction, 10 = behavioral control, 11 = enjoyment, 12 = subjective norms, 13 = image, 14 = critical communication partners' perception, 15 = voluntariness, 16 = organizational support, 17 = top management support, 18, innovation climate, 19 = organizational communication satisfaction, 20 = frequency of use.

Appendix B: Binary Correlations Between Variables for Continuers

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
2	-.01																		
3	.05	-.02																	
4	.06	-.03	.38**																
5	.06	.05	.07	.14															
6	-.02	-.07	.34**	.40**	.10														
7	-.02	-.01	.06	-.09	.13	-.08													
8	.01	.12	.08	-.04	.14*	-.14	.58**												
9	.10	.07	.19**	.05	.42**	.06	.18*	.24**											
10	.17*	.09	.21**	.23**	.34**	.16*	.20**	.22**	.38**										
11	.05	.04	-.02	.04	.23**	.01	.14	.21**	.36**	.33**									
12	-.13	-.03	-.05	.03	-.03	-.06	-.04	-.06	.06	.01	-.02								
13	-.01	-.02	-.04	-.15*	.01	-.08	.11	.08	.10	.08	.03	.34**							
14	-.08	-.14*	.01	.03	.10	-.01	.06	.07	.12	.12	-.06	.37**	.32**						
15	.07	-.02	.04	.11	-.14	.05	-.08	-.13	-.21**	-.21**	-.19**	-.09	-.10	-.04					
16	-.06	-.03	.05	.07	.43**	.17*	.02	.01	.31**	.21**	.18*	.09	.04	.10	-.35**				
17	-.16*	-.10	.12	.15*	.07	.04	.12	.05	.05	.09	.00	.40**	.32**	.39**	-.04	.13			
18	-.06	.21**	-.01	-.10	.23**	-.02	.04	.06	.12	-.02	.19**	.06	.02	-.07	-.09	.22**	.07		
19	.01	.14*	.06	.15*	.29**	.02	.05	.01	.25**	.09	.23**	.06	.00	.13	-.17*	.28**	.02	.30**	
20	.07	-.03	.02	-.09	.19**	-.14*	.63**	.67**	.25**	.15*	.14	-.13	.05	.09	-.10	.07	.03	.07	.09

** significant at p < .01; *significant at p < .05.

1 = age, 2 = Intranet experience, 3 = innovativeness, 4 = self-efficacy, 5 = continuance commitment, 6 = ease of use, 7 = usefulness, 8 = compatibility, 9 = satisfaction, 10 = behavioral control, 11 = enjoyment, 12 = subjective norms, 13 = image, 14 = critical communication partners' perception, 15 = voluntariness, 16 = organizational support, 17 = top management support, 18, innovation climate, 19 = organizational communication satisfaction, 20 = frequency of use.

Appendix C: A Principal Component Analysis for Continuance Types

Rotated Component Matrix[a]

	Component			
	1	2	3	4
COM_1	.728	-.107	-.169	-.008
COM_2	.669	-.217	-.242	.154
COM_3	.715	-.121	-.191	.056
COM_4	.567	-.070	-.132	.177
SAT_1	.707	-.122	-.084	-.053
SAT_2	.744	-.168	-.062	.049
SAT_3	.714	-.210	-.032	.081
SAT_4	.593	-.086	-.146	-.051
PART_1	-.234	.800	.111	.023
PART_2	-.257	.782	-.024	-.079
PART_3	-.143	.773	.076	-.053
PART_4	-.137	.773	.047	-.057
IN_1	-.107	.095	.782	-.154
IN_2	-.151	.182	.832	-.041
IN_3	-.194	-.062	.749	-.060
IN_4	-.284	.010	.563	.060
POL_1	.002	-.071	-.063	.760
POL_2	.015	-.119	.030	.661
POL_3	.000	.153	-.188	.671
POL_4	.175	-.078	.022	.647

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

COM = comparative superiority continuance; SAT = satisfactory discontinuance;

PART = partial continuance; IN = indifferent continuance; POL = political continuance

Appendix D: Scales for the Primary Study

Categorical Scale for Types of Discontinuers

Question	Please check the one scenario that best identified the MAIN REASON that you stopped using the Intranet AT THE TIME YOU DECIDED TO STOP USING THE INTRANET
Replacement Discontinuer	I stopped using the Intranet because I found that other communication tools such as email or mobile phone were better fits for my work
Disenchantment Discontinuer	I stopped using the Intranet because I was generally dissatisfied with it
Indifferent Discontinuer	I stopped using the Intranet in a certain moment without any specific reason
Reserved Discontinuer	I am not using the Intranet currently but I am willing to use it if my job requires me to do
Partial Discontinuer	I stopped using a certain feature (or features) of the Intranet such as document uploading, emailing, or group mailing because I found that it was not useful
Political Discontinuer	I stopped using the Intranet because it would disadvantage me politically

Continuous Scale for Types of Discontinuance

Question	These statements are measured using a seven-point scale ranging from very strongly disagree to very strongly agree	
Replacement Discontinuance	1	I ended my use of the system because I found another service that work better
	2	I ended my use of the system because I found an alternative service that had better features
	3	I ended my use of the system because I found other services had more options than the system
	4	I ended my use of the system because I felt that the functional performance of other services was superior
Disenchantment Discontinuance	1	I ended my use of the system because I was unhappy with its performance
	2	I ended my use of the system because I was generally dissatisfied with it
	3	I ended my use of the system because I was unhappy with one or more features of it
	4	I ended my use of the system because I was unhappy with overall functional performance of it
Indifferent Discontinuance	1	I ended my use of the Intranet because I found that I was hardly using it
	2	I ended my use of the Intranet without encountering any problem with my previous use
	3	I ended my use of the Intranet because I became indifferent to it over time
	4	I ended my use of the Intranet because I lost my interest in it without any specific reason
Reserved	1	I stopped using the Intranet but I intend to use it again

Discontinuance	2	I will resume using the Intranet if my tasks require me to do
	3	I will resume my use of the Intranet if I have more time than I do now
	4	I reserve my use of the Intranet even though I am not using the Intranet currently
Partial Discontinuance	1	I am using the Intranet currently but I did not use some features such as group mailing, bulletin board, or web-browsing system provided by the Intranet
	2	I found that some features of the Intranet were unnecessary to perform my tasks
	3	I often visited bulletin boards to check updated information or organizational announcements without involvement in initiating discussion or disseminating information
	4	I perceived some features of the Intranet were useful but some were not
Political Discontinuance	1	I stopped using the Intranet because I did not want to appear to align with the Cyber Team that was responsible for the Intranet implementation
	2	I stopped using the Intranet because I wanted to dissociate myself from the Intranet
	3	I stopped using the Intranet because of disagreements with the supports of the Intranet
	4	I stopped using the Intranet because it would disadvantage me or my team politically
	5	I stopped using the Intranet because I want to see resources funneled to a different project or technology instead

Measure of Frequency of Use

How often have you used the Intranet on average? If you stopped using the Intranet how often did you used on average when you had been using it?		
___Never	___Once per month	___Once per week
___2 to 3 per week		
___4 to 6 per week	___Once a day	___More than once a day

Scale for Scope of Utilization

These statements will be measured using a seven-point scale ranging from “never” to “more than once a day”
Send emails to individuals
Send information to a certain group or the overall organization
Read individual emails
Read organizational announcements
Participate in (or form) discussion groups for critical issues or problems
Browse the news (from internal and external sources)

User Attributes: Operational definitions and scales

Construct	Operational definition	Items
Personal Innovativeness	The degree to which an organizational member is relatively susceptible to new ICTs with respect to others in the organization	1 If I heard about a new information communication technology, I would look for ways to experiment with it. 2 Among my peers, I am usually the first to try out new information communication technologies. 3 In general, I am hesitant to try out new information communication technologies. 4 I like to experiment with new information communication technologies.
Self Efficacy	The degree to which an organizational member believe in one's ability to perform a specific behavior using the Intranet with respect to others in the organization	I could complete a job or task using the system… 1 If there was no one around to tell me what to do as I go 2 If I could call someone for help if I got stuck 3 If I had a lot of time to complete the job for which the system was provided 4 If I had just the built-in help facility for assistance
Continuance Commitment	The degree to which an organizational member perceives costs associated with	1 It would be very hard for me to stop using the Intranet right now, even if I wanted to 2 It wouldn't be too costly for me to

	stopping using the Intranet		stop using the Intranet in the near future
		3	I believe that I have too few options to consider to stop using the Intranet in this organization
		4	Right now, continue to use the Intranet is a matter of necessity as much as desire

Technological Attributes: Operational definitions and scales

Construct	Operational definition	Items	
Perceived Ease of Use	The degree to which an organizational member believes that using the Intranet would be free of effort	1	Learning to operate the system would be easy for me
		2	I would find it easy to get the system to do what I want it to do
		3	My interaction with the system would be clear and understandable
		4	I would find the system easy to use
Perceived Usefulness	The degree to which an organizational member believes that using the Intranet would enhance his or her job performance	1	Using the system in my job would enable me to accomplish tasks more quickly
		2	Using the system would improve my job performance
		3	Using the system would enhance my effectiveness on the job
		4	Using the system would make it easier to do my job
		5	I would find the system useful in my job
Compatibility	The degree to which the Intranet is perceived as being consistent with existing values, needs, and experiences of an organizational member	1	Using the system is compatible with all aspects of my work
		2	I think that using the system fits well with the way I like to work
		3	Using the system fits into my work style

Use-Related Outcomes: Operational Definitions and Scales

Construct	Operational definition		Items
Satisfaction	The degree to which an organizational member is affective with prior use of the Intranet	1	I was satisfied with the overall experience of the system use
		2	I was satisfied with the accuracy of information
		3	I was satisfied with the timeliness of information
		4	I was satisfied with the idea generation activities
		5	I was satisfied with the idea evaluation activities
Perceived Behavioral Control	The degree to which an organizational member perceives internal and external constraints on his or her behaviors related to the Intranet use	1	I have control over using the system
		2	I have the resources necessary to use the system
		3	I have the knowledge necessary to use the system
		4	Given the resources, opportunities and knowledge it takes to use the system, it would be easy for me to use the system
Perceived Enjoyment	The degree to which the activity of using the Intranet is perceived by an organizational members to be enjoyable in its own right, apart from any performances that may be anticipated	1	I found using the system to be enjoyable
		2	The actual process of using the system was pleasant
		3	I had fun using the system

Social Influence: Operational Definitions and Scales

Construct	Operational definition	Items	
Subjective Norms	The degree to which an organizational member perceive that most people who are important to him think he should use the Intranet	1	Organizational members who influenced my behavior preferred that I use the system
		2	Organizational members whose opinions I valued preferred that I use the system
		3	Organizational members important to me supported my use of the system
Image	The degree to which use of the Intranet is perceived to enhance one's image or status in the organization	1	People in my organization who use the system have more prestige that those who do not
		2	People in my organization who use the system have a high profile
		3	Having the system is a status symbol in my organization
Perceptions of Critical Communication Partners	The degree to which an organizational member believes that critical communication partners positively perceive the Intranet	1	How useful do you think your coworkers consider the Intranet relative to other forms of communication media?
		2	How useful do you think your immediate supervisors consider the Intranet relative to other forms of communication media?

Organizational Intervention: Operational Definitions and Scales

Construct	Operational definition	Items	
Perceived Voluntariness	The degree to which an organizational member perceives the use of the Intranet to be non-mandated	1	The organization does not require me to use the system
		2	Although it might be helpful, using the system is not mandatory in my job
		3	My use of the system was voluntary
Organizational Support	The degree to which an organizational member perceives the level of general support by the organization	1	The organization always supports and encourages the use of the Intranet
		2	A specific person (or group) in the organization is available for assistance with the Intranet use.
		3	The organization provides specialized instruction and education concerning the Intranet use.
Perceived Top Management Support	The degree to which an organizational member perceives the level of support by top management	1	Top management is interested in the use of the Intranet
		2	Top management considers the Intranet important to the organization
		3	Top management has effectively communicated its support for the Intranet
Organization's Innovation Climate	The degree to which an organizational member believes that the organization is open and supportive to new ideas	1	The organization recognizes and rewards new ideas from its members
		2	The organization and its members generally display flexibility and adaptability
		3	The organization and its members display a willingness to take risks
		4	The organization and its members generally display tolerance of failure of new ideas

Scale for Organizational Communication Satisfaction

These statements will be measured using a seven-point scale ranging from “very strongly disagree” to “very strongly agree”
1. I am satisfied with overall communication within the organization
2. I am satisfied with extent to which horizontal communication with other organizational members is accurate and free flowing
3. I am satisfied with the extent to which my supervisor listens and pays attention to me
4. I am satisfied with the information about the requirements of my job
5. I am satisfied with the information about the organizational policies and goals
6. I am satisfied with the extent to which the organizations' communication motivates and stimulates an enthusiasm for meeting its goals
7. I am satisfied with the amount of communication exchanged in the organization
8. I am satisfied with the extent to which my subordinates are responsive to downward directive communication

Scale for Personal Innovativeness

These statements will be measured using a seven-point scale ranging from “very strongly disagree” to “very strongly agree”	
1	If I heard about a new information communication technology, I would look for ways to experiment with it.
2	Among my peers, I am usually the first to try out new information communication technologies.
3	In general, I am hesitant to try out new information communication technologies.
4	I like to experiment with new information communication technologies.

Scale for Risk Taking Behavior

These statements will be measured using a seven-point scale ranging from “very strongly disagree” to “very strongly agree”	
1	When I eat out, I like to try the most unusual items the restaurant serves, even if I am not sure I would like them.
2	When I go to a restaurant, I find it safer to order dishes I am familiar with
3	I would rather stick to a brand I usually buy than try something I am not very sure of
4	I enjoy taking chances in buying unfamiliar brands just to get some variety in my purchases

Independent Judgment Making Scale

These statements will be measured using a seven-point scale ranging from “very strongly disagree” to “very strongly agree”	
1	I decided to end my use of the Intranet due to the opinions of friends who had already done so
2	I received advice from others who has discontinued the technology before deciding whether to stop using it
3	I found it hard to decide whether to stop using the Intranet before I learned the opinions of those who already done so

Appendix E: Survey Questionnaire

Section 1: YOUR USE AND PERCEPTION OF THE INTRANET IN ADVANCE AND PEACE COALITION

Are you currently using the Intranet? (If you use the Intranet rarely, please check 'NO')

- Yes
- Not now, but yes previously
- No

How often have you used the Intranet on average? If you stopped using the Intranet how often did you used on average when you had been using it?

- Never
- Once per month
- Once per week
- 2 to 3 per week
- 4 to 6 per week
- Once a day
- More than once a day

How long have you used any kind of Intranets (including your experience in other organizations)?

- Less than 6 months
- 6 to 12 months
- 1 to 2 years
- to 3 years
- to 4 years
- More than 4 years

Do you agree or disagree with that a majority of people in the organization stopped using the Intranet?

- Very strongly disagree
- Strongly disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Strongly agree
- Very Strongly agree

How useful do you think your coworkers consider the Intranet relative to other forms of communication media?

- Not at all useful
- Not useful
- Neutral
- Useful
- Very useful

How useful do you think your immediate supervisors consider the Intranet relative to other forms of communication media?

- Not at all useful
- Not useful
- Neutral
- Useful
- Very useful

By using 7 point scale (from Never, Once per month, Once per week, 2 to 3 per week, 4 to 6 per week, once a day, to More than once a day) please select an appropriate answer that adequately indicates your use the Intranet.

Send emails to individuals

Send information to a certain group or the overall organization

Read individual emails

Read organizational announcements

Participate in (or form) discussion groups for critical issues or problems

Using 7 point scale from "very strongly disagree" to "very strongly agree" please select the appropriate answer that indicates how well it describes your perception of overall communication in the organization.

I am satisfied with overall communication within the organization

I am satisfied with extent to which horizontal communication with other

organizational members is accurate and free flowing

I am satisfied with the extent to which my supervisor listens and pays attention to me

I am satisfied with the information about the requirements of my job

I am satisfied with the information about the organizational policies and goals

I am satisfied with the extent to which the organizations' communication motivates

and stimulates an enthusiasm for meeting its goals

I am satisfied with the amount of communication exchanged in the organization

I am satisfied with the extent to which my subordinates are responsive to downward directive communication

Please select an appropriate answer (from very strongly disagree to very strongly agree) next to each statement to indicate how well it describes your views and behaviors.

It would be very hard for me to stop using the Intranet right now, even if I wanted to.

It wouldn't be too costly for me to stop using the Intranet in the near future

I believe that I have too few options to consider stopping using the Intranet in this organization

Right now, continue to use the Intranet is a matter of necessity as much as desire

Using the Intranet in my job enabled me to accomplish tasks more quickly.

Using the Intranet improved my job performance.

Using the Intranet enhanced my effectiveness on the job.

Using the Intranet made it easier to do my job.

I found the Intranet useful in my job.

Learning to operate the Intranet was easy for me.

I found it easy to get the Intranet to do what I wanted it to do.

My interaction with the Intranet was clear and understandable.

I found the Intranet easy to use.

Using the Intranet was compatible with all aspects of my work.

I thought that using the Intranet fitted well with the way I like to work.

Using the Intranet fitted into my work style.

Organizational members who influenced my behavior preferred I continued to use the Intranet.

Organizational members whose opinions I valued preferred that I continued to use the Intranet.

Organizational members important to me supported my use of the Intranet.

People in my organization who used the Intranet had more prestige than those who did not.

Please select an appropriate answer (from very strongly disagree to very strongly agree) next to each statement to indicate how well it describes your views and behaviors.

People in my organization who used the Intranet had a high profile.

Having the Intranet was a status symbol in my organization.

I found using the Intranet to be enjoyable.

The actual process of using the Intranet was pleasant.

I had fun using the Intranet.

I was satisfied with the overall experience of the Intranet use.

I was satisfied with the accuracy of information.

I was satisfied with the timeliness of information.

I was satisfied with the idea generation activities.

I was satisfied with the idea evaluation activities.

I had control over using the Intranet.

I had the resources necessary to use the Intranet.

I had the knowledge necessary to use the Intranet.

The organization did not require me to use the Intranet.

Although it might be helpful, using the Intranet was not mandatory in my job.

My use of the Intranet was voluntary.

The organization always supports and encourages the use of the Intranet.

A specific person (or group) in the organization is available for assistance with the Intranet use.

The organization provides specialized instruction and education concerning the Intranet use.

Top management is interested in the use of the Intranet.

Top management considers the Intranet important to the organization

Please select an appropriate answer (from very strongly disagree to very strongly agree) next to each statement to indicate how well it describes your views and behaviors.

Top management has effectively communicated its support for the Intranet

I could complete a job or task using the Intranet if there was no one around to tell me what to do as I go.

I could complete a job or task using the Intranet if I could call someone for help if I got stuck.

I could complete a job or task using the Intranet if I had a lot of time to complete the job for which the Intranet was provided.

The organization recognizes and rewards new ideas from its members

The organization and its members generally display flexibility and adaptability

The organization and its members display a willingness to take risks

The organization and its members generally display tolerance of failure of new ideas

Section 2: DECISION TO STOP USING THE INTRANET

This section is only for those who stopped using the Intranet or some of its functions during your involvement in the organization. If you are currently using the Intranet, please skip this section and go to SECTION 4 directly.

Please describe what factors are perceived as discouraging your use of the Intranet (or inducing to stop using the Intranet). .

_____
_____
_____
_____
_____

Please check the one scenario that best identifies the MAIN REASON that you stopped using the Intranet AT THE TIME YOU DECIDED TO STOP USING THE INTRANET.

- ■ I stopped using the Intranet because I found that other communication tools such as email or mobile phone were better fits for my work.
- ■ I stopped using the Intranet because I was generally dissatisfied with it.
- ■ I stopped using a certain feature (or features) of the Intranet such as document uploading, emailing, or group mailing because I found that it was not useful.
- ■ I stopped using the Intranet in a certain moment without any specific reason.
- ■ I am not using the Intranet currently but I am willing to use it if my job requires me to do.
- ■ I stopped using the Intranet because it would disadvantage me politically.
- ■ Other (Please describe why you stopped using the Intranet)
  _____
  _____

Please select an appropriate answer (from “very strongly disagree” to ”very strongly agree”) next to each statement to indicate how well it describes your views and behaviors AT THE TIME YOU DECIDED TO STOP USING THE INTRANET.

I ended my use of the Intranet because I found another service that worked better.

I ended my use of the Intranet because I found an alternative service that had better features.

I ended my use of the system because I found other services had more options than the system

I ended my use of the system because I felt that the functional performance of other services was superior

I ended my use of the Intranet because I was unhappy with its performance.

I ended my use of the Intranet because I was unhappy with its overall functional performance.

I ended my use of the system because I was unhappy with one or more features of it

I ended my use of the system because I was unhappy with overall functional performance of it

I ended my use of the Intranet because I found that I was hardly using it.

I ended my use of the Intranet without encountering any problems with my previous intranet use.

I ended my use of the Intranet because I became indifferent to it over time.

I ended my use of the Intranet because I lost my interest in it without any specific reason.

I will resume my use of the Intranet if I have more time than I do now.

I will resume the Intranet if my tasks require me to do so.

I reserve my right to use of the Intranet even though I am not using the Intranet currently.

I stopped using the Intranet but I intend to use it again.

I am using the Intranet currently but I did not use some features such as group mailing, bulletin board, or web-browsing system provided by the Intranet.

Please select an appropriate answer (from “very strongly disagree” to ”very strongly agree”) next to each statement to indicate how well it describes your views and behaviors AT THE TIME YOU DECIDED TO STOP USING THE INTRANET.

I found that some features of the Intranet were unnecessary to perform my tasks.

I often visited bulletin boards to check updated information or organizational announcements without my involvement in initiating discussion or disseminating information.

I perceived some features of the Intranet were useful but some were not.

I talked to others who discontinued it before I decided to end my use of the Intranet.

I decided to end my use of the Intranet due to the opinions of friends who had already done so.

I received advice from others who discontinued the technology before I decided whether to stop using it.

I found it hard to decide whether to stop using the Intranet before I learned the opinions of those who had already done so.

I stopped using the Intranet because I did not want to appear to align with the Cyber Team that was responsible for the Intranet implementation.

I stopped using the Intranet because I wanted to dissociate myself from the Intranet.

I stopped using the Intranet because of disagreements with the supporters of the Intranet.

I stopped using the Intranet because it would disadvantage me or my team politically.

I stopped using the Intranet because I want to see resources funneled to a different project or technology instead.

Please describe how your use or discontinuance affects your overall communication in the organization.

_____
_____
_____
_____

Section 3: DECISION TO CONTINUOUSLY USE THE INTRANET

Please describe what factors are perceived as encouraging your use of the Intranet.
_____
_____
_____
_____

Please check the one scenario that best identifies the MAIN REASON that you use the Intranet currently.

- ■ I am using the Intranet because there are few alternatives to replace it.
- ■ I am using the Intranet because I am generally satisfied with its overall performance.
- ■ I am only using a certain feature (or features) of the Intranet such as document uploading, emailing, or group mailing because I found that it is useful.
- ■ I am using the Intranet without any reflexive thought.
- ■ I am using the Intranet because it advantages me politically.
- ■ Others (Please describe why you use the Intranet currently)
  _____
  _____

Please check the one statement that best describes your perception of the Intranet usage.

- ■ I am committed to the Intranet usage as an organizational member.
- ■ The Intranet usage is encouraged as a normal activity in the organization.
- ■ The Intranet enables me to access organizational database, thus helping me to be attentive to current issues.
- ■ The Intranet enables me to establish work flow linkages with other organizational members via collaboration applications.

Please select an appropriate answer (from “very strongly disagree” to ”very strongly agree”) next to each statement to indicate how well it describes your views and behaviors.

I am using the system because I found there are few alternatives to replace it.

I am using the system because I found that alternative service had lesser features.

I am using the system because I found that other services had fewer options than the system.

I am using the system because I felt that the functional performance of other services was inferior.

I am using the system because I am happy with its performance.

I am using the system because I am generally satisfied with it.

I am using the system because I am happy with one or more features of it.

I am using the system because I am happy with overall functional performance of it.

I am using the system but I have not thought of its utility.

I am using the system but I feel that I am indifferent to its functional performance.

I am using the system but I have never thought of the benefits I could get from its use.

I am using the system but I am not sure why I have used it.

I am using the Intranet currently but I did not use some features such as group mailing, bulletin board, or web-browsing system provided by the Intranet.

I found that some features of the Intranet were unnecessary to perform my tasks.

I often visit bulletin boards to check updated information or organizational announcements without involvement in initiating discussion or disseminating information.

I perceive some features of the Intranet were useful but some were not.

I am using the Intranet because I want to appear to align with the Cyber Team that was responsible for the Intranet implementation.

I am using the Intranet because of general agreements with the supporters of the Intranet.

I am using the Intranet because it advantages me or my team politically.

I am using the Intranet because I want to be recognized as a supporter of the Intranet.

Section4: ABOUT YOU

Using a 7 point scale from “very strongly disagree” to “very strongly agree,” please select the appropriate answer to indicate how well it describes your views and behavior.

If I heard about a new information communication technology, I would look for ways to experiment with it.

Among my peers, I am usually the first to try out new information communication technologies.

In general, I am hesitant to try out new information communication technologies.

I like to experiment with new information communication technologies.

When I eat out, I like to try the most unusual items the restaurant serves, even if I am not sure I would like them.

When I go to a restaurant, I find it safer to order dishes I am familiar with.

I would rather stick to a brand I usually buy than try something I am not very sure of.

I enjoy taking chances in buying unfamiliar brands just to get some variety in my purchases.

What is your team in the organization? Please select one.

- Cyber
- Public release
- Public relations
- Strategy
- Planning
- General affairs
- Organizing
- Policy devolvement
- External cooperation
- Secretary
- Others (please write the specific name of your team)_____

What is your current status in the organization?

- Regular employee
- Part-time employee
- Volunteer

What is your gender?

- Female
- Male

What year were you born? _____

THANK YOU FOR YOUR PARTICIPATION

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