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# A model of user adoption of interface agents for email notification

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ABSTRACT

This study presents and empirically validates a model that describes user adoption behavior towards email notification interface agents from the end-user perspective. In addition to the original Technology Acceptance Model (TAM) constructs, the model included perceived enjoyment, computer playfulness, and personal innovativeness in the domain of IT. Data were collected from 75 actual email interface agent users, the model was tested by employing PLS (Partial Least Squares) techniques, and several conclusions were offered. *First*, current email interface agent users are highly innovative individuals who perceive the technology as very enjoyable, useful, and easy to use. *Second*, in contrast to prior expectations, no direct effect of personal innovativeness on perceived usefulness of interface agents was found. This suggests that more innovative people do not necessarily perceive this technology more useful than less innovative ones. *Third*, the degree of personal innovativeness had a strong positive direct effect on the extent of perceived ease of use of email interface agents. This finding supports much of the prior research on the role of personal innovativeness in user technology perceptions. At the same time, with regards to the link between perceptions of enjoyment with an email interface agent and perceptions of its usefulness, no relationship was found. *Fourth*, user perceptions of enjoyment with an email interface agent were found to be the key influencing factor of future behavioral usage intentions towards an agent.



## 1. Introduction

The issue of user acceptance of computer technologies has traditionally attracted the attention of management information systems (MIS) scholars because of a high rate of project failures (Legris et al., 2003; Nelson, 2005). From an organizational perspective, new technology implementation projects are associated with a high degree of uncertainty and risk. From an individual viewpoint, the employment of new systems requires the investment of time, mental efforts, and financial recourses. Academics attempt to understand what drives people's decisions whether to adopt or reject a new application and to offer guidelines for developers. This search for answers has produced a variety of models that help explain and predict user technology adoption behavior. These models differ in terms of their overall purposes, target users, application areas, and predictive capabilities.

To date, the agent research community has devoted substantial efforts to develop various kinds of agents that may be embedded in computer applications. Interface agents are one of them. An interface agent is a software entity that is continuous (long-lived), reactive (adapts its actions depending on an external environment), collaborative (collaborates with users, other agents or electronic processes), and autonomous (independent) (Lieberman and Selker, 2003; Detlor, 2004; Serenko and Detlor, 2004; Serenko, 2007a). It serves as an intermediary between a human user and other parts of the software application by providing tips, offering real-time advice, automating repetitive tasks, and hiding system complexity. Research projects and laboratory experiments demonstrate that interface agents may be successfully included in many computer applications. For example, interface agents may be used as digital secretaries (Maes and Kozierok, 1993; Lashkari et al., 1994; Maes, 1994; Xiao et al., 2004), electronic commerce assistants (McBreen and Jack, 2001; Lieberman and Wagner, 2003), Web companions (Keeble and Macredie, 2000; Sharon et al., 2002), virtual teachers (Lester et al., 1997; Johnson et al., 2000; Person et al., 2000; Gulz, 2004), and entertainers (Gebhard et al., 2003). In addition, interface agents may be incorporated into Internet and electronic mail applications (Serenko, 2006a,b; Serenko et al., 2007b).

Electronic mail has become one of the most widely utilized telecommunications systems. Despite a wide adoption of email, many users feel dissatisfied with their email experience. Dow et al. (2006) report that the American Customer Satisfaction Index (ACSI) of email is only 65.5; this is below those of many other products and services. For example, the ACSI of electronic commerce is 80.2 and of fixed-wire telephone services is 72. Often, an inefficient direct manipulation interface is referred to as the source of dissatisfaction with email (Ducheneaut and Bellotti, 2001). On the one hand, a current situation with email cannot be considered critical; people still successfully utilize this

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new medium. On the other hand, there are ways to improve email clients. A number of projects demonstrate the potential benefits of incorporating interface agents into email applications (Maes and Kozierok, 1993; Lashkari et al., 1994; Payne and Edwards, 1997; Segal and Kephart, 1999, 2000; Brzezinski and Dain, 2001; Bergman et al., 2002). By acting as a digital assistant, interface agents may reduce information overload, speed up information exchange, connect different parts of a complex email client, and serve as personalizable interfaces between a user and a system. Some interface agents monitor all user activities, understand people's preferences, and mimic their behavior in future. Interface agents for email notification are one of the recent commercially available systems that employ agent technologies in the email environment. First notification facilities were incorporated in the early versions of UNIX OS with the purpose to inform users about incoming messages. Gradually, the technology dramatically improved and software developers started offering commercial versions of interface agents for email notification.

Despite the potential advantages of utilizing various types of interface agents in a wide range of software applications, there seems to be a gap between laboratory-built interface agents and the actual diffusion of this technology (Serenko et al., 2007a). For example, the commercialization of Microsoft Bob, which was a prototype of many contemporary interface agents, became a $100 million financial disaster (Dykstra-Erickson, 2000; Serenko, 2007b) because of dramatically low adoption rates. The extant literature does not offer clear evidence of the benefits of utilizing interface agents; moreover the findings of prior empirical studies on the usefulness and user adoption of interface agent technologies are very inconsistent (Dehn and van Mulken, 2000). One of the explanations of these mixed results is that most previous investigations were conducted in laboratory settings rather than studied actual users. Even though laboratory experiments have proved to be appropriate in some situations, Dehn and van Mulken (2000) hypothesize that accurate perceptions of agents may take some time to develop; therefore, insights obtained from real-life users may help researchers identify new phenomena. However, little empirical data were collected from the actual users of interface agents. In addition, except for a few notable (e.g., see Wang and Benbasat, 2005), there are very few documented attempts to suggest and empirically validate a model of user adoption of interface agents. Similar argument may be raised regarding email notification agents. With respect to email notification interface agents, to the best knowledge of the author, no empirical study that would report on surveying individuals who voluntarily adopted a commercially available interface agent for email notification has been documented.

As such, the goal of this project is to gain insights on the factors which affect a user's decision to utilize interface agents for email notification, to hypothesize a model which explains such user adoption behavior, and to subject this model to extensive empirical testing. It is hoped that by analyzing email notification interface agents from a user perspective, a greater understanding of the factors that influence individual decisions whether to accept or reject agent technologies can be obtained. This approach is consistent with the deductive nature of inquiry in management information systems research.

The rest of this paper is structured as follows. The next (second) section presents literature review and the development of the study's model. The third section offers methodology. The fourth section reports on the findings, the fifth section facilitates a discussion, and the last section offers concluding remarks and outlines several limitations that may be addressed by future researchers.

## 2. Theoretical background

Since its emergence in 1971, email adoption has been extensively studied in information systems, computer science, and sociology research. There are at least ten distinct theories that attempt to explain the acceptance and use of electronic mail as communication media: (1) diffusion of innovations (Rogers, 1995; Murphy and Tan, 2003); (2) social influence (Fulk et al., 1990; Fulk, 1993); (3) social presence (Rice, 1993); (4) critical mass (Markus, 1990); (5) structuration (Orlikowski, 1992; Yates and Orlikowski, 1992; Orlikowski et al., 1995); (6) critical social (Ngwenyama, 1997); (7) media symbolism (Trevino et al., 1990); (8) media richness (Daft and Lengel, 1986; Daft et al., 1987); (9) channel expansion (Carlson and Zmud, 1994, 1999); and, (10) uses and gratifications theory (Dimmick et al., 2000). None of these 10 approaches can be applied directly to measure user adoption of interface agents in email environments. First, they explore the nature of electronic communication itself. Second, these theories investigate aspects that enable and motivate the use of a particular communication channel but not an email application. Third, they derive and examine general user perceptions of email usage rather than factors that may be associated with utilizing an interface agent. Therefore, other areas should be investigated to achieve the purpose of this project.

Although the management information systems literature presents a variety of models that predict technology adoption by individuals, the Technology Acceptance Model (TAM) (Davis, 1989; Davis et al., 1989) is most frequently utilized in prior studies (Adams et al., 1992; Hendrickson et al., 1993; Subramanian, 1994; Szajna, 1994, 1996). According to TAM, actual system usage (USE) is influenced by a person's behavioral intentions (BI) that in turn are affected by perceived usefulness (PU) and ease of use (PEOU). PEOU also influences PU; those who find a system easier to use also perceive it to be more useful. A major advantage of TAM is that it may be applied to virtually any computer technologies, including interface agents. For example, Serenko et al. (2007a) adapted TAM to investigate user acceptance of interface agents in everyday work applications, and Serenko and Detlor (2003) employed TAM to study user adoption of agent toolkits[1] in academia. As suggested by Legris et al. (2003), the predictive power of TAM may be improved through the incorporation of other situation or technology-specific constructs.

An extensive review of the human–computer interaction, information systems, and interface agents literatures reveals three new factors that may pertain to user adoption behavior towards interface agents: perceived enjoyment (PE), computer playfulness (CP), and personal innovativeness in the domain of information technologies (PIIT) (Davis et al., 1992; Webster and Martocchio, 1992; Agarwal and Prasad, 1998). *Perceived enjoyment* is the first facet that may be included in TAM as another construct. It refers to "the extent to which the activity of using the computer is perceived to be enjoyable in it's own right, apart from any performance consequences that may be anticipated" (Davis et al., 1992, p. 1113). Perceived enjoyment relates to intrinsic motivation since it represents the usage of a computer system just for the sake of using it.

The assumption that user enjoyment is a significant determinant is based on the importance of user enjoyment with agents. Users often enjoy human-interface agent interaction processes; this has been shown in previous studies. For example, Lester et al. (1999) conclude that the strong visual presence of interface agents in knowledge-based educational environments increases

[1] An agent toolkit is a software package, application or development environment that provides agent builders with a sufficient level of abstraction to allow them to quickly implement agents with desired attributes, features, and rules.

students' enjoyment and enhances their learning experience. Takeuchi and Naito (1995) demonstrate that people identify and accept entertainment values of an animated face-like interface agent in a virtual interactive card matching game. These findings are consistent with the results obtained by Koda and Maes (1996) who also tested a face-like agent in analogous experimental settings. Their empirical study reveals that personified interface agents are well-suited for an entertainment domain because of their ability to help users engage in tasks. Suzuki et al. (1998) implemented an agent system called 'Talking Eyes' in which people chatted with interactive interface agents. Their experiment suggests that individuals enjoy chatting with agents for purely entertainment purposes even if they cannot obtain desired responses. Therefore, perceived user enjoyment is added as another construct into the TAM.

Individual differences play an important role in user perceptions of various software systems (Zmud, 1979). In terms of the present study, it is important to understand the antecedents of perceived usefulness, ease of use, and enjoyment. For this, computer playfulness and PIIT are chosen as external variables (i.e., external to the model) reflecting a user's individual characteristics. *Computer playfulness* is a situation-specific individual characteristic that represents a type of intellectual or cognitive playfulness and reflects a person's tendency to interact spontaneously, intensively, and imaginatively with computers (Martocchio and Webster, 1992). The concept of computer playfulness has appeared from the substantial body of prior research on play (English and English, 1958; Caplan and Caplan, 1973). Play is a purely intrinsically rewarding activity (Ellis, 1973; Levy, 1978) that is always accompanied by pleasure (Corsini, 1987). With respect to information technologies, the effect of playfulness was studied in working, learning, and training environments (Martocchio and Webster, 1992; Webster and Martocchio, 1993; Perry and Ballou, 1997; Webster and Ho, 1997).

*Personal innovativeness in information technology* is a domain-specific individual trait which reflects the willingness of a person to try out a new information technology (Agarwal and Prasad, 1998). Since agents represent an innovation, existing innovation models, frameworks, concepts, and techniques from the innovation literature may be effectively applied to agent technologies (Serenko and Detlor, 2004). Despite its newness, the concept of personal innovativeness in IT has already received considerable attention, recognition, and support in academia (Limayem et al., 2000; Karahanna et al., 2002; McKnight et al., 2002; Thatcher and Perrewe, 2002). Most importantly, PIIT has been included in TAM (Geary, 2000; Lee et al., 2002) that makes it appropriate to incorporate PIIT into this study's model.

As such, the following model is suggested (see Fig. 1). It views an individual as a unit of adoption and explains his or her personal adoption decisions.

According to this model, individual user characteristics, such as computer playfulness and PIIT, affect a person's perceptions of email notification interface agents. Specifically, it is suggested that computer playfulness has a positive direct effect on perceived enjoyment with email interface agents. According to Corsini (1987, p. 858), playful behavior produces "activity characterized by pleasure, interest and reduction of tension." Previous studies on computer playfulness demonstrate that the individual-specific trait of computer playfulness is positively associated with computer involvement, positive mood, satisfaction, learning, creativity, and exploratory computer behavior (Glynn and Webster, 1992; Webster and Martocchio, 1992). Martocchio and Webster (1992) demonstrate that computer trainees with higher levels of computer playfulness experience greater positive mood and are more satisfied with feedback on their performance. Previous play research suggests that during more playful interactions with different tasks, playful individuals not only engage in exploratory behavior but also spend more time and efforts on those activities and enjoy what they are doing to a higher extent (Csikszentmihalyi, 1975, 1990). Anandarajan et al. (2000) discover that people with a high level of Internet playfulness perceive Web-related activities more favorable and productive than those with a low level of Internet playfulness. Lewis (1999) reports that computer playfulness has a strong positive effect on enjoyment ($\beta = 0.4$, $p < 0.001$) but not on perceived ease of use. In addition, Hackbarth et al. (2003) report that there is a positive link between computer playfulness and ease of use ($\beta = 0.23$, $p < 0.05$). However, in terms of interface agents for email notification, it is hypothesized that playfulness may mostly lead to perceived enjoyment since playful individuals may explore playful features of the agent and find it highly enjoyable. At the same time, playful users may not necessarily find it easier to use. Therefore, it is suggested that:

H1: Computer playfulness has a positive direct effect on perceived enjoyment with interface agents for email notification.

Similar to computer playfulness, personal innovativeness in the domain of information technology may also potentially influence

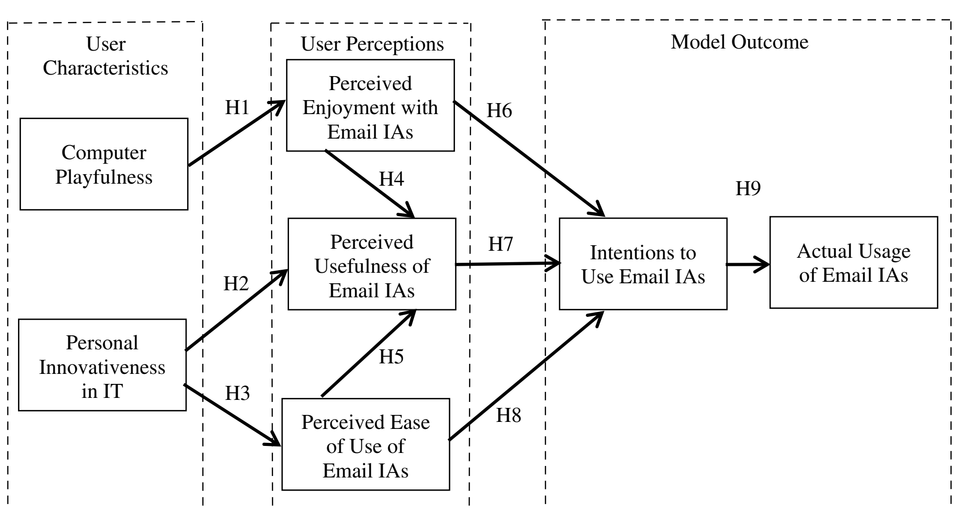


**Fig. 1.** A model of user adoption of email interface agents.

an individual's perceptions of interface agent usage. Agarwal and Karahanna (2000) empirically prove that personal innovativeness in IT strongly influences people's perceptions of their abilities to perform computer-related tasks. The study demonstrates that PIIT influences people's self-efficacy with a software application which, in turn, affects their perceptions of ease of use of this computer system. According to Agarwal and Karahanna (2000), PIIT has a positive effect on both perceived usefulness and perceived ease of use of the system. In the present study, it is hypothesized that:

H2: Personal innovativeness in the domain of information technology has a positive direct effect on perceived usefulness of interface agents for email notification.
H3: Personal innovativeness in the domain of information technology has a positive direct effect on perceived ease of use of interface agents for email notification.

The hedonic qualities of software products often inspire people to engage in human–computer interaction processes more frequently. The hedonic features of email interface agents are conceptualized in the form of the perceived enjoyment construct that is an important factor influencing an individual's perceptions of the usefulness of computers (de Souza Dias, 1998). The nature and predictive power of perceived enjoyment has not been fully explored in previous projects. For example, Davis et al. (1992) demonstrated positive interaction between perceived usefulness and perceived enjoyment. Serenko et al. (2007a) found that perceived enjoyment with an interface agent strongly influences the perceptions of the usefulness of this agent ($\beta = 0.707$, $p < 0.001$). With respect to the goal of this study, it is believed that:

H4: Perceived enjoyment has a positive direct effect on perceived usefulness of interface agents for email notification.

The initial Davis' TAM studies (Davis, 1989; Davis et al., 1989) hypothesize and empirically demonstrate a positive direct effect of perceived ease of use on perceived usefulness of a system. Those individuals who perceive a particular computer application easy to operate should utilize it more extensively and perceive it more useful in the completion of certain tasks. Virtually, all subsequent TAM-based investigations confirmed this standpoint (Gefen and Straub, 2000; Gefen et al., 2000. It is presumed that the same statement holds true in the case of interface agents for email notification:

H5: Perceived ease of use has a positive direct effect on perceived usefulness of interface agents for email notification.

Previous research demonstrates that people who perceive all computer-related tasks as naturally enjoyable and who experience pleasure and joy from using a software system directly, regardless of expected performance outcomes, are likely to utilize it more frequently and extensively than other users (Davis et al., 1992). It is assumed that if a person actually enjoys using an interface agent, he or she will utilize it more extensively apart from all anticipated outcomes, and extrinsic rewards:

H6: Perceived enjoyment has a positive direct effect on behavioral intentions.

Various MIS studies in different areas argue that both perceived usefulness and perceived ease of use of a system influence a person's decision whether to utilize it in a specific context. In fact, it is the goal of each TAM study to demonstrate the influence of the constructs reflecting a user's perceptions of the technology under investigation on his or her behavioral intentions. In most cases, the influence of perceived usefulness is at least twice as strong as that of perceived ease of use:

H7: Perceived usefulness has a positive direct effect on behavioral intentions.
H8: Perceived ease of use has a positive direct effect on behavioral intentions.

Prior research also strongly suggests that behavioral intentions are a key factor influencing actual technology usage. For this, the following hypothesis is stated:

H9: Behavioral intentions have a positive direct effect on the actual use of email notification interface agents.

In order to test these hypotheses, a survey of the actual users of interface agents for email notification was done.

## 3. Methodology

In order to identify an email notification interface agent available on the market, an extensive Web-search was conducted. Several interface agents for email notification were identified. They all utilize the Microsoft Agent Technology,[2] and they are relatively similar in terms of their functionality. Their major purpose is to inform users about the current state of an email application. For instance, agents may announce incoming emails, read calendar reminders, tell current time, deliver jokes, etc. They may also read help files, websites, or any other text. Some of them teach tutorials on the use of an email system that is very important for novice users and allow sending sound or animated messages to those who have the same functionality installed on their computers. Out of these products, the author randomly chose Email Announcer developed by Blind Bat Software,[3] and obtained the company's permission to conduct the study. The agent was installed at the author's personal computer and successfully tested. Fig. 2 presents a screenshot of Email Announcer. On the one hand, this application, as well as all other interface agent-based email notification systems, is relatively limited in terms of functionality. Specifically, this agent is reactive in nature; it does not initiate communication with users unless the status of a system changes (i.e., an email message arrives). On the other hand, this was the only email interface agent found on the software market, and there were actual users whom it was possible to survey. Therefore, it was believed that obtaining insights from the users of Email Announcer may potentially contribute to the body of knowledge.

It is noted that Email Announcer employs some anthropomorphic features. Anthropomorphism[4] is the ascription of human-like attributes and features to non-human objects. This characteristic of intelligent machines has a long-standing tradition in robot engineering, human–computer interaction, artificial intelligence, and interface agents research (Nass et al., 1993, 1994, 1996; King and Ohya, 1995, 1996; de Laere et al., 1998; Burgoon et al., 2000; Duffy, 2003). The aspects of anthropomorphization, personification, and emotionality have been one of the most controversial discussion topics in the field of interface agent research. On the one hand, the anthropomorphization of interface agents may produce positive effects that were reported in prior projects (Takeuchi and Nagao, 1993; Walker et al., 1994; Koda and Maes, 1996). On the other hand,

[2] More information on Microsoft Agent Technology is available at http://www.microsoft.com/msagent2.
[3] http://www.blindbat.com.
[4] The word anthropomorphism comes from the Greek words anthropos ('human being/man') and morphe ('form/shape/structure').

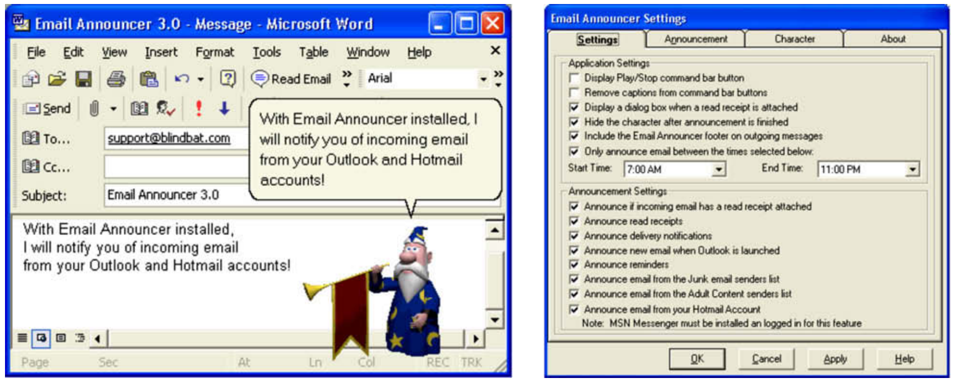


**Fig. 2.** Email Announcer by Blind Bat Software – agent interface and configuration environment.

there is empirical evidence to suggest that anthropomorphism is not a required feature for all interface agents since it often adds little, if any, improvement to the human–agent interaction processes (Takeuchi and Naito, 1995; Kiesler et al., 1996; Parise et al., 1999). Therefore, even though anthropomorphism is an important research area, it was not explored in the current project.

In order to test the suggested model, several existing research instruments were adapted from previous studies. *PIIT* was measured by a four-item scale developed by Agarwal and Prasad (1998) that was found to be reliable and valid (Agarwal and Karahanna, 2000; Agarwal et al., 2000; Thatcher and Perrewe, 2002). A short version of the *computer playfulness* scale was utilized (Webster and Martocchio, 1992) that was also believed to be reliable and valid (Venkatesh, 2000). The CP scale measures the degree of spontaneity, imagination, flexibility, creativity, playfulness, originality, and inventiveness that people exhibit interacting with computers in general. On the one hand, a longer CP version may also be employed to obtain valid and reliable results. On the other hand, prior investigations, including the original scale development paper, recommend the usage of the short version. This is consistent with most previous computer playfulness studies (Atkinson and Kydd, 1997; Yager et al., 1997; Agarwal and Prasad, 1998; Dijkstra, 1999; Woszczynski, 2000; Potosky, 2002; Hackbarth et al., 2003). In addition, MIS academics call for the usage of shorter instruments to reduce cognitive load on the subjects to obtain better results in terms of the entire study (Straub, 1989). To measure *PE*, the original instrument presented by Davis et al. (1992) was adapted, and *PU*, *PEOU* and *BI* items were adapted from Venkatesh and Davis (2000). All items were measured on seven-point Likert-type scales.

*Actual usage* is the extent to which an individual employs interface agents in his or her email application. Based on previous MIS studies (e.g., see Raymond, 1985; Igbaria et al., 1995, the perceived frequency of agent usage was measured. It represents the actual degree of agent utilization given that the use of the system is voluntary. Respondents were asked to indicate how often they used email interface agents in the following environments: at work, at home, and in school. The score was obtained by the employment of a Likert-type scale ranging from 'never' to 'very frequently'. In order to generate a final usage measure that was included in the model, the highest of these three measures (i.e., at work, at home, or in school) was selected. Overall, the employment of single item measures to assess self-reported technology usage is consistent with previous investigations (Gefen and Keil, 1998; Steffen, 1998).

In addition, basic demographic information was solicited. The questionnaire was posted online since it was assumed that all agent users were Web-savvy. Potential respondents were selected from the company database and contacted through a personalized email message. A $10 incentive was offered for the completion of the questionnaire. Three follow-up reminders were sent (Dillman, 1999). Data were collected as part of a larger project (Serenko, 2005). The questionnaire is presented in Appendix A.

## 4. Results

During the study, 75 valid responses were received and used for analysis at the response rate of 36% that is consistent with those of other management surveys (Frohlich, 2002). Twenty percent of all respondents were female, 65% were from 31 to 50 years old ranging from 20 to 65 years old, 63% resided in the US, 55% were occupied in the domain of IT or engineering, and most of them had a college or university degree. The respondents indicated that they used the agent for 12 months on average, ranging from three to 36 months. Therefore, all of them already adopted this technology and employed it long enough to form reliable perceptions and behaviors.

At the first stage of analysis, a common method bias assessment was done (Podsakoff and Organ, 1986; Podsakoff et al., 2003; Woszczynski and Whitman, 2004). Common method bias occurs when independent and dependent variables are provided by the same source (i.e., by the same individual) at one particular point in time. Harman's (Harman, 1967) one-factor test was performed. For this, an unrotated Principal Component Analysis solution was obtained in SPSS with an unspecified number of factors with eigenvalues of at least one. Common method bias takes place if only one general factor emerges. In this study, it was concluded that variables did not tend to load on a single general factor, and that there was no common bias in the data.

Before analyzing the model, the reliability of all constructs was measured. Cronbach's alpha exceeded the required threshold of 0.7 for all items that implied high internal consistency of the scales (Cronbach, 1951). The model was tested by using PLS-Graph Version 03.00 (Chin, 1998a,b, 2001). PLS (Partial Least Squares) is the second-generation structural equation modeling technique that assesses both the measurement and structural model in a single run. It was chosen for the following reasons. First, PLS has been frequently utilized in TAM-based research. This allows directly comparing this study's findings with those of previous investigations. Second, it places no restriction on data distribution such as normality. Third, it works well with smaller sample sizes.

Two CP items (CP1 and CP3) with loadings below the selected threshold of 0.7 were dropped to ensure construct validity. Once these items were removed, the model was re-estimated. For a detailed discussion of the psychometric properties of the Computer Playfulness Scale, refer to Serenko and Turel (2007). The item-to-total correlation coefficients of all remaining items exceeded the cut off value of 0.35. Further analysis is based on the re-estimated model (i.e., which excludes items CP1 and CP3). Table 1 offers the measurement model.

To evaluate the discriminant validity of measures, the matrix of loadings and cross-loadings was constructed. All items loaded on the construct to which they belonged higher than they cross-loaded on all other constructs, and it was concluded that discriminant validity of the measures was adequate. In addition, the measure of convergent validity was estimated by reviewing the *t*-tests for the item loadings (Anderson and Gerbing, 1988; Hatcher, 1994). The inspection revealed that all *t*-values were significant at the 0.001 level. This shows that all indicators effectively measured their respective constructs.

Table 2 presents construct statistics, and Table 3 offers the correlation matrix and discriminant validity assessment. The Fornell and Larcker's (1981) measures of internal consistency and convergent validity of a construct were greater than 0.7 and 0.5 threshold, respectively, and all values along the diagonal of the correlation matrix were higher than those in corresponding rows and columns.

Jackknifing was done to derive *t*-statistics that is a resampling procedure for the assessment of the significance of PLS parameter estimates (Chin, 2001). Fig. 3 presents the structural model.

According to the results, seven out of nine hypotheses were supported and two were rejected. Table 4 below summarizes the validation of the hypotheses.

As such, most relationships were supported. In order to show the insignificance of the rejected linkages, the PIIT–PU and PE–PU links were removed and the model was re-estimated. This did not result in the further alternation of the conclusions on other hypotheses. The model demonstrated high explanatory power. *R*-square of the BI construct was 0.69 that means it explained 69% of the variance in user intentions to adopt an email agent. *R*-square of actual usage of agents was 0.42.

Note that the *R*-square values of PE and PEOU constructs were relatively small (i.e., 0.12 and 0.09, respectively). This, however, did not represent a threat to the model's validity. Cohen (1988, pp. 532–535) suggests that in many circumstances, the amount of actual association between constructs is, in fact, greater that the proportion of variance accounted for by measuring *R*-square. In general, low *R*-square values are common in behavioral science research. Many TAM-based investigations report low *R*-squares (for example, see Moon and Kim, 2001; Chau and Hu, 2002). Even Davis and his colleagues (1989) and Davis (1993) observed *R*-squares below 0.1. In addition, both PE and PEOU were influenced by a single construct (i.e., CP–PE and PIIT–PEOU). Such construct associations tend to provide low *R*-square values compared to multi-relationship models (Nunnally, 1978).[5] If, for example, another antecedent, which correlated significantly with both PE and PEOU but did not correlate with CP and PIIT, was added to the model, the *R*-square values of PE and PEOU would increase substantially.

In addition, the effect size of the PE–BI, PU–BI, and PEOU–BI links were calculated (Chin, 1998b). The results demonstrated that the degrees of perceived enjoyment, usefulness, and ease of use had very large (0.50), medium (0.18), and small (0.04) effects on behavioral intentions, respectively, (Cohen, 1988). Overall, despite the rejection of two hypotheses, it was believed that the suggested model adequately explained reasons for which people accept or reject interface agents for electronic mail.

Recall this model is applied to a new agent-based technology. The usage of interface agents is a new research field that does not have an extensively researched theoretical base. Therefore, to explore all possible links among constructs, the saturated model was tested. In the potentially fully saturated model, there are a total of 21 possible path relationships. Of those, one path was entirely rejected in the literature (i.e., computer playfulness has shown to be correlated with PIIT but generally no path dependency) (Agarwal and Prasad, 1998), and three paths were discarded consistent with MIS research principles (i.e., since the BI construct is present in the model, there is no need to test the PE–USE, PU–USE, PEOU–USE relationships). The remaining 17 paths were simultaneously estimated. Table 5 describes the new relationships that were added to the model. All previously proposed links were supported. Out of eight new links, only one had a strong, significant path coefficient. Therefore, it may be stated that perceived enjoyment has an impact on perceived ease of use. However, since seven other new links were rejected, the PE–PEOU relationship may be attributed to a pure chance.

**Table 1**
Estimated loadings for the total set of measurement items

| Item | Mean | SD | Loading | Error | Item-total correlations |
|---|---|---|---|---|---|
| CP1 (removed) | 5.55 | 1.43 | 0.618 | 0.617 | 0.478 |
| CP2 | 5.99 | 1.16 | 0.831 | 0.309 | 0.780 |
| CP3 (removed) | 5.81 | 1.07 | 0.678 | 0.541 | 0.596 |
| CP4 | 5.96 | 0.99 | 0.808 | 0.347 | 0.743 |
| CP5 | 5.59 | 1.20 | 0.732 | 0.464 | 0.517 |
| CP6 | 5.92 | 1.14 | 0.831 | 0.310 | 0.779 |
| CP7 | 6.03 | 1.14 | 0.802 | 0.358 | 0.766 |
| PIIT1 | 5.97 | 1.01 | 0.863 | 0.256 | 0.726 |
| PIIT2 | 5.84 | 1.20 | 0.871 | 0.242 | 0.780 |
| PIIT3 | 5.95 | 1.16 | 0.866 | 0.218 | 0.793 |
| PIIT4 | 5.96 | 1.24 | 0.884 | 0.251 | 0.773 |
| PU1 | 4.80 | 1.32 | 0.847 | 0.282 | 0.765 |
| PU2 | 4.95 | 1.41 | 0.919 | 0.156 | 0.860 |
| PU3 | 5.07 | 1.04 | 0.944 | 0.110 | 0.898 |
| PU4 | 5.43 | 1.35 | 0.917 | 0.158 | 0.819 |
| PEOU1 | 5.77 | 1.13 | 0.835 | 0.302 | 0.655 |
| PEOU2 | 5.97 | 1.16 | 0.755 | 0.430 | 0.604 |
| PEOU3 | 5.84 | 1.23 | 0.860 | 0.261 | 0.760 |
| PEOU4 | 5.28 | 1.54 | 0.820 | 0.328 | 0.650 |
| PE1 | 5.84 | 1.37 | 0.987 | 0.025 | 0.969 |
| PE2 | 5.77 | 1.40 | 0.977 | 0.045 | 0.945 |
| PE3 | 5.77 | 1.51 | 0.968 | 0.063 | 0.933 |
| BI1 | 5.6 | 1.59 | 0.986 | 0.027 | 0.945 |
| BI2 | 5.59 | 1.61 | 0.986 | 0.028 | 0.945 |
| USE | 5.51 | 1.73 | 1.000 | | |

**Table 2**
Construct statistics

| | CP | PIIT | PU | PEOU | PE | BI |
|---|---|---|---|---|---|---|
| Arithmetic mean (used items) | 5.90 | 5.93 | 5.06 | 5.72 | 5.79 | 5.71 |
| Cronbach's Alpha | 0.87 | 0.89 | 0.93 | 0.83 | 0.98 | 0.97 |
| Internal Consistency | 0.903 | 0.924 | 0.949 | 0.890 | 0.985 | 0.986 |
| Convergent Validity | 0.612 | 0.752 | 0.823 | 0.670 | 0.956 | 0.971 |

**Table 3**
Correlation matrix and discriminant validity assessment

| | CP | PIIT | PU | PEOU | PE | BI | USE |
|---|---|---|---|---|---|---|---|
| CP | 0.783 | | | | | | |
| PIIT | 0.582 | 0.867 | | | | | |
| PU | 0.235 | 0.271 | 0.907 | | | | |
| PEOU | 0.221 | 0.301 | 0.421 | 0.818 | | | |
| PE | 0.357 | 0.361 | 0.386 | 0.499 | 0.978 | | |
| BI | 0.293 | 0.382 | 0.579 | 0.566 | 0.765 | 0.986 | |
| USE | 0.082 | 0.157 | 0.392 | 0.558 | 0.380 | 0.649 | 1.000 |

[5] Note that the *R*-square of PU is higher (0.23) because it was influenced by two independent constructs.

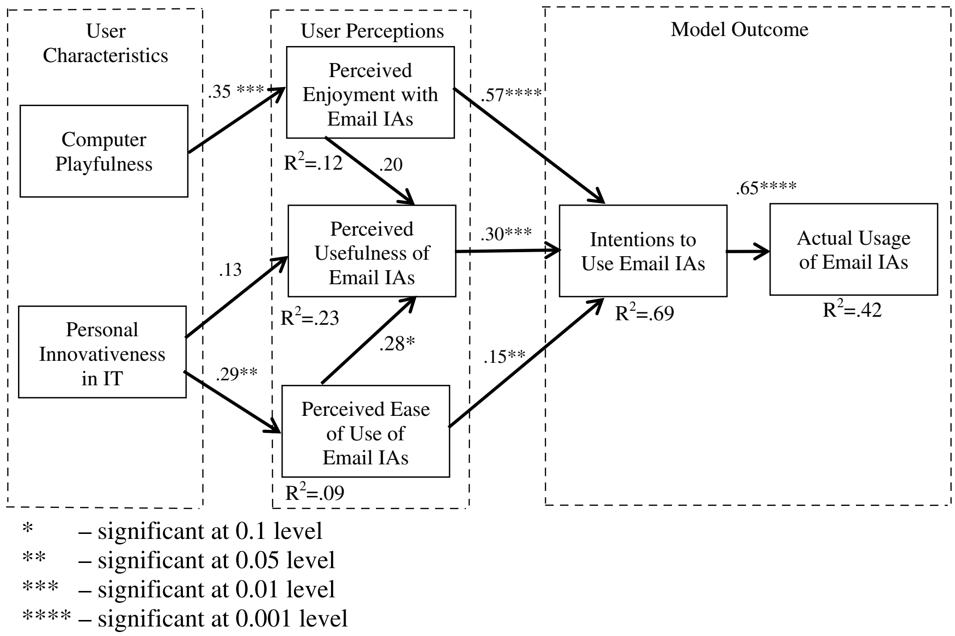


**Fig. 3.** The structural model.

**Table 4**
Hypotheses validation

| Hypothesis | *β* | *t*-Value | *p*-Value | Validation |
|---|---|---|---|---|
| H1: CP–PE | 0.346 | 2.771 | <0.01 | Supported |
| H2: PIIT–PU | 0.125 | 0.945 | Not reported | Rejected |
| H3: PIIT–PEOU | 0.292 | 2.479 | <0.05 | Supported |
| H4: PE–PU | 0.200 | 1.476 | Not reported | Rejected |
| H5: PEOU–PU | 0.277 | 1.731 | <0.1 | Supported |
| H6: PE–BI | 0.565 | 5.308 | <0.001 | Supported |
| H7: PU–BI | 0.304 | 3.240 | <0.01 | Supported |
| H8: PEOU–BI | 0.150 | 1.971 | <0.05 | Supported |
| H9: BI–USE | 0.649 | 5.966 | <0.001 | Supported |

**Table 5**
The saturated model – new relationships

| Link | *β* | *t*-Value | *p*-Value | Validation |
|---|---|---|---|---|
| CP–PU | 0.070 | 0.243 | Not reported | Rejected |
| CP–PEOU | 0.092 | 0.344 | Not reported | Rejected |
| CP–BI | −0.030 | 0.245 | Not reported | Rejected |
| CP–USE | −0.107 | 0.704 | Not reported | Rejected |
| PIIT–PE | 0.266 | 1.403 | Not reported | Rejected |
| PIIT–BI | 0.092 | 0.795 | Not reported | Rejected |
| PIIT–USE | −0.082 | 0.682 | Not reported | Rejected |
| PE–PEOU | 0.457 | 3.845 | <0.01 | Supported |

## 5. Discussion

The findings indicate that email notification interface agent users are innovative individuals who have adopted and utilized this technology for a relatively long period of time. With respect to the role of computer playfulness, it is argued that it positively influences a user's perceptions of enjoyment with email interface agents. As theorized, those individuals who tend to interact with computer systems more flexibly, imaginatively, creatively, playfully, originally, and inventively in general tend to enjoy using email interface agents to a greater extent than people with a lower degree of computer playfulness ($\beta = 0.346$, $p$-value < 0.01).

Regarding the nature of personal innovativeness in IT, two key findings warrant attention. *First*, in contrast to prior expectations, no direct effect of PIIT on perceived usefulness of agents was found. This suggests that more innovative people do not necessarily perceive this technology more useful than less innovative ones. Therefore, it is possible that both more and less innovative users perceive the actual characteristics of agent usefulness similarly. They all look for value-added features, productivity enhancement, and higher email efficiency in the same way. People who are more adept at using new technologies do not always find them more useful than their less innovative counterparts.

*Second*, the degree of PIIT has a strong positive direct effect on the extent of perceived ease of use of email notification interface agents. This finding supports much of the prior research on the role of personal innovativeness. In fact, it seems logical to suggest that if people tend to frequently explore new information technologies by experimenting with them, they become more proficient at learning the design and functionality of all new systems, including agent-based ones.

With regards to the link between perceptions of enjoyment with an agent and perceptions of its usefulness, no relationship was found. This contradicts prior research projects conducted by Davis et al. (1992) and Serenko et al. (2007a). Recall Davis et al. investigated the use of computers in workspace, and Serenko and colleagues analyzed the usage of interface agents in everyday work applications. In both situations, the employment of the technology of interest was required by either an organization or a software manufacturer that corresponded to mandatory usage settings. In contrast, respondents to the present survey made a personal decision to use an agent. The rejection of the previously validated hypothesis shows that the same relationship between two constructs may behave differently depending on whether usage conditions are mandatory or optional. As such, voluntariness may be a moderator of the PE–PU relationship. In addition, when a saturated model was tested, a strong, statistically significant PE–PEOU link emerged. Therefore, it is possible that perceived enjoyment with interface agents has a positive effect on perceived ease of use, so that those who find agents more enjoyable also perceive them to be easer to use.

In the model, the PEOU–PU link was observed. This confirms much of the prior research that suggests that, regardless of the type of technology under investigation and usage circumstances, if individuals perceive a system to be easier to use, they also perceive it to be more useful.

Recall that the relationships among the PE, PU, and PEOU constructs and behavioral usage intentions were analyzed. According to the findings, user perceptions of enjoyment with an email notification interface agent were the first, key influencing factor of future behavioral usage intentions towards an agent. Two arguments support this statement. First, the PE–BI association had a high, statistically significant beta coefficient of 0.565 ($p$-value < 0.001). Second, the PE–BI relationship exhibited a large effect size ($f^2 = 0.50$) that suggests that the degree of user enjoyment with an agent is the major reason why they adopt this technology.

This observation is in accordance with the recent stream of Human–Computer Interaction (HCI) research that emphasizes the importance of user enjoyment with various software applications. The entire issue of *Interactions*, a journal on applied HCI, was devoted to the discussion of 'funology' – the science of enjoyable technology (Blythe et al., 2004). The editors argue that boundaries between work and play are increasingly being called into question and blurred. Many computer users stop differentiating between fun and work; they expect software applications to be fun to use. This study shows that interface agent users tend to utilize this technology if they perceive it to be enjoyable, even apart from all anticipated usage consequences, such as an agent's usefulness.

User perceptions of an agent's usefulness are the second, medium factor that affects usage behavior. The results show that the PU–BI association is 0.304 ($p$-value < 0.01), and that the effect size of this construct is slightly above the medium threshold ($f^2 = 0.18$). In accordance with previous MIS research, it is concluded that if users perceive an agent to be more useful, they develop stronger behavioral intentions towards its usage.

It should be noted that the model of user adoption of interface agents in everyday work applications suggested by Serenko et al. (2007a) demonstrates that the PU–BI relationship ($\beta = 0.508$, $p$-value < 0.001) is stronger that the PE–BI relationship ($\beta = 0.428$, $p$-value < 0.001). This divergence, again, may be explained by the different usage conditions. In the Serenko et al. (2007a) study, agent usage was mandatory, whereas in this investigation, agent use was optional. This indicates that interface agent users may tend to emphasize the actual usefulness of an agent in mandatory settings. At the same time, they may perceive enjoyment to be a more important factor if use is voluntary.

User perceptions of an agent's ease of use are the third, least significant factor that influences user behavioral intentions towards email interface agent usage. According to the results, the effect of PEOU is weaker than those of PE and PU. As such, the PEOU–BI association is 0.150 ($p$-value < 0.05). The PEOU construct has a relatively small effect on the predictive power of the model ($f^2 = 0.04$). This supports the prior TAM-based line of research that argues that PEOU is less influential than PU in technology adoption decisions. For example, Davis (1989) shows that perceived usefulness is 50% more significant than perceived ease of use. Subramanian (1994) and Igbaria et al. (1997) claim that perceived usefulness rather than ease of use is a determinant of predicted actual usage. This study supports that well-established view. Overall, it is concluded that, user adoption decisions towards email interface agents are mostly affected by perceptions of enjoyment, moderately impacted by perceptions of usefulness, and relatively weakly influenced by perceptions of the ease of use of an agent.

In addition, it was found that user behavioral intentions have a strong, significant effect on actual usage of email notification interface agents. The results demonstrate that the BI–USE relationship is 0.649 ($p$-value < 0.001). This finding is in agreement with prior MIS research. If, for example, H9 was rejected, this phenomenon would be difficult to explain.

In terms of the predictive power of the model, the comparison of $R$-square values was done. Recall the $R$-square values of the behavioral intentions and actual usage constructs are the key predictors of the explanatory power of a TAM-based model. In order to demonstrate the appropriateness of the study's model in explaining user adoption behavior towards email notification interface agents, the $R$-square values of BI and USE were compared with those of well-known MIS studies. Legris et al. (2003) present a list of the articles that utilized or adapted the Technology Acceptance Model, and that were published in the leading journals, such as MIS Quarterly, Decision Sciences, Management Science, Journal of MIS, Information Systems Research, and Information and Management. From this list of publications, the papers that utilized linear regression or PLS were selected (Davis, 1989; Davis et al., 1989; Szajna, 1996; Venkatesh and Davis, 1996, 2000; Agarwal and Prasad, 1997; Igbaria et al., 1997; Dishaw and Strong, 1999; Karahanna and Straub, 1999; Venkatesh and Morris, 2000) and the $R$-square values were analyzed. In these works, an average $R$-square of the BI and USE constructs were 0.48 and 0.37, respectively. Given that the respective values of this study's model were 0.69 and 0.42, it was concluded that the model exhibited good explanatory power. A high $R$-square value of the BI construct may be explained by the line of reasoning offered by Nunnally (1978) who argues that there are three major contributors to the $R$-square values of dependent constructs: (1) the number of independent constructs that influence it, (2) the correlation of each independent and dependent construct, and (3) the correlation among these independent constructs.

*First*, an increase in the number of independent constructs influencing one dependent construct may lead to a higher $R$-square value. The multiple correlation cannot be lower than the highest correlation of any one of the independent constructs with the dependent one. With respect to the study's model, three independent constructs (PE, PU, and PEOU) influence the BI construct that increases its $R$-square value. *Second*, the correlations of PE, PU, and PEOU with BI are 0.765, 0.579, and 0.566, respectively. High correlations between the independent variables and the dependent variable lead to high $R$-square values. *Third*, the correlations of independent constructs with one another fall into the medium correlation range. Recall no positive association was found between PE and PU. When correlations among independent variables tend to be low, each independent construct contributes something to the predictive power obtained from the others. Overall, this justifies the high explanatory power of the behavioral intentions construct.

## 6. Conclusion

In terms of the contributions of this study, *the first* one is the extension and validation of the Technology Acceptance Model. An analysis of the relationship between user perceptions of email notification interface agents and behavioral intentions supports the nomological validity of the Technology Acceptance Model. The statement that the constructs constituting TAM are valid becomes more compelling if they were tested with different technologies. With respect to this study, four TAM constructs (i.e., PU, PEOU, BI, and USE) and a relatively novel PE construct were found valid. The relationships among them (PE–BI, PU–BI, PEOU–BI, PEOU–PU, and BI–USE) were identified as it was theorized based on the existing literature. This substantiates the nomological validity of the Technology Acceptance Model and suggests that email interface agent designers should first focus on the development of enjoyment features, followed by usefulness facets. At the same time, agent manufacturers and marketers do not have to strongly emphasize the ease of use of this technology. However, as less technologically skillful users start adopting agents, the importance of PEOU may become more apparent.

*The second* reflection of this investigation is the demonstration of the importance of individual characteristics of agent users. In addition to user perceptions of agents, the model utilized two individual-specific traits – PIIT (Agarwal and Prasad, 1998) and computer playfulness (Webster and Martocchio, 1992). A relationship between PIIT and perceived ease of use, and computer playfulness and perceived enjoyment was established. Recall the suggested model shows that PIIT has a strong positive direct effect on PEOU of email notification interface agents ($\beta = 0.292$, $p < 0.05$). This demonstrates that more innovative computer users tend to find agent systems easier to use. This may occur because they are able to apply past software experience to any novel application including agents. At the same time, more innovative people do not necessarily find agents more useful than their less innovative counterparts.

A strong positive relationship was found between the degree of computer playfulness and perceived enjoyment with agents. This suggests that those individuals who tend to interact playfully with computers in general also tend to transfer their playful behavior on interface agents. By working with an interface agent in a playful manner, users perceive themselves to enjoy an agent to a greater extent. Overall, it was concluded that people's individual characteristic of computer playfulness serves an essential role in user perceptions of various computer technologies, including interface agents for email notification.

To address the needs of playful users, agent developers may incorporate extra features that allow people to interact with agents in a more playful manner. By utilizing the playful facets of an agent, users who exhibit a high degree of computer playfulness may find the agent more enjoyable. At the same time, in order to address the needs of less playful individuals, those extra playful features should be optional because non-playful users tend to find interface agents less enjoyable. In addition, they may perceive agents to be even less enjoyable if they are forced to interact with agents in a highly playful mode. Therefore, an agent should exhibit varying degrees of playfulness. Webster (1988) presents a list of methods for accommodating various degrees of playfulness of computer users. Based on her work, a number of practical recommendations for agent manufacturers may be developed. For example, an email interface agent may be employed in different modes, such as help, learn, work or play mode. This would address the playfulness needs of various categories of users and protect non-playful individuals. By selecting an appropriate mode, a highly playful person may prefer to employ an agent in the 'play mode' whereas a less playful counterpart in the 'work mode'.

*The third* contribution is that the comparison of results of the empirical validation of the proposed model and the model of user adoption of interface agents in everyday work applications (Serenko et al., 2007a) demonstrates that usage conditions play a key moderating role in affecting the relationships among several constructs. As shown in this study's model, in the case of voluntarily use of interface agents, perceived enjoyment is the key influencer of behavioral usage intentions (for more information on the importance of voluntariness and moderators in MIS research, refer to works by Venkatesh et al. (2003) and Sun and Zhang (2006)).

Currently, the role of voluntariness in technology adoption remains ambiguous. However, there is agreement in the MIS research community that voluntariness may potentially become an important moderator of usage behavior. It is hoped that the results of the comparison of this study's model with the model by Serenko et al. (2007a) may advance the field and inspire future researchers to embark on investigations of the moderating effects of voluntariness.

Despite its potential contribution, this study has several limitations. First, the results are generalizable to email interface agents for email notification only. In fact, this study's artifact was an email notification interface agent. Currently, a variety of types of interface agents for email exists. Therefore, the suggested model should be tested with other kinds of agents for email. Second, users of only one interface agent-based email system were surveyed. To strengthen the validity of the findings, a survey of users of an email agent notification application developed by another manufacturer should be conducted. Unfortunately, it is unlikely that such a study may be undertaken in the short-term. It was impossible to extend this study because the entire customer database of Blind Bat was utilized to contact the potential respondents. For a future follow-up project, the researcher approached all other manufacturers of email interface agents. Sadly, all of them ultimately declined the researcher's proposal to conduct a user survey.

The third drawback is that that Hypothesis 4 (i.e., the link between PE and PU) was not supported even though the path was in the appropriate direction (i.e., 0.20) and the *t*-value was 1.476 which is only slightly below the lowest *p*-value threshold. This *t*-value may have risen above the threshold if the sample size was significantly larger or the respondent profile was slightly different. The fourth limitation is that the data were collected at one particular point in time. The majority of MIS projects conducted user surveys in one period of time only. However, a longitudinal study may demonstrate that user perceptions and usage intentions change over time. Fifth, self-reported measures were utilized as a proxy for agent usage. On the one hand, there is evidence to suggest that self-reported and actual measures may not always strongly correlate. For example, Szajna (1996) reports a correlation of only 0.26 ($p < .05$). Therefore, the employment of other objective measures, such as usage log files, may potentially produce different results. On the other hand, all users employed the agent for a long period of time (i.e., for 3 months and over), and it may be assumed that most of them formed a good understanding of their actual agent usage frequency. The sixth limitation was the usage of a single method (i.e., quantitative approach) that helps to understand what processes take place but does not explain them in detail. It would be interesting to interview a number of agent users to get insights on additional factors influencing their decisions. In addition, controlled usability experiments may also produce findings of interest to agent developers. The seventh constraint is the employment of only two individual user characteristics, such as computer playfulness and PIIT. It is possible that there are other important user characteristics, for example, the Big Five Personality Traits, that may have an impact on user perceptions of agents. After other types of interface agents for email notification appear, future scholars may also explore the role of usage condition, which may serve as an important moderating variable of the suggested model (King and He, 2006). At the same time, despite these limitations, it is believed that this study was successful, and that none of these constraints are fatal in terms of the validity of the findings.

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## Appendix A

### *A.1. Online questionnaire*

Please answer all questions based on your experience with Email Announcer developed by Blind Bat Software. Please indicate the number that best matches your opinion (7-item Likert-type scale: from strongly disagree to strongly agree). *Note:* item numbers (e.g., PU1, PU2, etc.) did not appear in the online questionnaire.

PU1. Using interface agents improves my performance in the email system
PU2. Using interface agents in the email system increases my productivity
PU3. Using interface agents enhances my effectiveness with the email system
PU4. I find interface agents useful in the email system
PEOU1. My interaction with interface agents is clear and understandable
PEOU2. Interacting with interface agents does not require a lot of my mental effort
PEOU3. I find interface agents easy to use
PEOU4. I find it easy to get interface agents to do what I want them to do
PE1. I find using interface agents to be enjoyable
PE2. Using interface agents is pleasant
PE3. I have fun using interface agents
BI1. Assuming I have access to interface agents, I intend to use them in future
BI2. Given that I have access to interface agents, I predict that I would use them in future

The questions below ask you to describe your behaviors in the context of *information technologies*. Information technologies are computer systems concerned with all aspects of managing and processing information. Information technologies include personal computers, software applications, telecommunications networks (e.g., the Internet and Email), etc. Please indicate the number that best matches your opinion (7-item Likert-type scale: from strongly disagree to strongly agree).

PIIT1. If I heard about a new information technology, I would look for ways to experiment with it.
PIIT2. Among my peers, I am usually the first to try out new information technologies.
PIIT3. In general, I am hesitant to try out new information technologies. (R)
PIIT4. I like to experiment with new information technologies.

(R), reverse scaled items. (*Note:* (R) did not appear in the online questionnaire).

The following questions ask you how you would characterize yourself when you use personal computers. For each adjective listed below, please indicate the number that best matches a description of yourself *when you interact with computers* (7-item Likert-type scale: from strongly disagree to strongly agree).

CPS1. Spontaneous.
CPS2. Unimaginative. (R)
CPS3. Flexible.
CPS4. Creative.
CPS5. Playful.
CPS6. Unoriginal. (R)
CPS7. Uninventive. (R)

(R), reverse scaled items. (*Note:* (R) did not appear in the actual questionnaire).

Please specify where and how often you use interface agents. (Likert-type scale for each selection below: very frequently, frequently, sometimes, occasionally, rarely, very rarely, never).

At work
At home
In school
Other (explain)

How long have you been using Email Announcer?
What is your age?
What is your gender?
What is your occupation?
What is your highest level of education?

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