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CONSUMER PHIM

GOING BEYOND PAPER AND COMPUTER ANXIETY

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ABSTRACT

Personal health information management (PHIM) refers to an individual's use of various tools (i.e., email, paper, sticky notes, calendars, health portals) to manage their healthcare information (Jones 2008). With advances in technology, it becomes even more imperative that the healthcare community understand the factors that may influence consumers' intentions to use various PHIM tools to manage his/her healthcare information. The Theory of Planned Behavior (TPB) and constructs from the Technology Acceptance Model (TAM), and the Computer Anxiety Rating Scale (CARS) guide this investigation into how consumers might use patient health portals to manage their healthcare information.

Keywords

TPB, TAM, C-TAM-TPB, Consumers, Healthcare IT, CARS

INTRODUCTION

In order to ensure that they receive the best care, health consumers today have to learn how to navigate an increasingly complex, often fragmented system of care distributed across different clinicians, specialists and institutions. Moreover, health consumers are expected to have a better handle on their health information including medical histories, medications, and treatment in order to maximize consultations with their physicians and make more informed health decisions. In addition to personal health information (which can come in many forms: i.e., e-mail, phone messages, mail, webpages from research, receipts, etc.), patients need to manage a slew of financial information related to healthcare such as insurance procedures, medical fees, and employee benefits.

Health consumers are aware of the complexity and sometimes challenging task of managing their healthcare information. For example, a college student is required to provide proof of immunizations and medical history for college enrollment. He/she may find that searching for such information is a challenge because they have to contact their physician(s) office to get this type of information. Sometimes this process may take a few days and can end up costing him/her money because some physician offices charge a fee for searching health consumer information. Managing health care information utilizing the physician office as the information portal is a common practice by health consumers today. Health consumers may also rely on information management strategies such as "just-at-hand" where documents are visible and readily available such as on top of a desk or night stand (Moen et al. 2005). Another strategy is "just-in-case" where the health consumer may store the document in a cabinet where they can find it within reasonable time (Moen et al. 2005). A viable solution for managing health information more efficiently is the use of the patient health portal. The patient health portal is defined as a secure healthcare information repository maintained by the health consumer and/or his/her physician. This repository may contain information about the consumers' vaccinations, allergies, illness, medications, laboratory results, and any other medical information. The health consumer will have the capability to maintain his/her information and have the flexibility to access his/her health records anytime he/she chooses without the need to involve his/her physician for the information. The patient health portal also offers health consumers the ability to securely exchange messages (Weingart et al. 2006) with their physician. The flexibility and ease of use enables the consumer the ability to manage his/her own health information in an efficient and reliable manner.

Background

Today, there are an increasing number of patient health portals that are available to consumers. Some examples include Google Health, Microsoft HealthValut, WebMD, and many others, that provide the healthcare consumer the ability to manage their healthcare information. These patient health portals provide consumers the ability to store their medical information, track their medical history, and share medical information with their physician, to name a few. While there are a vast number of benefits to the use of the patient health portal, past research studies have focused on understanding the salient factors that influence the healthcare consumer to use technology to manage their health.

Current research findings illustrate that PHIM is an important area of consumer health informatics (Civan-Hartzler et al. 2006) with several barriers associated with the adoption of technology to manage health information. Much of the research has been focused on the technologies available for consumers to manage their healthcare information and barriers associated with the technology adoption. For example, these barriers may include information quality, security, and costs related to the use of technology to manage healthcare information. Information quality refers to how the information is presented to the consumer precisely and bias free (Civan-Hartzler et al. 2007). Security is another barrier that has been a topic of several research studies due to consumers' fears and concerns of a breach or unauthorized access of their medical information. (Paul et al. 1999; Reich-Hale 1998). For example, a health consumer may store their medical information using Google Health. Two months from now, a security breach occurs at the Google headquarters and the consumers' medical records are stolen. Such scenario is commonly attributed to the lagging effect of adoption of technology due to information security. The final barrier is the cost associated with the implementation of the technology. Often times, many studies have cited how the use of technology will provide the healthcare community with a reduction of administrative costs in healthcare treatment (England et al. 2007; Hsu et al. 2005; Kerr et al. 2008). Nevertheless, recent developments in technologies and the availability of new health portals, such as Google Health, provide healthcare consumers with a free service to manage their health information. While the health consumer has no direct cost associated with the adoption of health portals, stakeholders, including physician offices, insurers, and hospitals, may perceive the adoption of such technology as costly with limited benefits (Menachemi et al. 2004).

Research on patient health portals have illustrated the benefits associated with the technology, but lack the fundamental understanding of how consumers' affects impact to use it. Patient health portals offer unprecedented access to health information and services to the health consumer. Access to information when a health consumer needs it most is beneficial in situations such as natural disasters. For example, in 2005 hurricane Katrina destroyed parts of New Orleans and Mississippi. The destruction included homes, hospitals, and physician offices along with thousands of health consumers' medical records. During a disaster such as hurricane Katrina, health consumers who use a health portal could benefit by having easy access to their health care information in a time of need. In contrast, health consumers who relied on their physician to manage their healthcare information may experience a greater challenge accessing their medical records. While there are many benefits to the use of the patient health portal to manage health care information, many health consumers have not fully embraced technology to manage their health care information. One reason consumers have not fully embraced the patient health portal could be due to computer anxiety.

Thatcher and Perrewe (2002) stated that "computer anxiety refers to fears about the implications of computer use such as the loss of important data or fear of other possible mistakes." Computer anxiety is classified as a state anxiety reaction because it is only experienced in specific situations. Anxiety has been defined as "a state of anticipatory apprehension over possible deleterious happenings" (Bandura 1997). The impact that computer anxiety may have on a health consumer is an area that has received little attention in past research. Therefore, this study will focus on impact that computer anxiety has as a moderator in the intention for health consumers to use the patient health portal to engage in PHIM. Furthermore, this study will utilize the TAM model in conjunction with the TPB and the CARS to measure the impact anxiety has as a moderator in the intention to use the patient health portal to engage in PHIM.

Technology adoption in healthcare has been a widely studied field today with the use of various theories and models as the theoretical models. These theoretical models include the Theory of Reasoned Action (TRA) in the study of behaviors and technology adoption (Elliott et al. 2008; Gee-Woo et al. 2005; Karahanna et al. 1999; Ortiz de Guinea et al. 2009), and the Unified Theory of Acceptance and Use of Technology (UTAUT) to study factors that impact the intention to use technology (Venkatesh et al. 2003). While these theoretical models have been proven reliable in their areas of study, they were not fitting for this study. This study will focus on the salient factors of computer anxiety that influence the constructs of TAM and TPB in relation to consumers' intentions to use technology. Therefore, this paper will identify the use of C-TAM-TPB model and how anxiety will impact the constructs identified in this model.

TAM has been widely used to better understand the intentions to use IT. The model has been used to study various fields including online consumers (Koufaris 2002), teachers (Gefen et al. 2003), training (Amoako-Gyampah et al. 2004), and consumer use of phone text services (Turel et al. 2007). Such studies have fundamentally proven that TAM can provide a variance averaging 40% or higher which is considered high compared to other models. In its form, TAM includes two constructs, Perceived Ease of Use and Perceived Usefulness. Perceived Usefulness may be defined as the level to which a consumer believes that n technology will increase their productivity (Davis 1989). Perceived Ease of Use may be defined as the level of difficulty to learn a particular technology (Davis 1989). Each of the constructs play a crucial role on identifying how consumers are likely to engage in a behavior that will lead to the intention and ultimately lead to the behavior. Much of the research has identified that once a consumer engages in a particular behavior, they are more likely to engage in the behavior. Therefore, identifying the variance between the constructs will provide a level of predictability by using this model.

While the use of TAM has been proven to have good predictability, this model alone may not be the best fit for consumer research. There have been many obstacles that have been presented before TAM. These obstacles include applying the model outside the workplace (Moon et al. 2001), and understanding external variables that influence a consumers decisions, such as social situations (Taylor et al. 1995). These obstacles have been addressed by the addition of external constructs that have helped TAM increase the variance and explain other factors that influence the intention to use IT. Some of the external constructs include Perceived Value (Turel et al. 2007), Perceived Risk (Im et al. 2008), Technology Ready Index (Walczuch et al. 2007), and Perceived Playfulness (Ahn et al. 2007), to name a few. These constructs have helped with the increased variance on the predictability by first identifying the salient factors to the area of study and then providing empirical evidence for the study. Yet, these studies do not provide the understanding of PHIM use among consumers. Furthermore, the use of TAM alone is not a fit for understanding consumer use of PHIM because the focus of study is their behavior and not a particular IT.

First proposed by Icek Ajzen in 1985, TPB has become a widely used theory in social sciences. TPB has been used to study exercise behaviors in older adults (Brenes et al. 1998), predict behaviors related to diets (Sparks et al. 1998), personal computer adoptions in the United States (Venkatesh et al. 2001), and the adoption of personal digital assistants (PDA) (Yi et al. 2006), to name a few. TPB focuses on 3 areas which have been found to guide human behavior. Figure 3 illustrates TPB. According to TPB, human behavior is guided by 3 considerations: 1) beliefs about the likely outcomes of a particular behavior, 2) beliefs about normative expectations from others, 3) belief of the presence of factors that impede the performance of a behavior (Ajzen 2006). TPB is an extension of TRA that includes the perceived behavioral control. With roots on Bandura's (1977) research on self efficacy, TPB includes control beliefs that identifies how much control consumers have about a particular area of study (Jost et al. 1996). Self efficacy is an important part of this construct because according to Bandura (1977), consumers are more likely to try a behavior if they feel efficacious about that behavior. Therefore, if an individual has any anxiety about engaging in that behavior, they may be less likely to engage in that behavior. While TPB has been proven to have a high predictability, the theory lacks the usage intentions already posed by TAM (Taylor et al. 1995) in its original form.

Computer anxiety has been a widely studied field in the US. For this paper, computer anxiety is defined a consumers' fear of interacting with a computer to engage in PHIM. Various studies have focused on the impact that computer experience (Wilfong 2006), internet use (Durndell et al. 2002), computer phobia (McIlroy et al. 2007), and computer training (Chou 2001), have on the anxiety consumers experience when using computers. The anxiety experienced from the intention to use the technology may have an impact on the self efficacy described by Bandura (1977), thus impacting the Perceived Behavioral Control of a consumer's intention to use healthcare technology to engage in PHIM. Notwithstanding, that anxiety may have an impact on perceived behavioral control, this study will include the relationships that exist between anxiety and the impact it has on the constructs laid out in this model as a moderator.

PROPOSED STUDY

To better understand how consumers engage in PHIM, this study will use a theoretical model with the use of TPB and TAM constructs and the Computer Anxiety Rating Scale (CARS). This study will utilize validated question from TPB, TAM, and CARS. For example, a question from the CARS questionnaire "I look forward to using a computer" will be modified to "I look forward to using a computer to manage my healthcare information via the web portal?" in order to measure computer anxiety. Each question will be modified to include the use of a computer to engage in PHIM through a patient health portal. TPB has been selected because the purpose of this study is to identify how consumers manage healthcare information and determine the impact of computer anxiety as a moderator. Similar models have been proposed such as Decomposed TPB to better understand technology use (Huang et al. 2007; Taylor et al. 1995), Innovation Diffusion Theory (IDT) to study the adoption of personal digital assistants (PDA) (Yi et al. 2006), and Technology Adoption Model 3 (TAM3) to study the

determinants presented in the new model to study technology adoption (Venkatesh et al. 2008). Other studies include the use of Perceived Level of Satisfaction and TAM to understand how consumers accept technology (Wixom et al. 2005). Yet, these studies all have presented areas of research that include the use of TAM and TPB but lack the fundamental questions asked in this study and the impact that computer anxiety may have as a moderating variable for the C-TAM-TPB model. Figure 1 illustrates the proposed model. Below are the proposed research questions:

R1a: Does computer anxiety have an impact on a consumer's Perceived Ease of Use toward computers to engage in PHIM?

R1b: What is the relationship between Perceived Ease of Use and the Intention to use computers to engage in PHIM?

R2a: Does computer anxiety have an impact on a consumers' Perceived Usefulness toward computers to engage in PHIM

R2b: What is the relationship between Perceived Usefulness and the Intention to use computers to engage in PHIM?

R3: What is the relationship between the subjective norms and behavior to use computers for PHIM and how does anxiety moderate the link between the two areas?

R4a: Does computer anxiety have an impact on perceived behavioral control toward a consumer's use of computers to engage in PHIM?

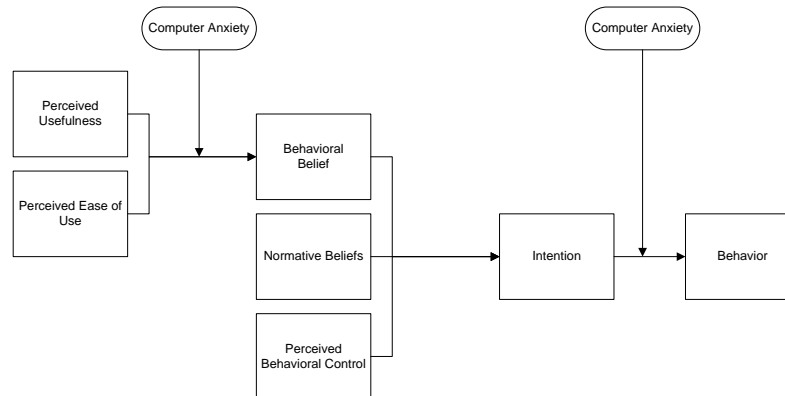R4b: What is the relationship between perceived behavioral control and use computers to engage in PHIM?

Figure 1. Proposed Theoretical Framework

PARTICIPANTS

Participants for this study will be recruited from Florida State University (FSU). The selected participants must be planning to enroll in at least one credit hour in the fall 2010 semester. The reason students were selected to participate in this research is because they represent a large portion of the young population in the United States. Furthermore, all students attending FSU are required to enroll in healthcare insurance. Their participation in an insurance program is the first requirement for the population in this study. The second requirement for this study will include access to any form of computer technology to engage in PHIM. Since a large portion of the students at FSU are enrolled with Blue Cross Blue Shield (BCBS) insurance, they are automatically have access to web tools for engaging in PHIM. Furthermore, students also have the ability to use other services such as Google Health to engage in PHIM, in situations where their insurer does not offer the service. All students selected to participate in this study must have access to a Web portal provided by their insurer or some form of computer technology that enables them to engage in PHIM. If they do not have access to a Web portal, they will not be considered for this study.

CONCLUSION

Understanding what influences the intention to use healthcare technology will provide valuable insight to some of the barriers that we face today in the adoption of healthcare IT. Understanding PHIM and the salient factors that attribute to the intention to engage in PHIM with or without the use of technology is valuable to the future development and adoptions of healthcare

IT. Similar to what other industries have adopted, such as the retail industry and banks, integrating what we know about consumers into the implementation of healthcare technology will help improve how consumers engage in PHIM. Furthermore, integrating other areas such as computer anxiety will further delineate some of the barriers that prevent consumers to go beyond paper to manage their healthcare information through a patient health portal.

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