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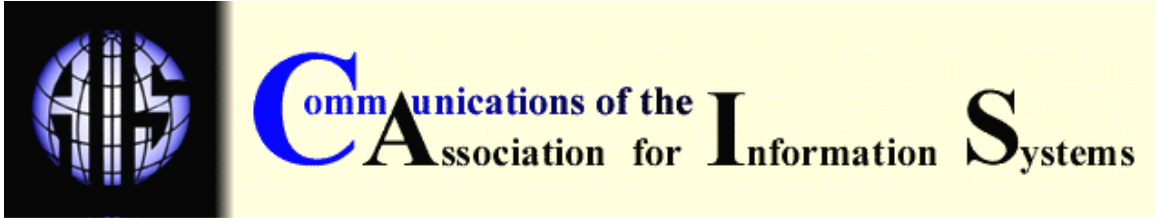
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INFORMATION SYSTEMS AND HEALTH CARE XIV: CONTINUING USE OF MEDICAL INFORMATION SYSTEMS BY MEDICAL PROFESSIONALS: EMPIRICAL EVALUATION OF A WORK SYSTEM MODEL

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ABSTRACT

Physicians face an increasing variety of options for using information systems in the course of delivering and managing medical care. Although the technical capabilities of medical information systems are expanding rapidly, such systems cannot be expected to be truly effective unless they mesh with the broader work system that includes the physician's work place and work routines. This research focuses on physicians' intent for continued use of an online medical evaluation system as an indicator of the mesh between an information technology and medical work environments, and it draws contextual elements from technology acceptance and compatibility models to help explain the intent for continued use. Ninety-seven physicians throughout the U.S. participated in an extensive survey that provided a basis for analysis, and results showed general support for the acceptance model used in the study. The theoretical and managerial implications of the study center on the importance of understanding continued use of medical information systems with the help of work practice compatibility and acceptance models as they apply to the demanding environment of medical practice.

Keywords: Medical Informatics, Physician Acceptance of Information Technologies, Medical Workflow Systems, Technology Acceptance Model, Work Practice Compatibility, Continued Use of Information Systems

I. INTRODUCTION

Physicians are unique as users of information technologies in that they are highly time-constrained and face the daily pressure of dealing with vital information. In spite of these pressures, at least a third of physicians' time is spent "recording and synthesizing information" (Smith, 1996), and medical information systems play an increasing role in this process. However, the potential benefit of medical information technologies cannot be adequately analyzed in isolation, because medical information technologies are part of a broader medical work system in

which the physicians' work routines and environment play an important, and perhaps dominant, role.

While efficiency of medical information management is an obvious priority for physicians, and physicians may test many information technologies in pursuit of such efficiencies, a physician's intention to continue using a medical information system may be an indicator of a technology's compatibility with the physicians' broader medical work system.

This study focuses on the construct of Behavioral Intent for Continued Use of a medical information technology and presents it as an important behavioral indicator of the potential success and effectiveness of an information system in a medical practice environment. The model includes several contextual factors that are known to contribute to physicians' adoption of information technologies, including the perceived usefulness and ease of use of a system as originally presented in the Technology Acceptance Model (TAM) (Davis et al., 1989). The model is enhanced with related ideas that help clarify a technology's mesh with the medical work system context, including Work Practice Compatibility, Medical Task Compatibility, Medical Work Flow Compatibility and Medical Professional Compatibility. The model was evaluated with data gathered from a survey of ninety-seven physicians in the U.S. who are frequent users of a specific online medical evaluation and reporting system.

This paper continues with a discussion of the research precedent and theoretical background for the main constructs of our model, along with our hypotheses. This is followed by a description of research methodology and study results. The paper concludes with a discussion of the implications for research and practice.

II. BACKGROUND

BEHAVIORAL INTENT FOR CONTINUED USE OF A MEDICAL INFORMATION TECHNOLOGY (IT)

This research proposes that a physician's intention to continue using a medical information technology is an important indicator of the potential success and effectiveness of an information system in a medical environment. Behavioral intent to begin using a technology can be distinguished from intent for continued use in a number of ways. For example, medical practitioners have historically presented high resistance to information technologies that are perceived as inefficient (Lee et al., 1996), although such resistance appears to be eroding as technologies become easier to use (Schonfeld, 2005). In addition, a number of studies have shown that behavioral intent for use of a technology is highly dependent on the trust placed in the particular application category (Sultan et al., 2002). Much of this trust may be based on practical focus on the utility of the IT. Studies of physician order entry, an evaluation context that parallels this research, indicate that intent for continuing use by physicians is expected to take place if there is a clear potential for time-saving benefit and the "familiarity barrier" is overcome (Overhage et al., 2001). In addition, physician intent for continued use may be derived from the increased scientific, or medical content of physician-patient consultations that is made possible by information technologies (Sullivan and Mitchell, 1995). The congruence between user expectations for these practical benefits and the realization of these expectations in user experience has been proposed as an important contributor to continued use of information systems (Bhattacharjee, 2001).

Attitudes and expectations that lead to continued use of information technologies have been shown to be mainly based on the reliable experience that users develop with the technology, and therefore user trials are persuasive and important contributors to continued use (Karahanna et al., 1999). Perhaps most illustrative of the distinction between Behavioral Intent and Intent for Continued Use is the related concept of Loyal Use, an idea initially tested in the context of knowledge management system use and which is defined as "consistent, ongoing, and routine use behaviors" (Clay et al., 2005). Our concept of Intent for Continued Use parallels these ideas,

but adds the elements of future intent and is applied in the context of physician use of medical information systems.

Our construct for Behavioral Intent for Continued Use of medical information technology (BICU) is based on the physician’s expected future behavior. As illustrated in Figure 1, our model proposes that BICU is the result of several elements, for which hypothesized relationships are discussed below.

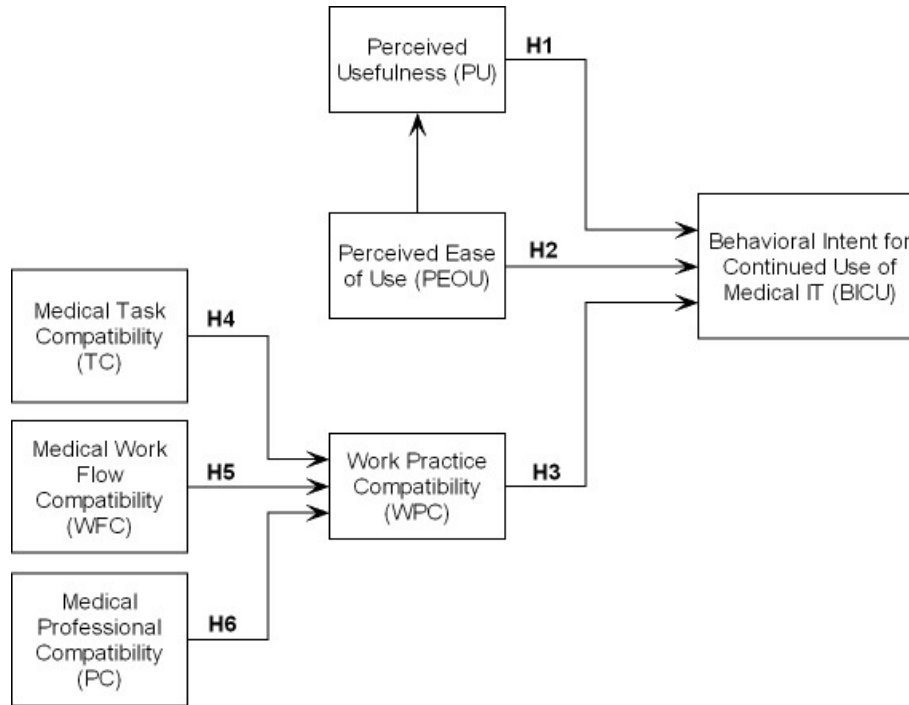


Figure 1 - Research Model

MODELS OF TECHNOLOGY ACCEPTANCE AND DERIVED HYPOTHESES

Familiar acceptance models help us understand work practice contexts in which medical professionals are the primary users of an information system. The first of these is the TAM (Davis et al., 1989), which has been studied in a variety of environments in which acceptance of an information system (IS) creates important outcomes for an organization. The TAM is a well-accepted and extensively analyzed approach to understanding behavioral intent to adopt and use a technology, and the model combines four familiar constructs: Perceived Usefulness (PU), which refers to the extent of belief that a technology will contribute to one’s performance, Perceived Ease of Use (PEOU), or the belief that a technology will require low levels of effort, Attitude Toward Using the Technology (ATT), which is formed as a result of PEOU and PU, and the resulting network influences behavioral intention toward use. The TAM forms an excellent foundation for our study because of its proven consistency (Legris et al., 2003), and because of its acceptance as a comprehensive, stand-alone model.

TAM and its precursor, the Theory of Planned Behavior, have been used to examine acceptance of technologies by physicians (Chismar and Wiley-Patton, 2003; Hu et al., 1999; Succi and Walter, 1999). For example, physician perceptions of user resources such as information technology interfaces can affect attitudes toward use of technologies either positively or negatively (Mathieson et al., 2001) as can the expectation of gains in job performance (Venkatesh et al., 2003).

However, any measure of usability should include a “cognitive accessibility” that is specific to the physician’s field of practice (Bevan, 1999). Cognitive accessibility may stem directly from the structure that is imposed by information technologies on the work of physicians, who in turn prioritize their behaviors in response to the technology – including avoidance behaviors. The direct measures of perceived usability and ease of use, which are inherently experiential and based on active practice, may be more strongly related to intent for continued use than attitude. In our model, the TAM elements of Perceived Usefulness and Perceived Ease of Use are hypothesized to have the strongest direct relationship to the endpoint of Behavioral Intent for Continued Use. The following hypotheses allow examination of these relationships:

H1: A high level of Behavioral Intent for Continued Use of medical information technology is associated with a high level of Perceived Usefulness of the technology.

H2: A high level of Behavioral Intent for Continued Use of medical information technology is associated with a high level of Perceived Ease of Use of the technology.

THE SPECIAL ENVIRONMENT OF MEDICAL WORK PRACTICE AND DERIVED HYPOTHESES

Other insights into medical work practices can be found in the Work Practice Compatibility model that has been explored by Rogers (Rogers, 1995), Benbasat and Moore (Moore and Benbasat, 1991) and others. The importance of WPC to an information system in a work context is that it is “the extent to which a technology ‘fits’ with the user’s existing work processes,” which in turn is related to the consistency of a technology with a “desired work style” (Agarwal and Karahanna, 1998). Evaluation of an information technology in a work practice context tends to have a favorable effect on adoption decisions (Karahanna et al., 1999). We employ the construct of Work Practice Compatibility (WPC) as defined by Chau and Hu (2001).

A workflow can be defined as a set of tasks organized towards an organizational objective, such as a physician’s evaluation procedure; and workflows increasingly take place in interaction between a professional and a computer (Mentzas, 1999). Chau and Hu (Chau and Hu, 2002a) found that physicians tend to focus on the practical issues of a technology’s usefulness to their work activities. In particular, they found that physicians appear to value a technology that is compatible with their practice procedures, or medical work flows. The concept of workflow has been examined in the unique environment of medical workflow technologies (Horan et al., 2004). We define Medical Work Flow Compatibility (WFC) as the physician’s perception of the relationship of the IT to the flow of the medical procedure for which it is used.

The concept of task compatibility of information technologies has been extensively evaluated in medical practice contexts. Task-specific plans lead to active selection of task-related behaviors such as technology use (Venkatesh and Davis, 2000). Other research suggests that the functionality set of the technology should match the immediate task needs of the user (Dishaw and Strong, 1999), and that the functionality should be closely matched to the work practice tasks facing physicians. In addition, the evaluations of usability of a technology by physicians are more positive when technology is directly linked to specific task details (Coble et al., 1997). Rigid information system designs may lead to burdensome “task tailoring” by physicians (Cook and Woods, 1996). Task-related adaptations of information system have favorably affected use of a variety of systems (Ye and Fischer, 2002) and examples of such adaptations highlight the need for customizing information technologies to fit the needs of the individual medical professional (Pappas et al., 2002). In spite of this need, the relatively rigid structure imposed by information systems, including patient record systems, are evaluated in the same task and work-flow related context that affects adoption by physicians (Sicotte et al., 1998). We define Medical Task Compatibility (TC) as the perceived compatibility of the IT to specific medical tasks.

The question of whether a technology-related work practice is appropriate may be influenced by the opinions of medical peer professionals who help define the scope of professional activities, which in turn affect system use (Taylor and Todd, 1995). For example, a physician’s self-

perceived professional role may or may not appear to be compatible with a particular set of technology-based work practices, particularly when peer recommendations are involved in the choice of medical information technologies. There is recent evidence that physicians act on technology endorsements by their peers (Schonfeld, 2005) and that the influence of professional peers tends to develop over time (Gibson, 2003). Our model defines Medical Professional Compatibility (PC) as the construct to represent a physician's perceptions of the appropriateness of an IT-based activity for the professional medical role.

Our model proposes that Work Practice Compatibility will positively affect Behavioral Intent for Continued Use of the medical technology. In addition, the established Work Practice Compatibility construct is expected to be positively affected by the new constructs of Medical Task Compatibility, Medical Work Flow Compatibility, and Medical Professional Compatibility. The following hypotheses represent these relationships:

H3: A high level of Behavioral Intent for Continued Use of medical information technology is associated with a high level of Work Practice Compatibility.

H4: A high level of Work Practice Compatibility is associated with a high level of Medical Task Compatibility.

H5: A high level of Work Practice Compatibility is associated with a high level of Medical Work Flow Compatibility.

H6: A high level of Work Practice Compatibility is associated with a high level of Medical Professional Compatibility.

Our model presents Behavioral Intent for Continued Use as the causal endpoint of three primary (H1-3) and three secondary (H4-6) relationships, reflecting the key concept that physicians may make choices about continued use of an information system long after the primary adoption decision (possibly beyond the physician's control) is made.

III. METHODOLOGY

SAMPLE

The research was performed in collaboration with a national medical informatics firm that interacts with physicians and disability compensation providing agencies. The company has developed and implemented an IT-based system to enable online submission of medical exam reports required for disability evaluations. The technology includes a knowledge library for disability ratings that provide support for the evaluating physicians during their medical evidence collection, and a web-based application to enable creation of electronic medical reports for disability evaluation. The online system assists the physicians in producing accurate and ratable medical reports that conform to the strict standards and requirements of the compensation providers. This system radically changes the traditional methods of performing disability evaluations and is expected to save significant time and expense for its physician providers and their organizations.

This study analyzed data from a nationwide survey of physicians who are members of the company's provider network. The overall physician network includes approximately 10,000 physicians all around the nation. At the early stages of the implementation, the physicians that conduct the largest number of medical exams for the company were trained on the new online system. At the time of this study, there were approximately 300 frequent physician users of the system (the number reported by the company). Frequent use is defined based on the number of medical exams conducted by the physician within 2004 using the online system. All of these users have been trained by the company on how to use the new online system. The system had been in use since the beginning of 2004.

DATA COLLECTION PROCEDURES

Data collection was completed using a two-step process. An online survey was first announced through the online disability evaluation system to all the physicians who logged in between October 4, 2004 and November 1, 2004 and a follow-up invitation via email and fax was sent to physicians who were already trained in use of the system but had not responded to the survey by October 20, 2004. The two phases of invitations led to a final group of ninety-seven physicians who completed the survey and who were among the 300 frequent users. This indicates a 32.3% response rate.

OPERATIONALIZATION OF CONSTRUCTS

Measurement items for the variables in this study were based on the previous literature, with additional items created for the constructs in our research model. A large pool of validated items exists for constructs defined in TAM. In this study, measurement items for Perceived Usefulness and Perceived Ease of Use were adapted from Davis (Davis, 1989). Work Practice Compatibility items were adapted from another study (Chau and Hu, 2002b) that extended broadly defined compatibility to the environment of healthcare professionals.

This research extended compatibility with the introduction of three new constructs, TC, WFC, and PC, and new items were created and validated to measure these components. Compatibility at the task, workflow and professional level were introduced by creating measurement items that addressed the intended focus. Items were measured using five-point Likert scale ranging from (1) Strongly Disagree to (5) Strongly Agree. A complete list of measurement items including the sources for reused items are presented in Table 1. Six items were reverse scaled as illustrated in the table.

Table 1. Survey Items

Perceived Usefulness				
Reliability= 0.906, AVE = 0.828	Mean	Std. Dev.	Loading	t-stat
PU1 - Using the system in my practice increased my productivity	3.18	1.17	0.9248	54.5928***
PU3 - Using the system in my practice enabled me to complete DE reports more quickly.	3.61	1.24	0.8948	36.2506***
<i>Source of items: (Davis 1989)</i>				
Perceived Ease of Use				
Reliability=0.821, AVE=0.610	Mean	Std. Dev.	Loading	t-stat
PEOU1 - Learning to operate the system was easy for me.	3.91	0.96	0.8380	11.2566***
PEOU2 - It is not easy for me to become skillful at using the system. (reversed)	4.05	1.01	0.6015	3.3152***
PEOU3 - I find the system to be easy to use.	3.76	0.89	0.8756	24.9809***
<i>Source of items: (Chau and Hu 2001; Davis 1989)</i>				
Work Practice Compatibility (WPC)				
Reliability=0.928, AVE=0.812	Mean	Std. Dev.	Loading	t-stat
WPC1 - Using the system fits with the way I work.	3.70	1.11	0.9370	73.7731
WPC2 - Using the system does not fit with my	3.71	1.04	0.9174	46.3278***

practice preferences. (reversed)				
WPC3 - Using the system fits with my service needs.	3.70	0.89	0.8458	14.1283***
<i>Source of items:</i> (Chau and Hu 2001)				
Task Compatibility				
Reliability=0.789, AVE=0.556	Mean	Std. Dev.	Loading	t-stat
TC1 - I can use the system easily while I perform a medical evaluation procedure.	2.63	1.18	0.7130	9.4348***
TC2 - The way the system is designed is inconsistent with how I like to conduct medical evaluations. (reversed)	3.52	0.98	0.8035	15.7720***
TC3 - I have found the system to be quite flexible in terms of how I use it in my evaluations.	2.88	1.08	0.7168	8.0905***
<i>Source of items:</i> New				
Work Flow Compatibility				
Reliability=0.897, AVE=0.744	Mean	Std. Dev.	Loading	t-stat
WFC1 - The process of preparing and submitting disability evaluations through the system is easy for my office to handle.	3.80	0.98	0.9045	52.4850***
WFC3 - Using the system requires a lot of extra effort in my practice. (reversed)	3.39	1.23	0.8549	26.3890***
WFC4 - It has been easy to tailor the system to how my practice handles reports.	3.32	1.13	0.8265	17.1585***
<i>Source of items:</i> New				
Professional Compatibility				
Reliability=0.905, AVE=0.827	Mean	Std. Dev.	Loading	t-stat
PC2 - Physicians should not be spending their time having to deal directly with systems like this one. (reversed)	3.46	1.08	0.8976	30.5992***
PC4 - Systems like this are a distraction to the physician's main job of providing care to patients. (reversed)	3.69	1.01	0.9210	40.1318***
<i>Source of items:</i> New				
Behavioral Intent for Continued Use				
Reliability=0.901, AVE=0.819	Mean	Std. Dev.	Loading	t-stat
BICU1 - I think that I would like to use the system frequently.	3.48	1.08	0.9144	47.5871***
BICU2 - I expect to continue using the system in my practice.	4.15	0.80	0.8957	39.5472***
<i>Source of items:</i> (Chau and Hu 2001) (Bhattacharjee 2001)				

*** Indicates that the item is significant at the $p < .001$ level

IV. DATA ANALYSIS

SAMPLE

Among the 97 respondent physicians, ages ranged from 29 to 83 with a median of 48, an average of 49, and a standard deviation of 11.5. Physicians' experience in performing disability evaluations ranged up to 40 years, with an average experience duration of 6.7 years. The respondents were located in ten different states and they represented 13 different medical specialties.

This research was focused on the use of the new online system by physicians in different stages of a medical exam conducted for disability evaluation purposes. The workflow was analyzed in three different phases: (1) Data gathering, (2) Data entering, and (3) Final report submission. To provide a better understanding of how the system was used by the sample of the study, following descriptive analysis are provided.

The questions targeted toward the first phase on the workflow asked how the worksheets provided by the online system are utilized for data gathering. Among the physicians who responded to the survey, while 55.7% reported that they never view the medical worksheets *online* during the exam, 58.8% of the respondents reported that they always view *printed* worksheets during the exam. The next set of questions addressed entering exam data into the online system during or after the exam, with 64.9% of the participants reporting that they always enter their own reports directly into the system after the evaluation. In terms of who enters the data into the system, the clear majority of physicians perform the task as 74.2% of the respondents reported that they never let their assistants enter the data to the system. Finally, the last group of questions addressed how they finalize and submit the online reports. Only 11.3% of the participants reported that they always let an assistant to finalize the report.

PARTIAL LEAST SQUARES (PLS) ANALYSIS

The Partial Least Squares (PLS) approach, a structural equation modeling technique, was used to evaluate our research model. The PLS approach evaluates both the structural and measurement paths of a model (Chin et al., 1996). The PLS-Graph 3.0 analysis package was used to test the research model.¹

PLS offers some flexibility on measurement scales, sample size, and residual distributions and hence it is suitable for small sample sizes (Chin et al., 2003). Specifically, Chin (2003) recommends that an acceptable sample size must be equal to the larger of the following: (1) ten times the scale with the largest number of formative indicators, or (2) ten times the largest number of structural paths directed at a particular construct in the structural model (Chin 1999). Since our model contains seven structural paths and no more than four indicators per scale, the sample size recommendation was exceeded by 38%. Although the bootstrap approach used in this analysis is considered a leading method of sample estimation, Marcoulides and Saunders (Marcoulides and Saunders, 2006) urge conservative use of this technique, and propose careful examinations of models, data, variables, and effect sizes to help assure a statistically reasonable result. Our observation of these precautions, along with the substantial sample size of 97, helps justify our use of the bootstrap method of sample estimation that is included in PLS-Graph.

Reliability and validity tests are conducted to evaluate the applicability of the measures to the research model under investigation. Table 1 lists all the measures and their composite reliabilities. All reliability values reported in this table are above the recommended acceptable level of 0.70 (Nunnally, 1978) and therefore indicate adequate internal consistency.

¹ PLS-Graph 3.0 software was generously provided by Professor Wynne Chin of the University of Houston.

Convergent and discriminant validity analysis are used to demonstrate that a construct shares more variance with its own measures than it shares with other constructs in the model. In this study, discriminant validity was assessed using two methods. First, the average variance extracted (AVE) was analyzed. As illustrated in Table 1, for each construct AVE exceeds 0.50 (Fornell and Larcker, 1981), indicating that the variance accounted for by each construct exceeds the variance accounted for by measurement error (Hair et al., 1998). The next step is to determine that the square root of the AVE is larger than the correlations between constructs (Barclay et al., 1995). Table 2 presents the correlation matrix between constructs where the bold numbers on the diagonal represent the square root of the AVE. Results presented in this table indicate that the AVE rules are satisfied for discriminant validity. In addition, loadings presented in Table 1 indicate that all the measures have high loadings compared to the recommended 0.50 threshold (Wixom and Watson, 2001). These results demonstrate the convergent validity of the instrument items.

Table 2. Correlations of Latent Variables
(Diagonal elements are the square root of Average Variance Extracted)

	PU	PEOU	BICU	WPC	TC	WFC	PC
PU	0.91						
PEOU	0.49	0.78					
BICU	0.72	0.62	0.91				
WPC	0.65	0.56	0.68	0.90			
TC	0.66	0.49	0.58	0.64	0.75		
WFC	0.79	0.57	0.74	0.73	0.67	0.86	
PC	0.68	0.47	0.58	0.59	0.56	0.65	0.91

An alternative method for examining construct and discriminant validity is to examine the loadings and cross-loadings of the constructs. According to this method, each indicator should have a loading of 0.70 on its underlying construct and this loading should be higher than any of its loadings on other constructs (Barclay et al., 1995; Fornell and Larcker, 1981). Table 3 illustrates the loadings of constructs, and both rules were satisfied: Indicator loadings on constructs ranged from 0.713 to 0.925, with the exception of PEOU2 which had 0.601 loading. However, in all cases the loadings of indicators on their respective constructs was higher than cross-loadings on other constructs.

Table 3. Discriminant Validity Analysis Using Cross Loadings for the Research Model

	PU	PEOU	BICU	WPC	TC	WFC	PC
PU3	0.8947	0.4429	0.5813	0.5330	0.5972	0.7237	0.5769
PU1	0.9249	0.4545	0.7270	0.6407	0.6083	0.7158	0.6554
PEOU3	0.5304	0.8757	0.6303	0.5260	0.5341	0.5655	0.4953
PEOU1	0.3295	0.8379	0.4547	0.4322	0.3535	0.4235	0.3266
PEOU2	0.1830	0.6014	0.2437	0.3290	0.1073	0.2813	0.1991
BICU1	0.7022	0.5637	0.9145	0.6342	0.6086	0.6872	0.5507
BICU2	0.6053	0.5538	0.8956	0.5928	0.4408	0.6415	0.5053

WPC1	0.6321	0.5037	0.6301	0.9369	0.5945	0.6826	0.5256
WPC2	0.5563	0.4921	0.6114	0.9174	0.6114	0.6555	0.5440
WPC3	0.5641	0.5319	0.5918	0.8458	0.5239	0.6225	0.5313
TC1	0.4823	0.3567	0.3892	0.4098	0.7130	0.4794	0.3118
TC2	0.4750	0.3474	0.4660	0.5770	0.8035	0.4807	0.4755
TC3	0.5426	0.4029	0.4492	0.4204	0.7169	0.5445	0.4425
WFC1	0.7426	0.5658	0.6831	0.7091	0.6717	0.9045	0.6080
WFC3	0.6098	0.5120	0.5806	0.6164	0.4690	0.8549	0.5814
WFC4	0.6905	0.3883	0.6377	0.5353	0.5706	0.8265	0.4856
PC2	0.5635	0.3671	0.4334	0.5036	0.4583	0.5172	0.8977
PC4	0.6673	0.4885	0.6185	0.5699	0.5488	0.6598	0.9210

The next step in PLS is the assessment of the structural model by looking at the path coefficients, which explains the relationship between dependent and independent variables, and R², which explains the amount of variance explained by independent variables. Figure 2 illustrates the results of model evaluation including the significance levels of the paths calculated.

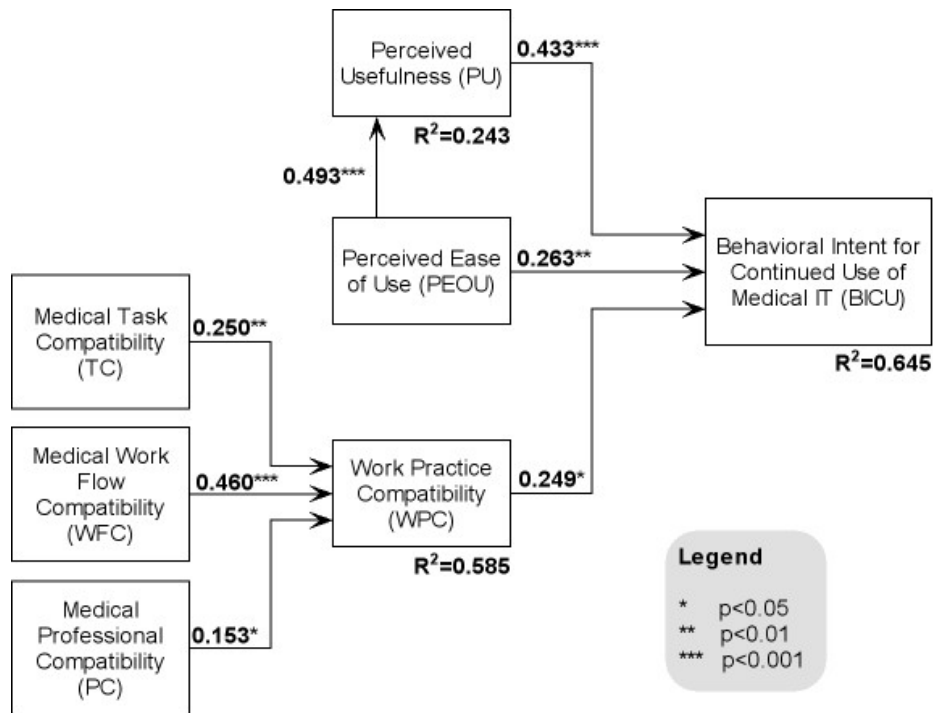


Figure 2. Research Model Evaluation

All relationships in the structural model were positive and significant, and support was found for each of the hypotheses presented for analysis. The results for each hypothesized relationship are explained below in Table 4.

Table 4. Results of Hypothesis

Hypothesis	Path Coefficient	Significance	Evaluation
H1: A high level of Behavioral Intent for Continued Use of medical information technology is associated with a high level of Perceived Usefulness of the technology.	0.433	p<0.001	Supported
H2: A high level of Behavioral Intent for Continued Use of medical information technology is associated with a high level of Perceived Ease of Use of the technology.	0.263	p<0.01	Supported
H3: A high level of Behavioral Intent for Continued Use of medical information technology is associated with a high level of Work Practice Compatibility.	0.249	p<0.05	Supported
H4: A high level of Work Practice Compatibility is associated with a high level of Medical Task Compatibility.	0.250	p<0.01	Supported
H5: A high level of Work Practice Compatibility is associated with a high level of Medical Work Flow Compatibility.	0.460	p<0.001	Supported
H6: A high level of Work Practice Compatibility is associated with a high level of Medical Professional Compatibility.	0.153	p<0.05	Supported

V. DISCUSSION

This study explores familiar elements of acceptance and compatibility models in a new combination that provides a useful way to help explain the intent for continued use of an online medical evaluation system. The research model is supported by the physician survey findings, and the study found support for the concept of Behavioral Intent for Continued use of a Medical IT. The resulting model offers a number of theoretical and managerial implications.

In theory, continued use of an IS by physicians is different from ordinary adoption in a number of ways. First, a wide variety of information technologies are used in medical contexts and in many cases the adoption decisions for these systems were made at an institutional level in months or years past. In practice, however, continuing use of an information system may be a daily option for physicians, especially if use of the IS in question is not mandated by a structured healthcare environment such as those found in hospitals. It is well established that information systems can present new kinds of cognitive burdens for physicians (Cook and Woods, 1996) and such burdens can ultimately affect intention for continued use of a technology. This study adds to the knowledge base for management of information systems in medical environments, not only because many technologies used by physicians are currently emerging or being upgraded, but continued use of an IT in medical environments can contribute to a positive return on investment (Devaraj and Kohli, 2003).

A practical, managerial implication of this expanded model is that it suggests ways to improve system use that extend beyond the traditional presuppositions associated with acceptance model. That is, in an environment where all things are equal in terms of Perceived Ease of Use, management may actively foster continued use of a medical information system by focusing on the mesh between the technology and the physician’s daily work system. The results suggest that

interventions focused on enhancing the compatibility between technologies and physician work practices can promote continued use of a variety of systems, including web-based technologies.

Our study also found that the adapted model, which incorporated elements of TAM and compatibility constructs, along with new constructs for medical professional, workflow, and task compatibility, explained a fairly large percent of the variance (0.645) in our terminal construct, Behavioral Intent for Continued Use of Medical IT. When compared to the traditional TAM model, this model provides the added insight into the role of medical work practice factors in acceptance their overall effect on continued use.

Other limitations of our study should be mentioned. Although our sample size of ninety-seven produced an acceptable and statistically significant outcome in our PLS-based evaluation, our data came from use of a single information system application by a single group of medical specialists. Until additional evaluations are conducted with other physicians, caution should be applied in generalizing these results in other contexts.

VI. CONCLUSION

This study presented an adapted acceptance model that brought together elements of acceptance and compatibility models in a new combination that helps to explain intention for continued use of an online medical evaluation system. While the acceptance models continue to evolve and find application in different environments, this study found that specific work practice elements contributed to continued use of an information system in a structured medical informatics context. In addition, this study's model introduced the construct of Behavioral Intent for Continued Use of a medical information technology and reinforced this continued use as an important behavioral outcome that is influenced by compatibility and meshing of an information technology and the context of medical task and work practices.

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