Investigating the influence of psychological ownership and resistance on usage intention among physicians

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Abstract

Rising health care costs are compelling many medical organizations to invest in new health information technologies (HIT). Physician adoption of such technologies is a common concern, and this concern has motivated many project teams to experiment with approaches that engage users early in the deployment process.

In this study, we examine the roles of psychological ownership, perceived threat, perceived risk, and resistance to change within a large North American Hospital. We integrate previous promising work to develop a new model of physician acceptance. Our analysis indicates that contextual factors brought on by user engagement in the design process may have significant positive effect on the development of psychological ownership, and this attachment can be a significant influence on user acceptance, particularly in counteracting the effects of resistance to change brought out by the physicians perception of threat, and risk.

1. Introduction

Rising health care costs are a key concern for many health care policy makers [17,30,33]. This issue is especially troublesome within those countries experiencing an aging population. Such shifts in demographic conditions are generating the double burden of increasing healthcare spending and declining workforce through retirement [15]. A key policy response to this growing issue has been to promote increased adoption of health information technologies (HIT) [17,30]. Such decisions are generally supported on the premise that deployments of technology will yield increased quality of care, reduced errors, and decreased costs [5,9,17,27,37].

But despite the potential positive impacts, after many years of effort, the adoption of key systems such as Computerized Provider Order Entry (CPOE) and Electronic Medical Records (EMR) remains disappointing [21,22,27,38]. The often cited example of the failed deployment of a CPOE system at Cedars-Sinai Medical Center indicates that acceptance of this technology is difficult, even within well-funded organizations with a strong track record of progressive usage of informatics [3,31].

The adoption of HIT can be understood from the perspective of research dealing with user acceptance of new technology. The number of studies utilizing IS acceptance models in health information technology studies are increasing [18]. These HIT studies have applied models previously developed to evaluate technology acceptance in a more general corporate setting; specifically technology acceptance models such as the Technology Acceptance Model (TAM), and the Unified Theory of Acceptance and Use of Technology (UTAUT) model. But despite the progress and initial optimism for these models, gaps remain [10,28,34]. The gaps exist, it is believed, because of the unique characteristics of the health care delivery context relative to the more general corporate environments in which technology acceptance models have typically been tested. In this research we seek to explore these gaps to uncover additional factors that may explain the behavioral intentions of health care providers to use health information systems.

1.1. Background

In Canada, between 1999 and 2009, the average annual growth rate in health care spending was 7.9% [7]. A number of trends are contributing to this upward pressure on the costs of the Canadian health care system and in response health care providers are actively searching for means of controlling these costs, The Ottawa Hospital, one of Canada's largest teaching hospitals, is one of such providers. It has recently undertaken a large program to invest in the deployment of various information systems to create more efficient workflows in order to deliver better patient outcomes. A key delivery within this program is the launch of a mobile computerized provider order entry (MCPOE) system. This system is expected to significantly reduce aggregate effort expended on executing various

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frequently used routines such as the ordering and review of lab tests and diagnostic imaging (DI).

A key concern of senior executives at this hospital is the level of acceptance this new system will achieve. Significant resistance by hospital personnel to the adoption of these systems may result in duplicative effort and a reduction in workflow performance. The acceptance of these systems is therefore viewed as critical to achieving anticipated benefits [23].

Our study aims to identify influences of resistance and perceived ownership on user intentions to adopt HIT. Our specific HIT is The Ottawa Hospital's ("TOH") MCPOE deployment. We utilize aspects from the basic TAM model to explore the validity of the TAM constructs, and extend the model to investigate issues of risk, threat, resistance, and psychological ownership.

The benefits from this study are two-fold; from a practical level, it will assist health care administrators to identify factors involved in acceptance of health care technology by physicians, and secondly, it will contribute to our overall theoretical understanding of resistance and psychological ownership associated with health information technology acceptance.

In this paper we first provide a brief review of technology acceptance models; secondly, we elaborate on recent applications and extensions of these models that have been applied to the health sector. From this review, we propose a theoretical model derived from a number of key model extensions that have shown promise in analyzing health information technology acceptance in the health care environment. Finally, we outline the research methods, instrument construction, site selection, and sampling methods for the empirical testing of our hypothesized model, results, and we highlight any anticipated limitations or issues with the study process in our conclusion.

1.2. Technology Acceptance in Healthcare

The Technology Acceptance Model (TAM) has been a key area of research in the field of IS; some claiming that it has become one of its most influential theories [4,25]. But despite its success, the popularity of TAM based research generated concern that other important insights were not being explored. A 2007 issue of the Journal of the Association for Information Systems (volume 8, issues 4, April 2007) was dedicated to addressing some of these concerns. In it, Bagozzi [2], discussed how parsimony contributed to the TAM's popularity, but also provided what he characterized as its Achilles' heel. He stated that "It is unreasonable to expect that one model and one so simple, would explain decisions and behavior fully across a wide range of technologies, adoption situations, and differences in decision making and decision makers"[2].

Despite any suggestion of saturated use of TAM within the core IS academic dialog, TAM has proven quite useful in investigating the unique acceptance characteristics of users of health information technology (HIT). HIT studies have arguably embraced TAM, and have produced many promising examples of the applicability of TAM to the health care environment [5,10,28,32,34,35]. For example, Yarbrough and Smith [43] recently conducted a detailed review into the use of TAM in HIT and identified eighteen studies. Holden and Karsh [18] identified an additional sixteen. These studies indicate that TAM has generated a more thorough understanding of user acceptance of HIT. Holden and Karsh further noted that TAM in the HIT field is being extended; similar to that which has been experienced by TAM researchers in the core IS field. New factors are being explored to further contextualize the model for the unique situation of hospitals and health care workers. This confirms Yarbrough and Smith's earlier findings that "context-specific variables must be added to the [TAM] model to increase its explanatory power" [43]. Further identification of potential factors can assist practitioners in identifying the unique context and characteristics of HIT technology acceptance and so they can develop appropriate planning and policy responses.

2. Theory and Hypotheses

Early discussion with senior management at TOH indicated that they believed that user engagement within the design and deployment phase of the technology would positively affect user acceptance. These discussions revealed two key underlying assumptions: 1) that physician resistance behaviors would emerge and impact user acceptance, and that 2a) a design and deployment process engaging leaders within the user community would increase psychological attachment and positively impact the systems perceived usefulness and ease of use of the system, and 2b) that through such engagement the negative impact of resistance on user acceptance would be attenuated.

A review of the literature revealed that though past attempts to model resistance to change with user acceptance [5,6] have shown promise, there has been a paucity of continued work in this area. Also, though initial exploration of effects of psychological attachment have been investigated, similar to the work in resistance, initial promising results have not been followed up with continued exploration and refinement.

We propose a model and empirical study to further the application and extension of initial promising work by exploring the antecedents to resistance and its effects user acceptance within a new health CPOE deployment. Within this context we explore the impact of

psychological ownership on acceptance and analyze mediating effects psychological ownership has on the effect of resistance behaviors.

2.1. Research Model

2.1.1. Usage of core TAM constructs

Any exploration of user acceptance must consider the "paradigmatic" status of TAM-based research. A common dependent variable of study within TAM has been the measure of actual system use. Given the context, a system's reported usage measure would be too difficult to obtain and associate with responses, therefore any measure of usage would require user self-disclosure. Previous research has indicated physician's satisfaction with CPOE as highly correlated with their perception of the efficiency and effectiveness of the technology by physicians [43]. Though HIT cannot be effective unless it is used, it is our assertion that self-disclosed measures of high usage does not necessarily indicate effectiveness and that it may in fact indicate a perceived lack of efficiency.

Considering this, we have therefore chosen as our dependent variable a measure of behavioral intention to use the CPOE system. Intention to use was first introduced and validated by Davis [13] and was derived from the theoretical work by Ajzen & Fishbein [1]. Originally called "Behavioral Intention", we follow the recent trend within the HIT literature of naming it "Intention to Use" [28,32,34].

Furthermore, though the attitude construct has been a common feature of early TAM models [12], we have not included it in our proposed model. Earlier TAM models utilized attitude as the single antecedent to intention to use (stated as "behavioral intention" in TAM). Our concern is primarily with the factors influencing user intentions, so we have followed the many recent extensions that have eliminated attitude [18,19,40,41,42,43],

Finally, the constructs of perceived ease of use and perceived usefulness remain within our model. Though these constructs were first introduced and validated by Davis et al, [12] within a general technology setting, perceived usefulness and ease of use have proven to be rather good predictors of intention to use within HIT [18]. We have therefore retained these constructs within our model and wish to contribute to ongoing tests of their relevance with physicians use.

Perceived ease of use is "'the degree to which the prospective user expects the target system to be free of effort" [14]. Though there is evidence from longitudinal studies that perceived ease of use diminishes its effect on perceived usefulness over time [40,42], our study looks at an early stage HIT deployment, and thus we expect this factor to produce a significant positive influence on intention to use.

H1. Perceived ease of use will have a positive direct effect on intention to use the MCPOE system.

Perceived usefulness is a user's subjective assessment that using the HIT system will increase their performance within their role [13]. Similar to previous HIT studies, we expect to find a significant positive influence of perceived ease of use on intention to use.

H2. Perceived usefulness will have a positive direct effect on intention to use MCPOE system.

Further, we also expect the perceived ease of use will have a positive effect on perceived usefulness.

H3. Perceived ease of use will have a positive direct effect on perceived usefulness.

2.2. Investigating Resistance to Change, Risk, Threat and Ownership

2.2.1. Resistance to Change

Egea & Gonzalez [34] and Holden & Karsh [18] identified the "resistance" situation that exists within the hospital environment. Following Bhattacherjee & Hikmet [5, 6], we have included both resistance to change and perceived threat within our model. We contribute a further extension to this conception of resistance, hypothesizing perceived risk as second key antecedent to resistance to change. We theorize that resistance is influenced by risk that users perceive; especially acute in a healthcare context.

The resistance to change construct was first introduced and operationalized by Bhattacherjee & Hikmet [5, 6] and used in tests of user acceptance of an electronic health records system in a hospital setting. Bhattacherjee & Hikmet's work drew upon work by Cenfetelli [8], who utilized Lewin's force field analysis [26] to argue for a theoretical extension to technology acceptance models. Cenfetelli hypothesized that a user's intention to use a system is the result of a dynamic balance between inhibitors and enablers, and that TAM models focused on enablers, but neglected to account for inhibitors. According to Cenfetelli's theory, inhibitors discourage IT acceptance when present, but do not enhance it when absent.

Though Cenfettelli did not introduce a construct of resistance to change (or its antecedents), Bhattacherjee & Hikmet used Cenfetelli's theory to justify the distinction between 'resistance to change', an inhibitor by their definition, as being distinct from the 'enabling' constructs within TAM. From this theoretical justification, Bhattacherjee & Hikmet operationalized the construct of resistance to change and verified significant influence on intention to use.

For the purposes of our model, we will utilize the construct of resistance to change as an external TAM variable to understand its negative impact on intention to use the CPOE system. Unlike Bhattacherjee & Hikmet [5,6], we include resistance to change as an external TAM variable. Following Venketesh and Davis's [41] definition of external variables, we investigate effects on perceived usefulness.

H4. Resistance to Change will have a negative direct effect on perceived usefulness of the new MCPOE system.

In their original operationalization of resistance to change, Bhattacherjee & Hikmet investigated a single antecedent, that of perceived threat. They referred to the work of Piderot [36] whose general research into organizational change noted that 'Rarely do individuals form resistant attitudes, or express such attitudes in acts of dissent or protest, without considering the potential negative consequences for themselves' (p. 784). From this Bhattacherjee & Hikmet argued that people resist change if they expect it to threaten the status quo. They further support their inclusion of this hypothesis by highlighting two studies in this area, one of which was directly investigating physician resistance [24]. We utilize this construct within our model to test the positive relationship between perceived threat and resistance to change.

H5. Perceived Threat of using MCPOE system will have a positive direct effect on Resistance to Change.

We propose that resistance to change stems not only from perceived threat, but also from physician concerns about risk. In past research on physician acceptance of HIT, perceived risk was investigated as an antecedent of trust [34] but one of our contributions is to investigate its effects on resistance to change. Ortega and Gonzalez list a number of previous studies that have identified or investigated perceived risks by physicians towards new HIT systems. These include uncertainty [43], concern for privacy [16,20], and less efficient time management [11,29,43]. We propose an even more general view which argues that physicians and many health care providers are extremely sensitive to risk factors in adopting a new HIT system due to the life threatening nature of deviations in their performance. Physicians are encouraged and empowered to act on any concern that they may have. Users who have such a significant responsibility and who are embedded within a culture that supports such a high degree of empowered action, may exhibit strong resistive behaviors in the face of perceived risk.

H6. Perceived Risk of using MCPOE system will have a positive direct effect on Resistance to Change.

2.2.3. Psychological Ownership (PO).

During initial meetings, TOH managers indicated that involvement of users in the planning and initial development cycle had been a key part of their user acceptance strategy. Their goal was to engage users in the process, and develop a community initiative whose responsibility and attribution of success would be shared across both users and those involved in design, development, and deployment of the new system(s). We conceive of this approach as increasing a user's sense of psychological attachment to the system artefact and project success, and this effect will positively impact a psychological ownership and ease of use. We seek to assess both the level of psychological attachment that has been generated through this approach, and explore its effects on perceived usefulness.

To assess this hypothesis, we have added the measure psychological ownership. This construct was first operationalized for the physician population by Paré, Sicotte & Jacques [35]. We are motivated to include this construct not only for its past successful application within the medical environment, but also as a means to measure and test a common expectation of HIT deployment projects teams– that is, through engaging personnel in the development process, a user's

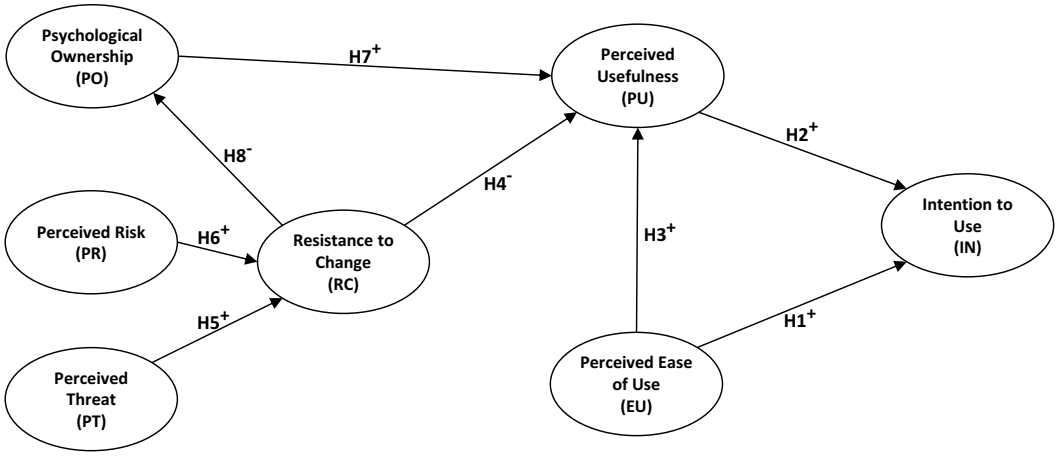

Figure 1: Research Model

sense of psychological ownership is generated, and that this will positively influence user acceptance and attenuate the effects of resistance to change. Early interviews with management at TOH indicated that they strategically engaged users early in the process, and that such an approach is expected to lead to a sense of ownership of the systems success. Similar approaches can be expected to be followed in many other health care environments, and therefore we believe this represents a key phenomenon of study.

We propose that the level of psychological ownership will be positively associated with a physician's perception of system usefulness and ease of use.

H7. Psychological Ownership of the MCPOE system will have a positive direct effect on Perceived Usefulness.

Finally, we hypothesize that resistive behaviors will inhibit and impede the development of psychological ownership.

H8. Resistance to change will have a negative and direct effect on Psychological Ownership.

3. Methodology

3.1. Sampling

The population surveyed was a group of physicians, users of a new MCPOE system recently deployed at TOH. An online survey was conducted with those that participated in a mandatory training process for new users of the MCPOE system. Two to four weeks after this initial training, physicians were sent invitations to participate in an online survey.

	Total	%
n	75	
Age		
<30	14	18.7%
30-45	28	37.3%
46-55	19	25.3%
56+	14	18.7%
Mobile Access		
Yes	68	90.7%
No	7	9.3%
Tenure (years)		
<1	12	16.0%
1-5	27	36.0%
6-10 years	12	16.0%
11+	24	32.0%

Table 1: Sample Profile

3.2. Survey Instrument

A survey consisting of twenty-nine items measuring seven variables was administered as part of a larger survey. All model items were measured using a five-point Likert scale.

Though scales used were validated within prior research, our context required certain minor modifications (sources and extensions are outlined in appendix A).

4. Results

4.1. Sample Profile

Our analysis was conducted on the sample profile shown in Table 1. The participating physicians varied in age, tenure, and access to mobile technology. Of note, a large portion of the sampled physicians have access to CPOE via a consumer mobile device, such as iPads.

4.2. Validation of Measurement Model

Table 3 contains internal consistency measures calculated from our measurement model. Cronbach alphas exceed the recommended minimum of 0.7. Due to the tendency of Cronbach alpha's measures to under estimate internal consistency, we have also included composite reliability measures. Our analysis indicated

Latent Variable	Indicator	Loading	Indicator Reliability	Mean	Standard Dev.
EU	EU1	0.9022	0.8140	4.0400	0.7612
	EU2	0.8696	0.7562	3.7200	0.9381
	EU3	0.7449	0.5549	3.4000	0.8853
	EU4	0.8501	0.7227	2.8800	1.0261
IN	IN1	0.7222	0.5216	2.8933	1.0210
	IN2	0.8326	0.6932	2.9467	1.0513
	IN3	0.9103	0.8286	3.4933	1.0184
PO	PO1	0.5983	0.3580	3.5867	1.0410
	PO2	0.7356	0.5411	3.6667	0.8436
	PO3	0.6876	0.4728	3.5867	0.8398
	PO4	0.8239	0.6788	3.2133	1.0040
	PO6	0.7093	0.5031	2.9867	1.1797
PR	PR1	0.6139	0.3769	3.6667	1.0569
	PR2	0.8367	0.7001	3.3333	1.0696
	PR3	0.6988	0.4883	3.0267	1.1025
	PR4	0.7863	0.6183	1.8533	1.0226
PT	PT1	0.8308	0.6902	2.2933	1.0368
	PT2	0.8962	0.8032	3.0667	1.0179
	PT3	0.8351	0.6974	2.6400	1.1466
	PT4	0.8360	0.6989	2.2933	0.9969
PU	PU1	0.8759	0.7672	2.6400	1.0609
	PU2	0.8757	0.7669	2.4267	0.9750
	PU3	0.9181	0.8429	2.2000	0.9300
	PU4	0.8284	0.6862	2.6800	1.1048
RC	RC1	0.8031	0.6450	2.3333	0.9492
	RC2	0.7474	0.5586	2.1867	0.8002
	RC3	0.8090	0.6545	2.1067	0.7636
	RC4	0.8728	0.7618	2.6667	1.1663

Table 2: Indicator Summary

	Chron. Alpha	Composite Realiability	AVE	EU	IN	PO	PR	PT	PU	RC
EU	0.8638	0.908	0.712	0.844						
IN	0.7611	0.864	0.681	0.755	0.825					
PO	0.7594	0.838	0.511	0.560	0.603	0.715				
PR	0.7201	0.826	0.546	-0.694	-0.672	-0.524	0.739			
PT	0.8729	0.912	0.722	-0.563	-0.528	-0.439	0.651	0.850		
PU	0.8986	0.929	0.766	0.663	0.685	0.694	-0.748	-0.505	0.875	
RC	0.8262	0.883	0.655	-0.419	-0.490	-0.626	0.528	0.592	-0.655	0.809

Notes:
1. Diagonal elements are square root of the average variance extracted.
2. Off diagonal elements are the correlations between constructs.

Table 3: Measurement Model Estimates

that all composite reliability measures exceed the recommended 0.7 level.

Our measurement results also indicate strong convergent validity. A review of the results in Table 3 shows that that the average value extracted (AVE) of all measures was greater than 0.5. The indicator loadings shown in Table 2 also demonstrate strong loadings across most indicators. Concern for those loadings below the recommended 0.7 level prompted further exploration of the impacts of these indicators. Each indicator below 0.7 loading was tested for effects on AVE. The indicators PO1, PR1, and PR3 were removed and the change in AVE was observed. None of these deletions resulted in any significant increase in AVE, and therefore these indicators were retained within the measurement model.

Discriminant validity was demonstrated by comparing the square of each AVE against correlations between constructs. As can be seen within Table 3, all square root values of AVE exceed the correlation values between constructs, thus our measurement model indicates good discriminant validity.

Path Analysis (Bootstrap Parameters: Cases=75, Samples=5000)						
Hyp.	Path	Path Coeff.	t Value	p-value	Sig. Level	90% C.I.
H1+	EU -> IN	0.54	3.63	0.00	***	(0.29,0.78)
H2+	PU -> IN	0.33	2.40	0.02	**	(0.10,0.55)
H3+	EU -> PU	0.37	5.35	0.00	***	(0.25,0.48)
H4-	RC -> PU	-0.32	3.51	0.00	***	(-0.47,-0.17)
H5+	PT -> RC	0.43	3.12	0.00	***	(0.20,0.66)
H6+	PR -> RC	0.25	1.69	0.10	*	(0.01,0.49)
H7+	PO -> PU	0.29	3.04	0.00	***	(0.13,0.44)
H8-	RC -> PO	-0.63	6.63	0.00	***	(-0.78,-0.47)
NOTE: ns = not signignificant ; * p<.10, **p<.05, *** p<.01						

Table 4: Path Properties

4.3. Structural Model Analysis and Results

The SmartPLS software was used to test our model. To test significance of path coefficient estimates, bootstrapping was used with parameters set to 75 cases, and 5000 samples. These results are shown in Table 4.

Of the 8 hypotheses, all but H6 indicated statistical significance at 5% level. As shown in the summary of results in Figure 2, overall explained variation in intention to use was a 63%. An analysis of the significance of the mediating effect of perceived ownership between resistance behaviors and perceived usefulness revealed a strong partial mediation (Sobel test statistic of -4.429, thus significant @$p<0.01$ [39]).

5. Discussion and Conclusions

5.1. Key Findings

Figure 2 summarizes the results of our path analysis. Our model explains 63% of behavioral intention to use. As expected, resistance to change exhibited a strong and significant effect on perceived ownership and perceived ownership had a significant effect on perceived usefulness. Furthermore, a test of mediating effect of perceived ownership on the effect of resistance to change on usefulness indicated a strong and very significant mediation effect ($p<0.01$) of this key relationship. These findings are consistent with expectations that the TOH's approach in engaging users had a significant partial effect in "disengaging" the negative effect of resistance on user acceptance.

5.2. Limitation of the Study

As with all studies, our method has limitations. Looking beyond the common discussion of the empirical limitations, of particular interest is 1) the type of analytical process being expressed by physicians and measured by the survey instrument and 2) how the HIT interacts with and affects these processes. Our use of a survey instrument to measure constructs rooted in user perception (i.e. Perceived Risk, Perceived Threat) may engage an intuitive, "gut level" decision making process (System 1), and thus may predispose such methods to

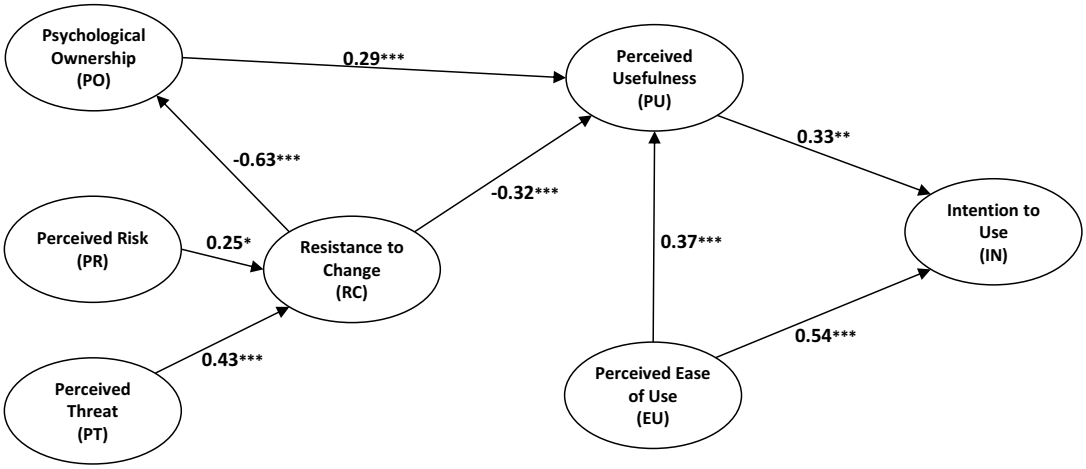

Figure 2: Path Analysis Results

identify factors that will be more likely expressed when System 1 level decision making processes are engaged in practice. [12] Furthermore, within contexts in which System 2 level decision making is more fully engaged, perceptions that have been derived from limited experience with a new HIT may have a lessor effect on actual usage, and vice versa.

Despite having met our goal of exploring the antecedent to user intentions to use HIT, future researchers may wish to utilize a multi-method approach to delineate the manifestation of system 1 and system 2 responses, and to more full illuminate the system of decision processes that are occurring both with the physician system interaction, and in system interaction with diagnostic processes.

5.3. Implications for Practice

Our findings indicate that increased psychological attachment through increased sense of psychological ownership can reduce the negative effects of perceived risk, threat, and resistance behaviors on user acceptance. Though continued research in this area will enhance our understanding of the means through which this goal is accomplished, initial testing of the current research model indicates that successful application of these efforts yields greater physician acceptance of HIT. These preliminary findings should further compel deployment teams to expand simple rationalizing techniques to also include approaches that engage a user's sense of psychological attachment and psychological ownership of the system.

5.4. Implications for Future Research

We have provided a preliminary analysis of our modeling of the impact of resistance and psychological ownership on the core TAM constructs and physician's intention to use HIT. We believe our analysis provides sufficient evidence to warrant continued exploration of the nature of these effects and to motivate research into differing design and deployment approaches as impacting these effects. Of particular interest is the attribution of differing design, development and deployment approaches to varying levels of psychological ownership to the system. As indicated through our empirical investigation, measures of psychological ownership are associated with a strong and significant partial mediation effect on the impact of resistance to change on perceived usefulness. We believe that careful selection of user engagement approach and methods can enhance these effects, and that such a focus can yield a greater degree of system acceptance and usage.

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Appendix A: Scale Items

Variable	Indicator	Scale Items	Orginal	Source
Perceived Usefulness	PU1	Using the CPOE system will improve my job performance.	unchanged	Bhattacherjee, A. and Hikmet, N. Physicians' Resistance toward Healthcare Information Technologies: A Dual-Factor Model. In System Sciences, 2007. HICSS 2007. 40th Annual Hawaii International Conference on. 2007, 141–141.
	PU2	Using the CPOE system will increase my productivity at work.		
	PU3	Using the CPOE system will make me more effective in my work.		
	PU4	Overall, I find the CPOE system to be useful in my job.		
Ease of Use	EU1	Learning to operate the CPOE system will be easy for me.	unchanged	Bhattacherjee, A. and Hikmet, N. Physicians resistance toward healthcare information technology: A theoretical model and empirical test. European Journal of Information Systems 16, 6 (2007), 725–737.
	EU2	I can easily become skillful at using the CPOE system.		
	EU3	I can get the CPOE system to do what I want it to do.		
	EU4	Overall, the CPOE system is easy to use.		
Intention to Use	IN1	I intend to use the CPOE system.	unchanged	Bhattacherjee, A. and Hikmet, N. Physicians' Resistance toward Healthcare Information Technologies: A Dual-Factor Model. In System Sciences, 2007. HICSS 2007. 40th Annual Hawaii International Conference on. 2007, 141–141. integrative view. Information & Management 43, 3 (2006), 350–363.
	IN2	I intend to use more CPOE features/modules.		
	IN3	I intend to use the CPOE system for more of my job responsibilities.		
Perceived Threat	PT1	I fear that I may lose control over the way I work if I use the CPOE system.	unchanged	Bhattacherjee, A. and Hikmet, N. Physicians resistance toward healthcare information technology: A theoretical model and empirical test. European Journal of Information Systems 16, 6 (2007), 725–737.
	PT2	I am worried that I may lose control over the way I make clinical decisions if I use CPOE.		
	PT3	I am worried that I may lose control over the way I order patient tests if I use CPOE.		
	PT4	I fear that I may lose control over the way I access lab results if I use CPOE.		
Perceived Risk	PR1	Using the CPOE system would lead to a loss of privacy because the information handled could be used without my knowledge.	Using the EHCR system would lead to a loss of privacy because the information handled could be used without my knowledg	Ortega Egea, J.M. and Román González, M.V. Explaining physicians' acceptance of EHCR systems: An extension of TAM with trust and risk factors. Computers in Human Behavior 27, 1 (2011), 319–332.
	PR2	Using the CPOE system would not fit in well with my personal values or self-image.	Using the EHCR system would not fit in well with my personal values or self-image.	
	PR3	Having to learn how to use and adapt to the CPOE system would imply a significant loss of my time.	Having to learn how to use and adapt to the EHCR system would imply a significant loss of my time.	
	PR4	Using the CPOE system in my job would pose risks to patient treatments and diagnoses.	Using the EHCR system in my job would pose risks to patient treatments and diagnoses.	
Resistance to Change	RC1	I don't want the CPOE system to change the way I order patient tests.	unchanged	Bhattacherjee, A. and Hikmet, N. Physicians resistance toward healthcare information technology: A theoretical model and empirical test. European Journal of Information Systems 16, 6 (2007), 725–737.
	RC2	I don't want the CPOE system to change the way I make clinical decisions.		
	RC3	I don't want the CPOE system to change the way I interact with other people on my job.		
	RC4	Overall, I don't want the CPOE system to change the way I currently work.		
Perceived Ownership	PO1	I personally invested a lot in the development of the CPOE.	I personally invested a lot in the development of the CIS.	Paré, G., Sicotte, C., and Jacques, H. The effects of creating psychological ownership on physicians' acceptance of clinical information systems. Journal of the American Medical Informatics Association 13, 2 (2006), 197–205.
	PO2	When I think about it, I see a part of myself in the CPOE.	When I think about it, I see a part of myself in the CIS.	
	PO3	. I feel the CPOE belongs to all the staff in my department or unit.	I feel the CIS belongs to all the staff in my department or unit.	
	PO4	I feel a high level of ownership toward the CPOE.	I feel a high level of ownership toward the CIS.	
	PO5	I hardly think of the CPOE as being my own system.	removed	
	PO6	I see myself as a champion of the CPOE in my department or unit.	I see myself as a champion of the CIS in my department or unit.	