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*Full Length Research Paper*

# The Effect of Knowledge Sharing on Technology Acceptance among Physicians

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The healthcare sector has utilized a variety of technologies such as clinical IT to improve effectiveness of healthcare professionals and the quality of health care delivery. Having unused clinical IT appears a strict challenge for hospitals. Meanwhile, there is enough evidence to state that healthcare professionals have not fully adopted and used clinical IT. The main objective of this study is to identify factors which influence healthcare professionals' adoption of clinical IT. This study comes up with a modified technology acceptance model (TAM) to integrate both the special characteristic of healthcare professionals and unique feature of clinical IT. This study investigates whether attitude toward knowledge determines healthcare professionals' intention to use clinical IT. The proposed model has been developed to mainly deal with IT adoption issues among healthcare professionals in hospitals. A survey has been done to evaluate the model among 300 healthcare professionals in Malaysia. The structural equation model has been used to test the model in this context. The results reveal the significant role of perceived threat to professional autonomy, attitude toward knowledge sharing, perceived usefulness and perceived ease of use in shaping healthcare professionals' intention to use clinical IT in Malaysia. The proposed model can explain 48% of the variance of physicians' intention to accept clinical IT.

**Keywords:** Perceived threat to professional autonomy, Attitude toward knowledge sharing, Perceived usefulness, Perceived ease of use.

## INTRODUCTION

User adoption of new technology has attracted the attention of a large number of researchers in Information Systems (IS) studies. As technology innovation can leave its mark on improving the productivity and performance (at different levels) of organizations (Orlikowski, 2000), researchers have been trying to find out factors affecting the successful adoption of technological advancement

among users. One of the most important determinants influencing the success of Information Technology (IT) adoption is that to what degree IT systems are accepted by users (Kijasanayotin et al., 2009). User acceptance is defined as the willingness of the users to use IT which is designed to support tasks (Dillon and Morris, 1996). Organizations invest in IT systems with the hope of cutting costs, increasing the quality of products or services (Lederer et al., 1998). But if users do not accept the systems, the organizations can not benefit significantly from the new systems. On the other hand, if users accept new IT systems they become more willing to make use of the new systems (Succi and Walter,

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1999). The usage of a newly introduced IT system can be a sign of the IT system success (Pikkarainen et al., 2004). Therefore, finding the reasons that motivate people to use the new systems or understanding the source of resistance toward using new systems is important to both system designers and developers (Mathieson, 1991).

The use of IT in health care practices has increased recently (Obstfelder et al., 2007). A variety of IT systems such as clinical information systems, personal digital assistants, electronic patient records and other applications have gradually become established in the healthcare industry. Clinical IT applications in healthcare are regarded as a key element in improving the quality of medical care. However, factors affecting healthcare professionals' adoption behavior regarding the IT systems is not completely clear yet ((Aggelidis and Chatzoglou, 2009), (Tung et al., 2008), (Walter and Lopez, 2008). The concern of having new clinical IT systems unused is still one of the biggest issues for the clinical IT developers (Kijisanayotin et al., 2009), (Gagnon et al., 2010).

With reference to Walter and Lopez (Walter and Lopez, 2008), two types of IT are available in medical care environment. The first one is Electronic Medical Records (EMR) systems which are computer systems that allow users to create, store, and retrieve patient charts on a computer. The second one is Clinical Decision Support (CDS) system that is classified as a decision support system. A CDS System is regarded as an application of Decision Support System (DSS), which takes patient data as input and generates decision-specific advice (Van Bommel and Musen, 2007), (Chang et al., 2007). These systems are referred to as knowledge-based systems that use patient data and series of reasoning techniques to generate diagnostic and treatment options and care planning.

When a new clinical IT is introduced in a hospital, healthcare professionals play an important role in the adoption and implementation process. Thus, healthcare professionals need to use emerging clinical IT to reap the benefits of new systems otherwise the technology will remain underutilized. In other words, healthcare professional's acceptance is reported as an important need to the success of the clinical systems (Payton, 2000), (Kijisanayotin et al., 2009). Once the users accept new IT, they are more likely to make changes in their existing work routines and incorporate the new IT into the flow of their everyday work practices (Walter and Lopez, 2008).

According to (King and He, 2006), in recent years there has been an increasing interest in the identification of factors that cause potential users to accept and take advantage of systems developed and implemented by others. With respect to individual intention to accept new technology, several studies have been conducted and eight theoretical models have been developed: Theory of

Reasoned Action (TRA), Technology Acceptance Model (TAM), Motivational Model (MM), Theory of Planned Behavior (TPB), a combined Theory of Planned Behavior/Technology Acceptance Model (C-TAM-TPB), Model of PC Utilization (MPCU), Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT). Each model explains the user's individual readiness to accept new information systems and technology (Davis et al., 1992).

Despite the large volume of studies in technology acceptance research, very little work has been done in the health care context (Aggelidis and Chatzoglou, 2009). This is a sign of a significant gap in this area. Also, based on the studies conducted in health sector, it is shown that healthcare professionals have not fully adopted the new IT systems (Tung et al., 2008), (Walter and Lopez, 2008), (Yi et al., 1992), (Chismar and Wiley-Patton, 2003), (Dearne, 2003), (Murray, 2002), (Wenn et al., 2002), (Western et al., 2001).

Although TAM has been used as a useful tool to explain technology acceptance process in different fields, this model is not applicable for healthcare professionals (Chismar and Wiley-Patton, 2003). For instance, this model is still very general and is not designed for any particular profession (Walter and Lopez, 2008). Each profession has special contextual characteristics that may affect IT adoption behavior. For instance, unique characteristics of IT users should be included in IT adoption models in order to better explain their intention to accept new technology.

Little research has studied special characteristics of healthcare professionals and different features of clinical information systems in the field of healthcare professional adoption (Walter and Lopez, 2008). Furthermore, according to Moon and Kim (Moon and Kim, 2001), besides the important constructs embedded in technology adoption models, additional exploratory factors are needed to better account for the variance of accepting new technology such as the specific technology context.

## **Theoretical Background**

### **Technology Acceptance Model (TAM)**

Based on a body of literature, TAM is the most influential IT adoption model and is widely applied to explain the IT acceptance process in different contexts (Hossain and de Silva, 2009). Davis developed TAM based on TRA in 1989 to mainly explain technology use in various situations and cultures in order to increase user acceptance of systems. Another reason for usefulness as well as popularity of TAM is its parsimony, simplicity, understandability and gaining empirical support within a variety of user groups (Wang et al., 2003).

The original TAM suggests that two beliefs namely,

perceived usefulness and perceived ease of use play a pivotal role in underscoring individual acceptance of a new technology (Anandarajan et al., 2002), (Ghorab, 1997). The first variable, perceived usefulness, is considered as the degree to which a person believes that by using a particular system his/her job performance would be enhanced (Davis, 1989). The second one, perceived ease of use, is operationally defined as the extent to which a person believes that using a particular system would be effortless (Davis, 1989). These factors can be addressed during the system development stage to solve the users' acceptance problem (Taylor and Todd, 1995). These factors determine behavioral intention that is found by a wide number of studies (Venkatesh and Davis, 1996), as a better predictor of actual system usage. In the field of social science, intention to use a new IT is defined as user willingness to actual behavior of using the new IT.

## THEORY OF PROFESSIONALS

According to Sharma (Sharma, 1997), the holders of some occupations (such as medical practice) are defined professionals. The healthcare professionals who considered in this study consist of all kind of physicians and specialists from different medical specialty areas. This group can make use of clinical IT potentials to improve health care delivery and efficiency. Professionals have been attributed some unique and professional characteristics that make them different from other non-professionals. As stated by Brennan and Coles (Brennan M, Coles C 2003), healthcare professionals' professionalism is rooted in a set of values. The most important characteristic is healthcare professional autonomy and the other features are patient sovereignty, physician confidentiality, and habits of learning. According to (Chau and Hu, 2002), the differences between healthcare professionals and other user groups in terms of accepting new IT derive from a set of values such as:

- Specialized training which is obtained over a considerable period gives them the knowledge and expertise that is required in this profession (Watts, 2008).
- Professional autonomy is defined as the control that professionals have over the processes, conditions and content of their medical practice (Raelin, 1989). Literature states that professional autonomy is the most important professional value provided for healthcare professionals (Zuger, 2004).
- The third characteristic is professional work arrangements where healthcare professionals are considered as health care providers, hospitals become health care facilities, and patient are both the product and the client in the healthcare environment (Watts, 2008), (Montague et al., 2009). Beside professionals, there are two other occupational groups working in a hospital. The

para-professional group, such as medical assistants, owns only partial professional knowledge and skill and assists healthcare professionals in their healthcare practices. The last group is non-professionals who are just prepared to engage in running clerical, office work and administrative duties.

Due to some privileges originate from professional autonomy, healthcare professionals have power over non-professionals and para-professionals and can control the tasks conducted by them (Freidson, 1988). Therefore, healthcare professionals try to support the factors that strengthen their professional autonomy and resist the factors that may erode their professional autonomy (Walter and Lopez, 2008). Despite the significant role of professional autonomy in healthcare professionals IT adoption behavior, less emphasis has been placed to explore whether and how this central characteristic influences healthcare professional's acceptance of new clinical IT (Walter and Lopez, 2008).

Adams (Adams, 1980) has argued that previous studies highlighted some similar constructs like behavioral control and professional autonomy has not been studied as a central characteristic of healthcare professionals. Walter and Lopez (Walter and Lopez, 2008), first introduced perceived threat to professional autonomy as a new construct in studying IT acceptance. This construct is operationally defined as "the degree to which a person believes that using a particular system would decrease his/her control over the conditions, processes, procedures, or content of his/her work".

## Factor Affecting Perceived Threat to Professional Autonomy

A considerable amount of literature has been published to show that the autonomous practice of physicians and their independence in decision making are two distinct characteristics of medical profession (Tanriverdi and Venkatraman, 1999). In addition, like other professionals, healthcare professionals are highly committed to their own profession and their performance is evaluated based on a subjective peer review process. Yet, healthcare professionals believe that their professional autonomy is influenced by a technology that is supposed to change physicians' long-established practice pattern.

According to a rich body of literature, a feature of clinical IT can be considered as threatening factors to healthcare professional autonomy (Adams, 1980). The factor is the level of knowledge codification and knowledge distribution conducted by a clinical IT system. Due to the possession of abstract and expert body of medical knowledge by healthcare professionals, they are less likely to accept the type of IT system that organize, codify and distribute their knowledge which mainly makes them distinct from other occupational groups.

According to Walter and Lopez (Walter and Lopez,

2008) different types of clinical IT (EMR and CDS), to some extent, involve knowledge codification and thus make physicians' analytical views and expert knowledge accessible to the subordinate group (such as non-professionals and paraprofessionals). Based on the existing literature on knowledge management, knowledge codification refers to converting tacit knowledge into explicit knowledge in a way that it can be usable by all the organizational members (Zack, 1999). Therefore, knowledge codification will lead to more knowledge distribution and contributes to knowledge sharing in organizations.

According to Prasad and Prasad (Prasad and Prasad, 1994), the practice of knowledge codification enables para-professionals to get access to greater amount of knowledge in organizations. Therefore, more knowledge codification leads to more knowledge distribution in a hospital. Harrison et al. (Harrison et al., 2002) have mentioned that knowledge codification abolishes the exclusive state of having abstract, expert and unshared medical knowledge, as well as the sole rights of having specialized competence and expertise possessed by healthcare professionals.

Moreover, measures for healthcare professionals' performance evaluation become more objective (rather than subjective) when their esoteric knowledge becomes more easily reachable to the subordinate group. Also due to the implementation of a clinical IT, the physicians' diagnostic decisions and any part of patient care practice is easily monitored by others such as physician assistants, paraprofessionals and non-professionals working in the health care environment and considered as the physicians' subordinates. Therefore, being monitored by others (especially from out of the profession) may increase the possibility of reviewing the physicians' prescriptions and revealing their patient care process. Consequently, monitoring the treatment options prescribed by physicians can intensify perceived threat to professional autonomy.

As a result, healthcare professionals can no longer claim exclusive possession of a body of specialized knowledge and might not have control over resources and the tasks done by the subordinate group. (Kritzer, 1999) has supported the idea that exclusive ownership of esoteric body of knowledge leads to professional autonomy. This study has also carried out an investigation into the relationship between the exposure of physicians' abstract knowledge to subordinate groups and decreasing their professional autonomy. Therefore, drawing on the above arguments, perceived threat to professional autonomy is mainly intensified through the increased level of knowledge codification by means of clinical IT system. (McLaughlin and Webster, 1999) have published a case study in which they described the effect of IT on professional autonomy. They conclude that physicians' professional autonomy is reduced as their abstract knowledge is codified by the IT system. Also,

they have stated that IT system can blur occupational boundaries among different occupational groups.

To sum up, healthcare professionals believe that clinical IT can codify their esoteric knowledge to a high extent and in turn distribute their knowledge to all physician assistants, non-professionals and paraprofessionals in a hospital setting. By doing so, healthcare professionals can no longer claim on having the abstract knowledge and they will lose their control over the tasks performed by the subordinate group. Therefore, if the features of a clinical IT contributes to knowledge codification and knowledge sharing, more threat will be perceived by healthcare professionals to their professional autonomy and they become less likely to use the clinical IT system.

### **Knowledge Sharing in a Hospital Setting**

Healthcare professionals are seen as knowledge-intensive employees working in a hospital. Due to the professional autonomy, physicians usually do not consider the subordinate group as their co-workers and they are less likely to share their knowledge with them. But it should be noted that other occupational groups working in a hospital (such as physician assistants and paraprofessionals) can help them better complete the process of disease diagnosis and treatments. The role of the subordinate group becomes more significant when knowledge sharing environment is built between professionals and this group. An issue on knowledge sharing between professionals and the subordinate group is related to the nature of knowledge sharing between subordinates and supervisors which is usually bounded by formal relationships (Yang and Farn, 2009). Hence, healthcare professionals do not want their subordinate group (such as physician assistants and paraprofessionals) to access to their knowledge by using the clinical IT in order to maintain their professional autonomy.

However, according to (Dexter et al., 2004), in some cases it has been reported that CDS becomes more effective if other clinicians (such as nurses) receive and use the information delivered by the system. As a conclusion, if healthcare professionals share the required knowledge and expertise with the subordinate group, this group can work effectively and also they can better assist healthcare professionals in the competition of delivering health services.

To share knowledge with a hospital's members two issues are essential. First, ideas and insights should be presented in acceptable and understandable forms with the intention that they can be clearly received, interpreted and used by others. Second, individuals with ideas should be eager to practice knowledge sharing for the benefit of the entire organization (Jabr, (2007).

Healthcare professionals' attitude toward knowledge

sharing can improve the exchange of ideas and in turn collaboration with other occupational groups. Although healthcare professionals have command over medical knowledge, the most reliable personnel in terms of serving care-giving and nursing practices are para-professionals. Thus, healthcare professionals should consider other occupational groups as a team member and they can enhance the quality of treatment given to patients through a reciprocal relationship and collaboration (Holsinger and Beaton, 2006). As a result, if healthcare professionals have a positive attitude toward knowledge sharing with physician assistants and para-professionals and they perceive that shared knowledge is effective for their organizations (hospitals). In turn, it may reduce the threats they perceive from clinical IT on distribution of their knowledge to the subordinate group.

### **Conceptual Framework and Hypotheses Development**

In the proposed framework, the dependent variable is healthcare professionals' intention to use the clinical IT. The construct perceived threat to professional autonomy indicates the threat observed by healthcare professionals on their central characteristic that is autonomous practice. The factor affects this construct stems from special feature of the clinical IT. The factor is the level of knowledge codification and sharing with subordinate group (such as para-professionals and physician assistants). This factor provides a human-oriented stream. In human-oriented stream, healthcare professionals' attitude toward knowledge sharing is defined as the main construct. The following figure (Fig.1) depicts the conceptual framework of this study.

### **Perceived Threat to Professional Autonomy and Intention to Use Clinical IT**

Intention to use new technology is the dependent variable which refers to individual intention or readiness to accept a new technology (Davis, 1989). Also according to Walter and Lopez (Walter and Lopez, 2008), perceived threat to professional autonomy is defined as "the degree to which a person believes that using a particular system would decrease his or her control over the conditions, processes, procedures, or content of his or her work". This study proposes that perceived threat to professional autonomy reduces healthcare professional intention to use clinical IT in a hospital setting. It implies that if healthcare professionals perceive the application of clinical IT as threatening to their professional autonomy, the possibility of using clinical IT by them will decrease.

Therefore, the first hypothesis is developed as follows:  
Hypothesis 1. Healthcare professionals' intention to use clinical IT in a hospital setting is negatively related to perceived threat to professional autonomy.

### **Perceived Usefulness and Intention to Use Clinical IT**

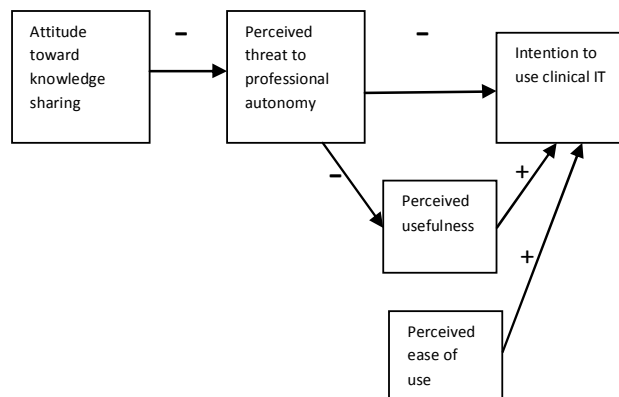
Consistent with prior studies in the healthcare context, (Yi et al., 1992) have stated that perceived improved performance resulting from using IT strongly affects physicians' intention to use the system in the healthcare sector. The significant role of perceived usefulness among physicians in shaping their intention toward using a new technology might have been centered on physicians' utility-based point of view about using technology (Chau and Hu, 2002). It means they accept a new technology when it possesses desired utility and becomes instrumental in their practices. According to (Chang et al., 2007), perceived usefulness exerts the most significant impact on physicians' intention to use CDS. Based on (Kijisanayotin et al., 2009), Perceived usefulness is the most important determinant of intention to use health IT in a developing countries healthcare context. Therefore, as long as healthcare professionals perceive clinical IT as a source of performance enhancement, they become more willing to use the system. Thus, the next hypothesis is developed as follows:

Hypothesis 2. Healthcare professionals' intention to use clinical IT in a hospital setting is positively related to their perceived usefulness.

### **Perceived Threat to Professional Autonomy and Perceived Usefulness**

As mentioned by (Walter and Lopez, 2008), perceived usefulness gained from using an IT is not always what physicians are concerned about and if the clinical IT system erodes their professional autonomy performance expectancy becomes insignificant for healthcare professionals. In the healthcare context, if a clinical IT invalidates healthcare professional autonomy and changes their practice patterns, the system would not be fully used for the purpose of performance improvement expected from the clinical IT. This may occur to maintain professional autonomy instead of the new useful clinical IT that is perceived as threatening to their professional autonomy. Thus, the next hypothesis manifests this effect as follows:

Hypothesis 3. Healthcare professionals' perceived usefulness is negatively related to perceived threat to professional autonomy in a hospital setting.



**Figure 1.** Proposal framework

### Perceived Ease of Use and Intention to Use Clinical IT

In line with (Davis, 1989), intention to use new IT systems is positively related to perceived ease of use. (Chang et al., 2007) have stated that effort expectancy is a significant predictor for physicians' intention to use CDS. As supported by (Kijisanayotin et al., 2009), effort expectancy is a key factor in shaping physicians' intention to use technology. Therefore, if healthcare professionals find the new clinical IT easy to understand and use, they become more likely to use the system in their practice pattern. Thus, the next hypothesis states this idea as follows:

Hypothesis 4. Intention to use clinical IT is positively related to perceived ease of use in a hospital setting.

### Healthcare Professionals' Attitude toward Sharing Knowledge and Perceived Threat to Professional Autonomy

According to (King and He, 2006), knowledge sharing occurs by distribution of knowledge through a system (repository) with individuals who are not usually familiar to the contributor. In this case, healthcare professionals' knowledge is shared by the clinical IT systems with the subordinate group (such as para-professionals, physician assistants and junior healthcare professionals). But in the light of claiming exclusive possession of esoteric bodies of medical knowledge, healthcare professionals are less likely to use this system. They perceive that this type of clinical IT can weaken their professional autonomy.

According to the new definition of professionalism suggested by (Holsinger and Beaton, 2006), corporate values (professionalism and teamwork) should be applied in a hospital setting. It means collaboration and teamwork should be established within healthcare professionals and also between healthcare professionals and other occupational groups. Knowledge sharing is a sign of

collaboration and inter-organizational relationship between occupational groups in a hospital (Bartunek, 2010). Thus, once healthcare professionals hold a positive attitude toward knowledge sharing and they perceive that shared knowledge is effective for their organization (hospital), they feel less threatened by the clinical IT system.

Healthcare professional's attitude toward knowledge sharing has been defined as the degree to which they have a favorable or unfavorable evaluation of knowledge sharing (Ajzen, 2001a), (Ajzen, 2001b), (Ajzen, 1991), (Bock and Kim, 2002), (Chang, 1998)). As mentioned by Kwok and Gao (Kwok and Gao, 2006), an individual's attitude toward knowledge sharing can affect his/her intention to share knowledge and in turn influence actual behavior. As a result, one way to reduce the negative effects of perceived threat to healthcare professionals' autonomy can be associated with their attitude toward knowledge sharing in hospitals. When healthcare professionals hold a favorable attitude toward knowledge sharing in a hospital setting, they may perceive less threat by clinical IT that is supposed to distribute their knowledge among other organizational members. Consequently, they may become more likely to use the clinical IT system. Therefore, the related hypothesis is developed as follows:

Hypothesis 5. There is a negative relationship between healthcare professionals' attitude toward knowledge sharing and the perceived threat to professional autonomy.

### Empirical Analysis

#### Data Collection

The purpose of this study is to determine factors affecting healthcare professionals' clinical IT adoption. Data for this study were collected using a questionnaire administered to physicians with different specialties in 12

**Table 1:** CR, COMP and AVE

Constructs	CR	COMP	AVE	Intention	Perceived Usefulness	Perceived Ease of Use	Perceived Threat	Attitude toward knowledge sharing
Intention	0.86	0.82	0.7	<b>0.62</b>				
Perceived Usefulness	0.90	0.93	0.69	0.53	<b>0.71</b>			
Perceived Ease of Use	0.87	0.89	0.71	0.45	0.6	<b>0.7</b>		
Perceived Threat	0.91	0.87	0.69	-0.47	-0.54	-0.31	<b>0.65</b>	
Attitude toward knowledge sharing	0.88	0.82	0.61	0.48	0.57	.49	- 0.51	<b>0.73</b>

Malaysia's hospitals. In our analysis, 300 valid questionnaires were used. Roughly equal numbers of men and women were represented. Respondents' major fields included General Practitioners (14.6%), Surgeon (14.6%), Pediatric (12.6%), Gynecologist (11%), Internist (10.7%), Anesthesiologist (8.7%), Radiologist (7.1%), Geriatric (6.8%), and Psychiatrist (6.1%). Approximately 60% of the physicians reported moderate to very high level of familiarity with clinical IT.

### Measurement

The questionnaire was used to measure the five constructs embedded in the research model. All measurement items were adapted from established sources and measured on a five-point Likert scale with anchors of strongly agree (5) and strongly disagree (1). The items used to measure perceived usefulness and perceived ease of use were adapted from (Davis et al., 1992) and (Chisnar and Wiley-Patton, 2003). Intention to use was measured based on six items adapted from (Taylor and Todd, 1995). Perceived threat to professional autonomy was measured using six items adapted from Walter and (Dillon and Morris, 1996). Attitude toward knowledge sharing was assessed through five items derived from (Ryu et al., 2003).

### Reliability and Construct Validity

The survey items were tested for scale reliability. The Cronbach's alpha scores for the five constructs were greater than the acceptable level of 0.7 indicating high internal consistency. Construct reliability was assessed using evaluation of factor loading as well as examining the composite reliability and Average variance Extracted (AVE). All constructs exhibited composite reliability greater than the acceptable level of 0.7 indicating that the measurement errors were relatively small (Fornell and Lacker, 1981). AVE value for all constructs was also

greater than 0.5. To assess the discriminant validity between constructs, the test that requires the square root of AVE for each construct to be higher than the correlation between the two associated latent variables was performed. All factors meet the criteria for discriminant validity as shown in Table 1.

### RESULTS

The hypotheses of this study were tested by AMOS 18. After confirming the measurement model, the structural model was then examined. Six common model-fit measures were employed to assess the model's overall goodness-of-fit: the ratio of  $\chi^2$  to degrees-of-freedom (d.f.), the comparative fit index (CFI), the Tucker-Lewis Index (TLI), the normalized fit index (NFI), the root mean square residual (RMR), and the root mean square error of approximation (RMSEA). Commonly, model fit is obtained when  $\chi^2$ / d.f. is lower than 3, the CFI, GFI and NFI are higher than 0.90, RMR is lower than 0.05 and the RMSEA is lower than 0.08 (Freidson, 1988). In this study, the model fit indices are: CFI = 0.92, NFI = 0.92, TLI = 0.91, RMR = 0.052, RMSEA = 0.053,  $\chi^2$ / d.f. = 1.9. These indices are within the prescribed limits and therefore, the model reflects a good fit to the data (Kline, 2005). The results of structural model are shown in Fig.2.

The hypotheses were tested based on the structural model and the results are:

H1: There is a significant negative relationship between perceived threat to professional autonomy and intention to use clinical IT ( $\beta = -0.4$ , p-value < 0.05).

H2: There is a significant positive relationship between perceived usefulness and intention to use clinical IT ( $\beta = 0.49$ , p-value < 0.05).

H3: There is a significant negative relationship between perceived threat to professional autonomy and perceived usefulness ( $\beta = -0.39$ , p-value < 0.05).

H4: There is a significant positive relationship between perceived ease of use and intention to use clinical IT ( $\beta = 0.23$ , p-value < 0.05).

H5: There is a significant negative relationship between healthcare professionals' attitude toward knowledge sharing and perceived threat to professional autonomy ( $\beta = -0.69$ ,  $p\text{-value} < 0.05$ ).

In summary, healthcare professionals' attitude toward knowledge sharing explains 52% of perceived threat to professional autonomy. The model also indicates that perceived usefulness, perceived ease of use and perceived threat to professional autonomy jointly explain 48% of the variance in intention to use clinical IT among physicians in Malaysia.

## DISCUSSION AND CONCLUSION

Recently, investment in IT in health care practices has increased. A variety of IT systems has gradually become established in the healthcare industry. Clinical IT in healthcare sector is considered as a key element in improving the quality of medical care. However, the concern of having underused clinical IT systems still is one of the biggest issues for the clinical IT developers. This study tries to determine the motives that make physicians adopt clinical IT. The results show that physicians' decision to adopt clinical IT depends on the following factors: perceived threat to professional autonomy, perceived usefulness, perceived ease of use and attitude toward knowledge sharing. This research explains that the degree to which a physician is threatened by clinical IT affects his/her intention to use the system. If physicians perceive treatment options and guidelines of clinical IT against their autonomous practice in Malaysia's hospitals, they feel threatened by clinical IT and in turn they become less likely to use the system.

In line with previous research, this study also reveals that perceived usefulness is an important factor for physicians to adopt clinical IT. The results stress the significant positive effect of instrumental benefits in intention of physicians to adopt clinical IT in a developing country like Malaysia. If physicians perceive that using clinical IT can improve their job performance in Malaysia's hospitals, they become more motivated to use the system in their practice patterns. In this study, obtaining more utility by using the system turns out to be the most important motives for physicians to adopt clinical IT in the context of Malaysia.

This study shows the significant effects of perceived ease of use on decision making to adopt clinical IT among physicians in Malaysia. Effort-oriented concept related to using clinical IT concerns with the belief that utilizing clinical IT is free of effort. If physicians find clinical IT easy to use they become more willing to apply the system in their day-to-day work activities in hospitals. This study signifies the importance of easy features of clinical IT to improve motivation of physicians in a developing country like Malaysia.

Moreover, the result of this study shows that if healthcare

professionals hold a positive attitude toward knowledge sharing with the subordinate group, they will consider knowledge sharing as an effective tool in hospitals and instead of showing negative reaction toward clinical IT they will support the new system that is supposed to share their medical knowledge with other occupational groups in hospital. As a conclusion, the more favorable the attitude toward knowledge sharing held by healthcare professionals, the less threat perceived from clinical IT system. This result has a practical implication for hospital managers. One way to reduce perceived threat to professional autonomy is directly related to human-related issue such as the teamwork environment and collaborative relationship between healthcare professionals and the subordinate group. Therefore, one possible step before clinical IT development and implementation is to get the organizational environment ready for a new clinical IT system. One way to provide a suitable environment is to improve healthcare professional attitude toward knowledge sharing with the subordinate group. To do so, hospital management may focus on the development of a social network and shared goals between healthcare professionals and the subordinate group. With this understanding hospital management can reduce the negative effects of perceived threat to professional autonomy and improve overall acceptance of clinical IT by healthcare professionals.

From a theoretical standpoint and theory building, the research contributes to IT adoption theories explaining healthcare professionals' intention to accept clinical IT systems. Since the TAM is general and cannot address healthcare professionals' unique characteristics, this model has been improved to fit the healthcare context and better explain healthcare professionals' IT adoption behavior in a hospital setting. The influential constructs from the medical literature are perceived threat to professional autonomy. The construct healthcare professional attitude toward knowledge sharing is borrowed from knowledge management related literature. This study argues that holding a positive attitude toward knowledge sharing in hospitals can reduce threat perceived from clinical IT and improve physicians' intention to use the IT systems. In other words, a modified model has been developed to explain and predict use of new technology in the healthcare industry by taking special characteristic of healthcare professionals and unique feature of clinical IT into consideration. The research model developed by this study can explain 48% of the variance in physicians' clinical IT adoption behavior.

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