

## MODEL OF HOSPITAL INFORMATION SYSTEM ACCEPTANCE IN HOSPITALS OWNED BY THE SOCIAL SECURITY ORGANIZATION

Seyed Abolhassan Pourhosseini<sup>1</sup>, Ahmad Reza Kasraei<sup>2\*</sup>, Tahmorth Sohrabi<sup>3</sup>

<sup>1</sup>PhD Student, Department of Information Technology Management, Central Tehran Branch, Islamic Azad University, Tehran, Iran; <sup>2\*</sup>Assistant Professor and Faculty Member, Department of Management, Central Tehran Branch, Islamic Azad University, Tehran, Iran; <sup>3</sup>Assistant Professor and Faculty Member, Department of Management, Central Tehran Branch, Islamic Azad University, Tehran, Iran.

Email: <sup>1</sup>poortaft@yahoo.com, <sup>2\*</sup>kasrai49@yahoo.com, <sup>3</sup>dr.tsohrabi@gmail.com

Article History: Received on 24<sup>th</sup> October 2020, Revised on 15<sup>th</sup> December 2020, Published on 13<sup>th</sup> January 2021

### Abstract

**Purpose:** The purpose of this study is to provide a model of hospital information system acceptance owned by the Social Security Organization.

**Methodology:** This study was performed Cross-sectional – applied and descriptively and analytically. This study had two stages. The study population was in the first stage (qualitative), information technology experts in the Social Security Organization (6 people) and the second stage (quantitative), users of the hospital information system in medical centres owned by the Social Security Organization (375 people). The first stage of this study was based on interviews with IT experts. The second stage of the study was based on the results of interviews with experts using the design of a researcher-made questionnaire. The validity of the questionnaire was measured by using the opinion of experts in the field of information technology and health information technology and by calculating the CVR index. Cronbach's alpha coefficient (0.941) was used to assess the reliability of the questionnaire. The questionnaire consisted of 12 axis and 46 questions with a five-point Likert scale with a score of 5-1. The interviews were analyzed qualitatively (content analysis) and the questionnaires were analyzed descriptively, analytically (correlation) and structural equation method is done with the help of SPSS software.

**Main Findings:** Evaluation of direct relationships between model factors and hypotheses showed that the relationships between habit with intent to use, intention to use with actual use, increase motivation to use, increase management support, meet user expectations in achieving the expected performance of the system, value the cost to the system and the social impact of co-workers significantly increases the intention to use the system. Also, the coefficient of determination R<sup>2</sup> for the target variables, which is the intention of use and actual use, were equal to 0.774 and 0.448, respectively. The goodness of fit (GoF) was equal to 0.671. The study of the effect of demographic factors on the target variables (intention to use and actual use) showed that none of the demographic variables has a significant effect on the intention to use and actual use. By considering these factors, the managers of the Social Security Organization can increase the rate of HIS admission in the hospitals and clinics of this organization.

**Application of Study:** One of the technologies used in the healthcare sector is the hospital information system. It is less developed than other information systems that use information technology and apply quality standards for customer satisfaction. The IT acceptance model is one of the most valid models available that examines the acceptance factors of technology at different levels, including the individual level.

**Novelty/Originality:** The novelty of this research is giving a model of clinic data framework acknowledgement claimed by the Social Security Organization.

**Keywords:** *Acceptance Model, Hospital Information System, Social Security Organization.*

### INTRODUCTION

One of the technologies used in the healthcare sector is the hospital information system, which is an integrated information system for storing, processing, retrieving, and analyzing information of hospital service providers in the fields of management, clinical and administration ([Gupta SK, Kant S, Chandrashekar R, 2007](#)). Compared to other information systems that use information technology and apply quality standards for customer satisfaction, the hospital information system is less developed. The hospital information system should support the provision of high-quality services and meet the needs of individuals. On the other hand, quality is mainly related to user satisfaction ([Kimiyafer K, 2006](#)). Since users are constantly interacting with the hospital information system to perform their duties, their negative attitude towards the system leads to challenges for other groups ([Foster R, 2005](#)) and rejection of the system by users and ultimately will lead to a lack of proper use of the system ([Mohaghar A, 2004](#)). Despite the removal of most technical barriers, this question arises whether employees are interested in using information technology to perform their duties or not and how this influence can be increased ([Chismar WG, Willey-Patton S, 2002](#)). Therefore, a better understanding of how people deal with the possibility of using an information system is essential to help increase the use of systems and increase the likelihood of acceptance by users ([Scott R, 2007](#)).

Information technology is the most important factor in increasing the efficiency and effectiveness of organizations and various industries in order to survive in the current competitive environment have taken effective steps to use it. The

health industry is no exception to this rule (Namamian F, Rahmi A. 2018) The importance and impact of technology in today's developed and complex organizations, especially hospitals, is such that the more that organization is equipped with the required and advanced technologies it will be the more successful (Imani E, Khademi Z, Yusefi P, Bahrami Z, Naghizadeh F. 2012). Advances in technology in the field of data processing, there have been huge changes in the workflow and data exchange between hospital units. These changes have led hospitals to rely more and more on computer information systems (Bouraghi H, Valinejadi A, Kiani M, Khodadadi M, Yazdanyar M, Vakilmofrad H, Amiri MR. 2012) So that the cost of IT applications in the field of health in 2009 is estimated at 43 to 48% of the total capital budgets of hospitals (Ford EW, Menachemi N, Hureto TR, Yu F. 2010).

Considering that the Social Security Organization is one of the largest insurance institutions in the country and covers more than half of the country's population, Also, considering that after the Ministry of Health, Treatment and Medical Education, it is one of the main custodians of public health, therefore offers a wide range of health services provided to insurers through civilian health centres. Preliminary research in the field of research indicates the lack of studies to determine the model of hospital information system admission in hospitals owned by the Social Security Organization. By presenting such a model, the acceptable behaviors of users of this system can be modelled and used to identify the future behaviors of users to accept or resist the acceptance of this system and use it. In this way, it is possible to identify the factors that have a greater role in improving the acceptance and use of this system and by intervening in it increased the use of this system that this itself can increase the effectiveness of this system. The results of this study will be effective in the field of policies of other information technologies in the Social Security Organization. Finally, in order to localize this model in the Social Security Organization, the model will be developed based on the opinions of experts as well as the priorities of the Social Security Organization in the field of operational programs in the field of information technology. The initial developed model will be finalized after evaluation by the hospital information system users. This model can be used as a reference for technology adoption in insurance organizations similar to the Social Security Organization.

## LITERATURE REVIEW

Based on the theory of social psychology, researchers have proposed various models to identify and test the factors that determine the desire of individuals to use an information system. According to the research by Algahtani and King, the ability to identify, predict and manage the acceptance of people in using the information system is one of the key factors in the success of these systems (Algahtani SS, King. M. 1999). The IT acceptance model is one of the most valid models available that examines the acceptance factors of technology at different levels, including the individual level. This model has been used in various studies in different countries and its applicability in these studies has been reviewed and confirmed (Kijisanayotin B, Pannarunothai S, Speedie S.2009). However, limited studies have been conducted on the adoption of information technology, including the adoption of hospital information systems in the health industry (Schaper LK, Pervan G. ICT & OTs: 2007). In fact, this is one of the most important challenges in using the hospital information system, whose performance and capabilities are affected by the level of acceptance and user satisfaction (Yi MY, et al. 2016).

The Social Security Organization is one of the country's insurance institutions, which covers more than half of the country's population. Medical services are one of the main responsibilities of this organization and provide these services to insurers through its owned medical centres. Since 2014, the process of installation, deployment, and use of hospital information systems in centres owned by the Social Security Organization began and so far has over 25,000 users of hospital information systems throughout the country in its medical centres. However, despite studies on the acceptance of this system in teaching hospitals, this issue has not been studied in social security hospitals. Given that the implementation of this system has a significant budget it is necessary to collect and analyze the attitudes, motivations, and thoughts of hospital users, the success rate of using the hospital information system considers as a competitive advantage in the health industry. Therefore, the purpose of this study was to present the model of acceptance of the hospital information system by hospital users in hospitals owned by the Social Security Organization to measure the level of acceptance of the hospital information system among hospital users, while identifying the factors affecting the acceptance of this technology (Baratpour M, Mehraein A, Bagheri S, Azarpouyeh M, Parvin S. 2018).

A study investigated the obstacles to the implementation of health information systems from the perspective of Iranian physicians. 163 physicians from hospitals of Iran and Tehran University of Medical Sciences participated in the study. The results showed that from the physicians' point of view, technical ( $3.4 \pm 0.89$ ), individual ( $3.1 \pm 0.98$ ), organizational ( $3.06 \pm 0.88$ ) and legal ( $3.04 \pm 1.2$ ) barriers are the most important obstacles to the implementation of these systems, respectively. Among the technical barriers, the most important challenges include the lack of a national network and appropriate information systems and strong Internet access; The most important individual and legal barriers include low awareness of providers and poor training about these systems, lack of participation in the process of systems implementation and system security and finally the most important organizational barriers include lack of proper planning and insufficient support services (Malekzadeh S, Hashemi N, Sheikhtaheri A, Hashemi NS. 2018). In another study, HIS acceptance among medical records users in Isfahan teaching hospitals was studied based on the UTAUT model. Findings showed that there is a significant correlation between users' behavioral willingness to use HIS with expected performance, social impact and expected effort. But there is a weak correlation between the facilitating

conditions and their behavioral willingness. The findings also showed that the score of any of these four factors is not affected by the type of HIS manufacturer ([Tavakoli N, Jahanbakhsh M, Yadegarfar G, Ranjbar N. 2017](#)).

In another study were investigated the factors related to the acceptance of RFID technology in the hospitals of Iran University of Medical Sciences. The results showed that social impacts, management support, expected performance, expected effort and facilitating conditions significantly affect to acceptance of this technology but security has no effect on the acceptance of this technology ([Sheikhtaheri A, Rostami Garavand S, Ahmadi H. 2018](#)). A study examined the acceptance of PACS technology based on the UTAUT model among users of this technology. The results showed that the expected effort, expected performance, social impacts and facilitating conditions have a positive and significant correlation with the intention to use this technology and have a positive effect on the acceptance of this technology ([Ahmadi M, Mehrabi N, Sheikhtaheri A, Sadeghi M 2017](#)). A study was conducted with the aim of to determine the factors affecting the intention to accept health information technology in hospitals covered by social security in Isfahan using the TAM model. The effect of computer knowledge and the importance of standardization on the mental perception of ease of use was confirmed. Also, the effect of the importance of documentation and mental perception of ease of use on perceived usefulness (mental perception of usefulness) was significant. But was not confirmed the effect of information security on perceived usefulness. The effect of perceived ease on attitude toward use and the effect of attitude toward use on system acceptance intention were significant ([Rajaeian E, Peikari H, Zamani N.2018](#)).

## METHODOLOGY

**I – Nature of the Study/ Population and sample** -This study was Cross-sectional – applied and performed descriptively and analytically. This study had two stages. The study population was in the first stage, information technology experts in the Social Security Organization and the second stage, users of the hospital information system (doctors, nurses, and paramedics) in medical centres owned by the Social Security Organization. In the first stage, qualified experts (executive managers of the Social Security Organization in the field of establishing the hospital information system with at least 5 years of managerial experience) and available, which is 9 people, and after obtaining initial approval from them to participate in the study announced readiness was 6 people that entered the study. The study population in the second stage, users of hospital information systems (doctors, nurses, and paramedics) in medical centres owned by the Social Security Organization, which according to official statistics at the end of 2019 was a total of 15,764 people. The sample size according to Cochran's formula included 375 people.

**II – Study method and data collection** - The study method was qualitative and quantitative. The first stage of this study was qualitative and based on interviews with IT experts. To collect data related to identifying factors affecting the development of the technology acceptance model were used the interviews and literature reviews. First, the existing models have compared comparatively and then components that the UTAUT2 model could not measure and predict were identified. Based on that, interview questions were designed and interviewed with experts. The second stage and the quantitative part of the research were performed by using the questionnaire. After identifying the components affecting the acceptance of hospital information systems, the initial model developed by UTAUT2 was designed for the acceptance of hospital information systems in hospitals owned by the Social Security Organization. Based on the results of the qualitative stage and review of texts and based on the results of the first stage, a researcher-made questionnaire with the components of the initial model was prepared and was distributed among the users of the hospital information system (doctors, nurses, and paramedics).

**III -Measurement tool** - The questionnaire consisted of 12 axes and 46 questions as follows: demographic and job characteristics (7 questions), social impact (4 questions), managerial support (4 questions), expected performance (3 questions), expected effort (4 questions) Facilitating conditions (3 questions), Security (5 questions), Intention to use (3 questions), Habit (4 questions), Intrinsic motivation (3 questions), Price value (3 questions) and Behavior (3 questions). The question-answer scale was a five-point Likert with a score of 5-1 (very high, high, medium, low, and very low). This questionnaire was distributed and collected among the main HIS users of the organization including physicians (general), nurses, and paramedics (experts in laboratory sciences, radiology and health information technology) in the form of physical submission and electronic methods. From 500 distributed questionnaires (375 questionnaires based on the calculation of the sample size formula and 125 people with a surplus of one third), 313 completed questionnaires were collected. The validity of the questionnaire was measured using the opinion of experts in the field of information technology and health information technology and by calculating the CVR index. Cronbach's alpha coefficient was used to assess the reliability of the questionnaire. Therefore, the reliability of the questionnaire was measured after distribution among 30 people in the statistical sample and it obtains the number 0.941.

**IV – Data analysis** - Results of the study were obtained by using two methods of descriptive statistics (dispersion and central indices including frequency and mean) and analytical statistics (correlation) with the help of SPSS software. The answers to the interview questions were analyzed qualitatively (content analysis). Besides, the structural equation method was used to design and evaluate the appropriateness of the proposed model for the social security organization. For this purpose, using the method proposed by Hear et al. According to this method, first the measurement part of the model and then the structural part of the model and finally, the suitability of the whole model is evaluated. In this regard, are used the indicators of AVE, combined reliability, factor analysis, and factor loads are measured for the model part,

and t, R2, and effect size analyzes for the structural part of the model. The goodness of fit index was also used to assess the overall fit of the model in the social security organization.

## RESULTS

Table 1 shows the demographic characteristics of the participants. Women and men participated in the study in equal proportions. Most of the age groups were between 30 and 49 years old. Most of the participants have a bachelor's degree in medicine. Nurses, physicians, and staff of health information management were the most employed participants in the study. Most of the participants had less than 10 years of work experience and most of them had used HIS for 5 to 10 years. The average age of employees was 38.7, the average work experience was 12.2 years and the average experience of using HIS was 4.9 years.

**Table 1:** Demographic characteristics of participants

		<b>Number ( in percentage)</b>
gender	Men	(50.5) 158
	Women	(49.05) 155
office	Clinic	(52.1) 163
	Hospital	(46) 144
	Not mentioned	(6) 9
age	Less than 30	(15.7) 49
	30-39	(34.2) 107
	40-49	(38.3) 120
	50 and more	(8.3) 26
	Not mentioned	(3.5) 11
Level of education	Associate Degree	(1.3) 4
	Bachelor	(54.3) 170
	MSc.	(16.9) 53
	Ph.D. (Medicine)	(21.4) 67
	Not mentioned	(6.1) 19
job	Doctor	(21.1) 66
	Nurse	(26.5) 83
	Health information management	(19.2) 60
	Laboratory sciences	(5.1) 16
	Radiology	(1.6) 5
	Not mentioned	(26.5)
Work experience	Less than 10	(41.5) 130
	10-19	(35.8) 112
	20 and more	(22.7) 71
	Not mentioned	-
HIS experience	Less than 5	(46.6) 146
	5-10	(49.2) 154
	10 and more	(3.2) 10
	Not mentioned	(1) 3

**Source:** (Author computation)

Table 2 shows that the average scores of the factors in the model vary from 3.55 to 4.55. The highest score is related to management support and expected performance, which means that respondents know the need for management support and a need for a HIS system with strong performance, is from their expectations. In contrast, the lowest score has for the price value of HIS and the motivation to use HIS

**Table 2:** Mean and standard deviation of factors in the model

	<b>Mean</b>	<b>standard deviation</b>
Management Support (ManSupp)	4.55	0.70
System Security (SEC)	4.24	0.79
Expected Performance (PE)	4.45	0.79
Expected Effort (EE)	4.36	0.73
Social Impacts (SI)	3.34	0.71
Facilitators (FC)	4.37	0.73
Motivation (MOT)	3.9	0.91
Price value (PV)	3.55	0.92
Habit (HT)	4.19	0.8

Intention	4.31	0.81
Actual Usage (USE)	4.2	0.95

Source: (Author computation)

To examine the constructed model, first, the measurement part of the model was evaluated. For this purpose, the factor load of the questions was calculated. All factor loads exceed the limit 0.4 and the lowest factor loads are related to the third motivation question (MOT3) with a factor load of 0.457. In addition, the fourth question of the expected effort (EE4) was 0.488. According to some sources, questions with a factor load of less than 0.4 and according to some other sources, questions with a factor load of less than 0.5 should be removed. According to the analysis and extraction of different models, it was found that considering the amount of 0.5, a more suitable model could be presented therefore; MOT3 and EE4 questions were omitted.

Table 3 shows the combined reliability and Cronbach's alpha. According to Table 4, Cronbach's alpha for all factors except facilitators was more than 0.7. Cronbach's alpha of facilitator factors was 0.6. The value of the composite validity index was more than 0.7 in all cases. According to sources, these two indicators should be more than 0.7. To modify Cronbach's alpha facilitators, the second question (FC2) was omitted and the improved Cronbach's alpha obtains 0.653. These findings show that the measurement part of the model has good reliability in all cases.

**Table 3:** Cronbach's alpha, combined reliability and AVE of factors in the model

AVE	Cronbach's Alpha	Composite Reliability	
0.748	0.831	0.899	<b>EE</b>
0.741	0.653	0.851	<b>FC</b>
0.737	0.881	0.918	<b>HT</b>
0.711	0.796	0.880	<b>Intention</b>
0.849	0.822	0.918	<b>MOT</b>
0.752	0.888	0.924	<b>ManSup</b>
0.719	0.799	0.883	<b>PE</b>
0.794	0.872	0.920	<b>PV</b>

Source: (Author computation)

According to Table 3, the value of the AVE index in all cases is more than the limit value of 0.5, which indicates the validity of existing factors in the model and we used the Fornell and Larker methods to evaluate the validity of the measurement model (Table 4). As Table 4 shows, there is a positive correlation between all factors and the correlation rate is variable between 0.268 (correlation between USE, FC) up to 0.830 (correlation between PE, EE). Fornell and Larker analysis shows that the divergent validity of the model is appropriate in most factors.

**Table 4:** Correlation rate of factors and validity of Fornell Larker

USE	SI	SEC	PV	PE	ManSup	MOT	Intention	HT	FC	EE	
										0.865	<b>EE</b>
									0.861	0.434	<b>FC</b>
								0.859	0.324	0.628	<b>HT</b>
							0.843	0.712	0.328	0.733	<b>Intention</b>
						0.921	0.720	0.729	0.297	0.631	<b>MOT</b>
					0.867	0.582	0.792	0.650	0.319	0.726	<b>ManSup</b>
				0.848	0.765	0.618	0.770	0.604	0.341	0.830	<b>PE</b>
			0.891	0.472	0.451	0.589	0.479	0.502	0.327	0.495	<b>PV</b>
		0.830	0.541	0.718	0.656	0.550	0.658	0.553	0.478	0.704	<b>SEC</b>
	0.751	0.585	0.490	0.646	0.792	0.557	0.732	0.626	0.385	0.658	<b>SI</b>
0.892	0.592	0.478	0.607	0.624	0.574	0.601	0.657	0.538	0.268	0.594	<b>USE</b>

Source: (Author computation)

Table 5 shows the evaluation results between the structural part of the model (direct relationships between model factors) and the research hypotheses. As Table 5 shows, there is no significant relationship between expected effort with the intended use, facilitator conditions with the intended use, facilitator conditions with actual use, management support

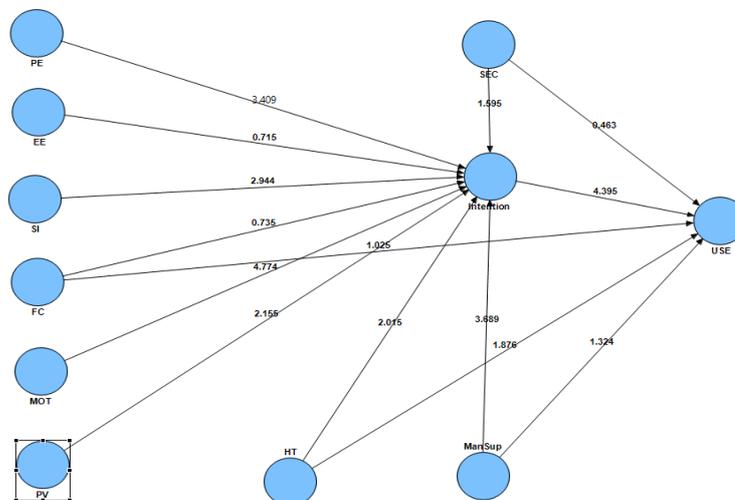
with actual use, knowing the system is safe with the intended use, and knowing the system is safe with actual use. On the other hand, there is a significant direct relationship between habit with the intended use and intention use with actual use.

**Table 5:** Evaluation of direct relationships between model factors and research hypotheses

Hypotheses	value of T	Model's direct relationships	Hypothesis test result
H1	EE → Intention	0.715	Not confirmed
H2	FC → Intention	0.735	Not confirmed
H3	FC → USE	1.025	Not confirmed
H4	HT → Intention	2.015	Not confirmed
H5	HT → USE	1.876	Not confirmed
H6	Intention → USE	4.395	Confirmed
H7	MOT → Intention	4.774	Confirmed
H8	ManSup → Intention	3.689	Confirmed
H9	ManSup → USE	1.324	Not confirmed
H10	PE → Intention	3.409	Confirmed
H11	PV → Intention	2.155	Confirmed
H12	SEC → Intention	1.595	Not confirmed
H13	SEC → USE	0.463	Not confirmed
H14	SI → Intention	2.944	Confirmed

**Source:** (Author computation)

Also, increasing the motivation to use, increasing management support, meeting users' expectations in achieving the expected performance of the system, valuing done the cost of the system and the social impact of colleagues, significantly increase the intention use the system. Figure 1 shows the obtained final model.



**Figure 1:** The research final model

**Source:** (Author computation)

The coefficient of determination rate R<sup>2</sup> for the target variables, the intended use, and actual use, was obtain 0.774 and 0.448, respectively. This shows that 77.4% of the changes in the users' intention to use the system are affected by the factors considered in the model and 44.8% of the changes in the actual use of the system are affected by the existing factors in the model. The model goodness of fit (GoF) was equal to 0.671 that based on available resources; it is at a strong level (more than 0.36).

The survey of the effect of demographic factors on the target variables (intention use and actual use) showed that none of the variables of gender, place of work, age, education, type of job, work experience, and experience of using the HIS doesn't have a significant effect on actual use and intended use.

## DISCUSSION

This study showed that the intention and desire to use HIS has a significant direct relationship with the actual use of this system. Many studies have shown this relationship. For example, this relationship regarding HIS acceptance among HIS users in Iran hospitals of medical sciences (Tabibi SJ, et al.2012), nurses in Zabol hospitals (Baratpour M, et al.2017), HIS users in Tehran public hospitals (Khandouzi H. 1390), health information management staff in hospitals of Tehran University of Medical Sciences (Abdekhoda M, et al. 2011) and also the users of social security hospitals in Isfahan (Rajaeian E, Peikari H, Zamani N. 2018) are shown. Therefore, it can be concluded that any strategy by managers that increases the willingness and intention to use the system can lead to more acceptance and use of the system.

The present study showed that management support does not have a direct relationship with actual use but it has a positive relationship with the intended use, so increasing support can increase the intended use of HIS, and the intended use of HIS directly increases actual use. A study on HIS acceptance among the staff of health information management of Tehran University Hospitals showed that increasing support of users has a positive relationship with intention use (Langarizadeh M, Gohari M, Koohestani A.2014). A similar study in the hospitals of Iran University of Medical Sciences showed that management support is significantly effective in technology acceptance (Sheikhtaheri A, Rostami Garavand S, Ahmadi H. 2018). Studies in Malaysia have shown that senior management support has a significant relationship with the intention to accept technology among hospital users, which is consistent with the present study (Zailani S, et al. 2015- Chong AY-L, Chan FT. 2012). In one study, Iranian physicians considered the most important organizational and managerial barriers to the use of health information systems, including the lack of proper planning and inadequate support services (Malekzadeh S, et al.2018). Therefore, it seems that the managers of the Social Security Organization can indirectly increase the intention to use HIS by increasing the support of staff and finally increase the use of the system directly. Our study in hospitals and clinics of social security showed that the expected performance of the HIS system is directly related to the desire and intention to use this system. Moreover, how much HIS system to provide better capabilities and functions and be recognized as staff that are more useful, will be more desire to use it. Other Iranian studies have also shown this relationship between different users (Ghorbani Zadeh V, Hasannangir T, roudsaz H.2013) (Tavakoli N, et al. 2017). Studies on other users, including clinical users of hospitals, have also shown this result (Ahmadi M, et al. 2017). A study outside of Iran showed that perceived usefulness has a direct and positive effect on the intention to adopt the technology (Ahmadi M, et al. 2017), which is consistent with our results. Therefore, social security managers, especially IT managers, should strive to ensure that the HIS system always provides the expected performance of staff and is useful to them. Updating the HIS capabilities to meet the needs of users is very important. In this regard, studies of HIS integration and its flexibility for system changes and speed (Kimi afar K, et al. 2015), system training documentation, system training to users within the system (in-system guides), system response time, system reliability (Sheikhtaheri A, Kimi afar K, Sarbaz M.2014) are important. They know that these cases can also be considered by social security managers to improve HIS acceptance. This study showed that the social impact of colleagues significantly increases the intention to use the system. The effect of colleagues on the acceptance and intention to use the health information technology in other Iranian and non-Iranian studies has been shown (Alazzam MB, Al-Sharo YM, Alazzam MK. 2018). However, studies outside Iran have the opposite effect and have shown that social effects do not have much effect on the behavior of the using of technology (Aboyami Owolabi K, Nurudeen Adeniyi A, Neil ED.2019). It seems that the effect of social and colleague relations on the use of the system is completely dependent on the environment of the Intended organization. In addition, due to the positive effect of this relationship in social security hospitals, based on the present study, managers can use the influence of influential colleagues and those who have a lot of knowledge and experience of the organization's system to influence other staff and increase their use of the system. Our study showed that there is no significant relationship between the expected effort and the intention to use HIS, in other words, knowing how hard or easy to use HIS hasn't effect on the intended use of this system. The results of this part of the study are not consistent with many Iranian previous studies. For example, internal studies of office and clinical staff have shown that knowing the ease of use of technology plays a role in increasing its acceptance. Studies outside Iran had the same result. These findings contradict the findings of the present study, which raises the need for further study in the Social Security Administration.

In the present study, a significant relationship was not found between the facilitator conditions and the intended use and actual use of HIS. Other studies in Iran have shown conflicting results but studies have shown similar results to the present study and showed that the facilitating conditions have a significant effect on the acceptance of these technologies. Other studies in South Africa and Jordan have shown that facilitator factors do not affect the intended use of the system. It seems that the type of technology and hospital conditions affect this relationship and for newer technologies such as PACS, RFID, or hospitals with less facilities (for example, non-university hospitals), the facilitator conditions have a greater impact. Due to the hospitals of the present study and the high score of the facilitator conditions, it seems that these conditions are very high in the hospitals and therefore its increase does not have a greater effect on the HIS acceptance rate. However, more details about these conditions are recommended in social security hospitals.

A significant relationship was not found between system security with actual use and intention use of HIS. In other words, knowing how secure the system is does not effect on the rate of its use. Security is not raised in many technology adoption models and for this reason, limited studies have examined its effect. Among Iranian studies checked, only two studies have examined this effect, and both studies, like the present study, showed that there is no relationship between

knowing the system is safe and accepting it. Nevertheless, contrary to these studies, a study among users of health information technology in Malaysia found that security and privacy concerns have a negative effect on acceptance and reduce the speed of acceptance.

## CONCLUSION

Our study showed that habit has a significant direct relationship with the intended use of the system. Habit is studied in UTAUT2 that so far, it seems that no study has been done in this regard and the effect of this factor on the use of HIS by the clinical and non-clinical staff of hospitals in the inside country. In the only study found in this regard, the study of system acceptance by administrative and clinical staff of Jordanian hospitals found that habit has a significant relationship with the intended use of the system that the results of this study are consistent with the present study. According to the present study, increasing motivation to use has a significant direct relationship with intention to use. In a study, researchers introduced the motivation to use the system in two categories of enjoyment of innovation and enjoyment of use and they believe that use of the system for health users should be enjoyable to increase their motivation to use the system ([Aboyami Owolabi K, Nurudeen Adeniyi A, Neil ED.2019](#)). Finally, our study showed that knowing the value of the cost done to the system is directly related to the intended use of it. In this regard, it seems that no study has been done in the country. However, the only study found in Malaysian hospitals found that cost has one of the strongest effects on technology acceptance, which is consistent with the present study.

In summary, the final model of this study showed that the habit has a significant direct relationship with intention use; intention use has a significant direct relationship with actual use. In addition, motivation, management support, the expected performance of the system, the value of the cost done for the system, and the social impact of colleagues have a significant relationship with the intention to use the system. In addition, age, gender, work experience, and history of HIS use do not affect the model relationships. By considering these factors, the managers of the Social Security Organization can increase the acceptance rate of HIS in the hospitals and clinics of this organization.

## LIMITATION AND STUDY FORWARD

In order to be able to compare the results between the groups of equal users in different centers, it is better to repeat the current study in specialized groups of hospital information system users, as well as separately in outpatient and inpatient treatment centers. Also, according to the present study on a small sample, it is recommended to repeat the study in a larger sample size. It is suggested that the UTAUT2 model be developed based on obtaining the opinions of IT experts in other organizations using hospital information systems and compare the results of the studies with the current study. It is recommended to study the UTAUT2 model among users of hospital information system subsystems such as radiology information system, laboratory information system, nursing information system, pharmacy information system, etc. and compare the results of studies with current studies. The study will be commendable on identifying the causes of failure and success of the hospital information system in the Social Security Organization. It can also be valuable to study the identification of barriers and facilitators of the hospital information system in the Social Security Organization. In the end, it is suggested that the two recent studies be reviewed with the same study approach in groups of users and separately in outpatient and inpatient treatment centres.

## AUTHORS CONTRIBUTION

Seyed Abolhassan Pourhosseini, Ahmad Reza Kasraei, Tahmorth Sohrabi.

S.A.P; collected the data, A.R.K; analyzed the results, T.S; wrote the paper.

## REFERENCES

1. Abdekhoda, M., Ahmadi, M., Hossini Agha, F., Prikhani, E., & Farhadi, A. (2011). Factors affecting information technology acceptance by health information management (him) staff of Tehran University of medical sciences' hospitals based on the technology acceptance model (TAM) In *Payavard* 2013, 7(4), 287-298.
2. Aboyami Owolabi, K., Nurudeen Adeniyi, A., & Neil, E.D. (2019). Factors influencing the adoption of clinical informatics tools among medical doctors in South Africa. *University of Dares Salaam Library Journal*, 14 (2), 69-86.
3. Ahmadi, M., Mehrabi, N., Sheikhtaheri, A., & Sadeghi, M. (2017). Acceptability of picture archiving and communication system (PACS) among hospital healthcare personnel based on a unified theory of acceptance and use of technology. *Electronic Physician*, 9(9), 5325-5330. <https://doi.org/10.19082/5325>
4. Alazzam, M.B., Al-Sharo, Y.M., & Alazzam, M.K. (2018). Developing (UTAUT 2) model of adoption mobile Health application in Jordan e- government. *Journal of Theoretical and Applied Information Technology* 96(12), 3846-60.
5. Algahtani, S.S., & King, M. (1999). Attitudes, Satisfaction and Usage: Factors Contributing to Each in the Acceptance of Information Technology. *Behav Inf Technol*, 18(4), 277-97. <https://doi.org/10.1080/014492999119020>
6. Baratpour, M., Mehraeen, E., & Bagheri, S., et al.( 2017). Factor affecting hospital information system acceptance by nurses based on the technology acceptance model. *J Uurmia Nurse Midwifery*, 15(1-90), 27-36.

7. Bouraghi, H., Valinejadi, A., Kiani, M., Khodadadi, M., Yazdanyar, M., Vakilmofrad, H., Amiri, M.R. (2012). A survey on the knowledge of managers of Hamadan university of medical sciences about applications of hospital information system. *J Health Syst Res*, 8(2), 275 -81.
8. Chismar, W.G., & Willey-Patton, S. (2002). Test of the Technology Acceptance Model for the Internet in Pediatrics. Proceedings of the 36th Hawaii International Conference. Honolulu.
9. Chong, AY-L., & Chan, F.T. (2012). Structural equation modeling for multi-stage analysis on radio frequency identification (RFID) diffusion in the health care industry. *Expert Syst Applic*, 39(10), 8645-54. <https://doi.org/10.1016/j.eswa.2012.01.201>
10. Ford, E.W., Menachemi, N., Hureto, T.R., Yu F. Hospital (2010). IT Adoption Strategies Associated with Implementation Success: Implications for Achieving Meaningful Use. *Journal of Healthcare Management*, 55 (3), 175- 189.
11. Foster, R. (2005). Human Factors in Health Information Systems: The Western Cape Experience [Online]. South Africa: Department of the Premier: Provincial Government of the Western Cape; Available from: URL: <http://212.52.129.62/SSN/projects/Lists/Announcements/DispForm.aspx?ID=65>.
12. Ghorbani zadeh, V., Hasannangir, S.T., & Roudsaz, H. (2013). Meta-analysis on effective factors on IT acceptance in Iranian Organizations. *Research in Management in Iran*, 17(2-79), 1-19.
13. Gupta, S.K., Kant, S., & Chandrashekhar, R. (2007). S.Satpathy. *Modern Trends in Planning and Designing of Hospital Principles and Practice*. New Delhi: Jaypee Brothers. <https://doi.org/10.5005/jp/books/10536>
14. Imani, E., Khademi, Z., Yusefi, P., Bahrami, Z., Naghizadeh, F. (2012). Experiences of nursing managers about hospital information system: a qualitative study. *Hormozgan Medical Journal*, 16(3), 223-32.
15. Khandouzi, H. (2011). *Factors effecting on HIS adoption*. [Master's thesis in Persian, A Izahra University]. Irandoc.
16. Kijisanayotin, B., Pannarunothai, S., & Speedie, S. (2009). Factors Influencing Health Information Technology Adoption in Thailand's Community Health Centers: Applying the UTAUT Model. *Int J Med Inform*, 78(6), 404-16. <https://doi.org/10.1016/j.ijmedinf.2008.12.005>
17. Kimiafar, K., Sarbaz, M., Sheikhtaheri, A., & Azizi, A. (2015). The Impact of Management Factors on the Success and Failure of Health Information Systems. *Indian Journal of Science and Technology*, 8(27), IPL0543. <https://doi.org/10.17485/ijst/2015/v8i1/84083>
18. Kimiyafar, K. (2006). A Study of Users Views About Hospital Information System Quality in Teaching Hospitals of Mashhad University of Medical Sciences [MSc Thesis in Persian, Iran University of Medical Sciences]. Irandoc.
19. Langarizadeh, M., Gohari, M., & Koohestani, A. (2014). Acceptance of Hospital Information System among Medical Records Users Based on Technology Acceptance Model. *Health Inf Manage*, 10(6), 800-808.
20. Malekzadeh, S., Hashemi, N., Sheikhtaheri, A., & Hashemi, N.S. (2018). Barriers for Implementation and Use of Health Information Systems from the Physicians' Perspectives. *Stud Health Technol Inform*. 251, 269-272.
21. Mohaghar, A. (2004). Developing of TAM in Ministry of Interior. *Knowledge of Management*; 67(17): 114-31.
22. Namamian, F., Rahmi, A. (2018). Influence hospital information system enhance on the value chain in Imam Ali hospital of Kermanshah [dissertation]. Kermanshah: Islamic Azad University of Kermanshah.
23. Rajaeian E., Peikari H., & Zamani N. (2018). Factors affecting the intention of adoption of health information technology in hospital. *Quarterly Journal of Nursing Management*, 7(2), 49-59.
24. Schaper, L.K., Pervan, G., ICT, & OTs. (2007). A Model of Information and Communications Technology Acceptance and Utilisation by Occupational Therapists (Part 2). *Stud Health Technol Inform*, 130, 91-101.
25. Scott, R. (2007). E-Records in Health- Preserving Our Future. *Int J Med Inform*, 76(5-6), 427-31. <https://doi.org/10.1016/j.ijmedinf.2006.09.007>
26. Sheikhtaheri, A., Rostami Garavand, S., & Ahmadi, H. (2018). Factors Related to the Acceptance of Radio Frequency Identification Technology in Health Information Management Departments of Hospitals Affiliated to Iran University of Medical Sciences. *Journal of Health and Biomedical Informatics*, 5(2), 265-273.
27. Sheikhtaheri, A., Kimiafar, K., & Sarbaz, M. (2014). Evaluation of system quality of hospital information system: a case study on nurses' experiences. *Stud Health Technol Inform*, 205, 960-4.
28. Tabibi, S.J., Farhangi Nasiripour, A., Baradaran Kazemzadeh, R., & Ebrahimi, P. (2012). The Effect of Supervisors and Work Group on Hospital Information System Acceptance Model. *Health Administration*, 15(50), 52-64.
29. Tavakoli, N., Jahanbakhsh, M., Yadegarfar, G., & Ranjbar, N. (2017). Acceptance and Use of Hospital Information System: a study on medical records users Based on Unified Theory of Acceptance and Use of Technology. *Journal of Health and Biomedical Informatics*, 3(4), 243-250.
30. Yi, M.Y., Jackson, J.D., Park, J.S., & Probst, J.C. (2006). Understanding Information Technology Acceptance By Individual Professionals: Toward An Integrative View. *Inf Management*, 43(3), 350-63. <https://doi.org/10.1016/j.im.2005.08.006>
31. Zailani, S., Iranmanesh, M., Nikbin, D., & Beng, J.K.C. (2015). Determinants of RFID adoption in Malaysia's healthcare industry: occupational level as a moderator. *J Med Syst*, 39(1),1-11. <https://doi.org/10.1007/s10916-014-0172-4>