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The Effect of Mental Factors on People's Acceptance of Electronic Medical Record in China

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Abstract

Compared with the traditional health service, electronic medical record (EMR) has distinct advantages, promising future in the 21st century. But until now, application of EMR in China can neither satisfy people's demand nor follow the world pace. What are the factors influence people's acceptance of EMR in China? Based on the Unified Theory of Acceptance and Use of Technology (UTAUT) and Technology Acceptance Model (TAM), we construct a conceptual model to analyze the effect of mental factors.

Keywords: *EMR, Influence factors, Chinese's user*

1. Introduction

According to the United States Institute of Medicine, EMR refers to electronically maintained information about an individual's lifetime health status and healthcare, which can replace paper-based medical records and meet all the requirements for diagnosis, medical care, legal and management, as the major source of information [1].

Since 2000, China has made remarked progress in issuing documents aimed at popularizing EMR system. In April 2002, Ministry of Health of the People's Republic of China formulated the Specifications of Basic Functions of Hospital Information System. In December 2009, Ministry of Health and State Administration of Traditional Chinese Medicine released the Basic Architecture and Data Standards of EMRs (Trial).In January 2011, Ministry of Health issued the Functional Specifications of EMR System. In May 2014, Ministry of Health issued 20 announcements on health industry standards including the Basic Dataset of Electronic Medical Record Part 1: Medical Record Summary which would be officially implemented since October 1st 2014.

According to the 2013 National Health Work Conference of Department of Medical Administration of Ministry of Health and the monitored progress of medical reform, by 2014, the coverage rate of EMR system has been over 50% and will reach 80% at the end of 2014.

The United States, Australia, New Zealand, United Kingdom, and Nordic countries have already established national electronic health record system. Building E-health system is an inevitable trend in the future [2]. Nowadays, it is developing with good momentum. In the UK, the Blair administration explicitly stated that its goal was to develop a lifelong electronic health record for every citizen and to make the records accessible to all physicians in 1998. Now UK has invested more than £12 billion to establish national EMR system. Japan has made significant achievements in researches on EMR due to its early commencement and support from the government. It now has the highest EMR application percentage in the world [3].

Compared with developed countries and areas in Europe and America, China lags

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behind in terms of theories, technical research and application of EMR. In this paper, we conduct psychological analysis on EMR users and find our factors affecting EMR's application rate, which can help to improve EMR system's application in hospitals and promote comprehensive and balanced development.

2. Research Model and Hypothesis

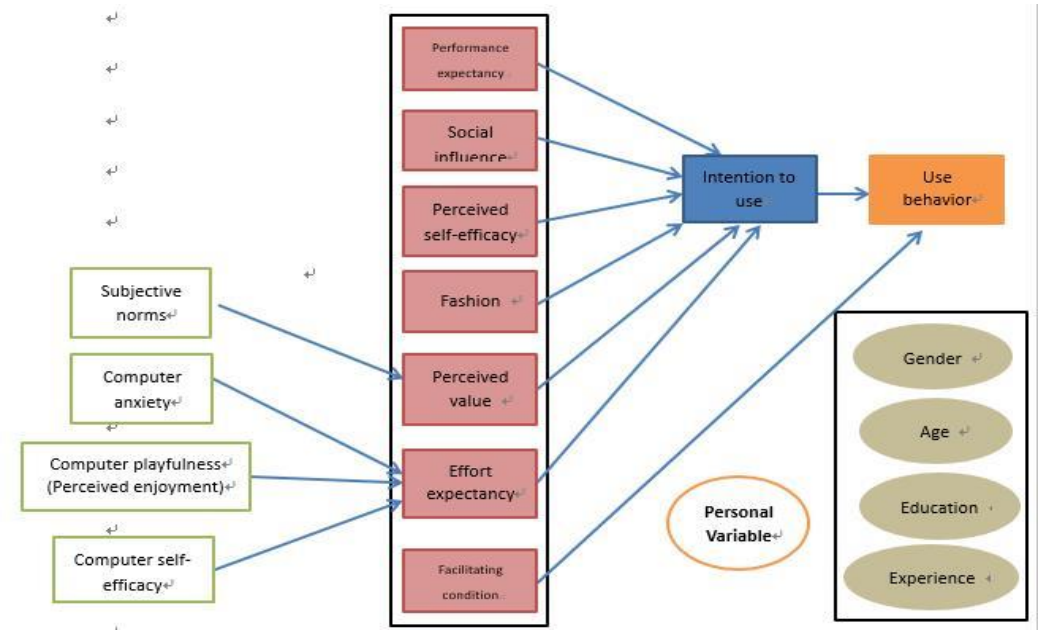

Figure 1. Conceptual Model of Analysis of Influence Factors

2.1. Model

Our research model is mainly based on the Unified Theory of Acceptance and Use of Technology (UTAUT) and Technology Acceptance Model (TAM).

The Unified Theory of Acceptance and Use of Technology (UTAUT) researches on IT users' acceptance and use as computer and information technology have been widely used and this model can explain users' acceptance and use. UTAUT originated from several theories: Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Motivation Model (MM), Theory of Planned Behavior (TPB), Combined TAM and TPB (c-TAM-TPB), Model of PC Utilization (MPCU), Innovation Diffusion Theory(IDT), and Social Cognitive Theory (SCT) [4].

Venkatesh, *et al.*, [6] proposed a new IT acceptance and use model which aimed to unify eight prominent competing IT acceptance and use models. The model is named the Unified Theory of AcceptanceandUseofTechnology (UTAUT).An extensive review of previous studies as well as new evidence from recent experiments has shown that the UTAUT model can explain 69% of technology acceptance while other previous models could explain just over 40% of the variance in acceptance [7].

ThebasicUTAUTmodel that Venkatesh, *et al.*, [6] proposedconsistsofseveral components that are hypothesized to relate to the intention to use IT. The components are effort expectancy (ease ofuse), performance expectancy (usefulness), social influence, and facilitating conditions.

Hu, *et al.*, [8] and Chauand Hu [9] suggested ageneric framework for technology acceptance and also contended that technology acceptance should be examined in three different contexts:(a) individual, (b) technological, and (c) implementation.

Davis, *et al.*, [10] first proposed the Technology Acceptance Model (TAM) which is recognized as a well-established and highly-accepted model for predicting end-user

acceptance of technologies. Until now, many studies have replicated, extended and used TAM.

TAM is widely used in various healthcare domains. For instance, P.J. Hu, *et al.*, [8] explored physicians' intention to use telemedicine technology in Hong Kong; in 2002, P. Van Schaik, *et al.*, [11] studied physiotherapists' acceptance of a low-cost portable system for postural assessment; in 2004, E.V. Wilson, *et al.*, [12] probed into patients' acceptance of provider-delivered e-health; in addition, I.J. Chen, *et al.*, [13] researched into public health nurses' intention towards web-based learning.

Adapting the TAM is "to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behavior across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified" [10].

According to the model, the initial TAM is composed of five constructs: perceived ease of use (PEOU), perceived usefulness (PU), attitude toward using (ATU), behavioral intention to use (BI), and actual system use (AU). And individual's behavioral intention to use a system is determined by perceived usefulness and perceived ease of use, which are the most dominant determinants for system use.

TAM does not consider social influence on user acceptance of IT. In 2000, Venkatesh and Davis [5] proposed an extension of the TAM referred to as TAM2. "TAM2 incorporates additional theoretical constructs spanning social influence processes (subjective norm, voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, results demonstrability, and perceived ease of use)." TAM2 includes social influence processes (subjective norm, voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, and result demonstrability).

Our study uses the UTAUT model and Technology Acceptance model to study factors that predict the intention to use electronic medical record system in hospital.

We anticipate that computer anxiety should significantly affect effort expectancy. D.R. Compeau, *et al.*, [1999] [14] defines computer anxiety as an individual's apprehension, or even fear, when she/he is faced with the possibility of using computers. So it may influence individual's intention by influencing effort expectancy. In addition, computer playfulness is added, which refers to an individual's tendency to interact spontaneously with a computer (J. Webster, *et al.*, [1989] [15]), to the model as a predictor of effort expectancy. In our study, computer self-efficacy, defined by D.R. Compeau, *et al.*, [1999] as an individual's perception of his or her ability to use computers in the accomplishment of a task, is an important predictor of effort expectancy.

2.2. Glossary

2.2.1. Performance Expectancy: In recent studies, performance expectancy is defined as the degree to which an individual believes that using health IT will help him or her to attain gains in job performance.

V. Venkatesh, *et al.*, [2003] [6] demonstrated that performance expectancy significantly influenced individuals' intention to adopt new technology. Similarly, F.D. Davis [1989] [10] identified the influence which perceived usefulness and perceived ease of use exerted on user's acceptance. S. Taylor, *et al.*, [1995] [17], V. Venkatesh, *et al.*, [2000] [5] and I.C. Chang, *et al.*, [2007] [16] found that performance expectancy was astrong predictor of intention to use IT.

2.2.2. Social Influence: According to S. Taylor Social, *et al.*, [1995] [17], social influence plays an important role when people make decisions. Venkatesh, *et al.*, [2003] [6] defines social influence as the degree to which an individual perceives that important others believe he/she should use the technology. The effect of social influence on people's intention to use technology is significant (I. C. Chang, *et al.*, [2007] [16]). However, P. Y. K. Chau, *et al.*,

[2002] [9] thought social influence was insignificant when physicians intended to use Internet-based health applications.

2.2.3. Perceived Credibility: In the previous researcheson EMR, A. Likourezos, *et al*., [2004] [18] found that the most concerned aspect in the application of new technology was safeguarding data. Most users were faithful but they were not certain whether data were safe; this is the credibility that an individual perceives. And according to Lu Y-C, *et al.*, [2005] [19], healthcare serviceswill lose credibility among patients, if they do not adopt new information technology for additional support.

2.2.4. Effort Expectancy: From previous studies, effort expectancy is defined as the degree of ease of use associated with health IT. F. D. Davis, *et al.*, [1989] [10], R. Agarwal, *et al.*, [2000] [20] and L.K. Schaper, *et al.*, [2007] [21] contended that effort expectancy had significant influence on intention to use and use behavior. Chang I-C, *et al.*, [2007] [16] found that the influence of effort expectancy on individual's intention to use clinical decision support system was positiveand Pai F-Y, *et al.*, [2011] [22] concluded that the influence of effort expectancy on individual's intention to use healthcare information systems was positive.

2.2.5. Facilitating Conditions: According to S. Taylor, *et al.*, [1995] [23], facilitating conditions has two aspects, namely resource facilitating conditions and technological facilitating conditions. Moreover, S. Taylor, *et al.*, [1995] [23] found that facilitating conditions had positive influence on the successful application of computerized systems. In addition, P.Y.K. Chau, *et al.*, [2002] [9] and V. Venkatesh, *et al.*, [2003] [6] contended that facilitating conditions was a positive factor to innovation use, but it could not predict individual's intention to use the technology when performance expectancy and effort expectancy existed.

2.2.6. Subjective Norms: I. Ajzen, *et al.*, [1991] [24] defines subjective norms as the degree to which an individual believes that people who are important think that she/he should perform the behavior in question. According to S. Taylor, *et al.*, [1995] [17], subjective norms have significant influence on individual's intention with inexperienced subjects. In addition, based on TAM, V. Venkatesh, *et al.*, [2000] [5] found that subjective norms were a positive factor that influenced individual's intention under mandatory situations and weakened as time passed. Moreover, they also believed that subjective norms affected intention indirectly through perceived usefulness.

2.2.7. Computer Anxiety: D.R. Compeau, *et al.*, [1999] [25] defines computer anxiety as an individual's apprehension, or even fear, when she/he is faced with the possibility of using computers. Based on TAM, P.Y.K. Chau, *et al.*, [2002] [9] regarded computer anxiety as an important factor that influenced users' behavioral intention and their actual behavior. Similarly, based onsocial cognitive theory, D.R. Compeau, *et al.*, [1999] [25] also found that computer anxiety had significant positive influence on individual's intention.

2.2.8. Computer Playfulness: J. Webster, *et al.*, [1989] [26] defines computer playfulness as an individual's tendency to interact spontaneously with a computer. Based on this definition, computer playfulness is a changeable system-specific trait since new technologies always appear as time passes. S. E. Yager, *et al.*, [1997] [27] made the assumption that individual was a generally playful person whose specific level of playfulness differed over different technologies.

2.2.9. Computer Self-efficacy: D. R. Compeau, *et al.*, [1999] [25] defines computer self-efficacy as an individual's perception of his or her ability to use computers in the

accomplishment of a task. P.Y.K. Chau, *et al.*, [2002] [9] and A. Durndell, *et al.*, [2002] [28] found that those with higher self-efficacy were more likely to experience positive effect than those with lower self-efficacy. Moreover, A. Durndell, *et al.*, [2002] [28] illustrated computer self efficacy, computer anxiety, and attitudes towards the computer technology.

2.3 Hypothesis

H1: Performance expectancy significantly affects individual intention to use EMR.
H2: Social influence significantly affects individual intention to use EMR.
H3: Perceived self-efficiency significantly affects individual intention to use EMR.
H4: Perceived credibility significantly affects individual intention to use EMR.
H5: Perceived valuesignificantly affects individual intention to use EMR.
H6: Effort expectancy significantly affects individual intention to use EMR.
H7: Facilitating conditions significantly affect use behavior.
H8: Intention to use significantly affects use behavior.

3. Study Results

3.1. Description

Table 1. Output Data

Variable	Type	Sample Size	Percentage	Cumulative Percentage
Gender	Female	155	52.2	52.2
	Male	142	47.8	100.0
Age	under the age of 20	10	3.4	3.4
	Age 20—29	141	47.5	50.8
	Age 30—39	90	30.3	81.1
	Age 40—49	40	13.5	94.6
	Over 50 years old	16	5.4	100.0
Education	High School or below	24	8.1	8.1
	Bachelor Degree	171	57.6	65.9
	graduate diploma	86	29.0	94.9
	Doctoral degree and above	15	5.1	100.0
Experience	Less than 1 year	24	8.1	8.1
	1-3 years	95	32.0	40.1
	3-6 years	51	17.2	57.2
	6-10 years	42	14.1	71.4
	10-20 years	53	17.8	89.2
	More than 20 years	32	10.8	100.0

In the survey, 300 questionnaires were distributed with 297 effective samples returned. Males and females account for 47.8% and 52.2% respectively of all respondents. In terms of age distribution, the largest group is people aged 20-29, accounting for 47.5%; the second is those aged 30-39, accounting for 30.3%. As for educational background, people with high school, bachelor, master, and doctoral degree make up 8.1%, 57.6%, 29.0%, and 5.1% of all respondents. In addition, people who have worked in healthcare industry for 1-3 years occupy the largest percentage—32%; and the numbers of those who worked for 3-6 years, 6-10 years, and 10-12 years are roughly the same。

3.2. The Degree to which Factors Influence the use of EMR System

Table 2. Degree of Influence

		PE	SI	PSE	PC	PV	FC	EE	UB	IU	Total scores
N	valid	291	293	294	294	292	292	290	292	291	283
	missing	6	4	3	3	5	5	7	5	6	14
	mean	16.16	15.61	11.53	11.56	7.96	23.42	12.08	11.74	12.25	122.34
	standard deviation	2.96	2.96	2.28	2.64	1.68	4.58	2.35	2.45	2.25	20.15
	minimum	6.00	7.00	4.00	5.00	3.00	12.00	3.00	4.00	4.00	68.00
	maximum	20.00	20.00	15.00	15.00	10.00	30.00	15.00	15.00	15.00	155.00
	influencing factor	4.04	3.90	3.84	3.85	3.98	3.90	4.03	3.91	4.08	3.95

Mean and standard deviation are calculated when we study performance expectancy, social influence, perceived self-efficacy, perceived credibility, perceived value, facilitating condition, effort expectancy, intention to use and use behavior of EMR system usage. In addition, since each layer in the scale includes various amounts of questions, the average score of each layer cannot be used to compare respondents' scores at each layer. Instead, we should divide the average score of each layer by layer's number of questions to obtain "average score of each item at each layer" (namely impact factor) and then conduct the comparison. It can be concluded that performance expectancy has the greatest influence on EMR system usage while perceived self-efficacy has the least influence. The ranking of those impact factors is as follows: performance expectancy, effort expectancy, perceived value, facilitating condition, social influence, perceived credibility, and perceived self-efficacy.

3.3. Hypothesis Test

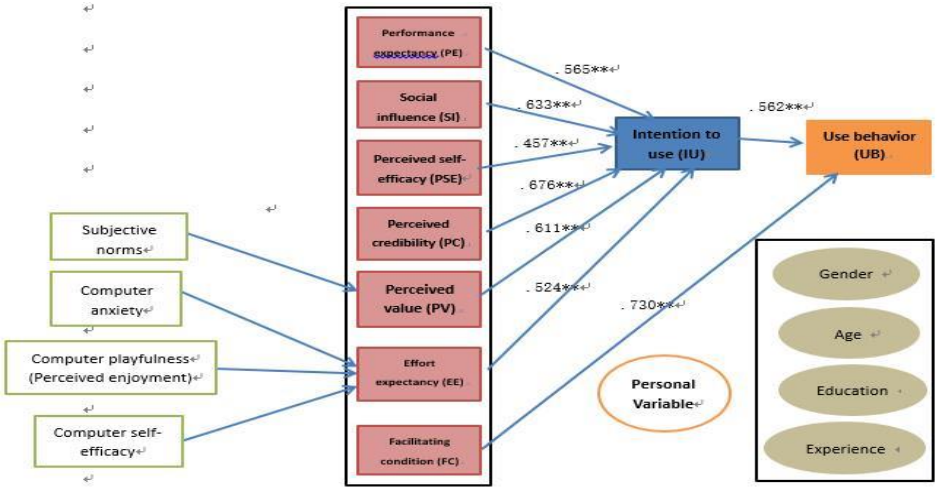

Figure 2. Results of Model Analysis

Pearson product-moment correlation is adopted to examine whether significant correlation exists among nine factors. The correlation test shows that the nine factors are significantly correlated to each other.

Table 3. Results of Product-moment Correlation

Hypothesis		Estimate	N	Result of hypothesis
H1	PE → U	.565	288	Supported
H2	SI → IU	.633	290	Supported
H3	PSE → IU	.457	291	Supported
H4	PC → IU	.676	291	Supported
H5	PV → IU	.611	291	Supported
H6	EE → IU	.524	291	Supported
H7	FC → UB	.730	288	Supported
H8	IU → UB	.562	291	Supported

The final result accords with hypotheses and hypotheses are valid.

3.4. Influence of Age on Factors

Table 4. Homogeneity of Variance Test---Age

	Levene Statistics	df1	df2	significance
Performance expectancy	1.216	4	286	.304
Social influence	.828	4	288	.508
Perceived self-efficacy	1.365	4	289	.246
Perceived credibility	.759	4	289	.553
Perceived value	1.956	4	289	.101
Facilitating condition	1.360	4	287	.248
Effort expectancy	4.012	4	285	.003
Use behaviour	1.106	4	287	.354
Intention to use	5.267	4	286	.000
Total	.759	4	278	.553

Table 5. One-way ANOVA---Age

		sum of squares	df	mean square	F	signi ficance
Performance expectancy	inter-group	69.436	4	17.359	2.008	.093
	intra-group	2471.973	286	8.643		
	total	2541.409	290			
Social influence	inter-group	66.360	4	16.590	1.912	.109
	intra-group	2499.285	288	8.678		
	total	2565.645	292			
Perceived self-efficacy	inter-group	33.500	4	8.375	1.629	.167
	intra-group	1485.782	289	5.141		
	total	1519.282	293			
Perceived credibility	inter-group	14.408	4	3.602	.512	.727
	intra-group	2033.990	289	7.038		
	total	2048.398	293			
Perceived value	inter-group	12.236	4	3.059	1.088	.362
	intra-group	812.352	289	2.811		
	total	824.588	293			
Facilitating condition	inter-group	131.767	4	32.942	1.582	.179
	intra-group	5975.261	287	20.820		
	total	6107.027	291			
Effort expectancy	inter-group	40.719	4	10.180	1.859	.118
	intra-group	1560.457	285	5.475		
	total	1601.176	289			
Use behavior	inter-group	80.168	4	20.042	3.457	.009
	intra-group	1664.052	287	5.798		
	total	1744.219	291			
Intention to use	inter-group	80.817	4	20.204	4.162	.003
	intra-group	1388.365	286	4.854		
	total	1469.182	290			
Total	inter-group	3661.003	4	915.251	2.296	.059
	intra-group	110828.106	278	398.662		
	total	114489.110	282			

Test for homogeneity of variance and one-way ANOVA are employed to study the influence of age on factors. From the above tables, it can be seen that age exerts significant influence on use behavior and intention to use.

3.5. Influence of Gender on Factors

Table 6. Independent Sample Test---Gender

		Levene test of variance equation		T test of mean equation				
		F	Sig.	t	df	Sig.(both sides)	Mean difference	Standard error
PE	Equal variances assumed	.093	.761	.982	289			.34726
	Equal variances not assumed			.983	288.977	.326	.34085	.34669
SI	Equal variances assumed	2.393	.123	1.095	291	.275	.37921	.34639
	Equal variances not assumed			1.093	286.343	.276	.37921	.34709
PSE	Equal variances assumed	.470	.493	.249	292	.804	.06625	.26619
	Equal variances not assumed			.249	291.608	.803	.06625	.26590
PC	Equal variances assumed	.710	.400	1.046	292	.296	.32274	.30854
	Equal variances not assumed			1.046	290.546	.296	.32274	.30857
PV	Equal variances assumed	1.031	.311	.673	292	.501	.13195	.19597
	Equal variances not assumed			.672	286.720	.502	.13195	.19643
FC	Equal variances assumed	2.247	.135	1.252	290	.212	.67080	.53597
	Equal variances not assumed			1.248	284.332	.213	.67080	.53731

EE	Equal variances assumed	3.376	.067	-.489	288	.625	-.13551	.27691
	Equal variances not assumed			-.492	282.536	.623	-.13551	.27543
UB	Equal variances assumed	.275	.600	.301	290	.764	.08642	.28716
	Equal variances not assumed			.301	289.193	.764	.08642	.28700
IU	Equal variances assumed	.103	.749	1.494	289	.136	.39371	.26352
	Equal variances not assumed			1.493	286.149	.137	.39371	.26376
Total	Equal variances assumed	.647	.422	1.047	281	.296	2.50790	2.39582
	Equal variances not assumed			1.046	279.939	.296	2.50790	2.39652

Use independent-samples T test to explore the influence of gender on all factors. The result indicates that gender has marginal effect on the significance of nine factors. For people with different genders, the tested results do not have marked differences. In other words, gender has minor influence on those factors.

3.6. Influence of Educational Background on Factors

Table 7. Homogeneity of Variance Test---Educational Background

	Levene Statistics	df1	df2	significance
Performance expectancy	.403	3	286	.751
Social influence	1.808	3	288	.146
Perceived self-efficacy	.711	3	289	.546
Perceived credibility	.356	3	289	.784
Perceived value	1.035	3	289	.377
Facilitating condition	.881	3	287	.451
Effort expectancy	2.493	3	285	.060
Use behaviour	3.461	3	287	.017
Intention to use	7.795	3	286	.000
Total	.738	3	278	.530

Table 8. One-way ANOVA---Educational Background

		sum of squares	df	mean square	F	significance
PE	inter-group	65.079	3	21.693	2.507	.059
	intra-group	2474.976	286	8.654		
	total	2540.055	289			
SI	inter-group	75.468	3	25.156	2.912	.035
	intra-group	2488.241	288	8.640		
	total	2563.709	291			
PSE	inter-group	16.796	3	5.599	1.079	.358
	intra-group	1500.146	289	5.191		
	total	1516.942	292			
PC	inter-group	45.877	3	15.292	2.207	.087
	intra-group	2002.328	289	6.928		
	total	2048.205	292			
PV	inter-group	11.308	3	3.769	1.346	.260
	intra-group	809.115	289	2.800		
	total	820.423	292			
FC	inter-group	108.273	3	36.091	1.727	.162
	intra-group	5996.737	287	20.895		
	total	6105.010	290			
EE	inter-group	17.898	3	5.966	1.075	.360
	intra-group	1582.109	285	5.551		
	total	1600.007	288			
UB	inter-group	5.212	3	1.737	.287	.835
	intra-group	1738.458	287	6.057		
	total	1743.670	290			
IU	inter-group	57.222	3	19.074	3.864	.010
	intra-group	1411.895	286	4.937		
	total	1469.117	289			
Total	inter-group	1886.586	3	628.862	1.553	.201
	intra-group	112597.049	278	405.025		
	total	114483.635	281			

Table 9. Multiple Analysis of Social Influence

dependent variable	(I) educational background(1=A: High School or below;2=B:bachelor degree;3=C:graduate diploma;4=D:doctoral degree and above)	(J) educational background(1=A:High School or below;2=B:bachelor degree;3=C:graduate diploma;4=D:doctoral degree and above)	significance	Mean difference	standard error
Social influence	1	2	.142	-1.56132	.66621
		3	.589	-.97463	.70227
		4	.999	-.12424	.98422
	2	1	.142	1.56132	.66621
		3	.519	.58669	.38934
		4	.350	1.43708	.79190
	3	1	.589	.97463	.70227
		2	.519	-.58669	.38934
		4	.785	.85039	.82246
	4	1	.999	.12424	.98422
		2	.350	-1.43708	.79190
		3	.785	-.85039	.82246

Table 10. Multiple Analysis of Intention to Use

dependent variable	(I) educational background(1=A: High School or below;2=B:bachelor degree;3=C:graduate diploma;4=D:doctoral degree and above)	(J) educational background(1=A:High School or below;2=B:bachelor degree;3=C:graduate diploma;4=D:doctoral degree and above)	significance	Mean difference	standard error
Intention to use	1	2	.015	-1.64232	.50377
		3	.163	-1.20695	.53148
		4	.172	-1.66970	.74398
	2	1	.015	1.64232	.50377
		3	.539	.43536	.29574
		4	1.000	-.02738	.59875
	3	1	.163	1.20695	.53148
		2	.539	-.43536	.29574
		4	.907	-.46275	.62225
	4	1	.172	1.66970	.74398
		2	1.000	.02738	.59875
		3	.907	.46275	.62225

Table 11. Descriptive Statistics

educational background(1=A:High School or below;2=B:bachelor degree;3=C:graduate diploma;4=D:doctoral degree and above)	mean	Standard deviation	N
1	10.8636	3.46816	22
2	12.5060	2.19689	168
3	12.0706	1.88849	85
4	12.5333	1.95911	15
Total	12.2552	2.25465	290

Dependent variable: Intention to use

Table 12. Levene's Test of Equality of Error Variances [a]

F	df1	df2	Sig.
7.795	3	286	.000

Dependent variable: Intention to use

Tests the null hypothesis that the error variance of the dependent variable is equal across groups. [a]

a Design: Intercept + education dependent variable: Intention to use

a. R SQUARE = .039(adjusted R square = .029)

Table 12. Test of Between-Subjects Effects

Source	Type III sum of squares	df	mean square	F	Sig.	Partial Eta Squared
Corrected model	57.222[a]	3	19.074	3.864	.010	.039
Intercept	17725.569	1	17725.569	3590.574	.000	.926
education	57.222	3	19.074	3.864	.010	.039
Error	1411.895	286	4.937			
Total	45024.000	290				
Corrected Total	1469.117	289				

One-way ANOVA is used to study the influence of educational background on factors. The table indicates that the results of groups with different educational backgrounds have significant differences regarding social influence and intention to use. Multiple analysis implies that intention to use is subject to greater influence. But the GLM analysis on variances shows that adjusted R square = .029 or correlation strength coefficient is 2.9%. In other words, educational background has small interpretation for intention to use and the

two are weakly related. In one-way ANOVA, if the sample size is large, difference significance test can soon reach the standard of significance. When the test sample size is large, in the equation MSw=SSw÷(N- k), the value of (N-k) will become large while MSw will become very small (the denominator increases); and then in MSb÷MSw, F value will increase so F test can easily produce significant result. But in the variance analysis, F is significant while W2 is small, which indicates that independent variable has marginal influence on dependent variable. Therefore, multiple analysis and GLM analysis produce different results. The defect of this method is that the result is only statistically significant but cannot be practically applied.

4. Conclusion

The result produced by mean and standard deviation method shows the degree to which each factor influences the EMR system usage. The order of factors with strong to weak influence is performance expectancy, effort expectancy, perceived value, facilitating condition, social influence, fashion, and perceived self-efficacy.

Pearson product-moment correlation is adopted to examine whether significant correlation exists among those factors. The test shows that they are significantly correlated to each other.

T test indicates that gender has small influence on those factors.

One-way ANOVA is employed to study the influence of age on factors. The conclusion is that age can significantly influence use behavior and intention to use.

One-way ANOVA is used to examine the influence of educational background on factors. It shows that the results of groups with different educational backgrounds have significant differences regarding social influence and intention to use. But after considering the influence of multi-factor variables, we conduct multiple comparisons and find that educational background has significant influence on intention to use. Later, we also conduct GLM analysis to study the influence of educational background on intention to use and the conclusion is that educational background has small interpretation for intention to use and the two are weakly related.

We believe that performance expectancy is the strongest factor that affects individual's intention to use EMRS. The results are consistent with previous studies (Venkatesh, *et al.*, 2003 [6]; Chang, *et al.*, 2007 [16]). Healthcare technology helps support services, including medical care in the healthcare industry. Schreuder and Verheijen, 2009 [29] argued that physicians would be able to treat patients correctly and quickly. Patients would have less bleeding, and secure, safe and small wounds. Thus, patients could also get well more quickly and return to their lives ordinarily and happily. It could increase satisfaction between physicians and patients. Therefore, they believed that using healthcare technology would enhance the performance of healthcare services (Venkatesh, *et al.*, 2003 [6]; Davis, 1989 [30]) [31].

From our study effort expectancy has a strong influence on individual behavior intention, but it is a factor with less effect than performance expectancy. This result is in accordance with prior findings (Chang, *et al.*, 2007 [16]; Davis, 1989 [30]). This study supports that information and service quality are related to perceived ease of use [31]. It also affects usage and physician satisfaction, according to their feelings about whether it is easier to use conventional methods. And finally, they also perceive ease of use in performing their job.

In our study, the impact of facilitating conditions has a positive influence on actual using behavior. This is in line with the results of previous studies (Kijsanayotin, *et al.*, 2009 [4]; Zhou, *et al.*, 2010 [32]). This implies that infrastructure support, such as computer systems or knowledge, is necessary. Internal and external organizations encourage physicians to allow healthcare technology to affect their behavior [31].

We find that social influence has less effect on behavioral intention and technology acceptance in target physicians, which is also proposed by Chang, *et al.*, (2007) [16].

Physicians demonstrate expert technical skills, which affects the research. In addition, the limited time available to physicians and nurses also affects interactions and minimizes exchanges. Furthermore, medical experts do not need to gain benefit from using these healthcare technologies, because they also perceive their usefulness and ease of use.

We find that perceived value is another strong factor that influences individual's intention to use EMRS. There are a few previous studies exactly consistent with our conclusion. But this result is similar to the study conducted by Chismar and Wiley-Patton (2002) [33] on internet adoption. In their study, social norms and image are similar to the perceived value determinants in the UTAUT.

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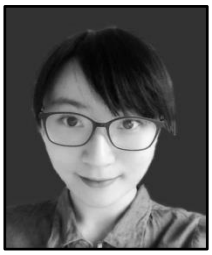

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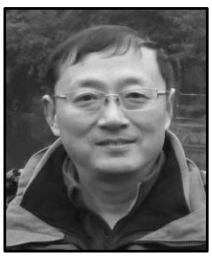

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