RESEARCH ARTICLE

Role of work engagement in behavioural intention to use electronic medical records: A cross-sectional study

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Abstract

Background: In this era of a rapidly advancing technological landscape, the Electronic Medical Record (EMR) has increased the awareness of health services on the importance of the roles of workers in utilising information technology. **Objective:** To analyse the factors influencing behavioural intention in the EMR system by adding the work engagement factor as an exogenous variable based on the Unified Theory of Acceptance and Use of Technology (UTAUT) theoretical framework. **Method:** This cross-sectional study enrolled a sample of 195 participants from a population of 390 medical students. Data analysis used structural models with multivariate structural equation modelling. **Results:** Facilitating conditions (*t*-statistic=3.154; *p*=0.0001), performance expectancy (*t*-statistic=2.983, *p*=0.003), and work engagement (*t*-statistic=4.998, *p*=0.0001) had an effect on the behavioural intention, while effort expectancy (*t*-statistic=0.779, *p*=0.436) and social influence (*t*-statistic=0.266, *p*=0.790) did not affect the behavioural intention. **Conclusion:** Performance expectancy, facilitating conditions, and work engagement could affect behavioural intention by R^2=74%. Work engagement had the strongest effect among other exogenous variables.

Introduction

Several spheres of society are undergoing a period of rapid technological progress. Electronic Medical Record (EMR) is an embodiment of the evolving health information system set to change the paper-based record practice in hospitals (Abdekhoda *et al.,* 2016). Government involvement is required to achieve the third point of the Sustainable Development Goals (SDGs), relating to healthy and prosperous lives by 2030 (Buse & Hawkes, 2015). One of the SDG efforts is to target all hospitals to implement a 100% integrated EMR by 2024 (Kementerian, 2023).

Providing accurate, reliable, and comprehensive health services to patients through information technology is challenging. EMR systems can increase productivity in healthcare delivery, creating better communication among healthcare providers and resulting in better clinical decision-making and overall satisfaction of patients and health workers. Also, implementing EMR will increase the workload due to changes in work habits or culture (Yulida *et al.,* 2021). However, the benefits of EMR, such as systematised report data exportation, easy access to inspection history, and payment processing capabilities, will facilitate work and make it more efficient. Notably, incomplete records are most commonly attributed to medical residents, highlighting the significant role of health workers in the documentation process. One study showed that less than 25% of doctors use electronic health records (Archer & Cocosila, 2011), while another reported resistance to using health information technology (Lulin *et al.,* 2020). Missing data include medical history, physical examination results, follow-up plans, and date

entries. Complete medical records help patients get more quality, effective, and efficient treatment. Other parties, such as hospitals, insurance, and study experts, can also benefit from complete medical records. While doctors argue that they lack time and are more concerned with patient care, patient services become inefficient when data are incomplete (Sugiarsi & Rohmadi, 2020).

Work engagement is required to generate competent human resources in an organisation. It refers to the simultaneous work and expression of one's liking in completing the task, connecting and working for others, and expressing oneself actively, physically, cognitively, and emotionally (Lu *et al.*, 2016). It also provides an overview of responsibility and persistence in carrying out tasks. More responsibility is expected to impact behavioural intention to use EMR, with several studies showing that work engagement affects behavioural intention (Hepola, Karjaluoto & Shaikh, 2016; Anggita & Trenggana, 2020; Fanani *et al.*, 2021; Wu & Zhu, 2021). The model development is expected to determine the most potent variable influencing behavioural intention in using EMR.

Methods

Purpose

This study aims to develop a model by adding work engagement as an exogenous variable into the Unified Theory of Acceptance and Use of Technology (UTAUT) theoretical framework. The results are expected to expand the existing variables in the original UTAUT theory (Venkatesh *et al.*, 2003; Venkatesh, Thong & Xu, 2016).

Participants and settings

This cross-sectional study used path analysis, and data were collected through questionnaires in a tertiary hospital. Medical students who have been using EMRs in outpatient for at least six months were in their final term (to be considered experts and skilled in handling patients), and were familiar with using EMRs were included in the study. Those who refused to fill out the informed consent and worked in settings outside the hospital were excluded. The sample obtained consisted of 195 from a total population of 390 medical students in outpatient units, with a relative precision of 0.15 using a random sampling technique with sample size determination software (sample size 2.0) (Chadha, 2006).

Instrument

The questionnaire employed in this study comprised six variables, five independent variables and one dependent variable. A total of 57 question items were subjected to validity and reliability testing using SPSS. Validity was assessed through item correlation coefficient analysis, while indicator reliability was evaluated using Cronbach alpha (see Table I).

Table I: Validity and reliability test results of data collection instruments

Construct	Indicator	Item	Validity		Reliability	
			Coefficient correlation item-total	Description	Coefficient Cronbach's Alpha	Description
Performance expectancy	Perceived usefulness	PE1.1	0.770**	Valid	0.878	Reliable
		PE1.2	0.793**	Valid		
		PE1.3	0.802**	Valid		
	Extrinsic motivation	PE2.1	0.720**	Valid	0.819	Reliable
		PE2.2	0.776**	Valid		
		PE2.3	0.660**	Valid		
	Job fit	PE3.1	0.780**	Valid	0.856	Reliable
		PE3.2	0.816**	Valid		
		PE3.3	0.865**	Valid		
	Relative advantages	PE4.1	0.734**	Valid	0.800	Reliable
		PE4.2	0.738**	Valid		
		PE4.3	0.732**	Valid		
	Outcome expectation	PE5.1	0.840**	Valid	0.882	Reliable
		PE5.2	0.797**	Valid		
		PE5.3	0.754**	Valid		
Effort expectancy	Perceived ease of use	EE1.1	0.706**	Valid	0.686	Reliable
		EE1.2	0.670**	Valid		
	Complexity	EE2.1	0.669**	Valid	0.805	Reliable
		EE2.2	0.632**	Valid		
	Ease of use	EE3.1	0.743**	Valid	0.846	Reliable
		EE3.2	0.739**	Valid		

Construct	Indicator	Item	Validity		Reliability	
			Coefficient correlation item-total	Description	Coefficient Cronbach's Alpha	Description
Social influence	**Subjective norm**	SI1.1	0.698**	Valid	0.689	Reliable
		SI1.2	0.701**	Valid		
		SI1.2	0.685**	Valid		
	Social factors	SI2.1	0.571**	Valid	0.637	Reliable
		SI2.2	0.545**	Valid		
	Image	SI3.1	0.749**	Valid	0.743	Reliable
		S13.2	0.685**	Valid		
Facilitating condition	**PBC**	FC1.1	0.716**	Valid	0.921	Reliable
		FC1.2	0.722**	Valid		
	Facilitating condition	FC2.1	0.821**	Valid	0.790	Reliable
		FC2.2	0.808**	Valid		
	Compatibility	FC3.1	0.779**	Valid	0.705	Reliable
		FC3.2	0.725**	Valid		
Behavioural intention	**Enthusiasm**	B1.1	0.838**	Valid	0.902	Reliable
		B1.2	0.877**	Valid		
	Willingness	B2.1	0.875**	Valid	0.825	Reliable
		B2.2	0.827**	Valid		
	Persuasiveness	B3.1	0.805**	Valid	0.831	Reliable
		B3.2	0.843**	Valid		
Work engagement	**Vigour**	EN1.1	0.832**	Valid	0.883	Reliable
		EN1.2	0.818**	Valid		
		EN1.3	0.813**	Valid		
		EN1.4	0.695**	Valid		
		EN1.5	0.482**	Valid		
		EN1.6	0.700**	Valid		
	Dedicated	EN2.1	0.692**	Valid	0.896	Reliable
		EN2.2	0.754**	Valid		
		EN2.3	0.831**	Valid		
		EN2.4	0.832**	Valid		
		EN2.5	0.741**	Valid		
	Absorption	EN3.1	0.738**	Valid	0.925	Reliable
		EN3.2	0.828**	Valid		
		EN3.3	0.810**	Valid		
		EN3.4	0.784**	Valid		
		EN3.5	0.767**	Valid		
		EN3.6	0.790**	Valid		

Ethical considerations

This study obtained ethical approval from the Dr Soetomo Hospital Foundation College of Health Sciences, Surabaya, Indonesia. The approval was granted with the Letter of Exemption number 0146/LOE/301.4.2/X/2020.

Study model and hypothesis

UTAUT can predict and explain the intentions and behaviours in using information systems. It is an integration of several previous study models, including the Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Motivational Model, Theory of Planned Behavior (TPB), A Combined Theory of Planned Behavior/Technology Acceptance Model (CTPB/TAM), Model of Personal Computer Use (MPCU), Diffusion of Innovations Theory (DIT), Social Cognitive Psychology, Cognitive Theory (SCT) (Zhou, 2012; Venkatesh, Thong & Xu, 2016).

UTAUT is widely used in studies focusing on information system technology in healthcare facilities. It highlights the importance of performance expectancy, effort expectancy, social influence, and facilitating conditions in fostering acceptance and utilisation of information system technology (Hennington & Janz, 2007; Nasir, 2013; (Iriani, Suyanto & Amborowati, 2014). One of its main advantages is its ability to explain around 70% of the variance in behavioural intention and about 50% in actual use (Wu, Tao & Yang, 2008; Fillion, Braham & Ekionea, 2012; Yu *et al.,* 2012; Zhou, 2012).

The UTAUT model does not include work engagement in estimating the use of information system technology (Venkatesh, Thong & Xu, 2016). Therefore, this study used the work engagement variable as a new exogenous mechanism in UTAUT extensions. This hypothesis was based on previous studies showing that work engagement partially affects behavioural intention (Hepola, Karjaluoto & Shaikh, 2016; Anggita &

Trenggana, 2020; Fanani *et al.,* 2021; Wu & Zhu, 2021. The following hypotheses were proposed:

H1: The effect of performance expectancy on behavioural intention;

H2: The effect of effort expectancy on behavioural intention;

H3: The effect of social influence on behavioural intention;

H4: The effect of facilitating conditions on behavioural intention;

H5: The effect of work engagement on behavioural intention.

Data analysis

Data analysis used the Partial Least Square (PLS) effect test to examine the discriminant validity of the outer loading values against the Fornell Larcker Criteria with

a standard >0.7 (see Table II). The reliability and validity of the constructs were assessed using rho_A, composite reliability, and Average Variance Extracted (AVE) >0.7. The inner loading values were considered significant with $p < 0.05$ and t-statistic >1.96. The model's power was determined based on the R^2.

Results

Based on Table III, the estimated path coefficients had a $p < 0.05$; therefore, the UTAUT model, with the addition of work engagement as an exogenous variable, could be developed in hospitals using question items adapted to the conditions of the existing EMR system. The R-square results of performance expectancy, effort expectancy, social influence, facilitating condition, and work engagement on behavioural intention showed a value of 0.740, indicating a goodness-of-fit value of the strong effect.

Table II: Discriminant validity of the variables forming UTAUT

Fornell Larcker criteria	Behavioural intention	Effort expectancy	Facilitating condition	Performance expectancy	Social influence	Work engagement
Behavioural intention	0.904					
Effort expectancy	0.653	0.768				
Facilitating condition	0.751	0.612	0.833			
Performance expectancy	0.712	0.648	0.629	0.880		
Social influence	0.640	0.682	0.638	0.627	0.779	
Work engagement	0.810	0.676	0.728	0.678	0.665	0.918

Table III: Distribution of estimate for path coefficients

Influence of behavioural intention	Original sample	T statistics	*p* values	Results
Effort expectancy → behavioural intention	0.054	0.779	0.436	Hypothesis rejected
Facilitating condition → behavioural intention	**0.263**	**3.514**	**0.000**	**Hypothesis accepted**
Performance expectancy → behavioural intention	**0.211**	**2.983**	**0.003**	**Hypothesis accepted**
Social influence → behavioural intention	0.020	0.266	0.790	Hypothesis rejected
Work engagement → behavioural intention	**0.425**	**4.998**	**0.000**	**Hypothesis accepted**

Based on Figure I, five significant variables directly affected the behavioural intention to use the EMR system in Surabaya Tertiary Hospital, Indonesia. A model for using electronic medical records was developed through work engagement as an exogenous variable in the UTAUT theoretical framework. Furthermore, the path coefficient value showed that work engagement had the greatest effect strength compared to other exogenous variables on behavioural intention at 0.425. The behavioural intention had an R^2

value of 0.740, indicating that all variables strongly affected it.

Discussion

According to Schaufeli's theory (2011), work engagement is a state of positive and affective motivational fulfilment characterised by vigour, dedication, and absorption. It is a promising concept for building better occupational health psychology.
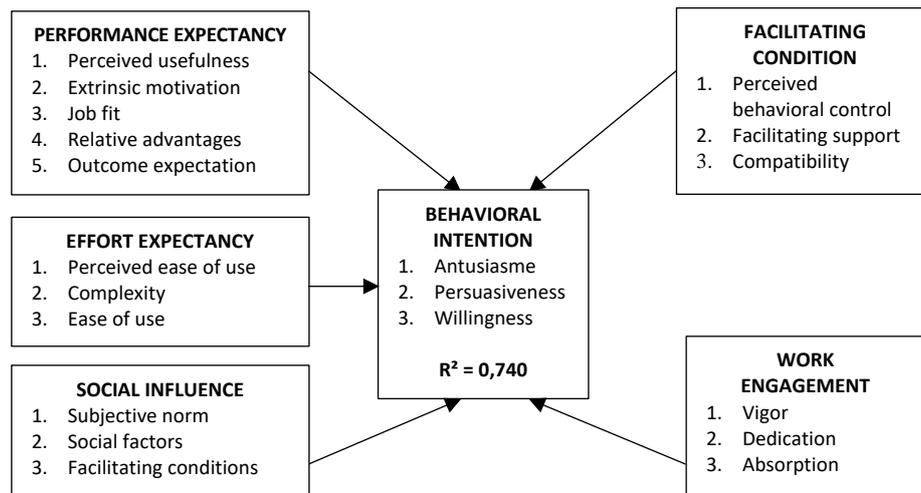
Figure I: PLS UTAUT Model development algorithm with the addition of work engagement

The results show that all indicators have a mean value perceived as good by medical residents regarding vigour, dedication, and absorption. Work engagement also partially affected behavioural intention, as previously demonstrated (Kang, 2014; Hepola, Karjaluoto & Shaikh, 2016; Anggita & Trenggana, 2020; Fanani *et al.,* 2021; Wu & Zhu, 2021).

Vigour and dedication indicators showed nearly equal values, with above-average means. This result can be attributed to medical residents displaying high levels of energy, persistence, joy, and a strong willingness to exert maximum effort in their work; they exhibited perseverance when faced with challenges (Schaufeli, 2011). Vigour is further characterised by enthusiasm, energy, mental resilience, earnestness, ease of waking up early, and the ability to endure prolonged periods of using EMR. Vigour provides a better contribution or significant value to work engagement in influencing behavioural intention.

Hospital management and leadership should acknowledge the advantages of implementing the system, allocate financial resources, and display a proactive attitude toward changes and continuous learning (Pujani, Sermiaty & Kotama, 2019). Motivation, satisfaction, psychological well-being, and a positive look at the use of EMR can benefit health workers. It facilitates tasks, such as timely and legible recording, and contributes to enhancing patient safety, indicating that EMR can be utilised with increased satisfaction (Bao *et al.,* 2020; Jedwab *et al.,* 2021).

In summary, vigour, dedication, and absorption in the work engagement variable had a good mean value and influenced behavioural intention, as supported by previous studies (Kang, 2014; Hepola, Karjaluoto & Shaikh, 2016; Anggita & Trenggana, 2020; Fanani *et al.,* 2021; Wu & Zhu, 2021). Among the exogenous variables, work engagement exhibited the most significant effect in terms of strength. Therefore, these indicators of vigour, dedication, and absorption of this path can be used as components of a work engagement model to predict behavioural intention regarding the acceptance of EMR among medical residents at the Surabaya Tertiary Hospital.

Conclusion

The findings indicated that this model accounts for a 74% variance in the behavioural intention to use EMR. Organisations should focus on enhancing the following seven most frequently cited drivers of engagement to foster intention among medical residents: the nature of the work, clear goals and objectives, development opportunities, timely recognition and appreciation, building respectful and assertive relationships, facilitating open and two-way communication, and inspiring leadership and systems. The involvement of medical residents could be enhanced by instilling vigour, dedication, and absorption aspects that can significantly increase behavioural intention to use EMR. Therefore, the regularity of recording and documenting patient health status can improve the quality of health services while meeting the objectives set by the Indonesian Ministry of Health for a 100% EMR integration by 2024 to align with the Sustainable Development Goals.

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