

Management Information System at Dental Education Hospital Using UTAUT Method

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Abstract. Information system technology has encouraged and influenced the health services needed in order to meet the demands of the community for the accuracy and speed of services provided by hospitals. But the application of information technology is not always successful. One of the determinants of the success of the application of information technology is the attitude of users of technology that reflects the extent to which interest in using information systems. This can be known by applying one of the evaluation models, namely the UTAUT model, which is a combination of eight models of technology user acceptance that have been developed previously. The four UTAUT constructs are used as determinants that influence the user's intention and use behavior. This study aims to determine the effect of performance expectations, effort expectations, social influences and facilitation conditions on behavioral intentions of users. Data were obtained through 30 questionnaires distributed to hospital information system users at Unsoed Dental Education Hospital in Purwokerto with sampling techniques using simple random sampling.

Keywords: UTAUT, Hospital Information System, Behavior Intention, Use Behavior

1. INTRODUCTION

Information system technology has encouraged and influenced the health services needed in order to meet the demands of the community for the accuracy and speed of service. Hospitals as health care services are expected to provide maximum service to the community [1]. The Indonesian Ministry of Health has issued a policy that is a guideline for the implementation of health development in order to improve the quality of health services in hospitals, in accordance with Health Minister Regulation of the Republic of Indonesia No.1171/MENKES/PER/ VI/2011 article 1 Paragraph 1 which states that "Every hospitals are required to implement Hospital Information Systems "[2].

Hospital Management Information System (HMIS) is an integrated information system prepared to handle the entire process of hospital management so that it can present accurate and timely information. However, at this time many hospitals are not aware of the importance of managing data in hospitals that are very large and have not been properly arranged so that the hospital services do not work effectively. At present, several hospitals have started implementing MIS because hospitals are required to always improve services to the community in the form of increasing accreditation (type) of hospitals including dental and oral hospitals [3]. Dental Education Hospital is a health service facility that organizes individual dental and oral health services for treatment and recovery services without neglecting health improvement services and prevention of diseases carried out through outpatient services, emergency services and medical treatment services [4]. Dental and oral health services at Unsoed Dental Education Hospital are performed by general dentists and specialist dentists in the Public Service Unit clinic and students of the dental profession in the Integration clinic.

Based on the medical record data of Unsoed Dental Education Hospital during 2019, the number of outpatient visits increased every month, which led to the increasing demand and service needs given to patients. In an effort to improve service quality, coordination, efficiency, responsibility, supervision and provision of information quickly, precisely, and accurately in 2014 this hospital has implemented MIS in several units. However, there are problems that arise in the

implementation of the system, namely the use that is still low on continuous information systems. According to staff at this hospital, there are still staff who do not know and understand the use of MIS so that there are many errors in applying the system and there are still installations that have not used MIS modules provided by the hospital regularly. Therefore, in Unsoed Dental Education Hospital there needs to be a system evaluation on management that is currently running.

Evaluation is a real effort to find out the actual condition of an information system implementation. With this evaluation, the achievement of the implementation of an information system activity can be known and further actions can be planned to improve the performance of its implementation [5]. The UTAUT model is one of the relatively new models for receiving information technology developed by Venkatesh et al. [6] and can be used in evaluating MIS. The main focus of the research examines the determinants of behavioral intention and use behavior which consist of performance expectancy, effort expectancy, social influence, and facilitating conditions on the user of the management information system. The purpose of this study was to examine the application of management information system evaluation at Unsoed Dental Education Hospital using the UTAUT method.

2. LITERATURE REVIEW

2.1. Hospital Management Information System

Hospital information system is an order relating to data collection, data processing, presentation of information, data analysis and conclusions of information and delivery of information needed for hospital activities. Hospital Management Information System (HMIS) is a computerized system that is able to process data quickly and accurately, and produce a collection of information that interact with each other to be given to all levels of management in the hospital [7].

HMIS functions to manage and manage information needed by health or medical officers to help and improve their performance effectively and efficiently. The purpose of HMIS in general is to be able to provide accurate, timely information for decision making at all administrative levels in planning, implementing, monitoring, controlling, and evaluating in hospitals [8].

2.2. Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) is an IT acceptance theory developed by Venkatesh et al. [6]. The purpose of this theory is to provide criteria or variables that affect IT acceptance by the user. Initially there were eight criteria that determined IT receipts which were then reviewed, grouped by similarity and validated into four main criteria, which were named Unified Theory of Acceptance and Use of Technology (UTAUT). After being tested, UTAUT provides an assessment that is almost the same as the eight previous criteria to determine the IT acceptance and intention of the user [5].

The UTAUT model has four constructs that play an important role as direct determinants of behavioral intention and use behavior, namely, performance expectancy, effort expectancy, social influence, and facilitating conditions [6].

- a. Performance expectancy, namely the extent to which an individual believes that using a system will help him to achieve results in his work performance.
- b. Effort expectancy, which is the extent of ease associated with using the system.
- c. Social influence is the extent to which an individual's perception of the beliefs of others in using a new system.
- d. Facilitating conditions, namely the extent to which an individual believes that organizational and technical infrastructure must exist to support the use of the system.

In addition there are also four moderators used in the UTAUT model, namely gender, age, experience, and voluntariness of use which are positioned to moderate the impact of constructs on

behavioral intention and use behavior [6]. Schematically the theory of UTAUT can be seen in Figure 1 below.

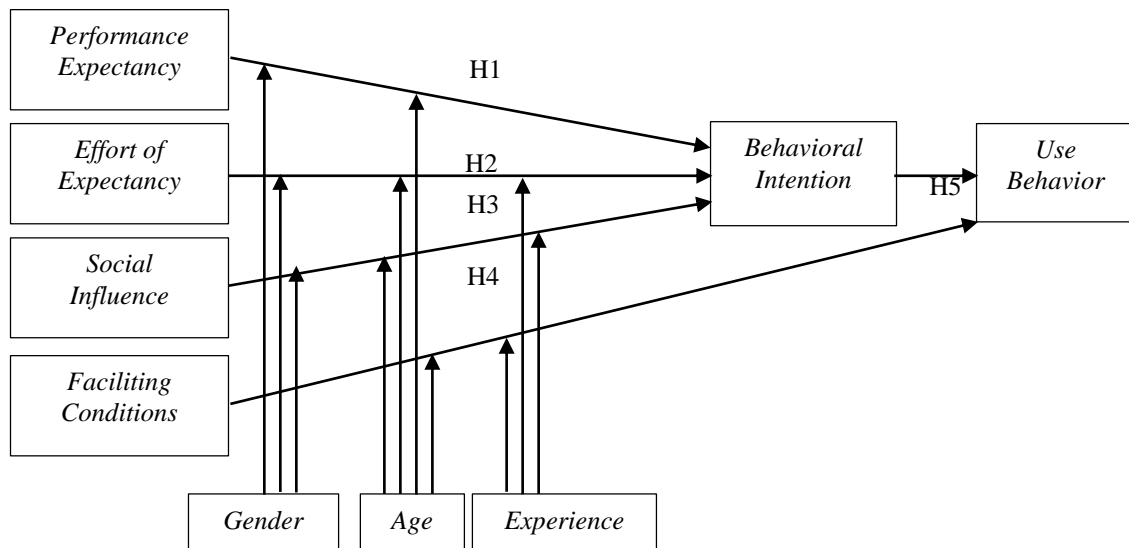


Figure 1. Development of a research model

Based on Figure 1, the research hypotheses developed in the UTAUT method are: (1) performance expectancy has a positive effect on behavioral intention, (2) expediting efforts have a positive influence on behavioral intention, (3) social influence has a positive influence on behavioral intention, (4) facilitating conditions have a positive influence on use behavior, (5) behavioral intention has a positive influence on use behavior.

3. RESEARCH METHOD

The research conducted is analytical research with a quantitative approach. The type of data used is primary data. The population of all employees who use management information systems as many as 43 people with a simple random sampling technique. From this population, the number of samples of 30 people was calculated using the Slovin formula. The method of data collection in this study was interviews with research instruments using questionnaires. Questionnaires contain questions with closed questions and questions for each variable derived from items that have been validated from previous studies. The constituent dimensions used are the variable performance expectancy, effort expectancy, social influence, facilitating conditions, behavioral intention, and use behavior from respondents to MIS. The measurement scale used in this questionnaire is a Likert scale using a range of scores 1-4.

Data analysis in this study uses the SPSS program which starts from testing instruments, namely validity and reliability tests. The validity test used is Pearson correlation and reliability test using Cronbach Alpha analysis technique. A questionnaire is declared reliable if it produces a value of $\alpha > 0.6$. Then continued the classic assumption test using normality test, multicollinearity test, and heteroscedasticity test. Data normality testing using the Kolmogorov-Smirnov test. How to detect multicollinearity can be seen from the value of Tolerance and Variance Inflation Factor (VIF). Whereas to detect the presence of heteroscedasticity symptoms using the Glejser test to see whether or not a pattern occurs at residual values in the model in this study. Hypothesis testing is done by conducting multiple regression tests.

4. RESULT AND DISCUSSION

4.1. Characteristics of Respondents

4.1.1. Age of respondent

The results of the characteristics of respondents based on age, respondents who have a age less than 35 years are 19 respondents or 63.3% and more than or equal to 35 years as many as 11 respondents or 46.7%. It was seen that respondents were dominated by the age group <35 years. This is due to the age, which in general employees are relatively easy to understand information systems. According to the Indonesian Ministry of Health [9], the age group 26-35 years is an early age group. In this age group, it is known that the productive age of humans is at work, where the function of the human body is working optimally, including its memory, so that Unsoed Dental Education Hospital employs employees with this age range [10].

4.1.2. Gender

The results of respondents' characteristics by gender, respondents who were female were 21 respondents or 70% while the number of male respondents was 9 respondents or 30%. Respondents by sex were the most respondents with female sex than men. This happens because the conditions of employees in Unsoed Dental Education Hospital, both doctors, pharmacists, nurses, and other fields that can access directly the most MIS are female.

4.1.3. Experience working with information systems

Based on work period, it is dominated by respondents who work more than 3 years. From the results of interviews, respondents generally followed the process of converting the old system to a new system, and they followed the training phase of the use of a new system that was updated in 2017. The length of work period is directly related to the work experience of the respondents running the information system. According to Ranupandojo [11], work experience is defined as a measure of the time span a person has taken to be able to understand the tasks of a job and has been carried out properly. Based on Wulansih's research [12], the longer a person's work experience, the higher the productivity of his work. MIS officers at Unsoed Dental Education Hospital are dominated by productive age groups and work experience that has been around for quite a long time.

4.2. Test Validity and Reliability

From the results of the statement as many as 45 statements were tested for validity using the SPSS program with the following results:

Table 1. Validity test results

Variable	Statements	r table	Pearson correlation	Information
Performance expectancy	X1.1	0,361	0,663	Valid
	X1.2	0,361	0,594	Valid
	X1.3	0,361	0,742	Valid
	X1.4	0,361	0,698	Valid
	X1.5	0,361	0,634	Valid
	X1.6	0,361	0,204	Invalid
	X1.7	0,361	0,014	Invalid
	X1.8	0,361	0,340	Invalid
	X1.9	0,361	0,583	Valid
	X1.10	0,361	0,667	Valid
	X1.11	0,361	0,765	Valid
	X1.12	0,361	0,850	Valid
	X1.13	0,361	0,837	Valid
Effort expectancy	X2.1	0,361	0,071	Invalid
	X2.2	0,361	0,165	Invalid
	X2.3	0,361	0,428	Valid

	X2.4	0,361	0,384	Valid
	X2.5	0,361	0,459	Valid
	X2.6	0,361	0,684	Valid
	X2.7	0,361	0,674	Valid
	X2.8	0,361	0,744	Valid
	X2.9	0,361	0,611	Valid
	X2.10	0,361	0,434	Valid
	X2.11	0,361	0,646	Valid
	X2.12	0,361	0,625	Valid
Social influences	X3.1	0,361	0,852	Valid
	X3.2	0,361	0,743	Valid
	X3.3	0,361	0,604	Valid
	X3.4	0,361	0,524	Valid
	X3.5	0,361	0,574	Valid
	X3.6	0,361	0,642	Valid
	X3.7	0,361	0,797	Valid
	X3.8	0,361	0,792	Valid
	X3.9	0,361	0,556	Valid
Facilitating conditions	X4.1	0,361	0,603	Valid
	X4.2	0,361	0,322	Invalid
	X4.3	0,361	0,428	Valid
	X4.4	0,361	0,160	Invalid
	X4.5	0,361	0,767	Valid
	X4.6	0,361	0,701	Valid
Behavior intention	Y1.1	0,361	0,700	Valid
	Y1.2	0,361	0,773	Valid
	Y1.3	0,361	0,685	Valid
Use behavior	Y2.1	0,361	0,967	Valid
	Y2.2	0,361	0,967	Valid

The results of the validity test using the SPSS program show a valid statement of 38 statements from a total of 45 statements. Each statement is said to be valid if the value of $r_{count} > r_{table}$ is worth 0.361. So that the statement on the performance expectancy variable from 13 valid 10 statements and 3 is invalid. Variable effort expectancy from 12 valid 10 statements and 2 invalid. Variables of social influences of 9 statements 9 are valid all. Facilitating conditions from 6 statement items 4 valid and 2 invalid. The behavioral intention variable from 3 valid 3 statements all and the use behavior variable from 2 statements 2 valid all.

From the results of the validity test, 38 statements were then tested for reliability using the SPSS program shows that the Cronbach Alpha value is $0.923 > \alpha 0.6$, so 38 statements can be used entirely reliably.

4.3. Classic Assumption Test

The results of the normality test of the data using kolmogorov-smirnov show a significance value of $0.901 > 0.05$ so that it can be concluded that the data is normally distributed. Furthermore, the results of multicollinearity tests based on tolerance values showed results > 0.10 and based on VIF values < 10.00 so that it can be concluded that there was no multicollinearity. Then based on the results of heteroscedasticity test shows a significance value > 0.05 so it can be concluded that there is no heteroscedasticity.

4.4. Hypothesis testing

4.4.1. Test F

Based on the test results obtained by the value of F table with a significance level of $\alpha = 5\%$ and degrees of freedom (df) of 2.96. The results of data processing are known that the calculated F

value is 5.196 and the calculated F value is greater than F table or the significance value is below 0.05 (Table 3). It is known that F count is greater than F table or $5.196 > 2.96$, then the decision that can be taken is H_0 is rejected and the research hypothesis is accepted, meaning the performance expectancy variable, effort expectancy, overall social influence has a significant influence on the behavioral intention variable.

Table 3. Results F test

Model	Sum of squares	df	Mean squares	F	Sig
Regression	11.195	3	3.732	5.196	.006
Residual	18.672	26	.718		
Total	29.867	29			

F table value with a significant level of $\alpha = 5\%$ and df of 3.34. The results of data processing are known that the calculated F value is 7.445 and the calculated F value is greater than F table or the significance value is below 0.05 (Table 4). It is known that F count is greater than F table or $7.445 > 3.34$, so the decision that can be taken is H_0 rejected and the research hypothesis accepted, meaning that facilitating condition and behavioral intention as a whole have a significant influence on use behavior.

Table 4. Results F test

Model	Sum of squares	df	Mean squares	F	Sig
Regression	82.274	2	41.137	7.445	.003
Residual	149.193	27	5.526		
Total	231.467	29			

4.4.2. T test

Partial test (t test) aims to determine how much influence the independent variable partially on the dependent variable assuming the other variables are constant. From the results of this test it was found that:

H1: performance expectancy has a positive effect on behavioral intention

The desire to have good performance is the ideal of each employee. The hope of using the system is to improve their performance. The results of the regression analysis to test hypothesis 1 in this study state that performance expectations have a positive effect on interest in user behavior. This shows that if there is an increase in performance expectations, it is predictable that interest in the behavior of MIS usage will increase. Conversely, if there is a decrease in performance expectations, it can be predicted that interest in the behavior of MIS usage will decrease.

The results of this study are in line with the results of research from Wahyuni and Maita [5] stating that performance expectations have a positive influence on the interest in system usage behavior which means that performance expectations increase, the interest of user behavior to use MIS is also high. The research conducted by Hasyim [13], states that respondents assume that the use of MIS can help them to get performance benefits at work such as improving performance, increasing time efficiency, increasing work effectiveness, and improving their experience and skills in using information systems. This result is also in line with the results of interviews with respondents, where they can complete work more quickly and effectively.

H2: effort expectancy has a positive influence on behavioral intention

The ease of use of a system is a hope for system users. Business expectations are an illustration of the ease of use of information systems. The results of the regression analysis to test hypothesis 2 in this study are rejected so that it can be said that the expectations of effort do not affect the interest of user behavior. This shows that the level of ease does not have a significant influence on behavioral intention.

The results of this study are in line with the research of Zainiyah [14] which states that there is a negative relationship between business expectations and interest in user behavior to use a MIS. The negative value indicates that respondents do not need a big effort when using a MIS because the system used is easy so that it increases the user's interest to use a MIS.

H3: social influence has a positive influence on behavioral intention

As social beings, individuals always interact with their social environment where they are. Social factors are influences from the surrounding environment that convince individuals to use information systems. The influence of the surrounding environment intended in this study is like workmates outside MIS users, information system officers, hospital heads, and MIS user friends in different units.

The results of the regression analysis to test hypothesis 3 in this study are accepted so that it can be said that social influences influence the interest of user behavior towards MIS. This shows that high social influences increase the interest of respondents' behavior to use information systems. The results of this study are in line with the research of Megawati and Firnandi [15], where the results of the tests show that the quality of social influences has an influence on behavioral intention.

H4: facilitating conditions have a positive influence on use behavior

The results of the regression analysis to test hypothesis 4 in this study state that facilitating conditions have a positive effect on user behavior on MIS. The results of this study are in line with the results of research from Rohmadi et al. [16] which shows that facilitating conditions have an influence on behavioral intention. This shows that the user believes that the existence of conditions that help in using MIS will make it easier to apply MIS.

H5: Behavioral intention has a positive influence on use behavior

Activities carried out by individuals begin with intentions. The intention in this study was operationalized as an interest in using information systems. Whereas behavior in this case is operationalized as the use of information systems. This variable is a dependent variable that reflects actual behavior, namely the behavior of using an information system, either in the form of inputting transactions, printing reports, or other activities related to the use of an information system.

The results of the regression analysis to test hypothesis 5 in this study are accepted so that it can be said that behavioral intention has a significant influence on use behavior. This shows that the intention to use will have an influence on the user's attitude in using a MIS. The results of this study are in line with the theory put forward by Venkatesh et al. [6] which states there is a direct and significant relationship between interest in behavior towards the use of MIS. To increase the enthusiasm of users in completing their work, they must first increase their interest in the MIS that they use in completing their tasks.

5. CONCLUSION

The conclusion that can be drawn from this study is that overall performance expectancy, effort expectancy, and social influence variables significantly influence $p < 0.05$ on behavioral intention and facilitating conditions and behavioral intention significantly influence the use behavior of hospital information system users at Unsoed Dental Education Hospital. While individually it can be concluded that: (1) performance expectancy has an influence on behavioral intention; (2) effort expectancy does not have an influence on behavioral intention; (3) social influences have an influence on behavioral intention; (4) facilitating condition has an influence on behavioral intention; (5) behavioral intention has an influence on use behavior. Based on the results of the

study, it was found that MIS barriers often experienced problems such as duplication of data, features that were not functioning, system errors, and the problem was only resolved reactively and there was also no evaluation and monitoring of the use of MIS in Unsoed Dental Education Hospital.

Based on the results of the analysis and conclusions, the implications or benefits of this study, namely Unsoed Dental Education Hospital, need to conduct training in the application of MIS and also make regulations to use MIS regularly. With that, it can improve user behavior to use MIS and to avoid excessive workload when using a MIS so that users will feel working using a MIS provides benefits and improves its performance because it can complete its work quickly.

REFERENCE

- Jogiyanto. 2008. Sistem Teknologi Informasi. Yogyakarta. Andi Offset
- Kementerian Kesehatan RI. 2011. Sistem Informasi Rumah Sakit. Jakarta.
- Aji, M.B., Madiun, A.M. 2017. Evaluasi Penerapan Sistem Informasi Manajemen Rumah Sakit RSIA Bhakti Persada Magetan Menggunakan TAM. ISSN. 12(2): 32-55.
- Kementerian Kesehatan RI. 2004. Rumah Sakit Gigi dan Mulut. Jakarta.
- Wahyuni, V., Maita, I. 2015. Evaluasi Sistem Informasi Manajemen Rumah Sakit (SMRS) Menggunakan Metode Unified Theory of Acceptance and Use of Technology (UTAUT). Jurnal Rekayasa dan Manajemen Sistem Informasi, 1(1): 55-61.
- Venkatesh, V., Morris, M. G., Davis, G. B., Davis, F.D. 2003. User Acceptance of Information Technology: Toward A Unified View. MIS Quarterly. 27(3): 425-478.
- Shofari, B. 2005. Pengelolaan Sistem Rekam medis, Perhimpunan Organisasi Profesional Perekammedisan. Informatika Kesehatan Indonesia. Semarang.
- Puspitasari, N., Permanasari, E., Nugroho, H.A. 2013. Analisis Penerapan Sistem Informasi Manajemen Rumah Sakit Menggunakan Metode UTAUT dan TTF. JNTETI. 2(4): 225-233.
- Departemen Kesehatan Republik Indonesia. 2009. Sistem Kesehatan Nasional. Jakarta.
- Riauwi, H.M., Hasneli, N.Y., Lestari, W. 2014 Efektivitas Pendidikan Kesehatan Dengan Penerapan the Health Belief Model. Jurnal Online Mahasiswa Program Studi Ilmu Keperawatan. 1(2): 1-9.
- Ranupandojo, H., Husnan, S. 2002. Manajemen Personalialia. 4 ed. Yogyakarta. BPFE.
- Wulansih, H. 2014. Analisis Tingkat Pendidikan dan Pengalaman Kerja Terhadap Produktivitas Kerja Karyawan pada Perusahaan Furniture CV. Mugiharjo Kragilan Boyolali. Universitas Muhammadiyah Surakarta. Surakarta.
- Hasyim. 2010. Analisis Pengaruh Ekspektasi Kinerja, Ekspektasi Usaha, dan Faktor Sosial Terhadap Penggunaan Sistem Informasi. Universitas Hassanudin. Makassar.
- Zainiyah. 2016. Analisis Faktor yang Berhubungan dengan Perilaku Penggunaan Sistem Informasi Manajemen di Rumah Sakit Paru Jember. Universitas Jember. Jember.

Megawati, Firnandi, R. 2017. Analisis Perbandingan Metode TAM dan UTAUT dalam Mengevaluasi Penerimaan Pengguna Sistem Informasi Manajemen Rumah Sakit (SIMRS). Seminar Nasional Teknologi Informasi Komunikasi dan Industri. 9: 1-9.

Rohmadi, Soedijono, B. Henderi. 2017. Evaluasi Sistem Informasi Rumah Sakit untuk Mengetahui Minat Pengguna Dengan Metode UTAUT (Studi Kasus: RS. Jati Husada Karanganyar). Jurnal INFORMA Politeknik Indonusa Surakarta. 3(1): 90-106.