EVALUATION OF USER BEHAVIOR ELECTRONIC MEDICAL RECORDS BASED ON UTAUT (UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY) METHOD

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Abstract

Background: The technology of information systems at this time affects the implementation of health services needed by the community. The hospital information system is one of the important components that can create the realization of efforts to improve the quality of health services. Evaluation of the implementation of the hospital management information system needs to be carried out to optimize the use of information systems in data management in hospitals. One method to evaluate information systems and technology is to use the UTAUT (Unified Theory of Acceptance and Use of Technology) method. **Methods**: This study is a quantitative study with a research design using a cross-sectional approach. Data were obtained from the results of the questionnaire using the UTAUT questionnaire. **Result**: Performance expectancy has a negative impact on behavioral intention of 13,7%, effort expectancy has a positive impact on behavioral intention of 57,5%, social influence has a positive impact on behavioral intention of 29,7%, facilitating conditions have a positive impact on use behavior of 49,5 %, and behavioral intention has a positive impact on use behavior by 56,1%. **Conclusion**: There is a positive impact of effort expectancy and social influence on behavioral intention, there is a positive impact of facilitating conditions and behavioral intention on use behavior, while for performance expectancy there is a negative impact on behavioral intention.

Keywords: SIMRS, Electronic medical record, UTAUT

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INTRODUCTION

The technology of information systems at this time affects the implementation of health services needed by the community. The hospital information system is one of the important components that can create the realization of efforts to improve the quality of health services. Evaluation of the implementation of the hospital management information system needs to be carried out to optimize the use of information systems in data management in hospitals. One method to evaluate information systems and technology is to use the UTAUT (Unified Theory of Acceptance and Use of Technology) method. The purpose of this study is to determine the behavior of health workers in using electronic medical records.

RESEARCH METHODS

This study uses quantitative research methods to explain the relationship between variables to see how the behavior of health workers in using electronic medical records in outpatient installations. The design of this study used a cross-sectional approach. The sampling technique used in this research is total sampling. In this study, the independent variables are performance expectancy, effort expectancy, social influence, and facilitating conditions, while the dependent variables are use behavior and behavior intention. The main instrument used in this study was the UTAUT questionnaire. The data collection technique used in this study is a survey data collection technique by distributing questionnaires directly to respondents by providing direction and information about the process of filling out the questionnaire first.

RESULTS AND DISCUSSIONS

Results

This research was carried out in the Outpatient Installation which took place from January to February 2022. Data collection in this study was carried out using the UTAUT questionnaire to all hospital staff using electronic medical records. The number of respondents in this study was 56 respondents.

Table 1. Distribution of Research Respondents' Data

Data		Count	Percentage
Gender	Male	16	28,57%
	Female	40	71.43%
Profession	Doctors (General Practitioners, Dentists, and Specialists)	20	35,71%
	Nurse	12	21,43%
	Mid-wife	8	14,29%
	Other hospital staff	16	28,57%
History of Use of Electronic Medical Records	0-12 months	39	69,64%
	>12 months	17	30,36%

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In this study, data analysis and hypothesis testing used Partial Least Square (PLS) analysis techniques with the smartPLS 3.0 program. The following is a schematic of the PLS program model tested:
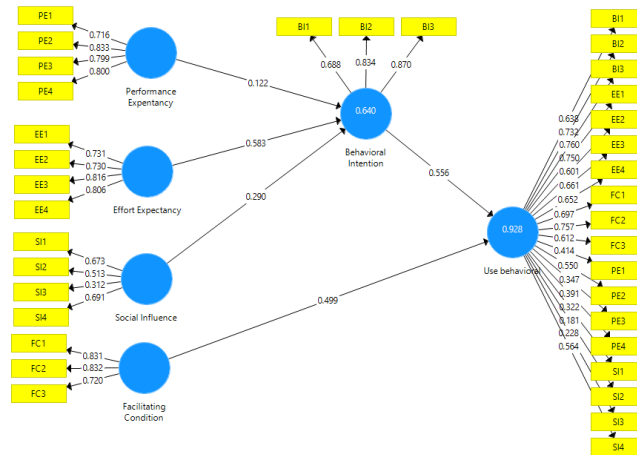

Figure 1. Outer Model

Based on the data presented above, it is known that each indicator of the research variable has a value of outer loading > 0.7. However, it appears that there are still some indicators that have an outer loading value of < 0.7. According to Chin as quoted by Imam Ghozali (2014), the outer loading value between 0.5 - 0.6 is considered sufficient to meet the requirements of convergent validity. The data above (SI3) < 0.5, so it is necessary to eliminate data, and re-specify the model. To test the convergent validity specification, the value of the outer loading or loading factor is used. The following is the value of the outer loading of each indicator on the research variable:
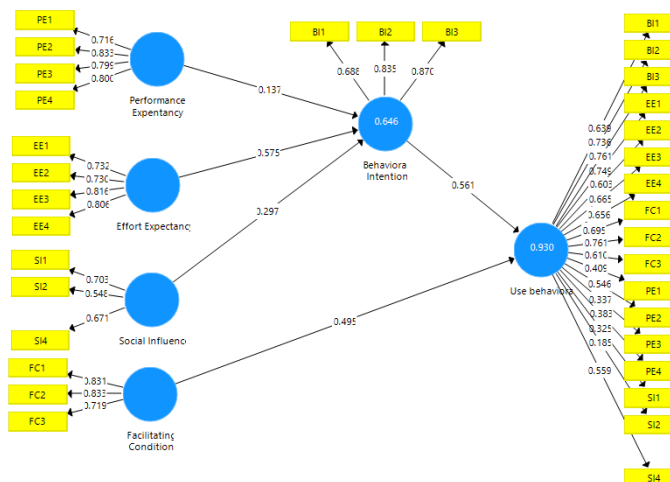

Figure 2. Model Respecification

Based on the data presented above, after elimination, it is known that each research variable indicator already has an outer loading value > 0.5. So it can be said that the variable meets convergent validity.

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The discriminant validity test uses the cross-loading value. An indicator is declared to meet discriminant validity if the value of the cross-loading indicator on the variable is the largest compared to other variables. The following is the cross-loading value of each indicator:

Table 2. Discriminant Validity

	Behavioral Intention	Effort Expectancy	Facilitating Condition	Performance Expectancy	Social Influence
BI1	**0.688**	0.486	0.556	0.236	0.421
BI2	**0.835**	0.569	0.567	0.393	0.483
BI3	**0.870**	0.684	0.491	0.476	0.413
EE1	0.741	**0.732**	0.569	0.391	0.462
EE2	0.347	**0.730**	0.589	0.337	0.086
EE3	0.536	**0.816**	0.542	0.236	0.157
EE4	0.463	**0.806**	0.604	0.180	0.207
FC1	0.521	0.593	**0.831**	0.188	0.378
FC2	0.576	0.704	**0.833**	0.221	0.461
FC3	0.490	0.461	**0.719**	0.187	0.403
PE1	0.360	0.220	0.240	**0.716**	0.324
PE2	0.480	0.389	0.285	**0.833**	0.367
PE3	0.224	0.221	0.121	**0.799**	0.207
PE4	0.321	0.325	0.074	**0.800**	0.218
SI1	0.339	0.156	0.189	0.280	**0.703**
SI2	0.189	0.121	0.104	0.043	**0.548**
SI4	0.447	0.324	0.561	0.307	**0.671**

Based on the data presented in the table above, it can be seen that each indicator in the research variables has the largest cross-loading value on the variables it forms compared to the cross-loading values on other variables. Based on the results obtained, it can be stated that the indicators used in this study have good discriminant validity in compiling their respective variables. From the above test, it can be said that the data has met the validity.

The reliability test was measured using Average Variance Extracted (AVE) and Composite Reliability. AVE and Composite Reliability are parts that are used to test the reliability value of indicators on a variable. A variable can be declared to meet reliability if it has a composite reliability value > 0.6. And AVE > 0.5 The following is the reliability value of each variable used in this study:

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Table 3. Reliability Test

	Composite Reliability	Average Variance Extracted (AVE)
Behavioral Intention	0.842	0.642
Effort Expectancy	0.855	0.596
Facilitating Condition	0.838	0.634
Performance Expectancy	0.867	0.621
Social Influence	0.678	0.415

Based on the data presented in the table above, it can be seen that the composite reliability value of all research variables is> 0.6, while the AVE test shows that there is one that has not been > 0.5, while the others already have a value of > 0.5. These results indicate that each variable has met composite reliability and AVE is sufficient, so it can be concluded that all variables have a sufficient level of reliability.
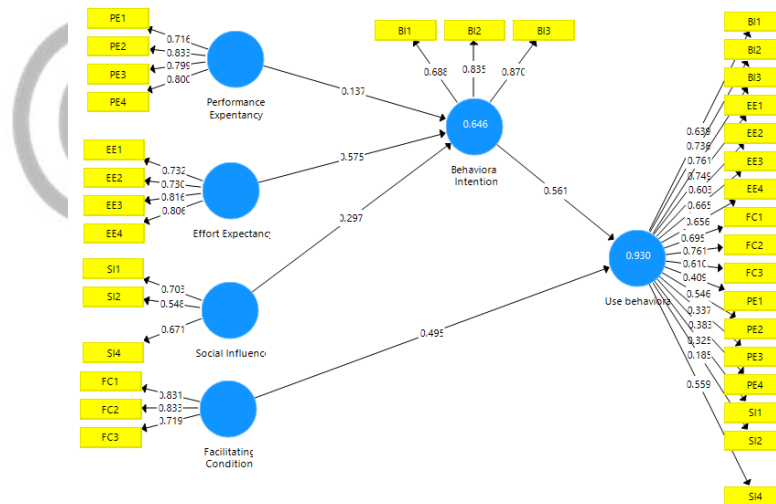

Figure 3. Evaluation Inner Model

Path coefficient evaluation is used to show how strong the impact of the independent variable is on the dependent variable. While the coefficient determination (R-Square) is used to measure how much the endogenous variable is influenced by other variables. Chin said the results of R2 of 0.67 and above for endogenous latent variables in the structural model indicated that the impact of exogenous variables (influenced) on endogenous variables (influenced) was in a good category. Meanwhile, if the result is 0.33 – 0.67 then it is included in the medium category, and if the result is 0.19 – 0.33 then it is included in the weak category.

Based on the inner model scheme that has been shown in picture 5 above, it can be explained that the largest path coefficient value is indicated by the influence of Behavior Intention on Use Behavior of 9.30. So it can be said that the model is in a strong category.

Based on the description of these results, shows that all variables in this model have a path coefficient with a positive number. This shows that the greater the path coefficient value on one independent variable on the dependent variable, the stronger the influence between the independent variables on the dependent variable.

Table 4. R-Square

	R Square
Behavioral Intention	0.646
Use behavioral	0.930

Based on the data presented in the table above, it can be seen that the R-Square value for the behavior intention variable is 0.646. Obtaining this value explains that the percentage of behavior intention can be explained by the independent variable of 64.6%. Then the R-Square value obtained from the Use Behavior variable is 0.930. This value explains that Use Behavior can be explained by independent variables and behavior intention is 93%.

Hypothesis testing in this study was conducted by looking at the value of T-Statistics and the value of P-Values. The research hypothesis can be declared accepted if the P-Values <0.05. The following are the results of hypothesis testing obtained in this study through the inner model:

Table 5. Results of Hypothesis Test

	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Values	Results
Behavioral Intention → Use behavioral	0,561	0,558	0,064	8.724	0.000	acceptable
Effort Expectancy → Behavioral Intention	0,575	0,576	0,084	6.864	0.000	acceptable
Facilitating Condition → Use behavioral	0,495	0,498	0,070	7.089	0.000	acceptable
Performance Expectancy → Behavioral Intention	0,137	0,130	0,096	1.430	0.153	rejected
Social Influence → Behavioral Intention	0,297	0,308	0,091	3.269	0.001	acceptable

Based on the data presented in the table above, it can be seen that the impact of Performance Expectancy on Behavioral Intention is not significant because the P-value (0.153) > 0.05. The impact of Effort Expectancy on Behavioral Intention is significant with a P-value (0.000) < 0.05. The impact of Social Influence on Behavioral Intention is

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significant with a P-value (0.001) < 0.05. The impact of Facilitating Condition on Use Behavior is significant with a P-value (0.000) < 0.05. The impact of Behavioral Intention on Use Behavior is significant with a P-value (0.000) < 0.05.

Discussions

1. The Impact of Performance Expectancy on Behavioral Intention

Based on the proposed hypothesis regarding the impact of Performance expectancy on Behavioral Intention, it is known that the proposed hypothesis is rejected because the P-value in this hypothesis is 0.153 (>0.05).

The coefficient value of the Performance Expectancy variable on the Output Path Coefficient is 0.137, which means that there is a negative impact of 13.7% on the Behavioral Intention variable.

The relationship between Performance Expectancy and Behavioral Intention is that the higher the benefits that will be obtained by the user, the higher the acceptance and use of a system by the individual. In this study, it was found that the Performance Expectancy of the electronic medical record users studied still yielded a negative value, this could be due to the low level of profit to be obtained by the user which resulted in lower acceptance and use of the electronic medical record system by the individual. This is different from Phichitchaisopa and Naenna (2013) who found that Performance Expectancy has a significant influence on Behavioral Intention in the use of health information systems in Thailand.

2. The Impact of Effort Expectancy on Behavioral Intention

Based on the proposed hypothesis regarding the impact of Effort expectancy on Behavioral Intention, it is known that the proposed hypothesis is accepted because the P-value in this hypothesis is 0.000 (<0.05).

The coefficient value of the Effort Expectancy variable on the Output Path Coefficient is 0.575 which means that there is a positive impact of 57.5% on the Behavioral Intention variable.

The relationship between Effort Expectancy and Behavioral Intention is that the higher the level of ease in using a system, the higher the acceptance and use of a system. In this study, it was found that Effort Expectancy has the greatest influence compared to other variables on Behavioral Intention. These results illustrate that most respondents use electronic medical records because they are easy to understand.

3. The impact of Social Influence on Behavioral Intention

Based on the proposed hypothesis regarding the impact of Social Influence on Behavioral Intention, it is known that the proposed hypothesis is accepted because the P-value in this hypothesis is 0.001 (<0.05).

The coefficient value of the Social Influence variable on the Output Path Coefficient is 0.297, which means that there is a positive impact of 29.7% on the Behavioral Intention variable.

Social Influence is the influence of important people who suggest the use of the system. Many studies have been conducted to investigate the social influence on the desire to use technology. The higher the influence exerted by people who are important to the user, the higher the acceptance and use of a system.

4. The Impact of Facilitating Condition on Use Behavior

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Based on the submission of hypotheses related to the impact of Facilitating conditions on Behavioral Use, it is known that the proposed hypothesis is accepted because the P-value in this hypothesis is 0.000 (> 0.05).

The coefficient value of the Facilitating Condition variable on the Output Path Coefficient is 0.495, which means that there is a positive impact of 49.5% on the Use Behavior variable.

5. The Impact of Behavioral Intention on Behavioral Use

Based on the submission of hypotheses related to the impact of Behavioral Intention on Behavioral Use, it is known that the proposed hypothesis is accepted because the P-value in this hypothesis is 0.000 (>0.05).

The coefficient value of the Behavioral Intention variable on the Output Path Coefficient is 0.561 which means that there is a positive impact of 56.1% on Use Behavior.

CONCLUSIONS

1. The Performance Expectancy variable has a negative impact on the Behavioral Intention variable with a value of 13.7%.
2. The Effort Expectancy variable has a positive impact on the Behavioral Intention variable with a value of 57.5%.
3. Social influence variable has a positive impact on the Behavioral Intention variable with a value of 29.7%.
4. The Facilitating Condition variable has a positive impact on the Use Behavioral variable with a value of 49.5%.
5. The Behavioral Intention variable has a positive impact on the Use Behavioral variable with a value of 56.1%.

SUGGESTION

Based on the results of the study, it can be seen that four of the five main factors in The Unified Theory of Acceptance and Use of Technology (UTAUT) model have a positive effect on the acceptance and use of electronic medical records for users in the Hospital Outpatient Installation. In connection with this, the hospital can further improve the benefits and usability of the system as a source of administration and support services to increase the ease of users in providing services at the hospital.

LIMITATIONS OF THE RESEARCH

The limitation of this study is that the use of electronic medical records has only been applied to outpatient installations and has only been used routinely in the 2-3 months before the research. Future research is expected to be able to conduct more in-depth interviews with users of electronic medical records, to be able to find out more about the obstacles or shortcomings in the implementation of electronic medical records used in hospitals.

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REFERENCES

1. Adikoesoemo, S., 2003. Manajemen Rumah Sakit. Jakarta: Pustaka Sinar Harapan

2. Ardianto, Elvinaro, 2004. Komunikasi Massa Suatu Pengantar. Bandung: Simbiosa Rekatama Media.

3. Aggelidis, Vassilios P. & Chatzoglou, Prodromos D., 2012. *Hospital Information Systems: Measuring End-User Computing Satisfaction (EUCS).* Xanthi: Democritus University of Thrace

4. Endriani, Lusiana Wiwid & Sulistyawati, 2019. SIMPUS eHealth Evaluation at Bantul District Yogyakarta. Yogyakarta: Universitas Ahmad Dahlan. JMMR, 8(1):62-68.

5. Ghozali, Imam, 2014. *Structural Equation Modeling* – Metode Alternatif dengan *Partial Least Squares* (PLS). Semarang: Universitas Diponegoro

6. Gücin, Nuray Öner & Berk, Özlem Sertel, 2015. *Technology Acceptance in Health Care: An Integrative Review of Predictive Factors and Intervention Programs.* Istanbul: Department of Psychology, Istanbul University

7. Kementerian Kesehatan RI, 2011, "Peraturan Menteri Kesehatan RI No.1171/Menkes/PER/VI/2011 tentang sistem informasi rumah sakit". Diakses pada 10 Desember 2018, dari https://www.persi.or.id/regulasi-persi/permenkes

8. Kementerian Kesehatan RI, 2013, "Peraturan Menteri Kesehatan RI Nomor 82 Tahun 2013 tentang sistem informasi manajemen rumah sakit". Diakses pada 10 Desember 2018, dari https://www.kemhan.go.id/itjen/wp-content/uploads/2017/03/bn87-2014.pdf

9. Naylor MD, Aiken LH, Kurtzman ET, Olds DM, Hirschman KB., 2011. *The care span: The importance of transitional care in achieving health reform. Health Aff* (*Millwood*). Philadelphia: University of Pennsylvania

10. Phichitchaisopa, N., & Naenna, T., 2013. Factors affecting the adoption of healthcare information technology. *EXCLI Journal, 12*, 413–436.

11. Sugiyono, 2012. Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, dan R&D. Bandung: alfabeta

12. Venkatesh, V., Brown, S.A., Maruping, L.M. and Bala, H., 2008. "Predicting different conceptualizations of system use: the competing roles of behavioral intention, facilitating conditions, and behavioral expectation", MIS Quarterly, Vol. 32 No. 3, pp. 438-502.

13. Venkatesh, V., et al, 2003. "User acceptance of information technology: toward a unified view", MIS Quarterly, Vol 27 (3), pp.425-478.

14. Venkatesh, V., Morris, M.G., Davis, F.D., dan Davis, G.B., 2003. "User Acceptance of Information Technology: Toward a unified view." MIS Quarterly, 27, 425-478

15. Zhang, M. J. 2005. Information Systems, Strategic Flexibility, and Firm Performance: An Empirical Investigation. Journal of Engineering and Technology Management 22: 163-184.