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Technology Readiness and Nurses' Acceptance Model Towards the Implementation of Electronic Medical Record (EMR) at Hospital X Tangerang

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Abstract

Introduction: One of the hospital's efforts to improve the quality of medical care is by implementing an electronic medical record (EMR). This depends on individual readiness factors and the acceptance of new technologies in hospital EMR implementation. **Objective:** The study aims to analyze the readiness of technology and nurse acceptance models for the implementation of EMR. **Method:** This study uses a quantitative approach with exploratory objectives. This study used a questionnaire to sample 264 respondents (nurses), as well as SEM (structural equation modeling) as a data analyst. The study results showed that of the 11 existing hypotheses, two hypotheses were rejected: insecurity against perceived ease of use with a p-value of 0.761 > p-value 0.05 and discomfort against perceived usefulness with a p-value of 0.156 > p-value 0.05. **Results:** The results of the study show that the futility of individuals and models of accepting new technology through factors such as optimism, innovativeness, insecurity discomfort, as well as perceived ease of use and perceived usefulness can influence Individual in accepting new technologies, such as electronic medical records. **Conclusion**: The study highlights the critical role of individual readiness factors—such as optimism and innovativeness—and the perceived ease of use and usefulness in influencing nurses' acceptance of electronic medical records. While insecurity and discomfort showed limited impact, fostering positive perceptions of EMR usability and benefits is essential for successful implementation. **Recommendation** of your study must be clear. The abstract also should not contain any references or display an equation.

Keywords: nurses, electronic medical record, technology readiness, technology acceptance model

INTRODUCTION

Hospitals are health service institutions that are essential in providing quality medical services (1). Theology plays a central role in improving the quality of hospital staff, especially after the COVID-19 pandemic, which has encouraged the adoption of technology such as online registration, telemedicine, and electronic records (EMR).

The government and healthcare service reform groups have urged that healthcare information technologies (HITs), such as electronic medical records (EMR) and computerized physician order entry (CPOE) systems, must be widely adopted as a means to improve patient safety, enhance the quality of healthcare services, and reduce costs (2)

The advancement of technology in mobility and ubiquity has led to the rapid adoption of healthcare information technologies (HITs), such as electronic medical records (EMR). Healthcare information technologies (HITs) are believed to have significant benefits in improving services.

Studies have highlighted that factors such as perceived ease of use, perceived usefulness, and facilitating conditions are critical determinants in the adoption of mHealth technologies (3). These factors influence healthcare professionals' acceptance and effective utilization of EMRs and other mobile health applications (4). However, the application of this technology still faces various challenges, including the readiness of health workers to adopt new technology.

Hospital x Tanggerang, under pre-implementation stage of EMR. Although there have been efforts to introduce EMR through workshops, the application of this technology has not been maximized. Several obstacles, such as the incompleteness of medical records in resistance to technological changes, are still challenging.

A systematic literature review identified "missing data" as a recurrent obstacle in EHR adoption, impacting data quality and patient care (5). Implementing EHRs can initially disrupt established workflows, causing frustration among staff (6). In addition, Physicians may perceive EHRs as a threat to their professional autonomy or feel that the burdens of implementation are not equitably distributed (7).

Therefore, it is essential to evaluate the readiness of technology (Technology Readiness) and technology acceptance (Technology Acceptance) among health workers, especially nurses, to ensure the feasibility of EMR adoption

This study will identify the factors affecting nurses' intention to use EMR, focusing on perceived ease of use and usefulness. The findings are expected to provide solutions to improve the implementation of EMR and, ultimately, the quality of service at X Tangerang Hospital.

OBJECTIVE

The study aims to analyze the association between technology readiness and acceptance on their intention to use electronic medical records (EMR) among nurses.

METHOD

Design

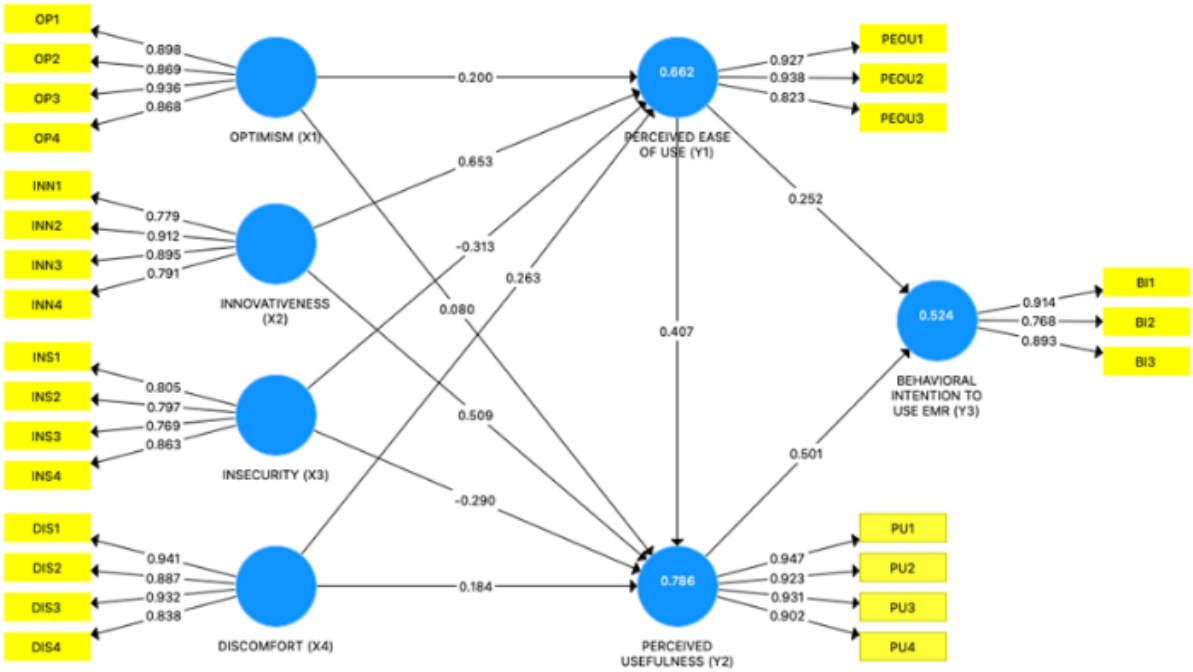
This study employed the cross-sectional study to determine the association between technology readiness and acceptance on their intention to use electronic medical records (EMR) among nurses. This study involved four independent variables (Optimism, Innovativeness, Insecurity, and Discomfort) and three bound variables (Perceived Ease of Use, Perceived Usefulness, and Behavior Intention).

Sample size and sampling technique

The total of 336 population in this study were involved from X Tangerang Hospital. We selected the sample size using the purposive sampling technique based on the inclusion criteria. The inclusion criteria of the sample 1) The nurse who works at Saki X Tangerang's house, 2) nurses with knowledge or experience in using electronic medical records (EMR) at Hospital X Tanggerang.

The sample size was calculated using the PLS-SEM formula based on the Hair et al., (2011). The technique used to determine the minimum sample size in this study is 10 times larger than the indicators used to measure each construct with the following calculation:

N = total of indicator x 10
= 26 x 10
= 260 samples



The instrument for data collection

The data collection process is employed within two months. The researchers are assisted by the research assistant Research instruments and questionnaire forms must be tested through a pre-test, including validity and reliability tests. The validity test ensures that the measuring instrument accurately defines the research object. Before conducting a validity test on a pair of questions, to ensure the reliability of the results obtained.

According to Henseler stated that the reflective loading indicator can be considered good if the result is more than 0.50. The recapitulation results are valid because they exceed the requirement of 0.7, and the reliability test results show that all initiators have been reliable in measuring the existing variables.

Table 1. Result of Cronbach alpha

Variable	Cronbach's Alpha	Rho_A	Composite reliability
Behavioral intention to use ER (Y3)	0.829	0.882	0.895
Discomfort (X4)	0.922	0.934	0.945
Innovativeness (X2)	0.866	0.882	0.910
Insecurity (X3)	0.826	0.856	0.883
Optimism (X1)	0.915	0.927	0.940
Perceived ease of use (Y2)	0.878	0.886	0.925
Perceived usefulness	0.945	0.947	0.960

Data analysis

This study analyzes the data using structural Equation Modeling (SEM), which is divided into two approaches: Convenience Base SEM (CBSEM) and Basec SEM or partial most miniature Square (PLS) variants.

Descriptive statistical analysis is carried out to describe data without generalization, using tables, graphs, and statistical calculations such as modes, medians, and averages. This study uses index numbers to show the respondents' perception of variables by categorizing low, medium, and high scores using the three-box method.

Meanwhile, SEM-PLS analysis aims to predict the relationship between construction and finding the latent variable value. The PLS parameter estimation process is carried out in three stages, including creating a latent variable score, estimating the path between the variables, and estimating the regression constant.

Ethical consideration

Clearly explain the name of the ethics committee institution for approval of the study. You also need to state the informed consent process.

RESULTS

This study's data was obtained through a questionnaire distributed online to 336

respondents. The sample criteria were met with 264 respondents who were netted; the following is a recapitulation of respondent characteristics that reflect the profile of 264 nurses of x Tangerang Hospital related to the use of electronic medical record (EMR) technology.

Table 2. Screening Questions

Screening Questions	Yes	No	Total
1. Are you a nurse at X Tanggerang Hospital?	336 (100%)	0	336
2. Do you have a study on using electronic medical record (EMR) technology in Rumh Sakit x Tanggerang?	264 (78.5%)	72 (21.5%)	336

Table 3. Characteristic of respondents

Responsive Features		n	(%)
Gender			
Male		41	16%
female		223	84%
	Total	264	100%
Age			
<21 years old		0	0
21-30 years old		137	52%
31-40 years old		115	44%
40-50 years old		12	5%
>50 years old		0	0%
	Total	264	100%
Last education			
Diploma III (DIII)		147	56%
Bachelor (S1)		117	44%
Postgraduate (S2)		0	0%
	Total	264	100%
Working period			
<1 year		111	42%
Characteristics Respondent		**Spread (%)**	
1-3		120	45%
3-10		22	8%
>10		11	4%
	Total	264	100%

Most respondents were women, with 223 people (84%). The largest age of respondents ranged from 21-30 years, as many as 137 people (52%). The last education of most respondents was diploma 3 (D3), as many as 147 people (56%). While the majority of respondents have a working period of 1-3 years, which is around 120 people (45%)

Coefficient of determination (R^2) and Adjusted Value

This table presents the coefficient of determination (R^2) values and the adjusted R^2 values for three dependent variables analyzed in the study using SmartPLS 4.0. $R^2 = 0.583$ and Adjusted $R^2 = 0.580$ of behavioral intention. This means that 58.3% of the variance in the behavioral intention to use EMR can be explained by the predictors in the model. The adjusted R^2 (58.0%) shows a very small reduction, indicating that the model has good predictive power without overfitting.

Similarly, 58.3% of the variance in perceived ease of use is explained by the predictors. The slightly lower adjusted R^2 value (57.7%) again reflects good model fit and stability.

The 70.8% of the variance in perceived usefulness is explained by the predictors. The adjusted R^2 value (70.3%) confirms strong predictive power.

	R-square	R-square adjusted
Behavioral Intention to Use EMR (Y3)	0.583	0.580
Perceived Ease of Use (Y1)	0.583	0.577
Perceived Usefulness (Y2)	0.708	0.703

Model Fit

The model explains that Saturated Model: 0.066, Estimated Model: 0. 079. SRMR values below 0.08 indicate a good model fit. The saturated model has a slightly lower discrepancy compared to the estimated model, indicating a better fit. The d_G (Geodesic Distance) showed the saturated Model: 1.003, Estimated Model: 1.058. Both models have small discrepancies, with the saturated model fitting slightly better. The chi-square showed the saturated model shows a slightly better fit compared to the estimated model, but the difference is minimal.

	Saturated model	Estimated model
SRMR	0.066	0.079
d_ULS	1.531	2.175
d_G	1.003	1.058
Chi-*square*	1399.039	1456.654
NFI	0.800	0.792

Correlation between independent and dependent variables

This table presents the association between independent variables with the dependent variable. The results found that some independent variables had a positive association with the dependent variables. The insecurity was negative association with perceived of use (p-value>.05). The discomfort also was not associated with perceived usefulness (p-value>.05). Details of information can be seen in the table.

Correlation between variables	Original sample (O)	T statistics (|O/STDEV|)	P values
Optimism (X1) -> Perceived Ease of use (Y1)	0.350	3.781	**0.000**
Innovativeness (x2) -> perceived ease of use (y1)	0.497	6.107	**0.000**
Insecurity (x3) -> perceived ease of use (y1)	0.026	0.305	**0.761**
Discomfort (x4) -> perceived ease of use (y1)	-0.055	1.985	**0.019**
Optimism (x1) -> perceived usefulness (y2)	0.196	1.994	**0.047**
Innovativeness (x2) -> perceived usefulness (y2)	0.427	4.761	**0.000**
Insecurity (x3) -> perceived usefulness (y2)	-0.154	2.511	**0.012**
Discomfort (x4) -> perceived usefulness (y2)	0.076	1.419	**0.156**
Perceived ease of use (y1) -> perceived usefulness (y2)	0.385	6.100	**0.000**
Perceived ease of use (y1) -> behavioral intention to use EMR (y3)	0.434	7.178	**0.000**
Perceived usefulness (y2) -> behavioral intention to use EMR (y3)	0.378	6.504	**0.000**

DISCUSSION

Optimism (X1) was positive and significant effect on perceived ease of use (Y1), with a path coefficient of 0.350, a T-statistic of 3.781, and a p-value of 0.000. The higher the optimism, the higher the perceived ease of use. This suggests that as users perceive a system to be easier to use, their satisfaction increases significantly.

Previous study mentioned that the significance of Perceived Ease of Use in user acceptance models. Optimism, as a personality trait, often influences an individual's perception of technology, potentially affecting their perceived ease of use (8)

Optimism in the context of technology refers to the belief that technology can enhance productivity, efficiency, control, and overall quality of life. Individuals with higher optimism are more likely to view new technologies, such as EMR, as beneficial and less intimidating (9-10). Healthcare professionals who are optimistic about technology are more likely to find EMR systems easy to use, which can facilitate broader acceptance and more effective implementation of digital health technologies

Innovativeness (X2) positively and significantly influenced perceived ease of use (Y1), with a path coefficient of 0.497, T-Statistic 6.107, and P-value of 0.000. The higher the innovativeness, the more perceived ease of use. Respondents showed highly innovative behavior, especially in statements about keeping up with the latest technological developments.

Individuals who are more innovative-those who enjoy experimenting with and adopting new technologies-tend to perceive new systems as easier to use. A study found that innovativeness significantly and positively affects perceived ease of use. Their structural equation modeling showed that "optimism and innovativeness were the only personality dimensions that significantly affected perceived usefulness and perceived ease of use (11)

Optimism (X1) positively and significantly influenced perceived usefulness with a path coefficient of 0.196, T-statistic 1.994. and P-value 0.047. This shows that increasing optimism will increase perceived usefulness. The evidence strongly supports that optimism (X1) is a significant positive predictor of perceived usefulness in technology acceptance models (12-13). Individuals with higher optimism are more likely to perceive new technologies as useful, which can facilitate greater acceptance and adoption. While the

innovativeness was positively and significantly influenced perceived usefulness of using EMR. Individuals who are more innovative tend to see greater value in adopting new technologies like EMR, as they are more open to exploring and utilizing new features and functionalities (14).

Perceived ease of use was found to have a positive and significant influence on perceived usefulness. This explains that the higher the perceived ease of use, the greater the perceived usefulness. Perceived ease of use directly affects perceived usefulness, meaning that the simpler and more effortless a technology is to operate, the greater the perceived benefit or usefulness by its users (15). Another study has been supported across various domains and technologies, reinforcing the importance of designing user-friendly systems to enhance perceived usefulness and, ultimately, user acceptance and satisfaction (16).

Another result found that perceived ease of use had a positive association with behavioral intention to use EMR. This means that when users find the Electronic Medical Record (EMR) system easy to use, they are more likely to intend to use it in the future. This positive relationship is well-supported by research using the Technology Acceptance Model (TAM), which shows that the easier a system is perceived to be, the stronger the users' intention to adopt and use the system regularly (17-18).

CONCLUSION

Based on the research conducted by the author, there are several conclusions regarding the influence of various factors on the use of EMR at Rs X Tangerang. First, optimism and innovativeness are proven to have a positive and significant impact on perceived ease of use (Y1), which means that improving both factors can increase the ease of use of EMR, with technology that increases personal productivity as the dominant aspect. However, insecurity does not affect ease of use, showing that the information security factor is not a critical influence. In addition, discomfort has a negative impact, where data discomfort interferes with coordination and increases the perception of difficulties.

Optimism and innovativeness also positively influence perceived usefulness (Y2), both of which can increase the perception of EMR usability by keeping up with the latest technological developments. However, insecurity hurts usability perception, so reducing insecurity can increase it. Interpretation of benefits. Discomfort itself does not affect usability, so discomfort does not become an obstacle to the perception of EMR's benefits. Furthermore, perceived ease of use (Y1) has a positive effect on perceived usefulness (Y2) and behavioral intention to use EMR (Y3), where high ease of use will increase the perception of use and the intention of nurses to use EMR. Finally, perceived usefulness (Y2) also contributes positively to nurses' intention to use EMR, with EMR allowing faster task completion as the dominant factor. Overall, this study underscores the importance of optimism and innovation in increasing the acceptance of EMR technology and managing insecurity and discomfort.

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REFERENCES

(1) World Health Organization. Quality of care [Internet]. Geneva: WHO; [cited 2025 Jun 15]. Available from: https://www.who.int/health-topics/quality-of-care?utm_source=chatgpt.com#tab=tab_1

(2) Kim S, Lee KH, Hwang H, Yoo S. Analysis of the factors influencing healthcare professionals' adoption of mobile electronic medical record (EMR) using the unified theory of acceptance and use of technology (UTAUT) in a tertiary hospital. *BMC Med Inform Decis Mak*. 2016 Jan 30;16:12. doi:10.1186/s12911-016-0249-8

(3) Garavand A, Samadbeik M, Kafashi M, Abhari S. Acceptance of health information technologies, acceptance of mobile health: A review article. *J Biomed Phys Eng*. 2017 Dec 1;7(4):403–408

(4) Raskovic D, Milenkovic A, De Groen PC, Jovanov E. From telemedicine to ubiquitous m-health: The evolution of e-health systems. *Experts@Minnesota*. [Unpublished/online resource].
(5) Kruse CS, Kristof C, Jones B, et al. Barriers to electronic health record adoption: a systematic literature review. *J Med Syst*. 2016;40:252. doi:10.1007/s10916-016-0628-9
(6) Ajami S, Arab-Chadegani R. Barriers to implement electronic health records (EHRs). *Mater Sociomed*. 2013;25(3):213–5. doi:10.5455/msm.2013.25.213-215
(7) Palabindala V, Pamarthy A, Jonnalagadda NR. Adoption of electronic health records and barriers. *J Community Hosp Intern Med Perspect*. 2016 Oct 26;6(5):32643. doi:10.3402/jchimp.v6.32643
(8) Londa DR, Worang FG, Arie FV. The influence of perceived credibility, perceived ease of use, and perceived usefulness toward customer satisfaction in using BSGTOUCH. *Jurnal EMBA*. 2021;10(4):934–45.
(9) Kuo KM, Liu CF, Ma CC. An investigation of the effect of nurses' technology readiness on the acceptance of mobile electronic medical record systems. *BMC Med Inform Decis Mak*. 2013 Aug 12;13:88. doi:10.1186/1472-6947-13-88
(10) Saputra Y, Ashila MN, Muliarini P. Readiness and acceptance of electronic medical record among health professionals in Indonesia. In: *Proceedings of the International Conference of Graduate School on Sustainability*; 2022
(11) Godoe P, Johansen TS. Understanding adoption of new technologies: Technology readiness and technology acceptance as an integrated concept. J Eur Psychol Stud. 2012;3(1):38–52. doi:10.5334/jeps.aq
(12) Nafia ZI, Hidayati D, Sulisworo D. The application of the technology readiness acceptance model on education. J Novel Eng Sci Technol. 2023;2(1):9–15
(13) Mufidah I, Husaini LR, Caesaron D. Improving online learning through the use of learning management system platform: A technology acceptance model-technology readiness index combination model approach. J Tek Ind. 2022;24(1):61–71. doi:10.9744/jti.24.1.61−72
(14) Chairunnisah R, Ismatullah NK, Andriani H. User readiness and acceptance of electronic medical record: a partial least square approach. In: Proceedings of the 3rd International Scientific Meeting on Health Information Management (ISMOHIM). 2024;6. doi:10.21070/pels.v6i0.1939
(15) Tahar A, Riyadh HA, Sofyani H, Purnomo WE. Perceived ease of use, perceived usefulness, perceived security and intention to use e-Filing: The role of technology readiness. J Asian Finance Econ Bus. 2020 Sep 30;7(9):537–47. doi:10.13106/JAFEB.2020.VOL7.NO9.537
(16) Lewis JR, Sauro J. Effect of perceived ease of use and usefulness on UX and behavioral outcomes. Int J Hum Comput Interact. 2023;40(20):6676–83. doi:10.1080/10447318.2023.2260164
(17) Walle AD, Ferede TA, Baykemagn DN, Shimie AQ, Mengistie MB. Predicting healthcare professionals' acceptance towards electronic personal health record systems in a resource-limited setting: using modified technology acceptance model. BMJ Health Care Inform. 2023;30:e100707.
(18) Kalayou MH, Endehabtu BF, Tilahun B. The applicability of the modified Technology Acceptance Model (TAM) on the sustainable adoption of eHealth systems in resource-limited settings. *J Multidiscip Healthc*. 2020;13:1827–37. doi:10.2147/JMDH.S284973