

Analysis of the Determinants of the Technology Acceptance Model (TAM) on the Use of Hospital Management Information Systems Among Young Dentists in the Outpatient Unit of Prof. Dr. Moestopo Dental and Oral Teaching Hospital

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Abstract

Background: The Hospital Management Information System (HMIS) is a crucial component in enhancing the quality of healthcare services. The successful implementation of HMIS largely depends on the acceptance and actual use by healthcare professionals. Objective: This study aims to analyze the determinants influencing the acceptance and utilization of HMIS at the Prof. Dr. Moestopo Dental and Oral Teaching Hospital, using the Technology Acceptance Model (TAM) framework. Methods: This study employed a quantitative approach with a cross-sectional design. The study population consisted of 182 individuals, from which 122 young dentists were selected using purposive sampling. Data were collected using a validated and reliable questionnaire. The data analysis involved bivariate tests (Chi-Square), Spearman correlation, and multivariate logistic regression analysis. Results: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Attitude Toward Use (ATU) significantly influenced the actual use of HMIS, while Behavioral Intention (BI) showed no significant effect. Conclusion: The successful use of HMIS is determined by perceived usefulness, ease of use, and user attitudes toward the system. Recommendations: Strengthening these determinants through continuous dissemination of HMIS benefits, sustained training programs, and enhanced motivation among healthcare professionals is essential to improve system utilization.

Keywords:

HMIS, perceived usefulness, perceived ease of use, attitude toward use, behavioral intention, actual use.

INTRODUCTION

A Hospital Management Information System (HMIS) is an integrated information and communication technology system that connects all departments and consolidates hospital services into a unified network. This system facilitates timely and accurate reporting, administrative procedures, and information distribution, and forms an integral part of the national health information system (Wijayanti & Nurhayati, 2024). The primary goal of HMIS is to reduce manual administrative tasks, accelerate service processes, and minimize operational errors. Furthermore, HMIS is expected to improve the overall quality and effectiveness of healthcare delivery.

According to Article 52(1) of Law No. 44 of 2009 concerning Hospitals, the Indonesian government mandates that all hospitals adopt management information systems to record and report operational activities systematically. In response, the Ministry of Health issued Regulation No. 82 of 2013, requiring all hospitals to comply with Article 3(1) of that regulation. This makes the utilization of technology in hospital services an obligation rather than an option. However, several challenges persist in the field, particularly regarding user acceptance and actual utilization by healthcare personnel. The Technology Acceptance Model (TAM) has been widely used to evaluate the implementation of HMIS.

In its most fundamental form, TAM is a theoretical framework explaining why new technologies are either adopted or rejected. Understanding technology usage requires examining the factors influencing acceptance or resistance to adoption. It is crucial to assess the determinants that shape the intention to use technology, as increased acceptance is a prerequisite for greater adoption (Tetik et al., 2024). Within TAM, the perception that technology enhances user performance reflects Perceived Usefulness (PU), while ease in learning and operating the system represents Perceived Ease of Use (PEOU). These two factors influence the Attitude Toward Use (ATU), Behavioral Intention (BI), and ultimately, Actual Use (AU) (Davis, 1989).

The TAM approach has been extensively applied in systematic evaluations of health information systems and is instrumental in identifying factors that facilitate or hinder technology acceptance in healthcare services (Tetik et al., 2024). Despite its potential, adoption rates remain low. A study by Alvito et al. (2023) at Kembangan Regional Hospital in West Jakarta revealed that only 63.5% of healthcare workers agreed to use HMIS. Similarly, research at Kajen Hospital by Sevtiyani and Sedyono (2020) found that only 50% of staff actively used the system. A pilot study at Dr. Soepraoen Army Hospital in Malang showed that 75% of outpatient staff were dissatisfied with the HMIS due to operational limitations (Utomo, 2023). Ineffective implementation leads to administrative delays, reduced operational efficiency, and increased service complexity. Various strategies, including comprehensive training, collaborative system design, managerial support, and continuous user experience evaluation, have been proposed to enhance system acceptance (Susilo & Mustofa, 2019).

The Technology Acceptance Model identifies five principal constructs influencing technology adoption: Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude Toward Use (ATU), Behavioral Intention to Use (BIU), and Actual Use (AU) (Siregar, 2021). A related study by Putra, Karsana, and Wasita (2024) applied TAM to examine the online outpatient registration system at Tabanan Regional Hospital. Despite system availability, user engagement remained low, with only 0.22% of patients registering online between July and October 2023, primarily due to network instability, delayed staff response, manual data retrieval, and long queues—highlighting the importance of TAM-based evaluations to assess system acceptance.

Unlike previous studies focusing primarily on public or general hospitals, this study investigates the acceptance of HMIS among young dentists in the outpatient unit of Prof. Dr. Moestopo Dental and Oral Teaching Hospital (RSKGMP). As a teaching hospital, RSKGMP possesses distinctive characteristics in terms of technological adoption, work culture, and organizational structure. Therefore, this research aims to analyze factors influencing HMIS utilization at RSKGMP Prof. Dr. Moestopo, identify existing barriers, and propose recommendations to improve system efficiency and acceptance among healthcare workers through the TAM approach.

Given this context, HMIS plays a strategic role in supporting operational efficiency and service quality. However, its effectiveness largely depends on user acceptance. Perceived usefulness and perceived ease of use are pivotal in shaping attitudes, behavioral intentions, and actual system use. Hence, this study aims to

evaluate the level of HMIS acceptance among young dentists in the outpatient unit of RSKGMP Prof. Dr. Moestopo using the TAM framework, focusing on five core indicators: PU, PEOU, ATU, BIU, and AU. The study is expected to benefit hospitals as an evaluative tool for decision-making, educational institutions in understanding the barriers to HMIS adoption, and researchers in expanding insights into the implementation of information technology in hospital management

METHODS

This study employed a quantitative approach with a descriptive cross-sectional survey design (Ministry of Health, 2018). The research was conducted in July 2025 at the Prof. Dr. Moestopo Dental and Oral Teaching Hospital (RSKGMP) and involved young dentists with at least one year of work experience. The sample of 122 participants was determined using the Slovin formula and selected through purposive sampling. The research instrument was a questionnaire based on the Technology Acceptance Model (TAM) developed by Davis (1989) and adapted by Jogiyanto (2007), encompassing five main variables: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude Toward Use (ATU), Behavioral Intention to Use (BIU), and Actual Use (AU).

Instrument validity was tested using Pearson's correlation (r -table = 0.361), and reliability was confirmed with Cronbach's Alpha, with all variables meeting acceptable standards. Data collection involved distributing questionnaires to eligible respondents after obtaining informed consent. The questionnaire method was chosen for its efficiency and measurability (Arikunto, 2019).

Data processing followed the stages of editing, coding, entry, and cleaning, in accordance with Nursalam (2008). Statistical analyses were performed using SPSS software. Univariate analysis described each variable's characteristics (Sugiyono, 2017), bivariate analysis evaluated relationships between two variables (Notoatmodjo, 2018), and multivariate analysis (logistic regression) was employed to assess the simultaneous influence of independent variables on the dependent variable within the TAM framework (Ghozali, 2018; Zhang, 2019; Heinze et al., 2019).

RESULTS

1. Univariate Analysis

Univariate analysis is a statistical method used to describe or explain the characteristics of each research variable individually (Sugiyono, 2017).

Table 1. Respondents' Gender Characteristics

Gender	Frequency (N)	Percentage (%)
Male	53	43.4
Female	69	56.6
Total	122	100

Based on Table 1, the majority of respondents were female (56.6%), while male respondents accounted for 43.4%.

Table 2. Respondents' Age Characteristics

Age (years)	Frequency (N)	Percentage (%)
22–23 years	60	49.2
24–25 years	62	50.8
Total	122	100

As shown in Table 2, most respondents were aged between 24 and 25 years (50.8%), while 49.2% were between 22 and 23 years old. This indicates that the majority of young dentists involved in the study are within the early professional age range.

2. Independent Variables

Perceived Usefulness (PU)

Table 3. Perceived Usefulness

Response Category	N	Percentage (%)
Neutral/Uncertain	1	0.8
Useful	18	14.7
Very Useful	103	84.4
Total	122	100

Based on Table 3, it can be seen that 103 respondents (84.4%) perceived the Hospital Management Information System (HMIS) as **very useful**, 18 respondents (14.7%) found it **useful**, and only 1 respondent (0.8%) was **neutral or uncertain**. This indicates that most young dentists consider the HMIS highly beneficial for supporting their professional activities.

Perceived Ease of Use (PEOU)

Table 4. Perceived Ease of Use

Response Category	N	Percentage (%)
Neutral/Uncertain	4	3.2
Easy to Use	23	18.9
Very Easy to Use	95	77.8
Total	122	100

Table 4 shows that 95 respondents (77.8%) perceived the system as very easy to use, 23 respondents (18.9%) considered it easy, and 4 respondents (3.2%) were neutral or uncertain. This suggests that the majority of users experienced minimal difficulty in learning and operating the system.

Attitude Toward Use (ATU)

Table 5. Attitude Toward Use

Response Category	N	Percentage (%)
Neutral/Uncertain	5	4.1
Accepts Technology	45	36.9
Strongly Accepts	72	59.0
Total	122	100

Based on Table 5, 72 respondents (59.0%) strongly accepted the use of the technology, 45 respondents (36.9%) accepted it, and 5 respondents (4.1%) were neutral or uncertain. These results demonstrate a generally positive attitude among young dentists toward the use of HMIS in their daily clinical practice.

Behavioral Intention (BI)

Table 6. Behavioral Intention

Response Category	N	Percentage (%)
Neutral/Uncertain	4	3.3
Interested	40	32.8
Highly Interested	78	63.9
Total	122	100

As indicated in Table 6, 78 respondents (63.9%) expressed high interest in continuing to use HMIS, 40 respondents (32.8%) were interested, and 4 respondents (3.3%) were neutral or uncertain. This reflects a strong behavioral intention among the majority of respondents to sustain system use in the future.

3. Dependent Variable

Actual Use (AU)

Table 7. Actual Use of HMIS

Response Category	N	Percentage (%)
Neutral/Uncertain	3	2.5
Frequently Use	35	28.7
Very Frequently Use	84	68.9
Total	122	100

As shown in Table 7, 84 respondents (68.9%) reported very frequent use of HMIS, 35 respondents (28.7%) reported frequent use, and 3 respondents (2.5%) were neutral or uncertain. This indicates that most respondents actively utilize the system in their daily professional duties.

4. Bivariate Analysis

Bivariate analysis was conducted to assess the relationship between each independent variable and the dependent variable. Based on the research findings, it was found that 102 respondents perceived the technology as useful and accepted it. The Chi-Square test result showed a p-value of 0.013 ($p < 0.05$), indicating that the null hypothesis (H_0) was rejected. This means there is a significant relationship between Perceived Usefulness (PU) and Actual Use (AU). The analysis also produced an Odds Ratio (OR) value of 19.125, which implies that respondents who perceived the technology as not useful were 19.125 times more likely not to use the technology compared to those who perceived it as useful. Furthermore, 94 respondents perceived the technology as easy to use and accepted it. The Chi-Square test yielded a p-value of 0.036 ($p < 0.05$), leading to the rejection of H_0 . This indicates a significant relationship between Perceived Ease of Use (PEOU) and Actual Use. The OR value of 11.750 indicates that respondents who found the technology difficult to use were 11.750 times more likely not to use it compared to those who perceived it as easy to use.

A total of 112 respondents who had a positive attitude toward the use of technology also accepted it. The Chi-Square test produced a p-value of 0.007 ($p < 0.05$), thus rejecting H_0 . This means that there is a significant relationship between Attitude Toward Use (ATU) and technology use. The OR value of 18.667 shows that respondents with an unfavorable attitude were 18.667 times more likely not to use the technology compared to those with a favorable attitude.

It was also found that 112 respondents who frequently intended to use the technology had accepted it. The Chi-Square test result obtained a p-value of 0.001 ($p < 0.05$), indicating that H_0 was rejected. This confirms a significant relationship between Behavioral Intention (BI) and Actual Use. The OR value of 56.000 means that respondents who rarely intended to use the technology were 56 times more likely not to use it compared to those who often intended to use it.

5. Multivariate Analysis

Multivariate analysis was performed to evaluate the simultaneous effect of all independent variables on the dependent variable, Actual Use (AU), using the Multiple Logistic Regression (Enter Method).

Bivariate Selection

The selection criterion for inclusion in the multivariate analysis was a p-value < 0.25. Based on the Chi-Square test results:

Table 8. Bivariate Selection Results

Variable	P-value	Candidate
Perceived Usefulness	0.002	Yes
Perceived Ease of Use	0.001	Yes
Attitude Toward Use	0.003	Yes
Behavioral Intention	0.026	Yes

Based on the table above, variables that met the inclusion criteria with a p-value < 0.25 were Perceived Usefulness, Perceived Ease of Use, Attitude Toward Use, and Behavioral Intention. The bivariate analysis results indicated that all independent variables had p-values < 0.25, so all were included in the initial stage of multivariate analysis and subsequently in the modeling process.

Initial Multivariate Modeling

Multivariate analysis was carried out using multiple logistic regression with the Enter method. The results are presented in the following table:

Table 9. Initial Multivariate Results

Variable	B	P-value	OR	95% CI (Lower–Upper)
Perceived Usefulness	-0.484	0.016	0.616	0.415 – 0.914
Perceived Ease of Use	0.307	0.046	1.359	1.005 – 1.837
Attitude Toward Use	0.476	0.036	1.609	1.032 – 2.509
Behavioral Intention	-0.252	0.208	0.777	0.525 – 1.151
Constant	0.453	0.854	1.574	—

In the initial multivariate model, variables with a p-value < 0.05 were retained, while those with p-values > 0.05 were excluded from the final model. The results of the initial analysis revealed that only several variables had p-values < 0.05; thus, not all independent variables were included in the final multivariate model predicting Actual Use. The analysis showed that three independent variables—Perceived Usefulness, Perceived Ease of Use, and Attitude Toward Use—had a statistically significant influence on Actual Use. The Behavioral Intention variable was excluded due to its p-value > 0.05.

Final Multivariate Modeling

Table 10. Final Multivariate Results

Variable	Nagelkerke R Square	P-value	OR
Perceived Usefulness	0.431	0.016	0.616
Perceived Ease of Use	—	0.046	1.359
Attitude Toward Use	—	0.036	1.609
Constant	—	0.000	0.000

The hypothesis testing using multiple logistic regression analysis indicated that Perceived Usefulness significantly influenced the actual use of the Hospital Management Information System (SIMRS), with a p-value of 0.016 ($p < 0.05$). The

Odds Ratio (OR) of 0.616 implies that young dentists who perceived SIMRS as beneficial were 0.616 times more likely to use the system compared to those who did not perceive its usefulness.

Similarly, the regression analysis on Perceived Ease of Use showed a p-value of 0.046 ($p < 0.05$), indicating a significant effect on Actual Use. The OR of 1.359 means that young dentists who found SIMRS easy to use were 1.359 times more likely to use the system than those who perceived it as difficult.

Furthermore, the regression analysis examining the effect of Attitude Toward Use on Actual Use revealed a p-value of 0.036 ($p < 0.05$), indicating a significant influence. The OR of 1.609 implies that young dentists with a positive attitude toward SIMRS were 1.609 times more likely to use it than those with a negative attitude.

Based on Table 10, the Nagelkerke R-Square value of 0.431 indicates that Perceived Usefulness, Perceived Ease of Use, and Attitude Toward Use collectively explain 43.1% of the variance in Actual Use, while the remaining 56.9% is influenced by other factors not examined in this study. Among these three variables, Attitude Toward Use contributed the most dominantly, as indicated by having the highest Odds Ratio (OR) value compared to the other variables.

Discussion

The Influence of Perceived Usefulness (PU) on Actual Use (AU) at the Outpatient Unit of RSKMP Prof. Dr. Moestopo

Based on the results of multiple logistic regression analysis, Perceived Usefulness (PU) has a significant effect on the actual use of the Hospital Management Information System (SIMRS) (p-value = 0.016 < 0.05) with an Odds Ratio (OR) of 0.616. This finding indicates that young dentists who perceive SIMRS as useful are more likely to use the system compared to those who do not perceive its usefulness.

This result aligns with the studies of Nugraha et al. (2022) and Gunawan et al. (2020), which emphasize that the perception of usefulness drives the adoption of SIMRS by enhancing efficiency and user satisfaction. According to TAM3 (Venkatesh & Bala, 2008), perceived usefulness is influenced by organizational support, user experience, and system quality.

The majority of respondents strongly agreed that SIMRS helps them complete their work faster (65.5%) and facilitates decision-making (44.3%). However, the perceived benefit tends to be considered a “standard” feature rather than a differentiating factor, which may explain why it does not exert a dominant influence in the multivariate model. Users appear to prioritize technical ease of use over general usefulness. Therefore, hospital management should strengthen the perceived benefits of SIMRS through feature enhancement, inter-unit integration, and continuous socialization to promote optimal and sustainable system adoption.

The Influence of Perceived Ease of Use (PEOU) on Actual Use (AU) at the Outpatient Unit of RSKMP Prof. Dr. Moestopo

The multiple logistic regression analysis showed that Perceived Ease of Use (PEOU) significantly affects the actual use of SIMRS (p-value = 0.046 < 0.05; OR = 1.359). This means that young dentists who perceive SIMRS as easy to use are more likely to use it.

This finding is supported by the studies of Imamah et al. (2022), Oktariyono et al. (2024), and Al-Momani et al. (2023), which reveal that the perception of ease of

use strengthens users' interest, intention, and perception of usefulness toward SIMRS. Both TAM2 and TAM3 emphasize the importance of user experience and organizational support in shaping the perception of ease of use.

Most respondents strongly agreed that SIMRS is convenient to operate without assistance (53.3%) and is easy to learn (45.9%), with only a small portion expressing neutrality or disagreement. In the context of a teaching hospital, ease of use is often prioritized due to high workloads and time constraints. The researchers assume that improvements in interface design, simplified navigation, and responsive technical support will enhance user confidence and ensure the sustainability of SIMRS usage.

The Influence of Attitude Toward Use (ATU) on Actual Use (AU) at the Outpatient Unit of RSKMP Prof. Dr. Moestopo

The results of multiple logistic regression analysis indicate that Attitude Toward Use (ATU) significantly affects the actual use of SIMRS ($p\text{-value} = 0.036 < 0.05$; $OR = 1.609$). This suggests that young dentists who hold a positive attitude toward SIMRS are more likely to utilize the system.

This finding is consistent with Roziqin et al. (2021) and Oktariyono et al. (2024), who emphasize that attitude reinforces the influence of perceived usefulness and perceived ease of use on both behavioral intention and actual use of SIMRS. However, according to TAM2 and TAM3, attitude can be mediated by cognitive factors such as usefulness and behavioral intention, while the UTAUT model highlights the importance of organizational support and facilitating conditions. Thus, a positive attitude alone may not be a primary determinant without adequate external support.

The majority of respondents strongly agreed that they felt positive toward SIMRS (54.9%), found its use enjoyable, and believed that SIMRS was a good choice. The researchers assume that the work culture at RSKGMP, which emphasizes commitment and professionalism, fosters a positive attitude toward SIMRS. In educational hospitals, attitudes are also shaped by the academic environment and a culture of innovation. Therefore, building positive user attitudes through training, regular socialization, and exemplary leadership is crucial to ensuring sustainable SIMRS utilization.

The Combined Influence of Perceived Usefulness, Perceived Ease of Use, Attitude Toward Use, and Behavioral Intention on Actual Use of SIMRS at the Outpatient Unit of RSKGMP Prof. Dr. Moestopo

The findings show an R-Square value of 0.431, indicating that perceived usefulness, perceived ease of use, and attitude toward use collectively explain 43.1% of the variance in the actual use of SIMRS, while the remaining 56.9% is influenced by other factors beyond the scope of this study. Among these variables, attitude toward use has the strongest effect, as reflected by the highest Odds Ratio value.

This result demonstrates that the three variables within the Technology Acceptance Model (TAM) framework are interrelated in influencing actual use, although with varying degrees of impact. In accordance with TAM theory, ease of use affects both usefulness and attitude, which in turn strengthen behavioral intention and ultimately actual use. Although one variable may appear more dominant, the others remain essential as mediating factors.

This model is consistent with the Human-Organization-Technology Fit (HOT-Fit) framework, which emphasizes the simultaneous roles of human, technological, and organizational factors. In the context of RSKGMP, the researchers assume that the four variables—usefulness, ease of use, attitude, and behavioral intention—jointly influence SIMRS utilization. Ease of use may be perceived more directly, yet the other variables reinforce system acceptance. Therefore, the successful implementation of SIMRS must integrate all these aspects, supported by adequate hospital infrastructure and policies to ensure optimal and sustainable outcomes.

CONCLUSION

Based on the findings of this study conducted at the Outpatient Unit of RSKGMP Prof. Dr. Moestopo, it can be concluded that Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Attitude Toward Use (ATU) have significant effects on the Actual Use (AU) of SIMRS among young dentists. These three variables demonstrate a positive relationship in encouraging the effective utilization of the hospital information system. However, the Behavioral Intention (BI) variable does not show a significant influence on actual system use.

Simultaneously, perceived usefulness, ease of use, and attitude toward use collectively influence actual SIMRS utilization, suggesting that these three factors contribute to the successful implementation of SIMRS in an educational hospital environment. Strengthening these factors—supported by consistent management policies, technical infrastructure, and user engagement—will be essential for enhancing sustainable system adoption and integration.

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