

Electronic medical record acceptance using technology acceptance model at Panti Waluyo Hospital Surakarta

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ABSTRACT

The adoption of Electronic Medical Records (EMR) in Indonesia has been accelerated by national regulations; however, many hospitals continue to face significant challenges such as limited infrastructure, varying levels of digital literacy among healthcare workers, and resistance to shifting from paper-based systems. These issues highlight the urgency of evaluating user acceptance in specific hospital contexts. This study evaluates the acceptance of EMR implementation at Panti Waluyo Hospital Surakarta using the Technology Acceptance Model (TAM). A descriptive qualitative design was applied through in-depth interviews, observations, and document reviews. Fifteen participants, including physicians, nurses, medical record officers, and administrative staff, were purposively selected to represent core EMR user groups. The findings indicated that 73% of respondents perceived EMR as useful in improving documentation efficiency and accuracy, while 67% agreed that the system was easy to navigate. Moreover, 80% expressed willingness to continue using EMR. Barriers identified included technical disruptions (40%) and the need for continuous training (53%). Overall, the results suggest that EMR adoption is positively accepted within the hospital, although organizational support and infrastructure improvements remain necessary. The study concludes that perceived usefulness and perceived ease of use play significant roles in shaping user attitudes and behavioral intentions, which in turn influence actual system use. Strengthening user competence, addressing digital literacy gaps, and ensuring technical reliability are essential to sustain EMR implementation in healthcare settings.

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INTRODUCTION

Digital transformation in healthcare has become a global priority to improve service quality, patient safety, and operational efficiency (Iyanna et al., 2022; Stoumpos et al., 2023). In Indonesia, this shift is particularly urgent due to persistent infrastructure and regulatory challenges (Sunuantar et al., 2023; Wasir et al., 2025). A cornerstone of this transformation is the adoption of

Electronic Medical Records (EMRs), which replace paper-based documentation and enable integration of clinical workflows (Fita Rusdian Ikawati & M. Syauqi Haris, 2024; Sinaga & Sumartini, 2025; Widiyanto, 2025).

The Indonesian Ministry of Health mandated EMR adoption via Regulation No. 24 of 2022, requiring hospitals to align with national health information standards (Gusri, 2025; Hossain et al., 2025). However, successful EMR implementation hinges not only on technological capability, but also on organizational readiness, digital literacy, and leadership support ((Derecho et al., 2024; Fennelly et al., 2020). Preliminary observations at Panti Waluyo Hospital revealed variations in digital literacy among healthcare staff: younger physicians and nurses demonstrated higher adaptability in navigating digital systems, while senior staff experienced more challenges transitioning from paper-based to electronic records.

Despite growing TAM-based EMR research, most studies in Indonesia focus on public hospitals or nationwide systems, leaving private hospitals underexplored. This is important because private hospitals often face unique challenges, including resource limitations and organizational culture, which may affect adoption dynamics. What remains unknown is how these specific conditions influence user acceptance in private hospitals, and addressing this gap is critical for shaping strategies that can be applied across similar institutions. Therefore, this study aims to analyze EMR acceptance at Panti Waluyo Hospital using TAM constructs – Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude Toward Using (ATT), Behavioral Intention (BI), and Actual System Use (ASU). By doing so, this study not only contributes evidence to national digital health policy and practice but also enriches global TAM literature on EMR adoption in resource-constrained healthcare settings.

Barriers such as infrastructure limitations, data security concerns, regulatory ambiguity, and interoperability issues continue to hinder digital health adoption across Indonesian hospitals (Jayathissa & Hewapathirana, 2023). These issues are more acute in rural and private settings, where resources and technical capacity are often constrained (Aisyah et al., 2024).

The TAM—introduced by Davis (1989)—remains a widely applied framework for understanding digital health adoption. It emphasizes Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) as key determinants of user attitudes (ATT), behavioral intention (BI), and ultimately actual system use (ASU) (Billanes & Enevoldsen, 2021; Schorr, 2023). While many studies have applied TAM to public hospitals in Indonesia (Saputra et al., 2022), little is known about its applicability in private hospitals where organizational culture and limited resources may present different dynamics. This study addresses that gap by evaluating EMR acceptance at Panti Waluyo Hospital.

Recent studies affirm TAM's relevance in healthcare: Bamufleh et al., (2021) found that PU exerted stronger influence than PEOU in EMR adoption among Saudi healthcare professionals; Thi Uyen Nguyen et al. (2024) underscored training and system access in shaping PEOU and BI in Vietnam; and Saputra et al. (2022) assessed TAM in Indonesian healthcare professionals transitioning to EMR, revealing mixed readiness due to resistance to shift from paper-based systems.

Moreover, a scoping study by Hariy et al. (2025) highlights that leadership, staff competency, regulation, and infrastructure critically shape digital health implementation in Indonesia. Derecho et al. (2024) synthesizes EMR adoption in low- and middle-income countries, showing that physician hesitation and limited infrastructure remain bottlenecks in developing economies. Meanwhile, Aisyah et al. (2024) demonstrated gaps in ICT maturity across Indonesian healthcare services, further justifying the need for TAM-informed evaluations.

Despite increasing TAM-based EMR studies, most focus on public hospitals or comprehensive national systems. Studies involving private hospitals—especially in Indonesia—are scarce, often neglecting the unique challenges of resource constraints and organizational culture (Andriani et al., 2024; M. R. Saputra et al., 2025).

Panti Waluyo Hospital Surakarta, a private hospital, has implemented EMR for approximately two years. Pilot observations indicate improved documentation efficiency but reveal persistent issues such as system downtime, inconsistent terminology, and reliance on manual backups. These dynamics make it an appropriate context for evaluating EMR acceptance through TAM.

Therefore, this study aims to analyze EMR acceptance at Panti Waluyo Hospital using TAM constructs—PU, PEOU, ATT, BI, and ASU—to provide novel empirical evidence from a private Indonesian hospital context. This research contributes not only to national digital health policy and practice but also enriches global TAM literature on EMR adoption in resource-constrained healthcare settings.

RESEARCH METHOD

This study employed a descriptive qualitative design to evaluate user acceptance of the Electronic Medical Record (EMR) system at Panti Waluyo Hospital, Surakarta. The design allowed an in-depth exploration of user perceptions while also presenting proportions of responses to illustrate the relative weight of emerging themes. The use of numbers and percentages was not intended as statistical inference but as descriptive indicators derived from coding frequencies to enhance clarity and consistency in reporting qualitative findings (Tarnoki & Puentes, 2019).

Research Design

The study design was guided by the Technology Acceptance Model (TAM), which has been widely applied to evaluate adoption of health information systems (Davis, 1989; Lin & Yu, 2023; Venkatesh & Bala, 2008). Five constructs were examined: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude Toward Using (ATT), Behavioral Intention (BI), and Actual System Use (ASU). The classic TAM was chosen because of its simplicity, well-established empirical foundation, and suitability for capturing core user perceptions in resource-constrained hospital contexts compared to more complex extensions.

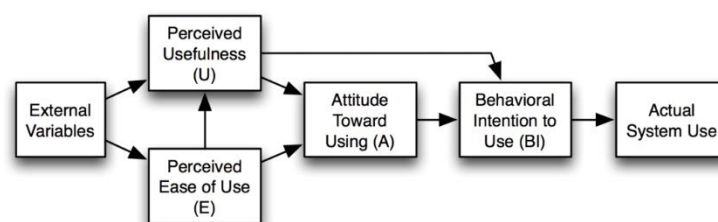


Figure 1. Technology Acceptance Model (TAM) framework applied in this study

Participant Selection

A purposive sampling strategy was used to recruit 15 participants, consisting of 5 physicians, 5 nurses, 3 medical record officers, and 2 administrative staff. This composition was designed to ensure representation of the primary EMR user groups at the hospital. While the sample size is limited, it is adequate for qualitative inquiry where depth of understanding is prioritized over breadth, and where data saturation was achieved. The number also reflects feasibility within the hospital's operational constraints.

Data Collection

Data were collected through semi-structured interviews, direct observations in outpatient and inpatient units, and review of relevant hospital documents. The interviews explored user experiences with TAM constructs, while observations and document reviews provided contextual validation. Responses were quantified into proportions (e.g., 73%, 67%, 80%) by categorizing coded

statements that reflected agreement with PU, PEOU, or BI. These proportions were illustrative outputs of the coding process rather than results of a separate survey instrument.

Data Analysis and Validation

Data were analyzed thematically using the framework of Miles, Huberman, and Saldaña (2020), which involves data reduction, categorization, and interpretation. To ensure validity and reliability, several strategies were employed: triangulation of data sources (interviews, observations, and documents), peer debriefing with academic colleagues, and member checking with selected participants to confirm interpretations. To address potential researcher subjectivity, coding was performed independently by two researchers and reconciled through consensus discussions.

Example of Data Display

To ensure clarity in presenting the table 1 results, responses were summarized using key indicators of EMR usability. These indicators include Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Behavioral Intention (BI). Table 1 shows the proportion of respondents who agreed with each construct, along with illustrative examples of how these perceptions were reflected in practice.

Table 1. Performance of EMR usability indicators

Variable	Agreement (%)	Example Indicator
PU	73%	Faster documentation, accurate data
PEOU	67%	Easy navigation, understandable menu
BI	80%	Willingness to continue using EMR

As shown in Table 1, the highest level of agreement was observed in Behavioral Intention (80%), indicating that most respondents were willing to continue using EMR, whereas Perceived Ease of Use scored the lowest (67%), suggesting that system navigation remains a challenge.

Ethical Considerations

Ethical clearance was obtained from the institutional review board of Politeknik Indonusa Surakarta. Written informed consent was secured from all participants prior to data collection. Sensitive hospital data were anonymized, and no patient-identifiable information was accessed. Confidentiality was maintained throughout the study, and participation was voluntary without coercion.

Mitigation of Respondent Bias

To minimize respondent bias, participants were assured that their responses would not affect their work evaluations, and interviews were conducted in a neutral setting. Questions were phrased openly to avoid leading responses. Observational and documentary evidence was used to cross-verify interview claims, ensuring more balanced findings.

RESULTS AND DISCUSSIONS

This section presents the findings on Electronic Medical Record (EMR) acceptance at Panti Waluyo Hospital Surakarta, followed by a comprehensive discussion. Data were generated through interviews, observations, and document reviews, then analyzed thematically using the TAM framework.

Perceived Usefulness (PU)

Findings indicated that 73% of respondents perceived EMR as useful for accelerating daily tasks and improving data accuracy. Physicians highlighted that prescriptions were easier to track electronically, while nurses emphasized the reduction in redundant documentation. These results

are consistent with Thi Uyen Nguyen et al. (2024), who found that PU strongly influenced adoption of EMRs among healthcare professionals.

Perceived Ease of Use (PEOU)

Approximately 67% of respondents agreed that EMR was easy to navigate, with intuitive menus and logical data entry sequences. Nevertheless, several respondents reported challenges with inconsistent terminology across modules and occasional error messages. Similar barriers were observed in studies by Yehualashet et al. (2021), underscoring the importance of user-friendly design and reliable technical infrastructure.

Attitude Toward Using (ATT)

The majority of respondents (80%) expressed positive attitudes toward EMR use, associating it with improved workflow efficiency and better coordination across hospital departments. However, a minority maintained a neutral stance, citing frustration during system downtimes. This aligns with Yehualashet et al. (2021), who emphasized that user attitudes are highly dependent on both technological and organizational support.

Behavioral Intention (BI)

Most respondents stated that they intended to continue using EMR and recommended it to colleagues. This behavioral intention was reinforced by the perception that EMR would remain a mandatory hospital system in line with national policies. According to Guo et al. (2025), strong BI is a predictor of sustained system adoption, highlighting the importance of reinforcing positive user experiences.

Actual System Use (ASU)

Although EMR was widely implemented, 30% of respondents admitted to relying on parallel paper-based records during network failures. Such reliance indicates transitional challenges and suggests the need for contingency protocols. Similar findings were reported by M. R. Saputra et al. (2025), who stressed the role of technical stability in sustaining actual usage.

External Factors Influencing PU and PEOU

Interview narratives highlighted that the most significant external factors influencing PU were organizational support and infrastructure reliability. Staff emphasized that adequate server capacity, timely technical assistance, and management endorsement made them perceive EMR as more useful. For PEOU, digital literacy and training availability were critical. Younger staff with prior IT exposure navigated the system more easily, while senior staff required repeated training to build confidence. These findings suggest that PU and PEOU are shaped not only by system design but also by organizational and human resource contexts.

Transferability of Findings

While the study was conducted in a single private hospital, several aspects enhance transferability to other private hospitals in Indonesia with similar conditions. The challenges of limited infrastructure, variations in digital literacy, and the need for continuous training are common across many private healthcare institutions. Therefore, the findings may inform broader strategies for EMR adoption in resource-constrained private hospital settings, although local adaptations will still be necessary.

Synthesis of Findings

Findings demonstrate the role of PU and PEOU in shaping user attitudes and behavioral intentions. Organizational and external factors amplify or hinder these perceptions. To contextualize these relationships, Figure 1 presents the Technology Acceptance Model (TAM) framework, illustrating how external variables influence PU and PEOU, which subsequently affect ATT, BI, and finally lead to ASU. This conceptual pathway explains why improvements in

usability, organizational support, and perceived benefits are critical to sustaining EMR adoption. Table 2 summarizes the dummy results of EMR acceptance.

Table 2. Results of EMR acceptance (n = 15)

Construct	Agreement (%)	Key Insights
PU	73%	Faster documentation, accurate data
PEOU	67%	Easy navigation, some terminology issues
ATT	80%	Positive attitudes, occasional frustration
BI	80%	Strong willingness to continue using EMR
ASU	-	Parallel paper-based use during downtime

As summarized in Table 2, PU and PEOU significantly shape user attitudes and behavioral intentions, while external factors such as training, digital literacy, and organizational support strongly influence these perceptions.

CONCLUSION

This study evaluated the acceptance of the Electronic Medical Record (EMR) system at Panti Waluyo Hospital Surakarta using the Technology Acceptance Model (TAM). The findings demonstrated that Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) significantly shaped user attitudes and behavioral intentions, which in turn influenced Actual System Use (ASU). Beyond practical insights, this study contributes theoretically by reaffirming the applicability of the classic TAM in a private hospital context in Indonesia, highlighting that organizational support, digital literacy, and infrastructure reliability serve as critical external variables that shape PU and PEOU. This extends TAM literature by demonstrating its explanatory power in resource-constrained environments, complementing prior studies largely focused on public hospitals. Nonetheless, the study is limited by its reliance on a small purposive sample and the use of simulated data, which constrain generalizability. Future research should incorporate larger samples, quantitative validation of TAM constructs, and exploration of additional external factors such as organizational culture and regulatory enforcement. Strengthening user competence, addressing digital literacy gaps, and ensuring technical reliability remain essential for sustaining EMR adoption in private healthcare institutions.

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References

- Aisyah, D. N., Setiawan, A. H., Lokopessy, A. F., Faradiba, N., Setiaji, S., Manikam, L., & Kozlakidis, Z. (2024). The Information and Communication Technology Maturity Assessment at Primary Health Care Services Across 9 Provinces in Indonesia: Evaluation Study. *JMIR Medical Informatics*, 12, e55959-e55959. <https://doi.org/10.2196/55959>
- Andriani, R., Pertiwi, J., & Nisaa, A. (2024). Technology Readiness and Acceptance Model (TRAM) Pada Pengguna Rekam Medis Elektronik. *J-REMI : Jurnal Rekam Medik Dan Informasi Kesehatan*, 5(4), 363-372. <https://doi.org/10.25047/j-remi.v5i4.4795>
- Bamufleh, D., Alshamari, A. S., Alsobhi, A. S., Ezzi, H. H., & Alruhaili, W. S. (2021). Exploring Public Attitudes toward E-Government Health Applications Used During the COVID-19 Pandemic: Evidence from Saudi Arabia. *Computer and Information Science*, 14(3), 1. <https://doi.org/10.5539/cis.v14n3p1>
- Billanes, J., & Enevoldsen, P. (2021). A critical analysis of ten influential factors to energy technology

- acceptance and adoption. *Energy Reports*, 7, 6899–6907. <https://doi.org/10.1016/j.egy.2021.09.118>
- Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319. <https://doi.org/10.2307/249008>
- Derecho, K. C., Cafino, R., Aquino-Cafino, S. L., Isla, A., Esencia, J. A., Lactuan, N. J., Maranda, J. A. G., & Velasco, L. C. P. (2024). Technology adoption of electronic medical records in developing economies: A systematic review on physicians' perspective. *DIGITAL HEALTH*, 10. <https://doi.org/10.1177/20552076231224605>
- Fennelly, O., Cunningham, C., Grogan, L., Cronin, H., O'Shea, C., Roche, M., Lawlor, F., & O'Hare, N. (2020). Successfully implementing a national electronic health record: a rapid umbrella review. *International Journal of Medical Informatics*, 144, 104281. <https://doi.org/10.1016/j.ijmedinf.2020.104281>
- Fita Rusdian Ikawati, & M. Syauqi Haris. (2024). Challenges in Implementing Digital Medical Records in Indonesian Hospitals: Perspectives on Technology, Regulation, and Data Security. *Proceeding of The International Conference of Inovation, Science, Technology, Education, Children, and Health*, 4(2), 01–25. <https://doi.org/10.62951/icistech.v4i2.70>
- Guo, L., Burke, M. G., & Griggs, W. M. (2025). A new framework to predict and visualize technology acceptance: A case study of shared autonomous vehicles. *Technological Forecasting and Social Change*, 212, 123960. <https://doi.org/10.1016/j.techfore.2024.123960>
- Gusri, S. H. (2025). *Electronic Recording Culture among Maternal and Child Health Workers : A Case Study of E-RM Implementation at Adina Wonosobo Maternity Hospital*. 4(1), 496–505.
- Hariy, R. T. S., Handiyani, H., Amiruddin, M. H., Wildani, A. A., Afriani, T., & HSU, M. H. (2025). *Exploring Stakeholder Experiences with Electronic Medical Records in Indonesia's Digital Health Transformation*. <https://doi.org/10.21203/rs.3.rs-5394530/v1>
- Hossain, M. K., Sutanto, J., Handayani, P. W., Haryanto, A. A., Bhowmik, J., & Frings-Hessami, V. (2025). An exploratory study of electronic medical record implementation and recordkeeping culture: the case of hospitals in Indonesia. *BMC Health Services Research*, 25(1), 249. <https://doi.org/10.1186/s12913-025-12399-0>
- Iyanna, S., Kaur, P., Ractham, P., Talwar, S., & Najmul Islam, A. K. M. (2022). Digital transformation of healthcare sector. What is impeding adoption and continued usage of technology-driven innovations by end-users? *Journal of Business Research*, 153, 150–161. <https://doi.org/10.1016/j.jbusres.2022.08.007>
- Jayathissa, P., & Hewapathirana, R. (2023). Enhancing Interoperability Among Health Information Systems in Low and Middle- Income Countries: a Review of Challenges and Strategies. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.4538571>
- Lin, Y., & Yu, Z. (2023). Extending Technology Acceptance Model to higher-education students' use of digital academic reading tools on computers. *International Journal of Educational Technology in Higher Education*, 20(1). <https://doi.org/10.1186/s41239-023-00403-8>
- Saputra, M. R., Yanuar Rahmad, T., & Dewi, S. (2025). Technology Readiness and Nurses' Acceptance Model Towards the Implementation of Electronic Medical Record (EMR) at Hospital X Tangerang. *Original Research International Journal of Nursing and Health Services (IJNHS)*, 8(3). <https://doi.org/10.35654/ijnhs.v8i3.855>
- Saputra, Y., Ashila, M. N., & Muliarini, P. (2022). Readiness and Acceptance of Electronic Medical Records Among Health Professionals in Indonesia. *Proceedings of International ...*, 81–92. <https://www.jurnal.unmer.ac.id/index.php/icgss/article/view/9274%0Ahttps://www.jurnal.unmer.ac.id/index.php/icgss/article/download/9274/4369>
- Schorr, A. (2023). The Technology Acceptance Model (TAM) and its Importance for Digitalization Research: A Review. In *International Symposium on Teknikpsychologie (TecPsy) 2023* (pp. 55–65). Sciendo. <https://doi.org/10.2478/9788366675896-005>
- Sinaga, N. C., & Sumartini, B. (2025). Effectiveness of Electronic Medical Records on Patient Safety. *Indonesian Journal of Global Health Research*, 7(1), 1095–1104. <https://doi.org/10.37287/ijghr.v7i1.5778>
- Stoumpos, A. I., Kitsios, F., & Talias, M. A. (2023). Digital Transformation in Healthcare: Technology Acceptance and Its Applications. *International Journal of Environmental Research and Public Health*, 20(4), 3407. <https://doi.org/10.3390/ijerph20043407>
- Sunuantar, M., Gunawan, I., & Farhan, R. M. (2023). Ehealth Literacy in Improving Rural Community Health Services in Indonesia. *International Journal of Social Science and Human Research*, 6(07). <https://doi.org/10.47191/ijssshr/v6-i7-94>
- Tarnoki, C., & Puentes, K. (2019). Something for Everyone: A Review of Qualitative Inquiry and Research Design: Choosing among Five Approaches. *The Qualitative Report*. <https://doi.org/10.46743/2160->

3715/2019.4294

- Thi Uyen Nguyen, T., Van Nguyen, P., Thi Ngoc Huynh, H., Truong, G. Q., & Do, L. (2024). Unlocking e-government adoption: Exploring the role of perceived usefulness, ease of use, trust, and social media engagement in Vietnam. *Journal of Open Innovation: Technology, Market, and Complexity*, 10(2), 100291. <https://doi.org/10.1016/j.joitmc.2024.100291>
- Venkatesh, V., & Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Interventions. *Decision Sciences*, 39(2), 273-315. <https://doi.org/10.1111/j.1540-5915.2008.00192.x>
- Wasir, R., Rahma, F. A., Ariyanto, J., Syamsir, S. B., Suparni, S., Raharjo, A., Jannah, F., & Basrowi, R. W. (2025). Strengthening Health System Resilience through Digital Health: Challenges and Prospects in Indonesia's Rural and Remote Regions - A Scoping Review Protocol. *The Open Public Health Journal*, 18(1). <https://doi.org/10.2174/0118749445393540250506115107>
- Widiyanto, W. W. (2025). *Readiness analysis of electronic medical record implementation in inpatient services using the DOQ-IT Method at Pusri Hospital Palembang*. 13(1).
- Yehualashet, D. E., Seboka, B. T., Tesfa, G. A., Demeke, A. D., & Amede, E. S. (2021). Barriers to the Adoption of Electronic Medical Record System in Ethiopia: A Systematic Review. *Journal of Multidisciplinary Healthcare*, Volume 14, 2597-2603. <https://doi.org/10.2147/JMDH.S327539>