Evaluation of the Implementation of the Electronic Medical Record Information (RME) System based on User Perceptions Using the Technology Acceptance Model (TAM) approach

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ABSTRACT

One of the rapid developments in information technology is the development of information technology. The development of information technology in the field of health services is no exception, including the development of the Electronic Medical Record (RME) system, namely computer-based medical records. Electronic medical records as a manifestation of the transformation of the national health system in the field of technology are still considered a challenge. Based on Minister of Health Regulation no. 24 of 2022, it is stated that every health service facility in Indonesia is required to maintain electronic medical records. Many hospitals have started to build and implement it, but until now there are still many obstacles in implementation.

This study aims to evaluate user acceptance of the implementation of electronic medical records using the TAM approach in hospitals.

This research uses quantitative methods with data collection techniques from the results of questionnaires and FGD (discussion group forums). Questionnaires are taken from the population of RME users related to services in hospitals, namely registration officers, medical records officers, general practitioners, specialist doctors, radiology officers, Laboratory and nurses. The questionnaires distributed were based on the TAM method approach, namely perceived usefulness, perceived ease of use, interest of actors and actual use. Meanwhile, the Forum Group Discussion (FGD) obtained results from evaluations of meeting results conducted by the DTO of each service unit that had direct access to RME. hospital.

Keywords: *Electronic Medical Records, Medical Records, TAM, Hospital, FGD*

1. Introduction

Facing the global situation and the very rapid development of information technology is a challenge and competition where hospitals must always formulate an appropriate and comprehensive strategy. The strategy of making hospitals "smart and safe" is of course a challenge for hospitals in the future. To achieve these conditions, hospitals must prepare themselves by providing quality, safe, effective and efficient services, environmentally friendly facilities and infrastructure, adaptive and competent resource management and hospital information systems that are transformed into a digital direction.

The government has established a regulation by issuing Minister of Health Regulation (PMK) number 24 of 2022 concerning Medical Records. Through this policy, health service facilities (Fasyankes) are required to implement a system for recording patient medical history electronically. The transition process for all Health Facilities is targeted to be no later than 31 December 2023. With this policy, hospitals must immediately change their medical record systems to digital. (ERM) In the strategic plan, the Indonesian Ministry of Health has also determined that one of the plans to achieve strategic goals through the targets of the National Health Services and Insurance Program (JKN) at the Directorate General of Health Services is to increase access to basic health services and quality referrals for the community with one indicator of achievement being 100% of hospitals implementing integrated Electronic Medical Records (RME) by 2024.

Electromedical Medical records are a computerized health information system that provides detailed records of patient demographic data, medical history, allergies, and history of laboratory examination results and some of them are also equipped with decision support systems. (Ludwick & Doucette). Electronic Medical Record Systems (ERM) have a very important role in improving the quality of medical services and hospital efficiency, because innovation has a positive effect on performance (Mursid, et al., 2019) Traditionally, patient medical records are stored in physical form, such as files or handwritten notes. With advances in information technology, the shift from manual menis recording to ERM is becoming increasingly important in improving the quality of medical services and hospital efficiency in terms of: Information Accessibility: With ERM, patient medical information can be accessed quickly and easily by authorized medical personnel. Electronic medical records allow users to instantly search for and obtain necessary medical data, including disease history, laboratory test results, and drug allergy information. This helps doctors make the right decisions and saves patients' lives in situations that require speed. Better Care Coordination: ERM allows the various medical teams involved in a patient's care, such as doctors, nurses, and pharmacists, to collaborate efficiently. They can share real-time patient information, review complete medical histories, and quickly update the care provided. This reduces the risk of errors and improves care coordination. Improved Patient Security: In ERM, patient data is kept confidential and can be controlled with appropriate access arrangements. This helps in protecting patient privacy and preventing loss or theft of physical medical records. In addition, ERM also allows the use of decision support systems that can provide warnings and suggestions based on the patient's medical history, helping in making better decisions and reducing the risk of medical errors. Hospital Administration Efficiency: ERM implementation can help in automating hospital administration processes, such as recording and processing patient data, scheduling, and billing. This reduces reliance on physical documents, saves time, and reduces the risk of human error. Improved administrative efficiency can allow medical personnel to focus more on patient care. Although implementing ERM requires an initial investment, in the long term it can result in cost

savings. This is associated with reduced paper usage, physical storage costs, and improved operational efficiency. In addition, by providing more accurate and complete information, ERM can also help in avoiding unnecessary repeat tests or treatments, reducing overall care costs. Through effective implementation of ERM, hospitals can improve the quality of medical services, improve care coordination, increase patient safety, increase operational efficiency, and reduce care costs.

The government's target is that health service facilities (Fasyankes) are required to implement an electronic patient medical history recording system no later than 31 December 2023. With this policy , all hospitals must start implementing electronic medical records in their services. The process of implementing medical records cannot be carried out and implemented immediately but requires a long process. Obstacles in the field will definitely arise and sometimes things don't go as well as expected, including Leadership Culture, Management Strategy, Clinical and Administrative Staff Information, Training, Work Flow Processes, Accountability, Finance and Budget, Patient Involvement, IT Management and Infrastructure support Technology.

Study This will look for know How perception user record medical electronic about expediency and convenience use record medical electronic inhouse Sick. Researcher will use questionnaire TAM (*Technology Acceptance Model*). This model was first introduced mby Davis in 1989. TAM is an information system that creates a model of how users are willing to accept and use technology. Perception of usefulness shown by the extent to which someone believes that the use of the system This will increase performance, whereas draft convenience use shows how someone will believe that using a system information That is easy, no need business hard from the user so users will tend use the system.

2. Literature Review

2.1 Electronic medical records (ERM)

According to the Minister of Health Regulation No. 24 Electronic Medical Records are Medical Records made using an electronic system intended for the organization of Medical Records. (Permenkes, 2022). Electronic Medical Records is one of the subsystems of the Health Care Facility information system that information system that is connected to other information subsystems in the Health Service Facility.

2.2 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), which was introduced by Davis in 1989 is an adaptation of the Theory of Reasoned Action (TRA) which is devoted to modeling user acceptance of technology. This model was redeveloped by several researchers such as Szajna (1994), Igbaria et al. (1995) and Venkatesh and Davis (2000) in Jogiyanto (2007). The modification of the TAM model was carried out by Venkantesh by adding trust variables with the title Trustenhanced Technology Acceptance Model. Acceptance Model, which examines the relationship between TAM variables and trust. trust. Another TAM modification, namely the Trust and Risk in Technology Acceptance Model (TRITAM) conducted by Lui and Jamieson in Jogiyanto (2007) using trust and risk variables along with TAM variable.

There are five main constructs that make up TAM, the five constructs are as follows:

- Perceived Usefulness
- Perceived Ease of Use
- Attitude toward Behaviour
- Behavioral Intention
- Behaviour

2. Methodology

Study This use method descriptive qualitative with technique data collection in the form of interviews, questionnaires and document analysis. Study This aims to evaluate the application of RME and explore user opinions regarding RME, identifying obstacles and supporters of implementing RME as well suggestions and recommendations for the hospital. Questionnaire respondents in this study are registration officers, RM nurses and doctors in the outpatient unit House Sick. Whereas respondent interview is coordinator registration officer, coordinator officer RM, coordinator nurse and coordinator nurse.

In this study, a TAM system acceptance questionnaire was used. This questionnaire was adopted from TAM taking four variables including about perceived usefulness, about perceived ease of use, about interest behavior and about actual use. Meanwhile, the items used for the assessment consists of 10 statement items regarding perceived usefulness, 12 items statements regarding perceived ease of use. In operations, everything variable will be measured by instrument gauge in form questionnaire Which fulfill Likert scale type statements. Likert scale according to (Sugiyono, 2019; Suliyanto, 2011) used for measure attitude, opinion and a person's perception or a group of people about a social phenomenon. For each choice answer, will given score. With a Likert scale, the variables being measured will be described becomes a variable indicator and is used as a benchmark in compiling items instrument Which form question or statement.

To determine the ranking in each research variable, it can be seen from the comparison between actual and ideal scores. The actual score is obtained through the results calculation all over opinion respondent, whereas score ideal obtained from the highest predicted score is multiplied by the number of questionnaire questions multiplied with amount respondents.

Explanation of the weight of the actual score is divided into 5 categories, namely very Good, enough, not good and not good. Test validity questionnaire Which done on study done on method:

- Test Validity Variable Questionnaire
  Technique testing Which used researcher for test validity is using Bivariate Pearson correlation (Pearson's Product Moment). Points- points question Which correlated significant with score total show bullet points the capable give support in reveal What Which want to reveal. ($\alpha \leq 0.05$)
- Test Reliability
  Tall low reliability, in a way empirical showed by something number Which called mark coefficient reliability. Reliability Which tall showed with mark rxx approach number 1. Agreement in

a way general reliability which is considered satisfactory if Cronbach alpha ≥ 0.6.

Where as on collection data with interview done test credibility. This test is carried out with increasing persistence through observation more carefully and continuously. Through this process, data is expected and order incident can reported in a way Certain And systematic. In This research carried out source triangulation, namely a data collection technique nature combine various source data Which There is. Triangulation source in study This is with take data from coordinator from each PPA or with a DTO that has been appointed to represent each service unit and profession.

3. Results

3.1 Results questionnaire

The results of an evaluation questionnaire using the TAM Model approach will provide an overview of how RME users (for example, doctors, nurses, or medical staff) measure their perceptions of the ease of use and benefits of the RME system. Questionnaire results may include: Mean score for Perceived Ease of Use: An indication of the extent to which users believe RME is easy to use. A high score indicates that users find the RME system easy to use. Average score for Perceived Benefits: An indication of the extent to which users believe that using RME brings benefits to their work, such as improving efficiency or patient care. A high score indicates that users see benefits in using RME. Correlation Analysis: Results may include correlation analysis between perceived ease of use and usefulness. If there is a strong positive correlation, this suggests that users who find RME easy to use are also more likely to see benefits. Recommendations and Suggestions: The questionnaire may also include a section where respondents can provide recommendations or suggestions for improving the RME system, if they have certain input or feelings regarding the use of the system.

The results of this questionnaire can be used as a basis for taking further action, such as making changes to the RME or organizing additional training for users. Additionally, questionnaire results can provide valuable insight into understanding the level of acceptance and use of RME by Professional Care Providing (PPA) teams.

3.2 Results Study Qualitative/Interview Deep

From results interview to coordinator officer registration, coordinator officer RM, coordinator nurse And coordinator nurse It was found that according to users, the benefits of implementing RME include: makes it easier search data, speed up work, benefit will it is felt to be optimal when the implementation and use of RME is maximal also, so that later Can replace role record medical *papers based.* However when Still processing Still simultaneously with record medical manual, so matter This will Lots confiscate time from officer.

Obstacles in implementing RME that often occur include computers and networks Which often problematic, lack of power or source Power man (HR), as well as obstacles or problems that sometimes occur in the system Can resolved by all party Which fill in. Lack from The application of RME, among other things, is not easy for beginners to use, many time-consuming if the number

of patients is large because you still have to fill in record medical manually as well as No exists team who is ready quick finish system problems, both *hardware or software.*

The hope for implementing RME is that all officers start from registration can input data, the computer does not often error, RME can used so that makes it easier search And minimize use paper as well as need more socialization carry on about RME.

Problem from facet policy management is No exists written policy of Standard Operating Procedures (SPO) regarding implementation RME from management

3.3 Discussion Group Forum (FGD)

Forums can be formed and conducted with members from each service unit or Professional Care Providers (PPA) who have been appointed from the start with a letter of decision from the hospital director and trained in the use of RME.

This discussion group forum has important aims and objectives in the context of the development and implementation of RME, including identifying challenges and problems faced by care professionals in using RME. This includes technical problems, difficulties in adaptation, or other problems that can affect the effectiveness of health services. . Understanding the perspectives and views of caregiving professionals regarding the use of RME helps in tailoring the system to their needs and preferences. Through feedback and discussion, the main goal is to improve the quality of health services provided by care professionals. By understanding how RME can be used more effectively, the impact on patient care can be improved. This forum can also be used for discussions about the ongoing development of RME to suit technological developments and the needs of caregiving professionals, including updates, data security improvements, and relevant new features. Apart from the above, fgds are used as a means to discuss the training and education needed by care professionals to help them feel more confident and competent in using this technology.

PPA hopes will also emerge for maximum use of RME, because with RME all patient medical record data can be easily retrieved without taking a long time. Other hopes include reducing unrelated job desks (such as registration having to be a cashier), reducing system errors, having employees who understand the system and can resolve them appropriately and quickly if there are obstacles in using RME, and no use of manual medical records. Overlap so as to speed up service.

Apart from that, several reasons why the RME system is not optimal include limited funds, not everyone can use it smoothly, *loading* the system takes a long time and has errors and not everyone is able and sometimes reluctant to do it.

So, the discussion group forum in evaluating the perception of user acceptance of RME by care professionals has the main objective of understanding and overcoming challenges, improving service quality, and supporting sustainable development in the use of RME in hospital services. The discussion was held to carry out an evaluation of problems that arose during the implementation of RME and as a forum for coordinating between ppas to reach an agreement to facilitate the implementation of RME. Thus, the benefit of this discussion forum is that problems

that arise from various service units can be addressed and jointly find solutions and then a joint agreement will be made and thoroughly socialized to the PPA in each service unit.

4. Discussion

Evaluation of information systems is a real effort to find out conditions actually an information system implementation. With this evaluation, then achievement activity maintenance system information can is known and obtained improved performance its implementation.

4.1 Evaluation Application system RME Related With Perception Expediency

Evaluation of the RME system is an attempt to find out the situation actually an implementation of the RME system. Evaluation of an information system is a real effort to find out the actual condition of an information system. Questionnaire TAM arranged in accordance with theory Davis (1989) that perception expediency defined as so far where somebody believes that use system certain will increase its performance. Draft perception usefulness shows the user's confidence in the contribution of the information system on performance users. Evaluation of the implementation of an electronic medical record system in relation to perceived usefulness can involve several important steps. Surveys and Interviews: Conduct surveys and interviews with medical staff, health workers, and patients who use electronic medical record (RME) systems. Questions should focus on the perceived or expected benefits of using RME in patient and health care data management. In analyzing data, it is necessary to collect data related to using RME, such as reducing time in searching for patient information, increasing service efficiency, reducing medical errors, or cost savings. Compare this data with the period before the RME was implemented. A review of the overall performance of the system needs to be conducted, including its reliability, speed, ease of use, and security. This evaluation must cover technical and operational aspects. Pay attention to feedback and complaints from RME users. This can provide insight into problems that need to be fixed or areas where the system can be improved. A cost-benefit calculation analysis of implementing and maintaining the RME system compared with the benefits obtained, both in terms of improving patient service and operational efficiency, must be carried out. The most important thing that should not be missed is apart from the PPA perspective, the patient perspective. Conduct surveys or interviews with patients to evaluate whether they feel RME has improved the experience their services, including access to their medical records.

By conducting a comprehensive evaluation of the implementation of the electronic medical record system and perceptions of its usefulness, we can identify ways to increase the use of RME and its benefits in improving health services in hospitals, so that when it is running well and in place suitability system Electronic medical records and user work needs will make things easier work they.

4.2 Evaluation of the Implementation of the RME System Regarding Perceived Ease of Use

Perception convenience use in theory TAM (T*echnology Acceptance Model*) states that perceived ease is defined as the level to which a person believes that using an information system is easy and does not require user effort to use it. Draft This ease of use will give the understanding that if a system information easy used, so user will tend use system the. Convenience in use system information will give rise to feeling in himself that system the useful and give feeling comfortable when Work use system the. According to Davis et al., (1989), perceived ease of use is considered

as one of the significant determinants of technology acceptance. Meanwhile, Teo (2009), when users feel confident the technology is effortless, will increase intent somebody to use and adopt. [12] On the other hand, there is a shortage knowledge user on record medical electronic and lack of ability in field I.T user This cause they consider that This electronic medical record is difficult to use.

Evaluation of the implementation of an electronic medical record (RME) system in terms of perceived user friendliness can involve several important steps: User Survey: Survey users of the RME system, including doctors, nurses, administrative officers, and other medical staff. Questions in the survey should focus on their experience of using the RME system and the extent to which they found it easy or difficult to interact with it. Performance Data Collection: Analyze EHR system performance data, such as time required to access patient information, system failure rates, and length of training required to properly use the system. Direct Observation: Observe users as they use the RME system in real situations. Note any difficulties or obstacles they face during daily use. Interviews: Conduct in-depth interviews with key users to understand more about their experiences. Ask about problems that may not be revealed in surveys or observations. Benchmarking: Compare your RME system with similar systems used elsewhere or that have been recognized as easy to use by users. This can help identify areas where your system can be improved. Results Analysis: Combine data from multiple evaluation sources to identify key trends and issues related to perceived user friendliness. Prioritize improvements that need to be made. Corrective Action: Once problems are identified, corrective action must be taken. This may include improvements to the user interface, additional training, or changes in system use policies and procedures. Continue Evaluation: Continue to carry out regular evaluations to ensure that the improvements made have succeeded in increasing the user's perception of ease. By actively involving users in this process, you can continually improve your RME system as needed.

This comprehensive evaluation of the RME system will help you improve the quality of health services and ensure that users feel comfortable and efficient in using it.

4.3 Evaluation System Implementation RME About Interest Behavior

Behavioral interest is a person's desire (interest) to do something something behavior certain. Based on results research previously show that interest behavior is predictions Which Good from use technology by users system. [5] The purpose of this Evaluation is to measure the extent to which the RME system influences offender interests or to assess its effectiveness in predicting or forecasting offender interests. The step that needs to be taken is to determine precisely the "perpetrator's interest." either interest in taking a particular action, interest in adopting a product or service, or interest in participating in an activity. Key Variables: Identification of those influencing offender interest in the context of this RME system may involve variables such as quality of recommendations, offender trust in the system, comfort of use, or social factors. In addition to offender interest, consider also measuring the offender's level of satisfaction with the experience of using the RME system, this can provide further understanding of the offender's perception of the system. Reveal weaknesses or areas for improvement, make concrete recommendations for improving the RME system in terms of influencing offender interest. Once recommendations are implemented, conduct further monitoring and ongoing evaluation to ensure that necessary changes have successfully increased the RME system's impact on offender interests.

This evaluation will assist in understanding the dynamics between the RME system and offender interests and provide guidance for increasing the system's influence on offender interests in a given context.

4.4 Evaluation Application System RME About Use Actual

According to context use system technology information, behavior is use actual from technology. Whereas behavior Alone is action Which done by somebody. In this evaluation, user perceptions regarding the level of satisfaction in using RME will be found. This level of satisfaction will determine the PPA's behavior in carrying out RME so that the actual evaluation results can determine the direction of successful implementation of RME in the hospital.

Problems and obstacles in implementation RME show work Which too Lots experienced by part registration, system Which often experience disturbance so that hinder use of the RME system, there are errors in entering data so that inappropriate data, as well as the use of manual medical records which goes hand in hand with RME so that use time No effective especially moment patient currently crowded. Hope use in implementing RME is that the system can run well and can be used optimally because with RME all patient medical record data can be easily easy taken without need time long. Hopes other is like subtraction *jobs desk* Which No relate, reduced system error, there is employee Which understand system and can overcome it appropriately and quickly if there are obstacles in use RME, and there is no use of manual medical records overlap.

All problems that arise can be overcome with a joint commitment from management and the entire hospitality community to continue to develop RME to be better in order to achieve effective, efficient and quality service in the context of customer satisfaction.

5. Conclusion

Based on the results of the discussion of several problems that often arise can be concluded several things as answers to existing problems. Application RME according to perception user beneficial for work they, only it's just that its implementation is not yet optimal so interfere with user performance and prolong the service process so that the impact is very serious in reducing customer satisfaction with hospital services. The implementation of RME requires strong efforts and continuous evaluation to improve the system in its use. User behavior interests in the future implementation of RME is quite good, but expect there to be repair system. Use actual in application RME Still not enough maximum. Applying RME when it is optimal can reduce workload. In implementing the RME system in hospitals, several obstacles often occur other things, the old registration system is not yet connected to the BPJS online queue, sending data from patient registration to polyclinic services still takes a long time, sending data from clinics to examination support units is still hampered, patient approval from clinics or emergency rooms to outpatient units and rooms operations often experience problems, units computer Which used often problematic, network Which connecting the computer to the server often has errors, inputting data from one patient to the next waits a long time, for example in the operating room, once the data is full, the system becomes slower, thus slowing down the work, implementation is not yet optimal, Policy policies And Standard Procedure Operational (SPO) Which clear about application RME is

still not being implemented well. The RME system is not yet fully connected to pharmaceutical supplies and hospital rates.

In its implementation system RME in House Sick there are several supporters, including the creation of an RME system and has done socialization although not yet maximum. Alternative solution in application RME in House Sick between other Necessity made SPO Which clear about use and how to troubleshoot problems with the RME system. Need made policy written from management related application RME. Party Hospital management carries out workload analysis for related users with RME. There are *rewards* and *punishments* for RME users. The presence of staff special that can be called when there are problems that cannot be solved by user. There is support fund in application RME in House Sick. A more comprehensive training or outreach program about RME is carried out to all user.

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