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Evaluation Of The Implementation Of Electronic Prescribing At Sinar Kasih Hospital Purwokerto Using The Hot-Fit Method

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ABSTRACT

The aim of this study is to reveal and assess the evaluation of implementation e-prescribing or electronic prescription module at the Sinar Kasih Hospital Purwokerto. This study uses a descriptive approach, namely a methodology that aims to determine system quality, information quality, service quality, user satisfaction, organizational support and net benefits for the implementation of electronic prescribing. A qualitative research design with a case study approach. Participants in this research were doctors, nurses and pharmacy staf. Using qualitative methods, in-depth interviews were conducted with 3 doctors, 2 Outpatient Installation nurses, 1 pharmacy staf. The validity of the data was tested using the triangulation method. Based on the results of research using the HOT-Fit method, it was found that the Human theme was the user's initial adaptability and user satisfaction. Organizational theme in the form of training and technical support. The Technology theme is network quality and information quality. There are obstacles in implementing e-prescribing where the network is slow, experiences downtime and there is no information on drug composition available in the e-prescribing feature. However, net benefits are obtained from implementing e-prescribing, namely speeding up medication administration, reducing paper use and reducing medical errors.

Keywords: e-prescribing evaluation, hospital, HOT-fit method

1. Introduction

The era of digital transformation requires an organization to be more effective in running its services. One effort to meet the demands of effectiveness is by implementing digital technology (Agrawal et al., 2018). One of the private health sector service facilities in Banyumas Regency that has implemented digital technology in the form of electronic medical records is the Sinar Kasih Hospital Purwokerto. Sinar Kasih Hospital Purwokerto implements electronic medical records as a form of response to the demands of digital developments with information technology as well as a form of compliance with government policy regulations. The

implementation has been carried out since November 2022 which is based on the Decree of the Director of Sinar Kasih Hospital Purwokerto No. 0200Dir/SIMRS/2022 and dated November 1, 2022 concerning the electronic medical record policy

One of the applications implemented by Sinar Kasih Hospital Purwokerto related to the application of digital technology in electronic medical record services is the *e-prescribing module* or electronic prescription. The e-prescribing module is part of the Hospital Management Information System managed by Sinar Kasih Hospital Purwokerto. Sinar Kasih Hospital Purwokerto uses conventional prescriptions until the end of 2022. In 2023, electronic prescriptions will be introduced with a module that appears in every patient's electronic medical record.

The results of the preliminary interview obtained information related to the obstacles in using this electronic prescription. The obstacles encountered in the field when using electronic prescriptions at Sinar Kasih Hospital Purwokerto were that doctors felt it was faster to write conventionally on prescription paper, so they ignored the *e-prescribing module*. Doctors also had difficulty in searching for drug keywords because the list of drugs available at the pharmacy was not *updated.* Slow networks and when there were many patients made doctors nervous in inputting with the *e-prescribing module* . Electronic prescriptions still coexist with conventional prescriptions when doctors practiced. Doctors had inputted the prescription, but it turned out that it was not included in the pharmacy information system, so patients had to wait a long time. This certainly hampered the service of providing drugs to patients.

The problem with the use of electronic prescriptions is that evaluation has not been carried out so it is not yet known how the performance of the *e-prescribing module* that has been run is. From these problems, it is necessary to carry out an evaluation of the implementation of electronic prescriptions at Sinar Kasih Hospital Purwokerto using the Hot-Fit method. This method model was chosen because considered capable of explaining the evaluation comprehensively with the core components approach of information systems, namely *Human, Organization, Technology* and the compatibility between the three components This affects *the Net Benefits* of implementing electronic prescription. Thus, the research problem can be formulated " How is the evaluation of the implementation of e-prescribing at Sinar Kasih Hospital Purwokerto using the HOT-Fit method ?"

2. Literature Review

2.1 Management Information System

According to Tyoso (2016), Management Information System is a system that processes and organizes data and information that is useful for supporting the implementation of tasks in an organization. Management information system is a planning part of a business's internal control which includes the use of people, documents, technology, and procedures by management accounting to solve business problems such as product costs, services, or a business strategy (Gaol, 2008; Ridwan et al., 2021). Thus, Management Information System is a collection of

hardware, software, brainware, procedures and/or rules that are organized integrally to process data into useful information for solving problems and decision-making.

2.2 Electronic Prescribing

Electronic prescribing is a powerful method to prevent medication errors caused by interpretation errors such as in handwritten prescriptions. Electronic prescribing can ensure that the drugs, doses, dosage forms, quantities, and times of administration written are correct and can also identify drug interactions, allergies to certain drugs and their suitability for the patient's condition (Widiastuti, 2013). Thus, electronic prescribing is the use of digital technology to manage prescription writing and transmission, which aims to improve patient safety, reduce medical errors, and increase efficiency in the drug administration process.

Study Urtasuna et al., (2022) presenting the results of a decline of almost 36% of the incidence of drug errors in hospitalization, which proves the positive impact of the use of e-prescribing. The types of prescription errors, namely wrong dosage and not specifying the route of administration, were significantly reduced by the implementation of e-prescribing . The implementation of health information technology will be more successful if supported by software that easy to use. The support system must be customized for each institution based on the needs local formulary and prescribing practices. Service providers as prescription software developers electronics need to continuously test, improve, update and adjust systems to be able to keep up with changing prescription needs, trends, and physician practices (Artawan & Martini, 2020).

2.3 HOT-Fit Method Evaluation

HOT-Fit is one of the theoretical frameworks used to evaluate information systems in the field of health services. According to Yusof et al, 2008 this evaluation method clarifies all components contained in the information system itself, the first is humans *who* assess the information system from the side of use (*system use*) which is related to who uses it, training, experience, knowledge, expectations, and attitudes to accept or reject the system. Second is the organization which assesses a system from the organizational structure and organizational environment related to planning, management, system control, management support, and financing and the third is technology which assesses from the side of system quality, information quality and service quality (Kodarisman, 2013).

A system can benefit a single user , a group of users, an organization, or an industry. *Net Benefit* can be seen through the positive and negative impacts obtained by users (staff , medical personnel , nurses, and so on) . Individual impacts are seen in the effects of the information provided on the behavior of the recipient of the information . These impacts can be seen through the performance of workers or staff in completing their tasks . Organizational impact is the effect of information provided on organizational performance. The higher the value of the existing *Net Benefit*, the higher the level of success of a system.

3. Research Methodology

This study is a research procedure that produces descriptive data in the form of written or spoken words and respondent behavior. Descriptive research is a form of research that aims to describe existing events or phenomena, both natural phenomena and human engineering (Moleong, 2000). This study aims to reveal and assess the quality of e-prescribing implementation at Sinar Kasih Hospital Purwokerto.

In this study, primary data sources were obtained from interviews, performance reviews of doctors and pharmacy staff, and observations. While secondary data sources in this study were medical record data and electronic prescriptions.

According to Arikunto (2002), the definition of data collection techniques is the methods that researchers can use to collect data, where the method is abstract, cannot be realized in visible objects, but its usefulness can be demonstrated. Data collection techniques in this study were carried out using the following methods:

The interview method is a conversation with a specific purpose conducted by two parties, namely the interviewer who asks questions and the interviewee who provides answers to the questions (Moleong, 2000). In this study, the researcher asked questions to 3 doctors and 2 nurses who used e-prescribing in the outpatient department and 1 pharmacy staff. The informants had a working period of between 2-10 years. The interview was conducted in September 2024.

The observation method can be interpreted as systematic observation and recording of symptoms that appear in the research object. This observation uses participatory observation, namely the researcher is directly involved in the daily activities of the person being observed and used as a source of research data (Sugiono, 2006). Observation is an observation made by researchers when users implement the e-prescribing system in the outpatient department and when pharmacy staff receive e-prescribing in the Pharmacy room. Observations were conducted in September 2024. In addition, to obtain secondary data, it is done through a search of the hospital management information system.

The validity of the data in this study is determined by using credibility criteria. To obtain relevant data, researchers check the validity of the data produced by triangulation. Triangulation in credibility testing is defined as checking data from all sources in various ways, and at various times. Thus there is triangulation of sources, triangulation of data collection techniques, and time. In this case, the researcher compares data from observations, interviews and documentation studies.

4. Results

4.1 Interview Process and Characteristics of Interview Subjects

Researchers conducted interviews with three data sources (informants), the first informant was a doctor who provided services in the outpatient department, the second informant was an outpatient installation nurse, and the third informant was a pharmacy staff.

The researcher immediately grouped the interview results into aspects of the hot fit method as an analytical tool in assessing the effectiveness of e-prescribing implementation. The results obtained were grouped into human, organization, technology and net benefit.

4.2 Human

The results of data collection through the interview method showed that most informants gave negative responses to their first experience using e-prescribing. This can be seen through the statements of 2 informants who are doctors and nurses.
" The first time the use of e-prescribing was quite hampered because the habit of writing to e-prescribing took some time to adapt. However, over time, I think electronic prescriptions are quite easy because we can find out the stock of drugs and which drugs can be given and are available at the hospital ." (Doctor A)
 "In the past, there were many rejections of e-prescribing because they were not used to it, not because of training. "If there is a drug that is not appropriate, then you have to ask the pharmacist first, what is the stock. In terms of time, it is less efficient if you don't know what the drug is." (Nurse A)

The implementation of e-prescribing in relation to interactions with patients and fellow work units has shown positive results. This can be seen through the statements of the following 2 informants:
"I don't think it affects interactions with patients, we can interact as usual." (Doctor A)
"There isn't any influence with interaction patient , but Still better than conventional ."(Doctor B)

satisfaction at the beginning of implementing e-prescribing is still lacking. This result was obtained during the interview process with informants doctors, nurses and pharmacy staff.
"When typing the initial methyl prednisolone, and it is inputted, then when deleting to type another drug, namely ambroxol, then what appears is meambroxol, so it takes time again to repeat the deletion." (Doctor B).
"If there is any drugs that are not accordingly , then must ask Formerly to pharmacy , preparations existence what . In time not enough efficient if No know the medicine what ."
(Nurse A)
" Initial design okay , but when walk There is problem Because system electronic Still matter new , so Still groping ." (pharmacy staff)

Based on the information above, it can be concluded that there are obstacles to acceptance at the beginning in the form of adaptation difficulties that require more time when typing drugs than writing. If there is a drug that you want to prescribe that does not appear in the system, then

doctors and nurses need to ask the pharmacy first so that it is less efficient in terms of time. During the initial adaptation, staff are still slow to learn this e-prescribing.

4.3 Organization

The results of the study indicate that organizational support in this case the management of Sinar Kasih Hospital provides adequate training. This can be seen through the statements of informants from doctors, nurses and pharmacy staff as follows: "
" "There was training at the beginning and it was quite adequate." "Management support was quite good (doctor A)
Training can be done adequately (doctor B)
"There is ERM training conducted." (nurse B)
"There are regular updates from Bethesda to accommodate needs." (pharmacy staff)

Based on the statements of the 3 informants above, adequate is when the role of IT Bethesda is presented to RS Sinar Kasih to provide development support in HR training. The management information system of RSU Sinar Kasih was built and developed by IT from RS Bethesda Yogyakarta. RS Bethesda is one of the business units that is a partner of the RSU Sinar Kasih work unit which is under the same auspices, namely YAKKUM (Christian Foundation for Public Health).

This is different from the statements of other informants who indicated that there had not been adequate training.
"There are no additional training sessions, usually the nurse (doctor c) tells you
"There is no training because it depends on habits, can't ignore experience." (nurse A)
Regarding management support for the e-prescribing implementation process, the study shows that the role of management is not optimal in meeting user needs and periodic maintenance. Training has not always been carried out comprehensively for new employees.

Based on the interview results, technical support from management to carry out supervision has not been carried out optimally, so there are still obstacles when using e-prescribing.
"The hospital management must understand what is needed by the doctor, the pharmacy that provides it, and the pharmacy informs the doctor about the available drugs so that it is faster for e-prescribing." (nurse A)
"The server system needs to be updated, because our lives are online, so it needs regular maintenance. There is downtime once a week. The solution is for nurses to ask for a copy of the prescription to the pharmacy for doctors who need it. (Nurse B)

4.4 Technology

Based on the technological aspect, informants appreciated the existence of an e-prescribing module that is integrated with electronic medical records.
"With the e-prescribing feature in ERM Sinar Kasih, we can write easily and find the medicine just by typing a few initial letters."

Research shows that there are several obstacles related to network infrastructure in the implementation of e-prescribing, namely loss of data access during power outages, unstable management information system networks and downtime so that patient services are disrupted.

"Usually, after experiencing problems with the internet, I end up using a manual recipe." (Doctor C)

The problem is the network, the wifi is slow so it takes a long time, but it doesn't affect medical errors. (Nurse A)

" The comparison between e-prescribing and conventional prescriptions is in the signal, the difficulty is usually that handwriting is done immediately, well with e-prescribing you have to look for the medicine first, the dosage. (Nurse B)

"If there are many patients, then there is downtime, waiting 1-2 minutes to respond." (Pharmacy Staff)

The design and features of e-prescribing developed by Bethesda still have limited access to information. On the e-prescribing display, there is no information related to the composition, dosage of drugs, side effects and drug interactions. This limited access to information can be a barrier to service.

This is as stated by the following doctor and nurse informants.

"There is no information about side effects and drug interactions, you can only find out the stock of drugs." (Doctor A)

"Drug information is still lacking, regarding the composition and dosage of the drug. (Doctor C)

"If there is a drug that is not suitable, you must first ask the pharmacist what the preparation is. (Nurse A)

4.5 Net Benefits

The results of the study showed that the first benefit of using e-prescribing is that it has a positive impact on prescription services, namely efficiency and productivity in terms of saving time, costs and human resources. Drug administration becomes faster than conventional prescriptions. The use of prescription paper is reduced so that it can reduce paper spending costs. When conventional prescriptions, nurses must deliver the prescription to the pharmacy. With the implementation of this electronic prescription, nurses do not need to walk to the pharmacy anymore so that it is very efficient for human resources.

"Currently e -prescribing is increasing efficiency and productivity. For example, in prescription We used to must write complete, but with this e-prescribing feature We can type part Name medicine and direct found it ." (Doctor A)

"Can be mutual increase efficiency work, from doctor to pharmacy, mutual help. (Doctor B)

"E- press increase productivity Because No need deliver recipe Again to pharmacy."(Nurse B)

" System This savings cost from paper and more human resources summary Because No need to pharmacy." (Doctor C)

"When the doctor currently chat with patient, medicine Already come in. When the patient going to pharmacy, then drug Already ready. Speed reception drug increase with e-prescribing. Conventional 5-10 minutes, e-prescribing under 5 minutes. "(Pharmacy Staff)

The second benefit based on the research results shows that the e-prescribing system has a feature of restrictions in administering drugs for certain types of drugs. This helps in the management of managing drug use in accordance with regulations.

"There is no hidden access, but like certain drug restrictions on the provision of drug restrictions such as in patient A, it cannot be given more than a certain amount and dose." (Doctor A)

Benefits of use the third e-prescribing system that is own very useful recipe copy feature for users and patients. With e-prescribing you can build connection with other organizations especially BPJS and patient insurance that is simplified the claims process patients. Patients who do control routinely and indicated accept same medication on visit previously, doctor can utilize copy recipe feature so that can save time.
" Rather make it easier patient, if patient the need a copy of the prescription in meaning need claim something, that more easy." (Doctor A)
This e-prescribing more fast, because there is copy prescription feature. Doctors do not need to repeat type recipe, just edit it according to the quantity needed." (Nurse B)

Third benefit of implementing e-prescribing is can reduce error medical. When the prescription conventional doctor write on paper recipe where is the doctor's writing varies which can influence results reading by pharmacist and its height error reading recipe.
"But I acknowledge my writing not enough Can read, so I think with this e-prescribing prescription can reduce error read Name medicine. (Doctor A)
" For reduce error medical is very precise once, for example similar like drugs. Pharmacy does not guess again. For incident past with recipe conventional Can big his mistake. (Doctor B)
"E-prescribing can reduce error medical. With e-prescribing, prescriptions easy readable by patients and pharmacists, reducing error medication caused by handwriting." (Pharmacy Staff)

5. Discussion

Most of the informant be at the stage implementation, where they experience constraint beginning Because lack of experience and rejection to change habit from recipe conventional become e-prescribing. According to Hotchkiss (2012) with diffusion of innovation theory approach, stage implementation is stage 4, namely user start apply technology. As time goes by time, the benefits of e-prescribing at Sinar Kasih Hospital Purwokerto start acknowledged as incoming in the confirmation stage. This is reinforced Agudo-Peregrina (2014 in Technology Acceptance Model (TAM) theory, Perceived Usefulness (PU) condition factors even though There is obstacle early, doctor show PU increase after adaptation. The next factor namely Perceived Ease of Use (PEOU) How much easy user consider technology the for used. Response beginning from doctors and nurses like " a bit " eat time in adapt " shows that initially, PEOU was low, which affected satisfaction user.

Various profit obtained in implementation of e-prescribing. The results of Akindele's (2019) research on 500 respondents survey stated that 43.8% of respondents strongly agreed that e-prescribing, can increase security treatment with remove ambiguity and error common writing happened to the recipe paper so that reduce error medical. Wrong medical decisions impact the safety and quality of care of health patient. Therefore that, is needed effort for prevent and reduce error with e-prescribing. Implementation sustainable system management treatment electronic is approach important For increase security treatment (Al- Sarawi , 2019; Artawan , 2020)
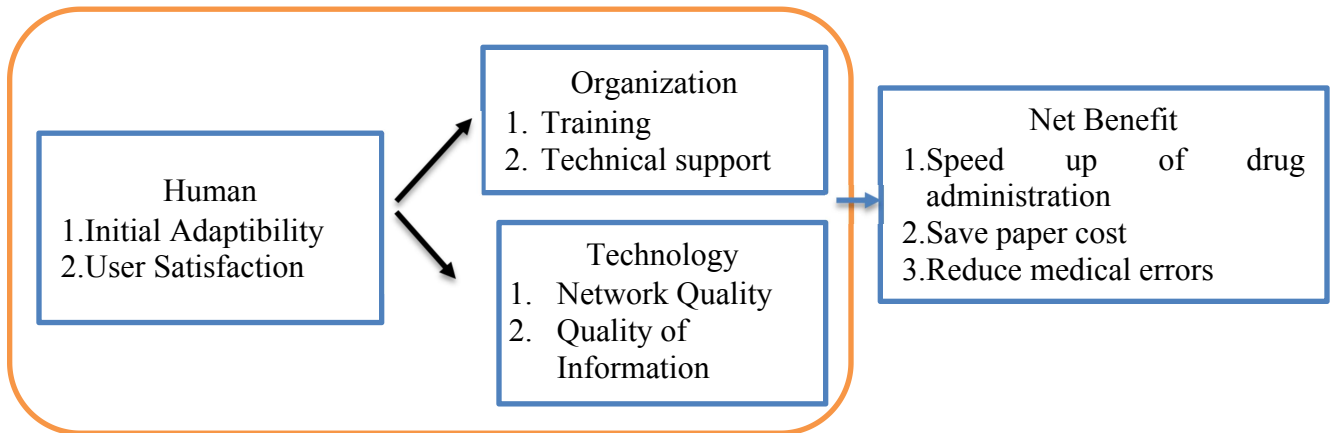
Figure 5.1 Interview Results Diagram based on the HOT-fit Method

6. Conlusion

This study provides an understanding of the implementation of e-prescribing at Sinar Kasih Hospital Purwokerto. In the implementation of e-prescribing, factors are needed that contribute to the implementation of e-prescribing based on HOT-Fit analysis such as initial user adaptation, user satisfaction, training, technical management support, network quality, quality of information on the e-prescribing feature. Support for the implementation of e-prescribing is quite good user satisfaction, adequate training, technical management support. However, there are obstacles to the use of e-prescribing, namely during the initial adaptation which takes time for implementation so that it is not smooth, the network is slow and experiences downtime and there is no information related to drug composition. Nevertheless, net benefits are obtained in the implementation of e-prescribing such as accelerating drug administration, reducing paper use and reducing medical errors related to errors in writing and reading prescriptions. The challenges that need to be considered by the management of Sinar Kasih Hospital are the need for network backup and development.

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References

Agrawal, P., & Narain, R. (2018). Digital supply chain management: An Overview. *InI KO Conference Series: Materials Science and Engineering* (Vol. 455, No. 1, p. 012074). IKO Publishing

Agudo-Peregrina, Á. F., Hernández-García, Á., & Pascual-Miguel, F. J. (2014). Behavioral intention, use behavior and the acceptance of electronic learning systems: Differences between higher education and lifelong learning. *Computers in Human Behavior*, *34*, 301-314.

Akindele A. (2019). The Significance of Electronic Health Records to Reduction of Patient Safety Events in Hospitals. *The Anatolian Journal Of Family Medicine*. 2(1):27–32.

Al-Sarawi, F., Polasek, T. M., Caughey, G. E., & Shakib, S. (2019). Prescribing errors and adverse drug reaction documentation before and after implementation of e-prescribing using the Enterprise Patient Administration System. *Journal of Pharmacy Practice and Research*, *49*(1), 27-32.

Artawan, I. P., & Martini, I. A. O. (2020). Hospital E-prescribingimplementation in reducing medication error. *International Journal of Business, Economics & Management*, *3*(1), 67. https://doi.org/10.31295/ijbem.v3n1.128

Gaol, C. J. L. (2008). *Sistem informasi manajemen*. Grasindo.

Hotchkiss, R. B., Mason, M. A., & Albright Jr, J. R. (2012). Provider perceptions of electronic medical records and e-prescribing and their integration into safety net clinics. *International Journal of Public Policy*, *8*(1-3), 79-91.

Kodarisman, R., & Nugroho, E. (2013). Evaluasi Penerapan Sistem Informasi Manajemen Kepegawaian (SIMPEG) di Pemerintah Kota Bogor. *Jurnal Nasional Teknik Elektro dan Teknologi Informasi*, *2*(2), 24-32.

Moleong, Lexy J. (2000). *Metodologi Penelitian Kualitatif*. PT Remaja Rosdakarya Bandung.

Ridwan, M., Widiastiwi, Y., Zaidiah, A., Purabaya, R. H., Isnainiyah, I. N., Ardilla, Y., & Rahayu, T. (2021). *Sistem informasi manajemen*. Penerbit Widina

Sugiyono.(2009). *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, dan R&D*. Bandung : Alfabeta.

Tyoso, J.S.P. (2016). Sistem Manajemen Informasi. Deepublish

Urtasuna, M., Takata, M., Davenport, M., Dominguez, P., Sudrez, G., Nova, S. V., Raiden, S., & Ferrero, F. (2022). Effect of electronic prescriptions on the safety of hospitalized pediatric patients. *Archivos Argentinos de Pediatria*, *120*(2), 111–117. https://doi.org/10.5546/aap.2022.eng.111

Widiastuti, M. S., & Dwiprahasto, I. (2014). Peran Resep Elektronik Dalam Meningkatkan Medication Safety Pada Proses Peresepan. *Jurnal Manajemen Pelayanan Kesehatan*, *17*(1), 30–36.

Yusof M. M, R.J. Paul dan L. K. Stergioulas. (2006). Towards a Framework for Health Information System Evalution. *Paper read at Proceedings of the 39th Hawaii international Conferences on System Sciences Kauai, at Hawaii, USA*