Evaluation and Development of a Prescription Service Management Information System in the Pharmacy Installation of Puruk Cahu Hospital

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ARTICLE INFO

ABSTRACT

Information systems have an important role in supporting the health service process, to support the performance of hospital services using computerization. The purpose of this study is to evaluate the prescription service information system with the HOT-FIT (human, organization, technology and net benefit) method at Puruk Cahu Hospital. This study used a *cross-sectional quantitative descriptive design* with a sample of 20 respondents. Data collection was carried out by direct observation, interviews with the Head of Pharmaceutical Installation, pharmacists, and pharmaceutical technical personnel, and data analysis by calculating SIM evaluation scores using the SPSS application. The results of the evaluation after development, the *human aspect* results are good category with the effectiveness of the application of SIM application after development, the *organization aspect* results are good category for the application of management information systems, the *technology* aspect obtained good results after development for system implementation. The last aspect of *net benefit* has good category results. The results of information system development at the pharmaceutical installation of RSUD Puruk Cahu showed a significant increase in *human, organizational, technology and net benefit aspects* of 5.97; 10.31; 11.88 and 3.00% respectively

INTRODUCTION

Management information systems have an important role in supporting the health service process, to support the performance of hospital services today, many hospitals have used computerization. Information systems are used by organizations to help organizations operate more efficiently up to their role as a tool to win competitions. In addition to helping routine hospital operations become more efficient, information systems are also a major competitive differentiating factor. SIM supports the provision of information, especially about patients, in the correct, relevant and up-to-date way, easily accessible by the right people in different places/locations and in a usable format (Rudiansyah et al, 2021). Hospital Puruk Cahu has been using SIMRS since April 2018, to assist services and be able to integrate information systems from, but there has never been a driver's license evaluation, because of the current regulation every health service be it hospitals, puskesmas and other health services are required to organize and apply a driver's license in accordance with the regulation of the Minister of Health of the Republic of Indonesia Number 82 of 2013.

Pharmacy installations in hospitals are places/units where all forms of pharmaceutical services are held that play a role in healing patients. Pharmaceutical services at the hospital include outpatient prescription services from various polyclinics and inpatient prescriptions from nursing wards. Manual data management has many disadvantages, in addition to taking a long time. According to the Regulation of the Minister of Health Number 129 of 2008 states that the standard waiting time for finished drug services is ≤ 30 minutes, while for concocted drugs is ≤ 60 minutes. Waiting time is one of the indicators of pharmaceutical service quality assessment. Before getting services at the pharmacy depot to pick up prescriptions, patients have experienced various queues, ranging from patients coming to register themselves until the examination process is carried out by medical personnel. Then, the patient arrives at the end of the treatment process after getting a prescription from a doctor. The patient's series of activities to wait continues until the patient redeems the prescription and gets the medicine. Long waiting time causes complaints of fatigue, boredom for patients. Then, in the end, it causes the quality of hospital services to decline and affects patient confidence in the future (Maharani, 2015). The use of the HOT-FIT method is an important component in information systems including humans, organization, technology and benefits, chosen because it is complete in the aspect of assessment carried out and best suits the existing problems compared to other models.[1,2]

METHODS

This study used design *Cross-sectional* with quantitative descriptive, to evaluate the benefits of implementing SIM prescription services before and after information system development. Data was obtained through filling out questionnaires and analyzed using the SPSS application. The subjects of the study were respondents who had knowledge of the use of management information systems. The population and sample in this study are all SIM users of prescription services at the pharmacy installation of Puruk Cahu Hospital, both permanent employees and honorary staff.

The researchers' sampling used the total sampling technique because the population for this study was less than 100 respondents, so the entire study population was used as a sample of research carried out at the pharmaceutical installation of Puruk Cahu Hospital from September to December 2023. With inclusion and exclusion criteria, as follows:

a. **The inclusion criteria are:**
   1) Pharmaceutical service officers, both pharmacists, TTK admins and other health workers.
   2) Officers who have worked in the Hospital for at least 1 year.

b. **The exclusion criteria in this study are:**
   1. Respondents did not fill out questionnaires.
   2. Respondents resigned

This research variable contains:

1. Identify Variables

The first main variable, identification of the results of the evaluation of the prescription service SIM using the HOT-FIT method. The second main variable, the design of developing a prescription service SIM The third main variable, evaluation of prescription services after developing SIM in pharmacy installations.

2. Classification of Main Variables

The independent variables in this study are evaluation of the prescription service SIM, development of the SIM and evaluation of the prescription service SIM after using the development SIM. The dependent variable in this research is identifying aspects HOT-FIT (human, organization, technology and net benefits).

3. Operational Definition

First, Puruk Cahu Hospital is a Type C regional general hospital located in Murung Raya district, Central Kalimantan. Second, the pharmaceutical installation is a part/unit of services at Puruk Cahu Regional Hospital which carries out pharmaceutical service activities at the hospital. Third, evaluation of management information systems is an assessment process used as a measurement process for the efficiency and effectiveness used in efforts to achieve goals. Fourth, the prescription service management information system is SIM prescription services at Puruk Cahu Regional Hospital which will be used for research. Fifth, prescription services are prescription services by doctors to the pharmacy installation using a SIM from the Puruk Cahu Regional Hospital. Sixth, HOT-FIT (human, organization, technology and net benefit) is a method for evaluating the information system at Puruk Cahu Regional Hospital. Seventh, Humans are prescribers who are able to manage and use a prescription service SIM at the Puruk Cahu Regional Hospital pharmacy installation. Eighth, Organization (Organization) is an organization at Puruk Cahu Regional Hospital to determine the value of the organizational structure to assess the success of the system, in organizational cooperation.

Ninth, Technology (Technology) is information technology for user and relevant. Technology elements consist of information quality, system quality and service quality. Tenth, net benefit is the result of the development of a prescription service SIM at Puruk Cahu Regional Hospital which supports hospital management to become more efficient and effective. Eleventh, system development is the preparation of a new system to replace the old system as a whole or improve the existing system. Twelfth, the design for developing a prescription service SIM is to redesign the SIM related to prescription services in accordance with the evaluation results. Thirteenth, Evaluation of prescription services after system development is the result of evaluation after officers receive development and trial use of a SIM with a new design.

This research has several stages, namely: Preparation stage, research, evaluation, development, trial, final assessment (post-test), data processing, data presentation.

1. Preparation Stage

The preparation stage involves conducting literature studies, preparing a thesis, consulting with supervisors, thesis examinations, institutional permits, submitting a research permit from campus to KESBANGPOL, to the city Health Service and submitting a letter of recommendation to conduct research at Puruk Cahu Regional Hospital. Preparation stages include a permit for ethical feasibility of health research (ethical clearance) and permits for the Puruk Cahu Regional General Hospital.

2. Research Implementation Stage

The implementation stages in this research were carried out by collecting data obtained through filling out questionnaires and analyzing them using the SPSS application.

a) Characteristics of Research Respondents

Data collection was carried out by distributing questionnaires to respondents directly to obtain information on respondents' characteristics including gender, age, highest level of education, length of work, position and assessment of the role

of the prescription service driver's license at the Puruk Cahu Regional Hospital pharmacy installation.

b) Interview and Questionnaire (Pretest)

Interviews were conducted in depth (depth interviews) with the consent of both parties to identify problems related to the SIM for prescription services at the Puruk Cahu Hospital pharmacy installation. Interview questions can be seen in attachment 8. A list of statements given to respondents to assess the level of success of the prescription service SIM at the Puruk Cahu Regional Hospital pharmacy installation before system development was carried out. The test questionnaire statements have been adjusted to the variables in the HOT-FIT framework.

RESULTS AND DISCUSSION
A. Characteristics of Research Respondents

The characteristic picture of respondents consists of gender, education, age and length of service at the pharmacy installation of RSUD Puruk Cahu. The classification of respondents was carried out with the aim of knowing the description of respondents in this study. The samples taken in this study were 20 pharmacy staff consisting of 1 Head of Installation, 1 pharmacist in charge, 2 accompanying pharmacists, 1 pharmacist in charge of the pharmacy warehouse and 15 employees at the pharmacy installation at Puruk Cahu Hospital. The study was conducted from September to December 2023.

1. Gender

Based on the results of a questionnaire from 20 respondents, employees who use SIMs at the Puruk Cahu Regional Hospital's pharmacy installation, the majority of whom are women with 13 people (65%), and 7 people (35%) who are men, the majority of those who work in pharmacy installations are women

2. Recent Education

Characteristics of SIM user respondents based on their latest education at the Puruk Cahu Regional Hospital's pharmaceutical installation. Most of the employees working at the Puruk Cahu Regional Hospital's pharmaceutical installation are pharmacy graduates such as D3 pharmacy, Bachelor of Pharmacy, Pharmacist and Master's degree in pharmacy. There are 6 pharmacists who serve as Heads. Installation, person in charge of prescription services, pharmacy warehouse, but not all employees whose final educational background is in pharmacy, there are those with a bachelor's degree in management, a bachelor's degree in accounting and high school, meaning those who work in pharmaceutical installations are not only people whose last education is from pharmacy but also those who dominates pharmacy graduates.

3. Age

Of the 20 respondents, employees who use SIMs at the Puruk Cahu Regional Hospital's pharmacy installation, most of them are under 40 years old with 17 people and for those over 40 years old there are several people with 2 people (10%) and over 50 years old. year there is 1 person (5%).

4. Period of Employment

Characteristics of SIM user respondents based on length of service at the Puruk Cahu Regional Hospital's pharmaceutical installation. Of the 20 employee respondents working at the Puruk Cahu Regional Hospital's pharmaceutical installation, it has long been known that the average for each employee is more than 5-10 years and the remainder with a working period of $\geq$ 15 years. 6 people, meaning employees at the pharmaceutical installation who have worked for quite a long time and have experience in using a SIM and operating the system at the Puruk Cahu Regional Hospital's pharmaceutical installation.

B. Test Questionnaire Validity

Testing the validity of questionnaires aims to determine whether or not a questionnaire from each system is valid. Based on the results to find out valid and invalid questionnaires, you must find the r value of the table first. The r value of the table for the number of 20 respondents with a significant rate of 5% is 0.361. The calculation of validity that has been filled in by 20 respondents that all questionnaires have a calculated r value > r table so that all questionnaire question items are declared valid. The result of calculating the validity of the highest value

in the NB4 indicator, namely r count, is 0.908 where the value is valid.

C. Reliability Test

On reliability tests to measure consistency in research. Before testing, there is a basis for decision making, namely value *Cronbach's Alpha* amounted to 0.60. The variable is considered reliable if the value of the variable is >0.60, if it is <0.60 then the variable under study cannot be said to be reliable. The results of the reliability test of all research variables can be seen that the value of *Cronbach's Alpha* In this variable higher than the base value of 0.905 > 0.60 the results prove that all statements in the questionnaire variable are declared reliable.

Table 1. Research Reliability Test Results

Reliability Statistics

Cronbach's Alpha	N of Items
.905	38

D. Results of Prescription Service SIM Evaluation Before Development

Results from all aspects of the HOT-FIT method Describe all research variables. The following is a recapitulation of the results of the score achievement index of each variable.

Table 2. Recapitulation of SIM Evaluation Results Using the HOT-FIT Method

No	Aspect	Average score	Category
1	Human :		
a.	System users	3,50±0,012	Good
b.	User satisfaction	3,66±0,07	Good
2.	Organization :		
a.	Organizational structure	3,54±0,11	Good
b.	Organizational environment	3,53±0,07	Good
3.	Technology:		
a.	System quality	3,60±0,10	Good
b.	Information quality	3,57±0,13	Good
c.	Quality of service	3,56±0,05	Good
4.	Net Benefit:	3,89±0,05	Good
	Average	3,60±0,12	Good

Based on the table above recapitulation that aspect *Human* that is System users and user satisfaction have a good category with the effectiveness of the application of SIM applications in the pharmacy installation of Puruk Cahu Hospital, for aspects *Organization* i.e. organizational structure and organizational environment get enough category results for SIM application implementation will be a priority and improvements will be made, Next aspect *Technology* i.e. system quality, information quality and service quality have sufficient category results to Application of Information Systems Applications and Recent Aspects *Net Benefit* get good category results in system use.

E. Identify Problems with Prescription Service Driver's License

1. Needs Analysis

The main elements of a system from the user and the source of data required in the SIM in pharmaceutical installations. Data sources were obtained from the head of pharmaceutical installations, IT heads and warehouse and drug ordering sections. Identify information needed for conformity monitoring of drug orders and BHP. By Sources of information obtained From an interview with the head of a pharmaceutical installation, head of IT, and section Provide advice for the development of information systems as follows.

Table 3. Data Requirements for Developing a Drug Ordering System

No	Data Requirements
1	Medicine and BHP ordering menu
2	Summary menu for ordering medicines and BHP
3	Medication and BHP reception menu
4	Menu summary of drug receipt and BHP
5	The menu is easy to access and user friendly
6	The application can be used on a laptop/computer
7	The application can be accessed by all users with employee ID

Management information system data sources began to be implemented into pharmaceutical intasalation in 2020, before being used for pharmaceutical services, all employees were given training in the use of management information systems. After the implementation of the driver's license, it makes it easier for employees to work and development suggestions to help pharmaceutical services, drug orders and BHP can be added as well as information on prices, suppliers and types of drugs. The resulting information system is able to facilitate drug ordering and the resulting BHP must be simple, uncomplicated, simple and user friendly.

F. SIM Display Development and Design

Information system design starts from designing the appearance, data and processes of the system with the aim of making specifications that are in accordance with the product and application display for its users, database models and process procedures and system controls. The stage for system design aims to meet the needs of system users and provide a clear picture as well as a complete design to programmers or IT department of the hospital and other technical experts involved. The following are the planning stages of implementing the development of a computerized driver's license that is ready to be used as follows: The stage of designing a drug information system to support drug ordering and BHP at Puruk Cahu Hospital is database design, input design, output and interface design.

1) Programming: Working with the Hospital IT department that is done on information systems is translating the design results into computer programs. The design results translated into computer programs on information systems and carried out SIM technical guidance aim to facilitate system users in implementing the proposed system and improve the effectiveness of the performance of abilities, skills and techniques for using SIM.

2) *SIM Trial: testing a new SIM* to ensure the software quality of a program application needs to be tested and ensure the software to be developed runs well, relevant, accurate, timely, and complete. Respondents involved in SIM trials in pharmaceutical installations are pharmaceutical engineering personnel, pharmacists, heads of pharmaceutical warehouse rooms and admins. The trial of developing the Drug Order SIM and BHP was

carried out by researchers to officers with data simulations at pharmaceutical installations starting from November to December 2023. The trial of SIM development of drug orders from researchers to officers at pharmaceutical installations can be seen in the picture of annex 15 to support pharmaceutical services in hospitals and provide benefits for users.

3) New SIM display: Implementation of a new menu system that creates an information system. The following is the design of *inputs* and *outputs* of drug ordering displays and BHP

and their summary in the pharmaceutical installation of Puruk Cahu Hospital which is computerized in accordance with *the design* proposed by the researcher as follows.

G. Results of SIM Evaluation of Prescription Services After Development

Results of all aspects of HOT-FIT after the development of management information systems Describe all research variables. The following is a recapitulation of the results of the score achievement index of each variable.

Table 4. Recapitulation of SIM Evaluation Results Using the HOT-FIT Method After Development

No	Aspect	Average score	Category
1	Human :		
a.	System users	3,50±0,012	Good
b.	User satisfaction	3,66±0,07	Good
2.	Organization :		
a.	Organizational structure	3,54±0,11	Good
b.	Organizational environment	3,53±0,07	Good
3.	Technology:		
a.	System quality	3,60±0,10	Good
b.	Information quality	3,57±0,13	Good
c.	Quality of service	3,56±0,05	Good
4.	Net Benefit:	3,89±0,05	Good
	Average	3,60±0,12	Good

Based on the table above recapitulation that aspect *Human* that is System users and user satisfaction have a good category with the effectiveness of implementing SIM applications after development, for aspects *Organization,* organizational structure and environment. The category results are good for the application of management information system applications, and there is an increase in subsequent aspects *Technology* i.e. the quality of systems, information and services has good results after development for Application of the system and the last aspect *Net Benefit* Get good category results for service.

H. Results of SIM Evaluation of Prescription Services Before and After System Development

Based on the design of the research method, initial observations were made before system development (*Pre-test*), then a second observation after system development (*post-test*) so that re-evaluation is carried out after the system is implemented. Human evaluation results (*human*) obtained the result of the overall average value before system development of (3.35±0.10) and after development by (3.55±0.12) with an increase of 5,97%. So that the human aspect is influenced by the variables of system usage and user satisfaction where

the two variables have a relationship between system users influenced by user experience in using service SIM.

The organizational aspect obtained the results of the overall average score before development amounted to (3.21±0.04) and after the development of a system of (3.53±0.09) with an increase of 10.31%. It can be concluded that the organizational aspect of the hospital fully supports the use of SIM pharmaceutical services by meeting the needs of technology and information to be able to develop a system.

The evaluation aspect of the technological aspects of the system obtained the results of the overall average value before system development of (3.20±0.06) and after system development of (3.58±0.10) with an increase value of 11.88%. In the technological aspect, having good information quality depends on the quality of the system and the quality of service that is easy to use, can be trusted, correct, and guaranteed by responsive services and technicians to solve problems in the system, the information produced becomes accurate, complete and relevant to improve the performance of pharmaceutical services.

Furthermore, the evaluation of the benefit aspect obtained the results of the overall average value before system development of (3.77±0.07) and after system development of (3.89±0.05) with an increase of 3.00%. On the benefit aspect there is an improvement generated after the development of the system. The development of this system can accelerate pharmaceutical services, facilitate the input process in obtaining drug information, be useful for pharmacy officers to reduce the workload because it is computerized, help improve the objectives of effective`e and efficient pharmaceutical and treatment services and help reduce errors due to *medication error*, lower the cost of paper expenditure

Test results *Wilcoxon* obtained consecutively $p = 0.005$; 0,035; 0.002 and 0.035 $p < 0.05$ means that there is a significant difference between the benefits of implementing a prescription service driver's license before and after the development of a management information system at the drug ordering stage, the researcher concluded that there was an increase in the benefits of developing a drug order management information system at the pharmacy installation of Puruk Cahu Hospital.

CONCLUSION

After being evaluated, the prescription service management information system has several problems that need to be corrected, especially from the organizational and technological aspects of the information system.

The management information system after developing a new menu for ordering medicines and BHP at the Puruk Cahu Regional Hospital pharmacy installation has increased effective and efficient service.

The development of prescription service management information system after evaluation resulted in significant improvements between pretest and postest in human (5.97%), *organization* (10.13%), *technology* (11.88%), *and net benefit* (3.00%), respectively.

Conflict of Interest

In writing this journal the author states that there is no conflict of interest in writing this journal, a conflict between carrying out tasks and personal interests which influences the assessment and results.

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