

PIECES For Evaluating Registration Information System in The Kasih Ibu Hospital Surakarta

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Abstract— Kasih Ibu Hospital has a Hospital Management Information System. Based on the preliminary survey, the implementation of SIMRS in the patient registration unit is still not stable. System evaluation is needed so that deficiencies in the implementation of the system are immediately addressed. The method used to evaluate the registration information system is the PIECES Method. The purpose of the evaluation is to conduct an assessment of the performance of the patient registration information system that is already running with the PIECES method based on aspects of performance, information, economic, control and security, service.

This research is a descriptive study with cross sectional approach. The object of this study was the patient registration information system and the subjects observed were outpatient and inpatient registration officers who were related to the registration information system. The research instruments were observation guidelines, interview guidelines, and questionnaires.

The results of the evaluation of the patient registration information system by the PIECES method at the Kasih Ibu Hospital based on performance aspects, showed the system was able to produce the desired throughput the system was able to carry out the patient registration process. The information system aspect is able to produce accurate information very well. The economic aspects of resources on the system are very good. The integrity control aspect of access to software or data is very good. The efficiency aspect of business reusability to study systems is very good. The service aspect shows that accuracy, computational accuracy and control are good. The conclusion of this study based on the assessment of respondents is that the patient registration information system at the Surakarta Ibu Hospital is categorized as good and can be accepted by respondents.

Keywords— *Pieces, Management Information System, Evaluation*

I. INTRODUCTION

Health services are any efforts carried out alone or together in an organization to maintain and improve the health of individuals, families, groups or communities. Based on the Law of the Republic of Indonesia Number 44 the Year 2009 Article (1), a hospital is an institution that conducts complete individual health services that provide inpatient, outpatient, and emergency services. Information is a valuable resource. Various operational activities and decision making depend on the information available. Permenkes No. 269 of 2008 concerning Medical Records that medical records are files containing records and documents about patient identity, examinations, treatment, actions and other services that have been provided to patients.

Patient Registration Place (TPP) is a facility in a health facility, whether in a hospital, clinic, or health center that is used to obtain information from patients themselves when they come for treatment at a health facility. Medical records

and patient registration is closely related to a system, where the system will process all patient data from the patient registering in until the patient returns home. To help improve smoothness in services, hospitals need a hospital information system often called SIMRS. The role of information systems in hospital management activities is very helpful and has a very effective role in the process of health services in hospitals, with the information system of a hospital leader can take a policy quickly, precisely, and accurately based on information obtained from health services in hospital he leads. To find out whether a system is running according to needs or not, it is necessary to evaluate the system.

System evaluation can be done with the PIECES method, which is a method used to evaluate an existing system that consists of aspects of Performance, Information, Economy, Control, Efficiency, and Service.

Kasih Ibu Hospital Surakarta has been computerized since 2009. Implementation of SIMRS the registration section is divided into registration outpatient, inpatient and emergency department on January 13, 2018 Kasih Ibu Hospital Surakarta using a new system called HISYS. The results of preliminary observations conducted by researchers found in the operation of HISYS there are still obstacles in the system that often runs slowly at crowded hours, and make services hampered because patients have to wait until the system returns to normal. Kasih Ibu Hospital Surakarta for HISYS new system beroprasi during this year has never been a researcher who examined the patient registration information system evaluation with PIECES method Kasih Ibu Hospital Surakarta.

II. METHOD

A. Types and Design of Research

This type of research is intended to investigate the circumstances, conditions or other things whose results are presented in the form of research reports. The research is a descriptive study of a set of objects that usually aim to see the picture of the phenomenon (including health) that occur in a given population [8].

The data collection method is observation and interview. Observations were made on the registration information system and interviews were conducted with medical records officers.

The approach in data collection in this cross-sectional study of a study carried out by way of the approach, observation or data collection conducted at the same time, so it can be collected variables are many.

B. Research Variables

Variable is something that can be used as a characteristic, trait or size that is owned or obtained by a study of a

particular concept of understanding. The variables used in this study are the evaluation of patient registration information systems based on aspects of Performance, Information, Economic, Control (safety), Efficiency (efficiency) and Service aspects (service) at the Kasih Ibu Hospital Surakarta .

The operational definition of the research variable is as follows:

1) *Performance*

Performance aspects include: Throughput, response time, audibility, communication prevalence, completeness, consistent and the generality.

2) *Information*

Evaluation of computing. Aspects of information include: Accuracy, relevance of information, data flexibility, data prevalence, and expandability.

3) *Economic*

Evaluation of economic aspects: Reusability and human and economic resources.

4) *Control*

Evaluate the ability of the registration information system to maintain confidentiality and deal with viruses. Aspects of control include: Security and Integrity systems.

5) *Efficiency*

The evaluation of the ease of learning and using the system registration information: Usability and maintainabilitas system

6) *Service*

Evaluate the practicality of features in the registration information system. Service aspects include: Accuracy, simplicity and reliability.

C. *Subjects and Objects*

1) *Subject*

Research sources are objects, things or people where the data for the research variables are inherent and disputed. The subjects in this study are all inpatient and outpatient registration officers who operate the patient registration information system at the Kasih Ibu Hospital in Surakarta.

2) *Objects*

The object of research is the thing, case or person that is the subject of discussion: goals, objectives, complements, goals of sufferers. The object of this research is the registration information system in the Hospital of Kasih Ibu Surakarta.

D. *Data Collection*

1) *Data Sources*

Data collection methods from this study consisted of:

a. *Primary data*

The primary data obtained directly in this study are the results of observations and interviews with all outpatient and inpatient registration officers who operate the registration information system of the Ibu Ibu Hospital in Surakarta.

b. *Secondary Data*

Secondary data is data or facts obtained from other people so that the data source used can be in the form of notes, medical record registers, information systems in health care facilities, index cards, and censuses. The secondary data of the researcher are the profile of the hospital, the instructions for operating the system and the registration information system in the Hospital of Kasih Ibu Surakarta

2) *Research Instruments*

a. *Observation Guidelines*

Observation guidelines are guidelines that contain things that must be known, namely by observing or recording systematically on the problem under study. Observation guidelines used in this study are in the form of sheets of paper that contain things that the writer must know by observing and recording systematically the problems to be examined. Observation guidelines attached.

b. *Interview guidelines*

The type of interview used in this study is free guided interviews, which is a combination of un-guided interviews and guided interviews. Although there is an element of freedom, but there is an influence of the conversation in a firm and directed manner.

c. *Questionnaire or Questionnaire*

This questionnaire is carried out by circulating a list of questions in the form of forms, submitted in writing to a number of subjects to get responses, information, answers, and so on. The questionnaire used in this study is a type of structured questionnaire in which the questionnaire is structured in such a way as to be firm, definitive, limited, and concrete, so that respondents can easily fill out or answer it. In a study conducted by a questionnaire writer given to the registration officer of the outpatient and inpatient department at the Hospital of Ibu Ibu Surakarta.

E. *Data Processing*

Data processing techniques for all patient registration officers at the Kasih Ibu Hospital Surakarta.

1) *Collecting*

The process of data collection is carried out by giving questionnaires to respondents regarding the use of the Patient Registration Information System at the Kasih Ibu Hospital Surakarta.

2) *Editing*

The process carried out at the time of data collection. This editing aims to check data that are incomplete or have errors in filling out the questionnaire.

3) *Coding*

The process of changing data in the form of sentences into numbers or numbers. The coding stage in this research is the process of identifying each statement in the questionnaire according to the variables studied.

4) *Classification*

The process of grouping data from the questionnaire results is based on the aspects studied such as aspects of performance, aspects of information, economic aspects,

aspects of control, aspects of efficiency, and aspects of service.

5) Tabulating

The process of making tables from the results of the questionnaire, according to the aspects studied.

F. Data Analysis

Analysis of the data in this study was to use a descriptive method by assessing the performance of the patient registration information system that was running at the Hospital of Kasih Ibu Surakarta. Data about evaluating the patient registration information system based on the PIECES method which will then be presented in the form of descriptive sentences, figures and tables and reviewed compared with the theory.

G. Measurement Method

To obtain the results of evaluation of the patient registration information system Kasih Ibu Hospital in Surakarta, it would require a measurement method. The scale used in the questionnaire is to provide a number of questions or statements to respondents using a Likert scale.

Likert scale is a scale that can be used to measure a person's attitudes, opinions, and perceptions about a social phenomenon or phenomenon. For each choice given a score, the respondent must describe, support the statement, for the chosen judgment. With a Likert scale, the variables to be measured are translated into indicator variables. Then the indicator is used as a benchmark to arrange instrument items which can be in the form of questions or statements.

III. RESULT

Hospital Management Information System (SIMRS) in Surakarta Kasih Ibu Hospital named HISYS that have been implemented from the date of January 13, 2018 which is used by the patient registration services. Since it has been implemented until now, there have been no researchers who evaluated the patient registration information system using the PIECES method at the Kasih Ibu Hospital Surakarta. With this evaluation it is expected to improve the quality of the system and improve system performance.

The HISYS system at the Kasih Ibu Surakarta Hospital in maintaining the security of the registration information system is limited by the right of access to the system with a login menu, that is, only certain officers can enter the menu according to their rights. To be able to enter the registration information system each officer will be confronted with a login and the attendant fills in their username and password to enter the system and if a user who does not have a username and password will not be able to enter the system. The following figure 1 Display HISYS login and Figure 2 is the initial menu display registration module after the login officer.

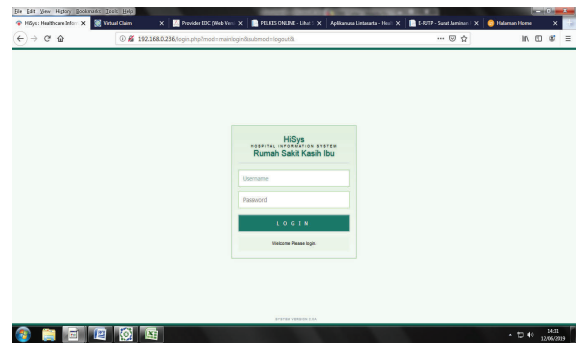


Figure 1. Display HISYS login

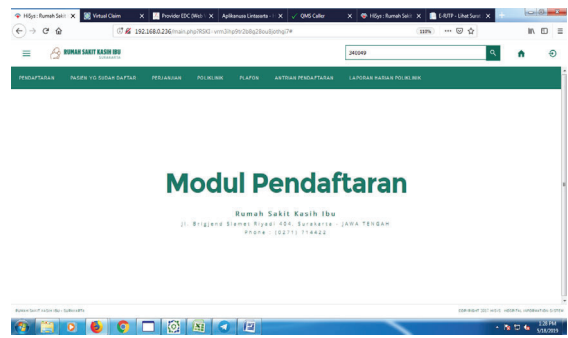


Figure 2 is the initial menu display registration module after the login officer.

A. Likert scale

Indicators as benchmarks arrange instrument items that can be questions or statements.

1) Likert Score

TABLE 1 LIKERT SCORE [13]

Assessment of Respondents	Likert Rating Score
VA (Very agree)	4
S (Agree)	3
D (Disagree)	2
SD (Strongly Disagree)	1

Rating Weight

Formula:

$$T \times P_n \tag{1}$$

Information:

T = Total Number of respondents who chose

P_n = Likert assessment score

2) Interpretation of Score Calculation

In order to get the results of interpretation, the highest score (Y) and the lowest score (X) must be known for the assessment items obtained from the following formula:

Y = highest score Likert x number of respondents

X = lowest score Likert x number of respondents

3) Index %

$$Index \% = \frac{\text{total skor}}{Y} \times 100\% \tag{2}$$

Information:

$$Y = \text{Highest Likert score} \times \text{amount}$$

4) Interval

Intervals have the properties of nominal and ordinal scales. On interval scale data, these levels can be expressed in numbers.

$$I = 100 / (\text{number of Likert scores}) \tag{3}$$

$$= 100/4 = 25$$

Result I = 25 (this is the interval from the lowest 0% to the highest 100%)

The following criteria for interpretation of scores based on intervals:

TABLE 2 INTERPRETATION OF SCORE INTERVALS

Skor	Keterangan
0% - 24,9%	Very bad (VB)
25% - 49,9%	Not good (NG)
50% - 74,9%	Good (G)
75% - 100%	Very good (VG)

B. Observations and interviews Patient Registration Information System Evaluation

Evaluation of the patient registration information system was carried out using questionnaires to 20 outpatient and inpatient registration officers who were directly related to the registration information system, the questionnaire was filled in accordance with respondents' ratings of the HISYS system. This questionnaire was prepared by translating the concept of PIECES from Whitten (2004). The description of the results of the Patient Registration Information System Evaluation questionnaire in terms of the PIECES aspect by first distributing the questionnaire to the respondent, after the questionnaire was completed by the respondent, then the questionnaire will be made a table of the frequency distribution of respondents' answers from the frequency distribution table calculated and obtained a table containing the weight of the assessment respondents, total score, index%.

1) Evaluate the patient registration information system from the Performance aspect

Based on the results of the questionnaire assessment, respondents stated that the performance of the system in terms of users has been able to produce the desired throughput that the system has been able to process the registration of patients with a percentage index of 80% and is able to input all data of patients who register very well with a percentage index of 75%. The system has a good response time proven by the system being able to print the forms needed in less than 10 seconds with a percentage

index of 70%, displaying the information needed in less than 10 seconds with a percentage index of 64% and can display print preview results before print within 5 seconds with a percentage index of 65%. The system is able to produce good audibility seen from the system can report all data patients who registered with a percentage index of 74%.

The interface owned by the system is good but seen from the color display of the striking system makes the eyes of the officer tired with a percentage index of 60% because this is a negative sentence, the display color interface of the system needs to be changed so that the officer's eye is not easily tired. The prevalence of communication has been very well proven by being able to produce orders that are easily operated by registration officers with a percentage index of 76%. The system has a complete implementation of the function has been achieved as evidenced by the system performs a data entry process (registration) in accordance with the data entered with a 76% index index and is able to record patient registrations well with a 75% index percentage. Consistency in the use of design in the system is good seen from the design of the system that is consistent with a 69% index percentage. Broad generality in the system is well evidenced by the registration information system has links to other parts with a percentage index of 64%.

Based on the above results from the overall performance aspects of the system stated good with a percentage index of 71%. With the highest percentage index of 80% on system items are able to carry out the registration process and the lowest percentage of 60% on the color display items of the striking system makes the officer tired eyes.

2) Evaluate the patient registration information system from the Economic aspect

Based on the results of the questionnaire assessment, respondents stated information on the system in terms of the user has been able to produce accuracy accuracy information is very well evidenced by the system to calculate and display the age of the patient in accordance with the date of birth entered with a percentage index of 75% and display the patient's identity accordingly with the medical record number entered with a percentage index of 76% and can provide report data such as patient and doctor visits on guard with a percentage index of 87%. The system has a very good relevance of information in producing reports for decision making in hospitals with a percentage index of 76% and is able to produce forms in accordance with well-established standards with a percentage index of 74%.

The system has data flexibility that is proven by the system being able to display information that suits the needs of officers with a percentage index of 74%. The system has the normal use of data structures and data types that are well viewed from the system that can produce reports and when printed have the same type with a percentage index of 66%. The accessibility of data has been well proven by the system being able to provide information that is easy to learn and understand with a percentage index of 74%.

Based on the above results from the overall information aspects of the system expressed very well with a percentage index of 75%. With the highest percentage index 87% on system items able to provide report data such as patient and doctor visits on guard and the lowest

percentage 66% on report items produced by the system have the same type.

3) Evaluate the patient registration information system from the Control and Security aspects

Based on the results of the questionnaire assessment, respondents stated that the economy in the system in terms of users already have a level of reusability of a program evidenced by the registration information system can be used and redeveloped in accordance with software development with a percentage index of 64%. The reusable system has a respondent's assessment that is not good as evidenced by the spinning of the registration information system into a new computer which requires a large cost with a percentage index of 47%. The resources in the system are very good seen from the registration information system can reduce the cost of material resources such as the use of paper with a percentage index of 75%. Good development resources are evidenced by the training of officers with a percentage index of 59% and the need for many IT teams with a percentage index of 61%.

Based on the above results from the overall economic aspects of the system expressed good with a percentage index of 61%. With the highest percentage index of 75% on the registration information system questionnaire items can reduce the cost of material resources such as paper use and the lowest percentage of 47% on the questionnaire items installation of the registration information system to a new computer requires a large cost.

4) Evaluate the patient registration information system from the Efficiency aspect

Based on the results of the questionnaire assessment, respondents stated control and security in the system in terms of users having integrity of access to software or data was very good as evidenced by non-registration officers not having data access to the registration menu with a percentage index of 82% and integrity of access to software or the data is good seen from patients who have registered in the patient data registration information system can be seen by other units such as wards / polyclinics / support with a percentage index of 70%. Mechanism security has been well proven by the registration information system that has never been exposed to a computer virus with a 57% percentage index and data protection security has been very well seen evidenced by each officer equipped with a user id and password to log on to each computer with an index of 81% percentage.

Based on the above results from the overall control and security aspects the system is declared good with a percentage index of 72%. With the highest percentage index 82% on the questionnaire items non-registration officers do not have data access to the registration menu and the lowest percentage of 57% on the registration information system questionnaire items have never been affected by a computer virus.

5) Evaluate the patient registration information system from the Efficiency aspect

Based on the results of the questionnaire assessment, respondents stated that the efficiency of the system in terms of users has been able to produce business reusability to study the system is very well proven by the registration information system easily taught to new officers with a percentage index of 80%, usability of the operation of the

system is not good with evidence that new officers require time long time to be able to skillfully use the system with a percentage index of 48%. The reliability of correcting errors can be seen from the IT team often having difficulty repairing errors / errors on systems with a percentage index of 64% and Damage to the registration information system can be fixed by restarting the computer with a percentage index of 67%. The reliability of fixing an error in a program has been very well proven by the damage to the registration information system that can only be corrected by the IT team with a percentage index of 76%.

Based on the above results from the overall efficiency aspects of the system declared good with a percentage index of 67%. With the highest percentage index of 80% on the registration information system items easily taught to new petugs and the lowest percentage of 48% on the questionnaire items new officers take a long time to be able to skillfully use the system.

6) Evaluate the patient registration information system from the Service aspect

Based on the results of the questionnaire assessment, respondents stated that the service on the system in terms of users has been able to produce accuracy, computational accuracy and control is well proven by the registration information system always save data if click save with a percentage index of 74% and the registration information system can also display the results of search button accurately with a percentage index of 74%. Reliable program reliability can be seen from the registration information system always displays data as inputted previously with a percentage index of 74% and the system can do all the work in the registration properly with a percentage index of 72%. The simplicity of the program can be understood without difficulty. It can be proven that the registration information system can easily and easily enter data with a percentage index of 72% and the registration information system can display the required output easily and simply with a percentage index of 67%.

Based on the above results from the overall service aspects of the system declared good with a percentage index of 72%. With the highest percentage index 74% on the questionnaire items the registration information system always saves data when clicked save, the registration information system can display the results of the search button accurately, the registration information system always displays data as inputted earlier and the lowest percentage is 67% the registration information system questionnaire items can display the required output easily and simply.

IV. CONCLUSION

The results of evaluating the patient registration information system using the PIECES method at the Kasih Ibu Hospital Surakarta based on performance aspects, shows the system has been able to produce the desired throughput the system has been able to carry out the patient registration process. The information system aspect is able to produce accurate information very well. The economic aspects of resources on the system are very good. The integrity control aspect of access to software or data is very good. The efficiency aspect of business reusability to study systems is

very good. The service aspect shows that accuracy, computational accuracy and control are good. The conclusion of this study based on the assessment of respondents is that the patient registration information system at Surakarta Ibu Hospital is categorized as good and can be accepted by respondents.

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