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ANALYSIS OF HOSPITAL MANAGEMENT INFORMATION SYSTEM (SIMRS) AND ITS RELATION TO THE READINESS OF ELECTRONIC MEDICAL RECORD (RME) IMPLEMENTATION IN RSUP. SANGLAH DENPASAR

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ABSTRACT
A hospital is a health service institution that provides plenary individual health services that provide inpatient, outpatient, and emergency services. This study focuses on the implementation of SIMRS using PIECES analysis where researchers assess SIMRS using six aspects, namely performance, information, economy, control, efficiency and service. Where the results of this system analysis aim to ascertain whether the system created has no error functions or the system is running properly. The method used in this analysis is the PIECES framework which includes 6 aspects of reference, namely: Performance, Information and data, Economics, Control and Security, Efficiency, and Service. This method is applied to calculate the level of user satisfaction with the system which later the results are used for evaluation of the system related to the development of system quality. Performance according to performance calculations in the PIECES analysis obtained a value of 3.96 with the predicate Satisfied, but there are several things that must be improved.

INTRODUCTION

A hospital is a health service institution that provides plenary individual health services that provide inpatient, outpatient, and emergency services (Muthahharah & Juhari, 2021). Hospitals have the task of providing health services in the form of providing treatment and health recovery services according to hospital service standards, maintenance and improvement of individual health through complete services (Mohammad Mosadeghrad, 2013). Therefore, hospitals must have a system that can help carry out their duties as health service providers. And this system is known as the Hospital Management Information System (SIMRS) (Fahmi, Zulkieflimansyah, & Esabella, 2022).

SIMRS is a system that is able to integrate and communicate the flow of information both inside and outside the hospital (Indrayati, 2021). These information systems include: electronic medical record systems, laboratory information systems, radiology information systems (medical imaging), pharmaceutical information systems, and nursing information systems (Khajouei, Abbasi, & Mirzaee, 2018). This system also has two main functions, namely for the purposes of patient data management and processing (Hussein et al., 2018). In terms of management, this system has a role in managing financial, material and technical data, staffing systems, payments (bills) to patients, and strategic planning (Hans, Van Houdenhoven, & Hulshof, 2011). From the patient side, it functions to manage incoming and outgoing patient data and manage patient medical data which includes treatment, diagnosis, and therapy (Rajabion, Shaltooki, Taghikhah, Ghasemi, & Badfar, 2019).

RSUP Prof. Dr. I.G.N.G. Ngoerah is a Central General Hospital that has owned and developed its own SIMRS since 2015. This system is then used to store and process data ranging from patient registration (outpatient, emergency and inpatient), patient examinations, supporting results, pharmaceutical, quality, managerial and even until now in the development stage of Electronic Medical Records (RME) (Cerchione, Centobelli, Riccio, Abbate, & Oropallo, 2023). This is due to the existence of PERMENKES No.21 of 2020 concerning the Strategic Plan of the Ministry of Health which states that the percentage of hospitals that implement integrated Electronic Medical Records (RME) in 2024 reaches the target of 100 percent. And there is a strategic plan for Sanglah Hospital which states that the percentage of RME implementation in 2023 reaches the target of 100 percent.

No.	TUJUAN STRATEGIS	No.	SASARAN STRATEGIS	No.	IKU	Baseline	PIC	TARGET				
								2020	2021	2022	2023	2024
3	Terwujudnya tata kelola RS yang Baik	4	Terwujudnya peningkatan akses, mutu dan keselamatan pasien	9	Penurunan persentase angka Kematian Ibu	0.73%	MEDIK	0.73%	0,50%	0,40%	0,30%	0,20%
				10	Persentase Penyelenggaraan Rekam Medis Elektronik	85%	POU/MEDIK	85%	90%	93%	100%	100%
				11	Modernisasi Pengelolaan BLU (Penerapan Aplikasi BLU Integrated Online System / BIOS)	100	KEU	100	100	100	100	100
				12	Jumlah RS yang dilakukan pendampingan pelayanan.	2	MEDIK	2	3	3	4	4
				13	Persentase Pelaksanaan Sisrute	-	MEDIK	-	60	70	85	100

Picture 1 Strategic Plan of Sanglah Hospital Denpasar

RME itself is a computerized health information system that contains demographic data, medical data, and can be equipped with a decision support system (Ingebrigtsen et al., 2014). Health care facilities also implement RME as an effort to improve service quality, increase patient satisfaction, increase documentation accuracy, reduce clinical errors, and speed up access to patient data (Dharma, Sukadarmika, & Pramaita, 2022).

RME is part of SIMRS. Therefore, before heading to the implementation of the RME, the existing SIMRS is first confirmed to be ready. Because a good information processing system is a system that is able to overcome problems that occur and can produce information that is fast, precise and accurate and effective (Kaufhold, Bayer, & Reuter, 2020). This ability will only be fulfilled if you have an adequate information system (Bajdor & Grabara, 2014). Because errors in terms of data processing carried out by officers can cause errors in information obtained by the Hospital management, so that it will affect the decisions to be taken by the Hospital management itself.

The SIMRS at RSUP Prof. Dr. I.G.N.G. Ngoerah is quite adequate in terms of providing data, but in the field there are still problems that we find, including:

1. Found data and reports that are not in accordance with the needs and rarely used, which can actually still be streamlined and searched in other reports for example; Visits per gender, Diagnosis analysis, Surveillance Report
2. The report we are looking for we look back is difficult to track because the data is in two places (double information). For example: RS indicators are in quality and in reports.
3. Modules in the manufacture of RME are everywhere. Where RME should only be inputted in one portal, but the input menu is in more than one place or one menu.

And in planning towards RME, actually the required modules are already in SIMRS, it's just that they are less arranged and structured. This is due to our plan to set up a dedicated portal that contains only the RME modules.

The preparation of the RME module module, it is necessary to conduct a system analysis to see the level of readiness of SIMRS in implementing RME (di RSKD & Fatimah, n.d.). And we can analyze the level of readiness with the PIECES Framework (performance, information, economy, control, efficiency, and services) (Francis & Bekera, 2014). The results of the PIECES analysis are documentation of system weaknesses that become recommendations for improvements to be made to the system to be further developed and for improvements to previous systems. From this analysis usually obtained several main problems, this is important because usually what appears on the surface is not the main problem, but only a symptom of the main problem (Al Fatta, 2007). And from the

results of this PIECES analysis, it can also be analyzed the relationship of SIMRS to the readiness of RME implementation. So we can draw up a SIMRS streamlining plan and module design for the RME portal.

Therefore, the author is interested in conducting research entitled Hospital Management Information System Analysis (SIMRS) and its relation to the readiness of Electronic Medical Record (RME) implementation at RSUP Prof. Dr.I.G.N.G. Ngoerah.

RESEARCH METHODS

This study focuses on the implementation of SIMRS using PIECES analysis where researchers assess SIMRS using six aspects, namely performance, information, economy, control, efficiency and service. Where the results of this system analysis aim to ascertain whether the system created has no error functions or the system is running properly.

Based on the existing approach, the research stage also applies methods, techniques, and tools quantitatively. Like data collection techniques carried out by means of surveys using questionnaire instruments, data analysis is carried out statistically with computer software.

RESULTS AND DISCUSSION

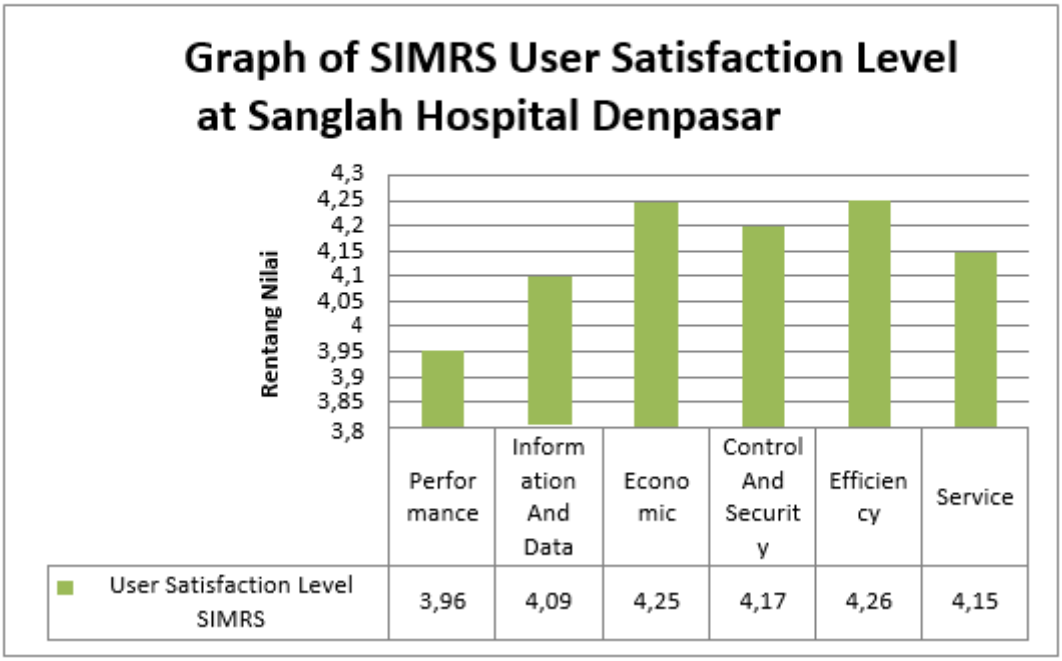
Analysis of PIECES at RSUP Prof. Dr. I.G.N.G. Ngoerah

The method used in this analysis is the PIECES framework which includes 6 aspects of reference, namely: Performance, Information and data, Economics, Control and Security, Efficiency, and Service. This method is applied to calculate the level of user satisfaction with the system which later the results are used for evaluation of the system related to the development of system quality.

Analysis of SIMRS user satisfaction at RSUP Prof. Dr. I.G.N.G. Ngoerah based on performance variables

Performance or performance is one of the domains measured in a system which is also the first domain of the PIECES Framework, where this domain will assess the extent to which a system can run and the extent of performance obtained when using the system according to the expected goals.

SIMRS User Satisfaction Rate Graph



The Relationship Between the Results of PIECES Analysis at SIMRS with the Readiness of Electronic Medical Record Implementation at RSUP Prof. Dr. I.G.N.G. Ngoerah

Based on the results of the analysis using the PIECES method, along with responses and suggestions from respondents, the researcher described the readiness of the Management Information System of RSUP Prof. Dr. I.G.N.G. Ngoerah towards Electronic Medical Records from various aspects as follows:

5.2.1 Performance Aspect

a. Throuput

Throughput means counting the number of jobs/outputs/deliverables that can be performed or produced at a given time. Is an assessment of the system from the amount of work done in some period of time. In its application, SIMRS has provided benefits and greatly helped users in terms of presenting patient data. However, when observations related to the problem were made, the following results were obtained:

1. Top 10 disease, demographic and census reports produced by SIMRS There is still a gap between the number of reports automatically generated by the system compared to the withdrawal of diagnostic data per case.
2. RL reports, some RL reports cannot work
3. The waiting time to access the surveillance report is too long.

Because it will take another long time. This is considered to greatly hamper the work of reporting officers.

This is also supported by responses from respondents as follows:

"For the census of patients who enter from the administrative officer is often not appropriate so they have to calculate the manual of new patients from SMF what is entered, for example new cardio that comes in but in the ENT patient system that seems to be entered so that in making reports we count manually again, actually simrs are good at storing data. Hopefully in the future it can be even better". In the performace aspect, SIMRS is currently still not able to meet user needs, both in terms of performance that is quite slow due to loading and to prepare SIMRS to go to RME. SIMRS still needs to add sub menus and improve the quality and quantity of reporting results.

b. Respons Time

The system can be said to be good and without obstacles, if the system can and is able to perform a number of commands in a predetermined period of time.

The results of observations and responses from respondents show that SIMRS takes a long time in the tracking process in obtaining the information needed during the service process. A slow SIMRS can hamper the service process and result in a backlog of officer work, especially if you have gone to RME where medical officers are required to be quick to input the patient's disease history with a fairly crowded number of patients, then in order to go to RME, SIMRS must be prepared for it.

c. Frequency of Communication

The prevalence of communication related to user interfaces can be understood and facilitate users (Apriyanti, et al.2015). Based on observations and responses of respondents show that SIMRS has a display that is easily understood by users but some SIMRS users complain that the SIMRS display is boring in the operation of SIMRS when performing services.

This is also supported by responses from respondents as follows:

" Please look more attractive, access faster and more features "

Based on these observations, it was found that SIMRS has a display that is easy to understand, however, the appearance of SIMRS is sometimes boring. The solution that can be provided is to change the appearance of SIMRS periodically starting from the smallest things such as background images, colors, and others so that the appearance of SIMRS is not boring for users.

Aspects of Information and Data (Information and data)

Information and data are said to be of no quality if the information is not fast, incomplete, inaccurate, irrelevant. For the accuracy of data content and information, SIMRS is now able to provide data and information needed by users through data that has been inputted in accordance with the variables needed so that the information provided is accurate. Except if there is a Human Error that may be done by the user in inputting data. 2. For the accuracy of additional information attributes which are certainly very important when searching, tracking or auditing trails, SIMRS still has

shortcomings such as the name of the user who coded the data, the date and time of the patient status update, etc.

This is also supported by responses from respondents as follows:

"If there can be a pop up, like WhatsApp, when the doctor changes the instructions in CPPT, or contains the time and date of the change, to know when the doctor changes the instructions.... so as not to think of each other"

So, in the information and data aspect, SIMRS still has to develop features that regulate additional attributes used in facilitating tracking or auditing the trail. Such as: the name of the officer who inputted, changed or even deleted the data. The date and time the activity was carried out and the reason for the data change. When data and information are downloaded and printed. So that the accuracy of the data and information owned by SIMRS is guaranteed in leading to Electronic Medical Records.

Economic Aspect

Economic aspect is one of the important variables in PIECES Analysis, where economical in this case is related to the costs incurred by the company in order to get results that are in accordance with the cold goals achieved.

But for now SIMRS has not been able to cut the travel process or service process flow. Where service activities still cannot save resources. For example, the use of print out paper is still needed, even though all the data and information that has been needed is already available at SIMRS where it is expected that all data and information have been integrated, so that the use of this paper can be minimized.

This is also supported by responses from respondents as follows:

" Outpatient receipt / bill so that LGS can be sent to the patient's cellphone number (without the use of paper) accompanied by information on the schedule of doctors Afternoon practice specialist and Saturday specialist practice. Patients who return home from the inpatient room, the bill should also be paperless / send to WA the patient directly plus the information of the Wing prtk doctor when doing control. Patient treatment card so that the barcode can be read by a QR scanner and the data goes lgs to simrs so that RM / registration officers do not repeat typing and reduce typos and also save time queuing for patient registration both through appointments and non-agreements. ”

In this aspect, it is hoped that the existence of this SIMRS can reduce user costs both in the interests of research, services or monitoring and evaluation so that it can accelerate the completion of the interests of services at Prof.Dr.I.G.N.G.Ngoerah Hospital.

Aspects of Control and Security (Control and Security)

a. Integrity

Integrity is the degree to which access to software or data of unauthorized persons on such systems can be controlled. The system can only be accessed by users who have a username and password. Based on the results of observations and responses of respondents show that SIMRS can only be accessed by SIMRS users who have usernames and passwords even more secure with chaptha. Security aspects in this case mean that information (data) can only be accessed by authorized parties. So that each unit can only access data in accordance with the work authority of each unit.

b. Security

Security is a mechanism capable of controlling or protecting programs and data in an information system. The system has restrictions on access to the division of labor of officers. Based on the results of observations and responses show that SIMRS officers/users have different access rights for each service unit. This is so that information in each service unit is not misused by irresponsible individuals.

Efficiency Aspect

a. Reusability

Reusability is the effort needed in studying, operating, preparing inputs and interpreting the output of a program. SIMRS users can operate the system, both entering data and interpreting the results produced by the SIMRS application. But for now there are still SIMRS users who feel difficult or dissatisfied with how to operate on one of the SIMRS menus or features.

This is evidenced by the responses from respondents as follows: "It is hoped that SIMRS can be better, especially during outpatient care, in inputting drugs so as not to repeatedly type the same thing, then

for initial writing in the emergency room that has not been implemented. Micro lab amprahs should be cancelable or editable like PK labs"

In this aspect, SIMRS can be designed with good operating techniques in input, operating each menu more effectively in the direction of Electronic Medical Records which later the content of the system will be even more complex.

Service Aspect

SIMRS performance analysis based on service aspects is an analysis related to services resulting from the implementation of the system which is assessed by accuracy and reliability. Aims to determine the level of service provided by the information system to user and customer satisfaction and the services produced by a system used.

However, from the service aspect, SIMRS users still have concerns about SIMRS, as evidenced by the responses from respondents as follows:

" The filter on still cannot be distributed to each KSM. CPPT is still mixed up so it is difficult to see CPPT itself and other KSM. Always having to repeat the CM number input on microbiological results and anatomical pathology results is quite disturbing and time-consuming even though the radiology order list and clinical pathology results have been integrated with 1x entering the CM number when CPPT input. Maybe you can add a list page of previous drug order history including drugs in previous hospitalizations / roads on 1 special page so that you can see the complete treatment history Cancellation of orders for anatomical pathology and microbiology may be added so that there is no need to always have to call billing "

In this aspect, SIMRS services must be further improved, namely by being more flexible, faster and easier to serve Electronic Medical Records.

Efforts to Recommend SIMRS User Satisfaction at RSUP Prof.Dr.I.G.N.G.Ngoerah Denpasar

1. It is necessary to do maintenance or maintenance on SIMRS so that loading does not occur often. This is in line with Putranto, et al (2017) which states that system maintenance includes all processes needed to ensure the continuity, smoothness, and improvement of the system that has been operated.
2. IT / SIMRS is expected to conduct regular monitoring at least once every 3 days on hardware and software at SIMRS
3. The review in terms of interface is good. However, for now it needs to be developed by IT / SIMRS so that system users can do their jobs properly.
4. IT / SIMRS is expected to hold training for SIMRS users with a minimum of 3 months with an even training target, so that all SIMRS users get the same knowledge to be applied when operating SIMRS.
5. To IT / SIMRS to make a target for solving problems and the severity of the problem.
6. We will provide a streamlining design of the menu menu on SIMRS so that SIMRS is more organized by managing the part between menu content included in SIMRS content and menu content included in the RME menu, making it in the form of an Electronic Medical Record portal design.

CONCLUSION

Based on the results and discussion of research on Hospital Management Information System Analysis (SIMRS) and its Relation to the Readiness of Electronic Medical Record (RME) Implementation at RSUP Prof.Dr.I.G.N.G.Ngoerah Denpasar can be concluded as follows:

Performance according to performance calculations in the PIECES analysis obtained a value of 3.96 with the predicate Satisfied, but there are several things that must be improved. In the performace aspect, SIMRS is currently still not able to meet user needs, both in terms of performance that is quite slow due to slow loading during service, SIMRS still needs to add sub menus and improve the quality and quantity of reporting results and making a more attractive display.

The Information aspect according to the calculation of Infomation and Data in the PIECES analysis obtained a value of 4.09 with the predicate Satisfied, but there are some suggestions that state that SIMRS still needs to develop features that regulate additional attributes used in facilitating tracking or auditing the trail. Such as: the name of the officer who inputted, changed or even deleted data. The date and time the activity was carried out and the reason for the data change. When data

and information are downloaded and printed. So that the accuracy of the data and information owned by SIMRS is guaranteed in leading to Electronic Medical Records.

The Economy aspect is that according to the calculation of Economy in the PIECES analysis obtained a value of 4.25 with the predicate Very Satisfied. However, there are several things that must be improved, namely SIMRS has not been able to cut the travel process or service process flow. Where service activities still cannot save resources. For example, the use of print out paper is still needed, even though all the data and information that has been needed is already available at SIMRS where it is expected that all data and information have been integrated, so that the use of this paper can be minimized.

The Control aspect is according to Control and Security calculations in the PIECES analysis obtained a value of 4.17 with the predicate Satisfied. In this aspect, SIMRS is quite good because it already has a username and password for access rights even after adding the chapta feature. And in terms of security, SIMRS runs well because SIMRS users have different access rights according to their respective authorities.

The Efficiency aspect according to the calculation of Efficiency in the PIECES analysis obtained a value of 4.26 with the predicate Very Satisfied. However, there are several things that must be improved, SIMRS still has to be designed with good operating techniques in input, operating each menu more effectively in leading to Electronic Medical Records which later the content of the system will be even more complex.

The Service aspect according to the Service calculation in the PIECES analysis obtained a value of 4.15 with the predicate Satisfied. However, there are several things that must be improved, SIMRS services must be further improved, namely by being more flexible, faster and easier to serve Electronic Medical Records.

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