

Design Of Information System Of Xyz Hospital Of Palangkaraya City By Using Sois Approach To Increase The Value Of Usability

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ABSTRACT

Information systems are able to integrate work units in order to improve efficiency and effectiveness in order to save organizational costs because information systems in hospitals greatly help the patient service process to petrify medical decision making. The application of Information Systems in XYZ Hospital is still not optimally marked by the results of the usability test which shows the results of 29% responses give bad grades, 57% give moderate grades and only 14% give good grades. So the purpose of this research is to design a form of information system that is able to integrate all information that can work effectively and can be received well shown by increasing the value of usability. The method of this research is to use SOIS (Serviced oriented Information System) as the main design method and participatory concept as ergonomic intervention. Respondents from this study were 2 admins, 2 doctors, 1 pharmacist and 30 patients from XYZ Hospital in Palangka Raya city. The results of this study were 10% of Respondents Gave Moderate Grades, 60% gave Good grades and 30% gave excellent grades. The increase in usability value is caused by the fulfillment of complaints and needs from end-users, this can be happened because the end-user is involved directly in the designer process.

Keywords - Usability, Participatory, Hospital Information System, SOA, Information System

Date of Submission: 04-04-2022

Date of Acceptance: 19-04-2022

I. INTRODUCTION

The information system is able to integrate work units in order to increase efficiency and effectiveness in order to save organizational costs [1]. This function applies when applied in hospitals which are service institutions managed by the government, community, and legitimate non-profit organizations [2]. Because the information system in the hospital is very helpful in the process of patient care to petrify medical decision making [3]

In accordance with Law no. 44 article 52 paragraph 1 of 2009 concerning hospitals and PERMENKES no. 1171 of 2011 every hospital is required to record and report as well as implement an information system in the hospital. Optimizing the function of the information system at the hospital can be done by creating an integrated patient account and having the complete data needed [4]. The use of a digital verification system is a solution to increase productivity and efficiency in the BPJS claim process in hospitals [5]. To improve service efficiency, an online queuing system can be implemented that is connected to the type of service and the desired time [6].

With the existence of an appropriate information system at the hospital, it accelerates the services provided [7]. The SOIS APPROACH method was chosen because it allows the integration and control of all existing business processes and is easy to integrate into a new information system as long as the system is service-based [8]. The advantage of using SOIS is that systems built with SOIS can be reused by other programs so that consumers can always search and find the services they need [9]. This can be done because Reusing SOIS-based applications allows developers to create add-ons without having to develop everything from scratch [10].

A participatory ergonomics approach is used to create a system that best suits user needs to increase productivity and quality as well as reduce inconvenience and human error [11]. Usability testing is used to determine how easy it is for a user to use the interface of an application [12]. An application is called usable if its functions can be executed effectively, efficiently, and satisfactorily [13].

In the preliminary study, there were many complaints regarding the difficulty of using SIMRS at XYZ Hospital in Palangka Raya, the system did

not meet the needs and the presence of the system increased the workload. and 30 Patients. This is in accordance with the results of the initial usability test which showed that 29% of respondents gave a bad score, 57% gave a moderate score and only 14% gave a good score. Therefore, this research will focus on designing an information system design that can integrate all the information needed in real time in the form of a dashboard that is easy to understand in order to increase productivity and service efficiency at XYZ Hospital, Palangka Raya City.

II. METHOD

2.1. Research Object

This research was conducted by XYZ Hospital palangka raya city which is addressed Jl. Haji Kiaps, Langkai, Kec. Pahandut, Palangka Raya City, Central Kalimantan

2.2. Research Subject

In this study, the subjects will be 2 admins, 2 doctors, 1 pharmacist and 30 patients from XYZ Hospital in Palangka Raya city with 18-45 years old, have worked Min 2 years at XYZ Hospital in Palangka Raya city (For Hospital Staff), have been treated at XYZ Hospital >3x in the period 2017-2022, and Have experienced manual service and use the system. (For patients) and Able to operate HP / Laptop well

2.3. Information Systems Design

The design method uses the SOIS Service Oriented Information System approach because with this model we can design an information system in a structured manner and can be tested for function and usefulness. The next reason is that this method can be combined with Usability as an information system test parameter. The stages of work are Literature Study, Production IS Identification, System and Service Analysis, IS Design and Testing[14].

2.4. Participatory Ergonomic Scheme

Participatory ergonomics is seen as an ergonomic intervention in the application of Information System Design. The participation mechanism consists of obtaining information and feedback from stakeholders in accordance with the design stage of the operating system. [15] The classification of stakeholders and their roles is as follows :

2.4.1. Participatory Flow

At this stage, it will be answered about the scheme of the participatory process flow that occurred from

the beginning of the study until it was completed, the respondents were 35 people with hospital staff who consisted of 2 admins, 2 doctors and 1 pharmacist and 30 patients. Further description of the schema of the participatory flow can be seen from the image below:

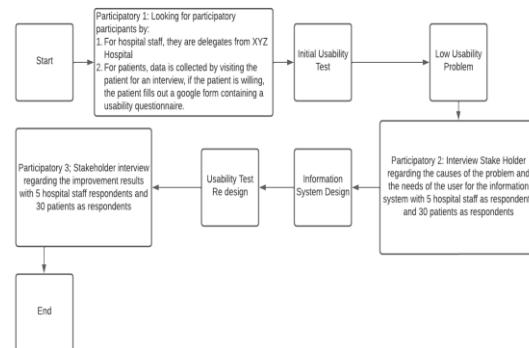


Figure 1 Participatory Flow scheme

2.4.2. Role of StakeHolder Pasrtisipatori

- Patient Role: Giving testimonials and conveying criticism and suggestions about the service system at XYZ Hospital in palangka raya city and providing a satisfaction scale from 1-5 with explanation 1 is very dissatisfied to 5, which is very satisfied [16]. As well as Filling out the Initial Usability Questionnaire and The Results of The Re-design of the information system
- Doctor's Role: Provide testimonials about the service system that must be done by doctors, and explain about the factors inhibiting services and Fill out the Initial Usability Questionnaire and the Results of Re-design information system
- The Role of Pharmacists: Provide testimonials about the system running in pharmacies and Analysis of service-enhancing factors and Fill out the Initial Usability Questionnaire and Information System Re-design Results
- Bpjjs Admin Role: Provide testimonials about bpjjs claim mechanisms that run and analysis of service-enhancing factors and fill out the Initial Usability Questionnaire and information system Re-design Results
- The Role of the RS Admin: Providing testimonials about the running administrative mechanisms and Analysis of service-enhancing factors and Filling out the Initial Usability Questionnaire and

the Results of the Information System Re-design

2.5. Usability Measurement Method

The method used in this study is the Usability method, which is a method to measure the efficiency, effectiveness, and satisfaction of users in using an information system. There are several common indicators that can be used as criteria for measuring usability characteristics included in conformity surveys, between Learability, Efficiency, Memorability, Error and Satisfaction.[17]

2.6. Wilcoxon test

The wilcoxon signed test is a nonparametric test used to determine the difference between 2 groups of ordinal ordinal or interval paired data but the data is distributed abnormally. This test is also known as the match pair test. The basis for decision making in the wilcoxon signed test is When the probability value of Asym.sig 2 tailed < 0.05 then there is a difference in average and When the probability value of Asym.sig 2 tailed > 0.05 then there is no difference in average. [18]

III. RESULTS AND DISCUSSIONS

3.1. Participatory 1: Characteristics of Respondents

At this stage will be described about the characteristics of the responden with age and gender variables. The results of the analysis of the characteristics of respondents are as follows:

1. Participatory Respondents 2 (before Improvement): The number of respondents was 35 people with hospital staff consisting of 2 admins, 2 doctors and 1 pharmacist and 30 patients, the average age of the respondent was 31.02 years with a standard deviation of 7.02 and the number of men as many as 17 people (48.6%) and the number of women as many as 18 people (51.4%)
2. Participatory Respondents 3 (after Improvement): The number of respondents was 35 people with hospital staff consisting of 2 admins, 2 doctors and 1 pharmacist and 30 patients, the average age of the respondent was 27.62 years with a standard deviation of 4.31 and the number of men as many as 17 people(48.6%) and the number of women as many as 18 people (51.4%)

3.2. Initial Usability Test

Usabilitas Test Results with 35 Respondents showed that 29% of Respondents gave Bad grades, 57% Of Respondents Gave Moderate Grades and 14% Respondents gave Good Grades.

Based on these results, it is necessary to make improvements to the information system by involving the end-User in order to provide a design that is in accordance with existing problems [19].

3.3. Participatory Results 2 : Information System Design Input

Participatory results using interviews found several problems conveyed by stakeholders regarding the current information system, participatory results from each stake holder as follows:

1. Findings: according to the existing information user system has not been integrated so that between users cannot exchange information quickly when the service is provided.
2. Follow-up: Designing an information system for patient registration by applying the principles of SOA (Service Oriented Arsitecture), an integrated information system so that the processing of information during the service process can take place quickly, and Adding several features according to each user

3.4. Information Systems Design (SOIS APPROACH)

3.4.1. Running System Analysis

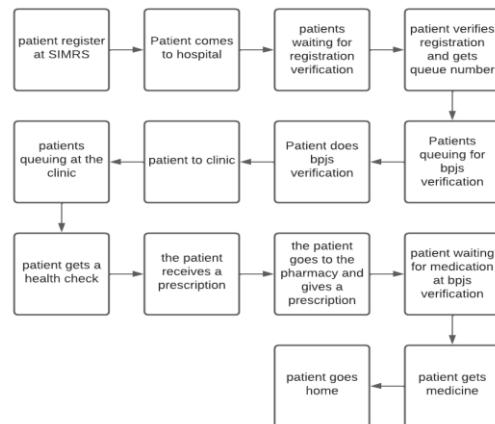


Figure 2 Patient Flow

Based on the Service Scheme above and the information from XYZ Hospital they set the standard time of a patient from the beginning to come home is 44 minutes, but it is different if we compare with the results of the information from patients whose overall time they came was at 88 minutes for Internal Medicine Poly and 118 minutes for Dental Poly. This can happen because there is a queuing factor that is not noticed by the hospital which is caused by a work system that is not in accordance with the needs of xyz hospital palangkaraya city [20]

3.4.2. IS design : Participatory Results

At this stage, the information system is created by the IT Expert and Program Developer who plays a role in realizing the concept that has been created and providing input on the information system model created. The results of the Information System that has been created can be accessed through the link <https://raiza.infinityfreeapp.com/> the full details of the information system will be attached



Figure 3. Participatory Results Home Page

Fig.3 shows participatory results in the form of a Main page that is directly addressed to patients in order to make an appointment with a doctor, there is also a login feature and a list that makes it easier for new users and existing users to be able to access the service.

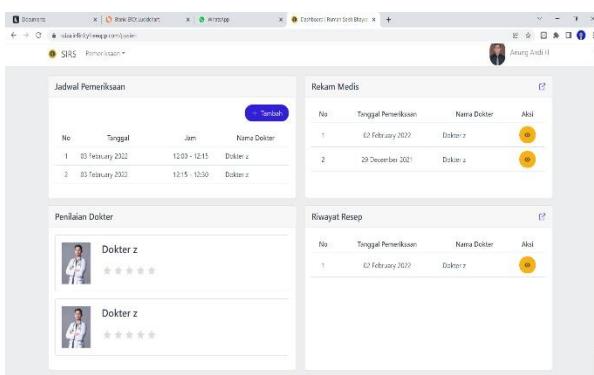


Figure 4. Participatory Outcomes Patient Start Page

Fig. 4 shows participatory results in the form of a Start page for Pasein which has several features, namely registration, Medical Record History and Drug History. In the registration feature, pasein can choose the date, hour, poly and doctor to go and after registering the patient can go directly to the poly at the selected hour so that there is no need to verify the registration manually. The Medical record history feature is the embodiment of the concept of medical E-Records that allows patients to

be able to see the History of Health checks that are done complete with the date and the doctor who gave the diagnosis. In the Drug History feature allows patients to see what drugs he has received while in xyz hospital this can be a solution to the problem of false prescriptions, lost prescriptions and incomprehension in prescriptions.

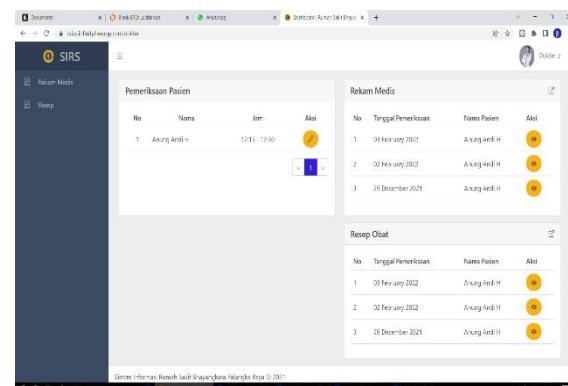


Figure 5. Participatory Results doctor's home page

Fig.5 shows participatory results in the form of a Doctor's start page that has several features, namely the list of patients today, writing prescriptions and Diagnoses, Medical Record History and Drug History. In the patient list feature, doctors can see the number of patients that day and the patient's hours will come, the doctor can directly write down the diagnosis and prescription of the drug to the patient after the examination. In the Medical record history and drug history feature allows the doctor to see all patients who have been examined complete with the diagnosis and drug given

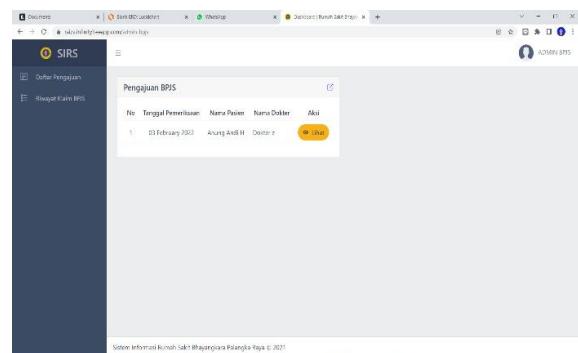


Figure 6. Bpjjs Admin Start Page Participatory Results

Fig. 6 shows participatory results in the form of bpjjs admin start page which has several features, namely bpjjs submission list and BPJS Submission History (Claim). In the BPJS submission list feature will show the number of patients who apply for payment by BPJS, this list will show the

amount of the bill and billing details then the BPJS Admin writes the amount of bill that bpjs will pay and chooses that the patient has been verified but if the BPJS Admin determines the patient is not verified then BPJS will not make payments for the patient. In the Submission History (claim) feature will show the number of transactions submitted with details of each transaction how much bpjs paid. This feature also allows patients to only be verified one time at the end.

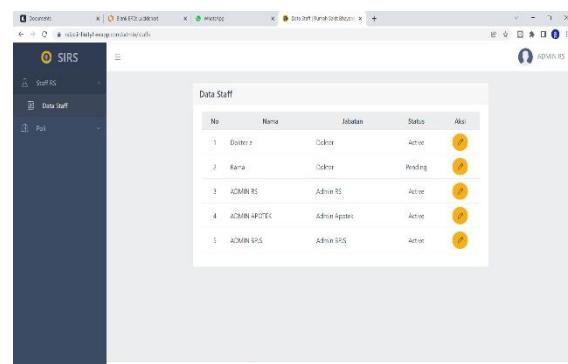


Figure 7. Participatory Results RS Admin start page

Fig. 7 shows participatory results in the form of the Rs admin start page which has several features, namely Staff List and Poli List. In the list feature of the hospital admin staff can determine whether the staff account has been verified or not if not then the account cannot be used, and in this feature there is a complete list of staff in the hospital complete with data-itself. In the poly list feature there will be a poly name available and can register poly or delete poly.

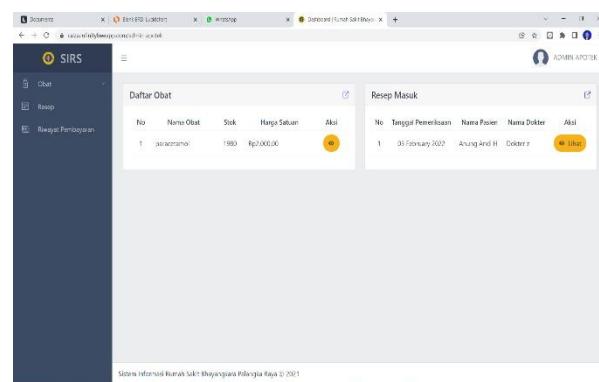


Figure 8. Participatory Results Pharmacist Start Page

Fig. 8 shows participatory results in the form of a Pharmacist's start page that has several features, namely Entry Prescription, Drug List and Payment History. In the incoming prescription feature will show the dose and amount of medicine

for the patient given by the doctor then the amount of money that must be paid. In the drug list feature will be seen the name of the drug, drug stock and drug price and if the new drug stock comes can add drugs. In the Transaction history feature will appear a list of patients and money paid

3.5. Re-Design Usability Test

Based on the Results of the Usability Test on The Re-Design of Information Systems at RS XYZ, 10% of Respondents Gave Moderate Grades, 60% gave Good Grades and 30% gave excellent grades. Increased usability value due to the fulfillment of complaints and needs from end-users, this can be done because the end-user is involved directly in the design process [19]

3.6. Wilcoxon test

The 2-tailed significance value indicates a value of 0.000 which means that there is a significant difference between the Initial Usability result and the Re-design Usability Result. . This result shows no decrease in the value of re-design usability compared to the initial usability results and shows a significant improvement result so that in general the re-design results are better than the initial design.

IV. CONCLUSION

Based on the discussion that has been done in the previous chapter, 2 conclusions can be drawn as follows:

1. Patient Flow after the Information System is repaired and added features then the patient flow becomes shorter which was originally 14 processes after the improvement of the patient process into 9 processes. This indicates that after improvements, the services received can be faster and hospitals can be more effective and efficient in serving patients.
2. The results of the usability test found numbers that showed 10% of respondents gave enough grades, 60% respondents gave good grades and 30% of respondents gave excellent grades. This proves that this system can be used well and can integrate the service process in RS XYZ so that this system can be said to be Usable.

REFERENCES

- [1] Tabibi, S.J., Ebrahimi, P., Fardid, M. and Amiri, M.S., 2018. Designing a model of hospital information system acceptance: Organizational culture approach. *Medical Journal of the Islamic Republic of Iran*, 32, p.28.
- [2] Sunandar, D., Kom, S. and Kom, M., Analisa Dan Perancangan Sistem Informasi Rumah

- Sakit Siaga Raya Berbasis Web. In *Prosiding Seminar Nasional Informatika ISSN* (Vol. 2549, p. 4805)
- [3] Rumambi, F.R., Robo, S. and Amalia, C., 2020. Identifikasi Dampak Penggunaan Sistem Informasi Rumah Sakit (SIRS) Terhadap Pelayanan Kesehatan Menggunakan Hot-Fit Model 2006. *Jurnal Media Informatika Budidarma*, 4(1), pp.216-224
- [4] Sodani, M.P. and Fanida, E.H., 2020. Inovasi Pelayanan Elektronik Sistem Kesehatan Lamongan (E-SIKLA) dalam Meningkatkan Layanan Kesehatan di Puskesmas Kedungpring Kabupaten Lamongan. *Publika*, 8(4).
- [5] Ahid, M., 2019. Sistem Verifikasi Digital Klaim (VEDIKA) BPJS Kesehatan di RSUD Kabupaten Sidoarjo tahun 2019 (*Doctoral dissertation, Fakultas Kesehatan Masyarakat*).
- [6] Khairullah, J.A.F., 2021. Perancangan Sistem Pendaftaran Pasien Secara Online Pada Rumah Sakit Jiwa Aceh Menggunakan Framework Codeigniter Dan Bootstrap. *Jurnal Teknologi Terapan and Sains 4.0*, 1(3).
- [7] Azizah, N.L.N. and Setiawan, M.V., 2017. Pengelolaan Informasi Kesehatan secara Terintegrasi untuk Memaksimalkan Layanan Kesehatan kepada Pasien di Rumah Sakit. *Indonesian Journal of Pharmaceutical Science and Technology*, 4(3), pp.79-91.
- [8] Neves, V.D.O., Garcés, L. and Neto, V.G.G., 2020, November. Towards Educational Systems-of-Information Systems: Reporting Results of An Exploratory Study. In *XVI Brazilian Symposium on Information Systems* (pp. 1-8).
- [9] Chindove, H., Seymour, L.F. and van der Merwe, F.I., 2017, April. Service-oriented architecture: describing benefits from an organisational and enterprise architecture perspective. In *International Workshop on Advanced Enterprise Modelling* (Vol. 2, pp. 483-492).
- [10] Domdouzis, K., Andrews, S. and Akhgar, B., 2016. Application of a new service-oriented architecture (SOA) paradigm on the design of a crisis management distributed system. *International Journal of Distributed Systems and Technologies (IJDST)*, 7(2), pp.1-17.
- [11] Ercan, S. and Erdinç, O., 2006. Challenges of leadership in industrial ergonomics projects. *İstanbul Ticaret Üniversitesi Fen Bilimleri Dergisi*, 5(9), pp.119-127.
- [12] Riyadi, N.R., 2019. Pengujian Usability Untuk Meningkatkan Antarmuka Aplikasi Mobile myUMM Students. *Sistemasi: Jurnal Sistem Informasi*, 8(1), pp.226-232
- [13] Nielsen, J., 1992, June. Finding usability problems through heuristic evaluation. In *Proceedings of the SIGCHI conference on Human factors in computing systems* (pp. 373-380).
- [14] Putro, M.K., 2017. Pengembangan Sistem Informasi Manajemen Produksi Berorientasi Layanan Pada Sektor Agribisnis Menggunakan Pendekatan SOIS Studi Kasus: Pabrik Pengolahan Kelapa Sawit PT X. *IKRA-ITH INFORMATIKA: Jurnal Komputer dan Informatika*, 1(1), pp.1-10.
- [15] Suhardi, I.B., Agustina Citrawati, S.T. and Astuti, I.R.D., 2021. *Ergonomi Partisipatori Implementasi Bidang Kesehatan Dan Keselamatan Kerja*. Deepublish.
- [16] Nilayani, S.A.P., 2020. Survei Kepuasan Siswa Terhadap Proses Belajar Daring Selama Pandemi Covid-19. *Cetta: Jurnal Ilmu Pendidikan*, 3(3), pp.453-462.
- [17] Saputra, I.W.Y., Watae, G. and Runtukahu, N., 2021. Measurement of Usability Online Storage in Cloud Computing for University Users. *International Journal of Information Technology and Education*, 1(1), pp.36-42.
- [18] Rakhmawati, A., 2019. Analisis Pengaruh Penggunaan Aplikasi Go-Food Terhadap Pendapatan Rumah Makan.
- [19] Kushendriawan, M.A., Santoso, H.B., Putra, P.O.H. and Schrepp, M., 2021. Evaluating User Experience of a Mobile Health Application ‘Halodoc’using User Experience Questionnaire and Usability Testing. *Jurnal Sistem Informasi*, 17(1), pp.58-71.
- [20] Febriani, F. and Busrah, Z., 2021. Analisis Sistem Antrian Pelayanan Administrasi Pasien Rawat Jalan Studi Kasus: Rumah Sakit Umum Daerah Kab. Pinrang. *Prosiding Semantik*, 3(1), pp.88-96.