



Web-Based Outpatient Information System at RSUD Indramayu

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Abstract. This outpatient information system is a system that is run on the hospital outpatient unit to support the service process provided to patients used by the units that provide services. This outpatient information system assists hospitals in implementing an integrated and structured digitization of patient medical record data. The study aimed to produce an outpatient information system that provides convenience to hospital staff and patients in the process of health services in the outpatient unit of RSUD Indramayu. In this study, the author uses a descriptive method, which is a method that describes a situation or problem that is currently happening based on the facts and data obtained and collected at the time of carrying out the research. Outpatient information system design uses document flow, system flow, tiered diagrams, context diagrams, data flow diagrams, conceptual data models, and physical data models. The implementation of this research uses the PHP programming language and MySQL database as well as writing the system design using DFD (Data Flow Diagrams), namely Data Flow Diagrams, FlowMap, Flowcharts, and Entity relationship diagrams (ERD). The result of the research is an integrated web-based outpatient information system application from the beginning to the end of outpatient services for patients.

Keywords: Outpatient, Outpatient, Information, System

INTRODUCTION

Based on Law of the Republic of Indonesia No.36 of 2009 concerning Health, health is a human right and one of the elements of welfare that must be realized by the ideals of the Indonesian nation as referred to in Pancasila and the Preamble to the Constitution of the Republic of Indonesia Year 1945. Every activity and effort to improve the highest degree of public health is carried out based on non-discriminatory, participatory, protection, and sustainability principles, which are very important for forming Indonesian human resources, increasing the resilience and competitiveness of the nation and national development.

Efforts to improve the highest degree of health were initially in the form of efforts to cure diseases, then gradually developed towards the integration of health efforts for the entire community by involving the community at large, which included promotive, preventive, curative, and rehabilitative efforts that were comprehensive, integrated and sustainable. This

development was contained in the National Health System (SKN) in 1982, further mentioned in GBHN 1983 and GBHN 1988 as an order to implement health development.

The Regional General Hospital (RSUD) of Indramayu Regency is one of the Regional Public Service Agencies (BLUD) owned by the local government of Indramayu Regency, which is engaged in health services. Indramayu Hospital is currently a Class B Hospital, so it can be used as a referral hospital by other health service facilities under it. One of the service facilities at Indramayu Hospital is nursing services.

Currently, Indramayu Hospital has not used an adequate information system, so in its implementation, several shortcomings are still found, such as the unavailability of online registration and the lack of integrated data between service units, for example, still using manual introductions when patients will get lab and radiology services/examinations. The outpatient service process is the face of hospital services because it occurs in the early stages of patients getting health services. If not managed properly, the level of patient satisfaction will decrease and damage the hospital's image, so public interest in visiting will decrease in the future.

Seeing the problems above, it is appropriate for the hospital to find solutions to improve the outpatient service process. One solution that can be used is to implement an integrated and transparent outpatient information system so that the service process runs optimally and can answer problems.

LITERATURE

The existence of a literature review intended to compare research conducted by the author is different from other studies. A literature review needs to be done to appreciate previous research; the literature review also contains differences between previous research and research being researched by the author. The difference is seen in the identity of the journal, the problems discussed, the methods used, the design of the system architecture, and the tools of system development and research results.

Akhmad Syukron and Noor Hasan (2015) explained that a good concept or system can improve the quality of health services so that later, a quality, effective, and efficient health service can be realized and can improve the performance of the puskesmas. One example is the use of computerized information systems in Puskesmas. From the observations that have been made, several obstacles are still faced, such as in the outpatient registration section, which experiences problems when identifying patients who will seek treatment, and also in the administration in making health reports.

Johani S Pasaribu and Johnson Sihombing (2017) explained that the practicality and computerization that can be accessed anytime and anywhere could facilitate all work, especially all registration and data processing, which requires speed, accuracy, or data validation. One impact of practicality and computerization can be felt in the field of health services, where information technology is needed to be used for storing patient data.

Dini Hariyati, Ricky Akbar, and Meza Silvana (2017) revealed that in providing outpatient services, Puskesmas takes a long time, such as searching for patient medical record books, recording the number of drugs available in warehouses, and so on, so a better system is needed in running business processes to overcome these problems.

Agus Tugiarto, Fitri Pratiwi, Ahmedika Azkya, and Pulla Pandika Widodo (2018) explained that the services provided by the Puskesmas are greatly influenced by the speed and accuracy of the officers in handling patients, starting from patient registration until the patient is examined by medical personnel to getting medicine for the disease he complained about. A computerized system is needed to improve the quality of services to the community in the health sector because the services provided to Puskesmas must also be fast and accurate.

Suriaman Gulo and Roni Jhonson Simamora (2018) explained that the performance of the system in inpatient and outpatient services for patients running at Siti Hajar Medan General Hospital is still not optimal because the management of inpatient and outpatient data is still carried out using manual bookkeeping media. This can hinder the course of reports and smooth service delivery to patients.

Therefore, an application was designed to help hospitals, primarily the inpatient and outpatient administration, speed up the process of presenting information, avoid errors in calculating inpatient and outpatient costs, and provide convenience in producing relevant, accurate, and timely reports.

Harianja (2018) explained that public health services must be effective and efficient to realize the ideal of a healthy Indonesian society. One of the ways to realize effective and efficient services is by implementing computer-based applications. This study aims to design a computer-based application to make patient registration, data collection, and reporting services easier.

Fernando B. Siahaan and Dede Awalludin (2020) tried to provide an alternative outpatient administration model using an information system with a client/server application architecture that can connect several parts involved in outpatient operations. The system development method is a structured system development approach (structure approach). With this system, patient registration administration, actions, and use of medical devices and prescription services can be

assisted by using the system. All patient bills can be readily displayed through the cashier menu.

Hendra Rohman and Selin Sheralinda (2020) explained that the clinic management information system is expected to help health workers facilitate service activities in the process and in finding information. The clinic management information system will also avoid problems in medical record activities.

Erliza Yubarda Nurul Huda (2020) explained that to design and build a web-based information system using PHP programming language and MySQL database used to manage outpatient information systems at Thursina Hospital and provide convenience in processing patient data so that the data produced is better and also with this information system, Can make it easier for medical record officers to manage outpatient data including the number of patient visits per polyclinic each month.

Miftah Hazimah and Muhammad Rizki (2020) explained that clinics are one of the most sought-after health service facilities needed to support health improvement. With this, the clinic must improve the quality of its services, including health services, namely in outpatient administration. At Insan Permata Clinic, the outpatient administration system is yet to use a fully computerized system. To overcome this problem, efforts are made to use computerization inpatient services at the clinic.

METHOD

In this study, the author uses a descriptive method, which is a method that describes a situation or problem that is happening based on facts and data obtained and collected when carrying out research. In making this report, the author uses the analysis description research method because the author collects data by looking directly at the conditions in the field so that they can be considered in decision-making.

The system development method used by the author in making an asset management information system uses the System Development Life Cycle (SDLC) method. This method was chosen because it is by creating this information system whose development process is carried out sequentially, and the stages passed must wait for the completion of the previous stage so that it will produce an exemplary system according to needs.

The stages in system development using the System Development Life Cycle (SDLC) method, according to Supriyanto (2017), are shown in Figure 1.

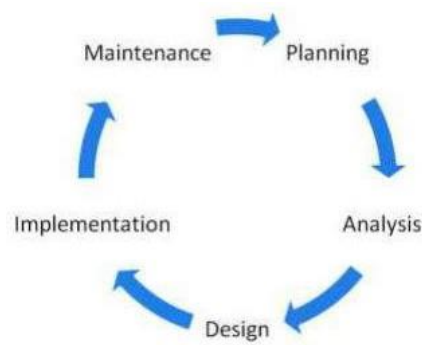


Figure 1 Stages of the System Development Life Cycle (SDLC) Method

DISCUSSION

The login page is the first page displayed by the application as an entrance for application users before utilizing the facilities in the application. Users who want to log in must enter their username and password then press the "Login" button.



Figure 2. Login Page

Incorrect Username or Password Notification Page

This page is a login page that displays an "Invalid Username or Password" message in response to user input that entered the wrong username or password.

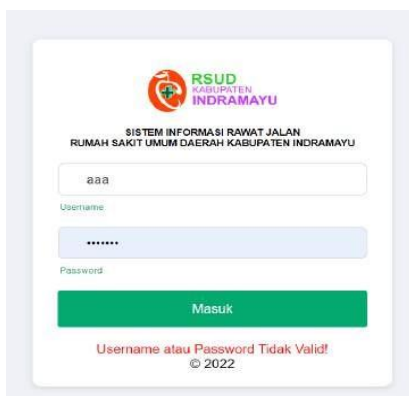


Figure 3. Incorrect Username or Password Notification Page

Patient Page

The patient page is a page given to old patients who log into the application with a username and password in the form of an ID card number and patient medical record number. Patients are given the facility to register online using the application and can monitor their registration status.

Online Registration Page



Figure 4. Online Registration Page

Online Registration Info Page



Figure 5. Online Registration Info Page

Registration Officer Page

New Patient Registration Form Page

This page serves to process new patients who register in outpatient units. The registration officer inputs the patient's biodata and identity number every time they register a new patient. After being registered, the officer prints the patient's medical card to be used at the next visit.

Figure 6. New Patient Registration Form Page

Existing Patient Registration Form Page

This page is used by registration officers in registering existing patients. Namely patients who have visited Indramayu Hospital. The registration officer only inputs the patient's medical record number on the patient's medical card.

Figure 7. Existing Patient Registration Form Page

Visit History page

This page serves to display a list of patients visiting the outpatient unit. Officers can search for patient visit data by selecting the registration period, medical record number or patient name.

No	Tanggal	No. Rekam Medis	Nama	Umur	Jenis Kelamin	Alamat	No. RUMAH SAKIT	No. KARTU KESEHATAN	No. KARTU KESEHATAN	Status
1	11/08/2023	000001	Wahid Hidayat	25	L	Jl. Pahlawan No. 100	000001	000001	000001	Active
2	11/08/2023	000002	Wahid Hidayat	25	L	Jl. Pahlawan No. 100	000001	000001	000001	Active
3	11/08/2023	000003	Wahid Hidayat	25	L	Jl. Pahlawan No. 100	000001	000001	000001	Active
4	11/08/2023	000004	Wahid Hidayat	25	L	Jl. Pahlawan No. 100	000001	000001	000001	Active
5	11/08/2023	000005	Wahid Hidayat	25	L	Jl. Pahlawan No. 100	000001	000001	000001	Active
6	11/08/2023	000006	Wahid Hidayat	25	L	Jl. Pahlawan No. 100	000001	000001	000001	Active
7	11/08/2023	000007	Wahid Hidayat	25	L	Jl. Pahlawan No. 100	000001	000001	000001	Active
8	11/08/2023	000008	Wahid Hidayat	25	L	Jl. Pahlawan No. 100	000001	000001	000001	Active
9	11/08/2023	000009	Wahid Hidayat	25	L	Jl. Pahlawan No. 100	000001	000001	000001	Active
10	11/08/2023	000010	Wahid Hidayat	25	L	Jl. Pahlawan No. 100	000001	000001	000001	Active

Figure 8. Visit History page

Polyclinic Page

Patient List Page

The patient list page at the polyclinic serves to display the list of names of patients who visit each polyclinic. From this list of patients, officers can process services by clicking the existing process button.



Figure 9. Patient List Page

Patient Examination Page

This page is used by polyclinic admins to process data input Services available at the polyclinic. It includes the process of examination, diagnosis, action, laboratory, radiology and medicine.

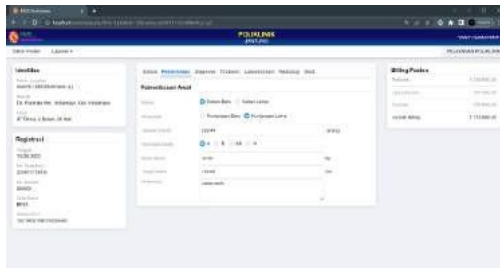


Figure 10. Patient Examination Page

Laboratory Page

Laboratory Order List Page

This page serves to display a list of patients who want to do laboratory tests. The data displayed comes from input requests for laboratory tests from polyclinics.

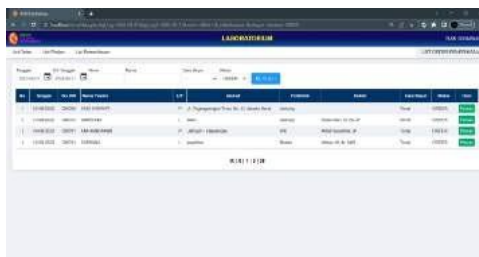
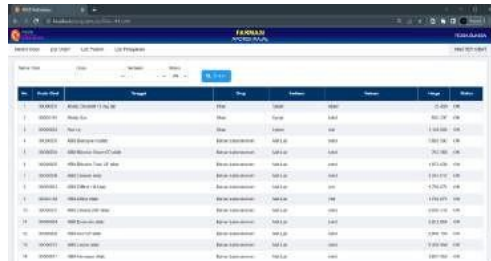


Figure 11. Laboratory Order List Page

Pharmacy Page

Drug Master Page

The drug master page displays the names of drugs in the database to assist pharmacy officers in performing drug services to patients.

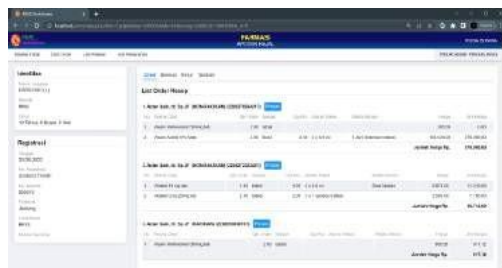


ID	Name	Brand	Price	Category	Manufacturer	Stock	Unit
1	Aspirin 100mg	Aspirin	1000	Tablet	Roche	1000	Box
2	Paracetamol 500mg	Paracetamol	500	Tablet	Roche	500	Box
3	Amoxicillin 500mg	Amoxicillin	500	Tablet	Roche	500	Box
4	Clonidine 0.1mg	Clonidine	1000	Tablet	Roche	1000	Box
5	Metoprolol 50mg	Metoprolol	500	Tablet	Roche	500	Box
6	Lisinopril 10mg	Lisinopril	1000	Tablet	Roche	1000	Box
7	Simvastatin 40mg	Simvastatin	400	Tablet	Roche	400	Box
8	Atorvastatin 20mg	Atorvastatin	200	Tablet	Roche	200	Box
9	Rosuvastatin 10mg	Rosuvastatin	100	Tablet	Roche	100	Box
10	Warfarin 5mg	Warfarin	500	Tablet	Roche	500	Box
11	Dabigatran 150mg	Dabigatran	1500	Tablet	Roche	1500	Box
12	Apixiban 150mg	Apixiban	1500	Tablet	Roche	1500	Box
13	Warfarin 5mg	Warfarin	500	Tablet	Roche	500	Box
14	Dabigatran 150mg	Dabigatran	1500	Tablet	Roche	1500	Box
15	Apixiban 150mg	Apixiban	1500	Tablet	Roche	1500	Box

Figure 15. Drug Master Page

Pharmacy Services Page

This pharmacy service page is used by pharmacy staff to input pharmacy services so that they are stored in the database. The results stored are in the form of the amount of medicine given, rules of use and drinking time.



Service ID	Service Name	Amount	Rules of Use	Drinking Time
1	Aspirin 100mg	1000	Take 1 tablet 3 times a day after meals	After meals
2	Paracetamol 500mg	500	Take 1 tablet 4 times a day when needed	After meals
3	Amoxicillin 500mg	500	Take 1 tablet 3 times a day after meals	After meals
4	Clonidine 0.1mg	1000	Take 1 tablet 2 times a day	After meals
5	Metoprolol 50mg	500	Take 1 tablet 2 times a day	After meals
6	Lisinopril 10mg	1000	Take 1 tablet 1 time a day	After meals
7	Simvastatin 40mg	400	Take 1 tablet 1 time a day at bedtime	At bedtime
8	Atorvastatin 20mg	200	Take 1 tablet 1 time a day at bedtime	At bedtime
9	Rosuvastatin 10mg	100	Take 1 tablet 1 time a day at bedtime	At bedtime
10	Warfarin 5mg	500	Take 1 tablet 1 time a day	After meals
11	Dabigatran 150mg	1500	Take 1 tablet 2 times a day	After meals
12	Apixiban 150mg	1500	Take 1 tablet 2 times a day	After meals

Figure 16. Pharmacy Services Page

Cashier Page

The cashier page is a special page for cashiers to process payments for visiting patients. Patients who appear on the cashier page are only types of patients who use cash payment methods.

Patient List Page

The patient list page at the cashier serves to display a list of names of patients who visit the outpatient unit. From this patient list, officers can process payments by clicking the process button.



ID	Name	Address	Phone	Gender	Age	Payment Method	Status
1	John Doe	123 Main St, New York, NY 10001	212-555-1234	Male	35	Cash	Active
2	Jane Smith	456 Elm St, Los Angeles, CA 90001	213-555-5678	Female	28	Cash	Active
3	Michael Johnson	789 Oak St, Chicago, IL 60601	312-555-9012	Male	42	Cash	Active
4	Sarah Williams	101 Pine St, Houston, TX 77001	281-555-3456	Female	31	Cash	Active
5	David Brown	202 Cedar St, Phoenix, AZ 85001	602-555-7890	Male	25	Cash	Active
6	Emily Davis	303 Birch St, San Antonio, TX 78201	214-555-2345	Female	22	Cash	Active
7	Christopher Miller	404 Maple St, San Diego, CA 92101	619-555-6789	Male	38	Cash	Active
8	Amanda Wilson	505 Walnut St, Austin, TX 78701	512-555-0123	Female	29	Cash	Active
9	Robert Taylor	606 Elm St, Fort Worth, TX 76101	817-555-4567	Male	45	Cash	Active
10	Laura Anderson	707 Oak St, Dallas, TX 75201	214-555-8901	Female	33	Cash	Active

Figure 17. Patient List Page

Patient Payment Page

This page is used by cashiers in processing payments for patients who receive outpatient services from registration, polyclinics, labs, radiology and pharmacy.



Figure 18. Patient Payment Page

CONCLUSION

Based on the description and discussion in the previous chapter about the web-based outpatient information system at Indramayu Hospital, the conclusions of this study are as follows:

- The system runs online
- The system can process the patient's online registration
- The system can save the registration by the registration officer
- The system can store polyclinic service processes
- The system can process patient payments covering the entire cost of outpatient services
- The system can exchange data between service units
- The system can display data from user input in the form of reports
- The system can identify user levels so that application interfaces for one user level and another are designed differently according to needs.

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