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Medical Records Search Application Design Outpatient at RSI Ibnu Sina Padang Year 2023

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ABSTRACT

The problem at RSI Ibnu Sina Padang in 2023 is that the search for medical records is always done manually with the time needed for 1 medical record ± 10 minutes, this is because the medical records are not specified or scattered. The purpose of this study is to find out the design of an outpatient medical record search application at RSI Ibnu Sina Padang in 2023. By adopting the type of research, namely Research & Development (R&D) with the prototype development method. The research was conducted from January to July 2023. The number of informants was 5 people, namely 5 runner officers. Conduct data analysis of potentials and problems, collect data, design products, validate designs, improve designs, and test products. The results showed that the process flow for filling in components, especially in the form of searching was done manually which included outpatient registration proof sheets. Application design can be fully implemented. The test results show that the existing components are in accordance with the hospital format and the application of the search process is faster and more efficient than manual search. Based on the results of the study, it was concluded that the design of the outpatient medical record storage information system was in accordance with the hospital format. It is hoped that this research application design can be used in hospitals and this research can be continued by other researchers.

***Keywords**: Search, Information Systems Design, Electronics*

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INTRODUCTION

Hospitals are required to maintain medical records as stated in (RI Minister of Health Regulation No.24, 2022) Regarding Medical Records, namely: Health facilities are a tool and/or place used to carry out health/fitness management efforts, whether promotive, preventive, curative or rehabilitative, which are carried out with the assistance of the authorities, environmental government and or network.

Medical record management begins when the patient is received at a medical institution, the activity of recording the patient's medical information while receiving services at the health facility and handling medical record documents which includes organizing the storage and deletion of files from storage to serve requests or borrow for other functions. One of the activities carried out in scientific reports is managing the document storage system. Garage management for recording medical records is very important in a fitness service organization because it can simplify and speed up the retrieval of health documents stored on garage shelves, smooth retrieval from the garage, ease of return, and protect medical documents. documents from risk of robbery, risk of danger. physical, chemical and organic (Ritonga et al., 2019; Sari & Nugroho, 2021; Wibowo et al., 2020).

According to Nugraha (2020), a website is a collection of pages that display text information, photo statistics, animated information, sound, video, and a combination of all of them, both static and dynamic, which form a series of interrelated houses where each is connected to the community page (link). This definition aligns with the general understanding of a website as a compilation of web pages containing various types of information accessible via the internet. As Hidayat (2010) states, a website is a collection of pages used to display information such as text, images, animations, sound, or a combination of all, whether static or dynamic, forming an interconnected structure where each page is linked to others. Similarly, Susilowati (2019) describes a website as a set of web pages with related topics, typically hosted on a web server accessible through the internet or local area network (LAN). These definitions underscore the role of websites as interconnected platforms for disseminating information across various media formats.

The approach used is Prototype, this improvement mode is useful for developing archive structures. This technique provides the possibility for program development and gadget research to interact with each other through gadget design methods. The prototyping version is also a method that allows developers to create software models, this approach is good to use if consumers cannot provide maximum statistics about the desired requirements (Yurindra, 2017; Kurniati, 2017).

Based on research conducted by Mirna Septria et al. (2011) entitled "Overview of the Implementation of the Medical Record Document Alignment System in the Filing Room at Dr. Soetomo Hospital," it was found that the coverage or permanent process for the submission of clinical reports, which includes storage of scientific file documents and tools for harmonizing medical records, has been created but has not been completely explained, especially regarding officers in the delivery stage. This causes outpatient registration officers to participate in searching for clinical documents on the archive shelves, leading to longer service times for patients. Similarly, research by Arini et al. (2022) at UPT Puskesmas Karanganyar revealed that misfiles occurred due to a lack of carefulness among non-RMIK officers in returning medical record documents to their

proper places, and the insufficient number of medical record staff in the filing department. This situation also resulted in delays in patient services. Furthermore, a study by Oetari et al. (2022) at Petala Bumi Regional General Hospital in Riau Province highlighted that inadequate human resources and facilities in the medical record installation led to incomplete document processing and delays in medical record retrieval, affecting overall service efficiency.

An initial survey conducted by researchers on February 2 2023 at RSI Ibnu Sina Padang using observation techniques found that medical record search activities were still carried out manually or conventionally, where the process included runner officers receiving prescriptions or proof of patient registration from the registration desk and then , the runner/filling officer will immediately look for the medical record file that matches the medical record number listed on the prescription paper or proof of patient registration.

Based on the results of interviews conducted with one of the runner officers, it was found that searching for 1 medical record file takes ± 10 minutes, while the results of interviews conducted with the Head of the Medical Records Room at RSI Ibnu Padang explained that the search time for 1 medical record file is 3 minutes and for The distribution activity itself takes 2 minutes with a total time of 5 minutes, then the problem with searching for medical record files is that the location of the files is erratic or scattered, this makes the search process hampered and the location of the storage space is divided into 3 rooms.

METHODS

Type The research applied is in the form of a development method (Research and Development). The research was conducted at RSI Ibnu Sina Padang from January to July 2023, the data source in this research was taken using Purposive Random Sampling, namely a sampling technique with certain considerations, where in this research the data sources were 5 runner officers. The primary data source was obtained through face-to-face interviews with 5 sources, namely 5 runner officers at the hospital with secondary data obtained through existing data at the hospital, including patient medical record numbers, shelf numbers and shelf rows. Data collection techniques use observation and interview techniques as well as data collection tools in the form of recording devices, notebooks, pens and checklist tables.

Data processing in this research was carried out using the stages of the Research and Development method. There are 10 stages in the Research and Development method, but this research was only carried out up to step 6, namely:

a. Potential and Problems

   The potential and problems contained in this research are that during the search process problems were still found in the form of searches still being carried out manually and requiring a long time in the search process. To search for medical record files, officers need ±10 minutes for 1 medical record file. The problem that occurs during the search is that the location of the file is unknown or scattered.

b. Gathering Information

The information collected in this research was obtained through interviewing officers directly. Interviews were conducted in May-June 2023 at RSI Ibnu Sina Padang.

c. Product Design

The product design is adjusted to the officer's needs at the time the interview is conducted. The initial product design includes patient medical record numbers, shelf numbers and shelf rows.

d. Design Validation

Design validation is carried out to assess whether the product design is appropriate or not in accordance with the officer's request. According to the design filling officer, the design for the medical record search process should include the patient's date of birth.

e. Design Improvements

In the process of improving the design, the officers and researchers held discussions and it was found that the design results were in accordance with the officers' requests and the researchers continued the process of making the product.

f. Product Trial

For the product trial, the results were found in the form of an application for searching medical records for borrowing and returning outpatient medical records. Officers assessed that the product was effective and efficient in the processing process. Product trials include logging in to the application, testing patient data input, search data input, loan data input, return data input, and report generation.

RESULTS

The next step taken after conducting the survey was application visual modeling, this research used Unified Modeling Language (UML), then the researchers created a database using MySQL and a local server using XAMPP to make it easier for users to carry out the editing, design and application development process.

Website-based Outpatient Medical Record Search Application for the process of searching and returning outpatient medical records for medical record officers at RSI Ibnu Sina Padang is described in use case diagrams, activity diagrams and sequence diagrams.

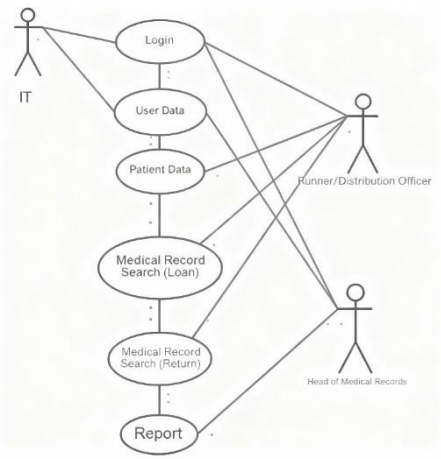


Figure 1. Use Case Diagram

Use Case Diagrams In Figure 1 there are three actors, namely IT, runner and head of clinical information. where each actor must log in first before being able to access the outpatient medical record search software. After logging in, consumers can see a menu according to their individual needs, especially the statistical authority for outpatient medical record searches, then the authority for affected people's records and search reviews. outpatient medical records.

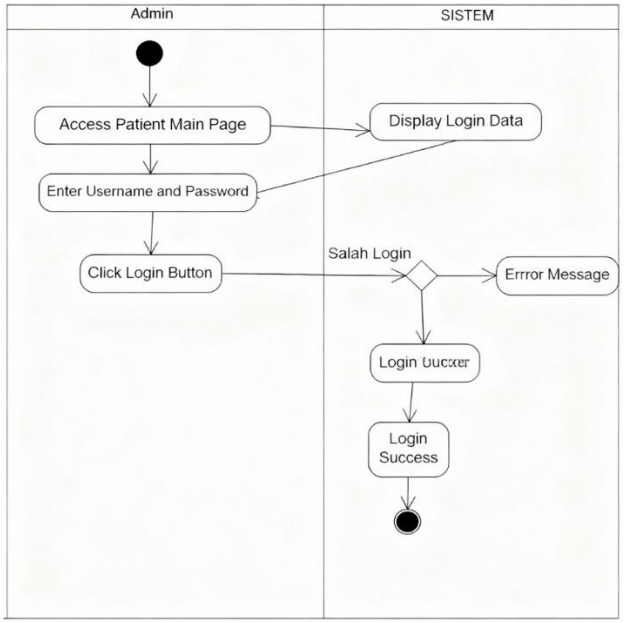


Figure 2. Login Activity Diagram

Activity Diagram loginabove explains the interaction between the admin or officer and the system, starting with entering the main web page of the internet site so that the gadget will display a login page and the admin enters a valid username and password, the device will display a dashboard page, if the username or password entered is incorrect then the device will display an error message.

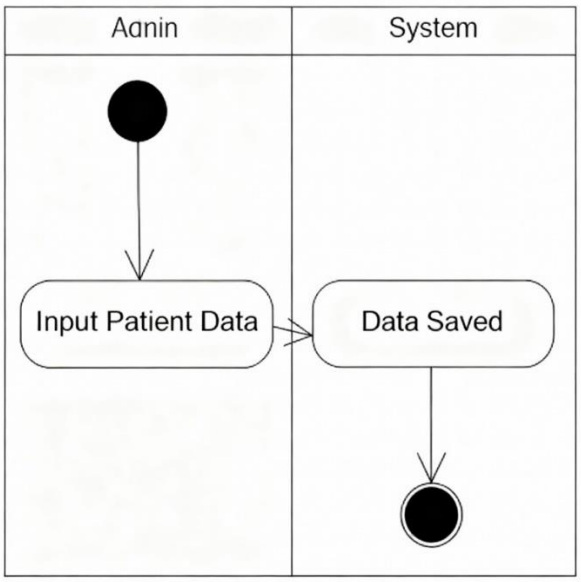


Figure 3. Activity Diagram Input Patient Data

Activity DiagramsThe patient data input above explains the admin's interaction with the system starting with entering patient information according to the patient's social information. Once input, the machine will save the input information.

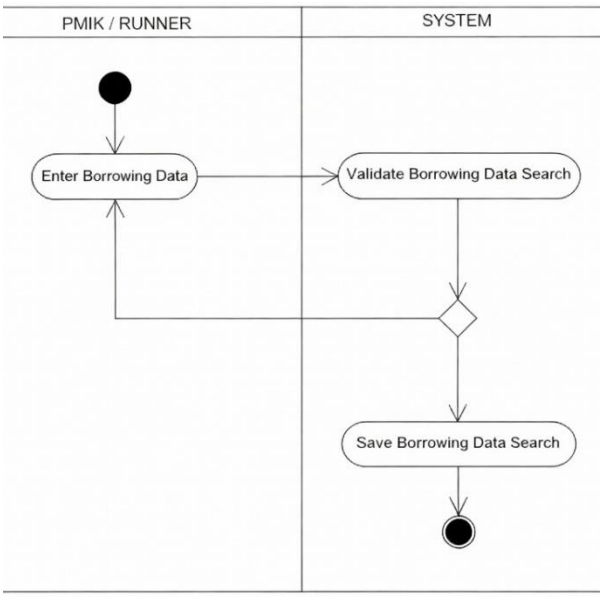


Figure 4 Activity Diagram Input search-borrow data

Activity Diagrams The loan search information input above explains the admin/clerk's interaction with the device which begins by inputting loan statistics, then the machine will validate the loan search statistics, if the information entered is not accurate then the machine will ask the runner to input valid records. If the facts entered are valid, the system will save the loan search data.

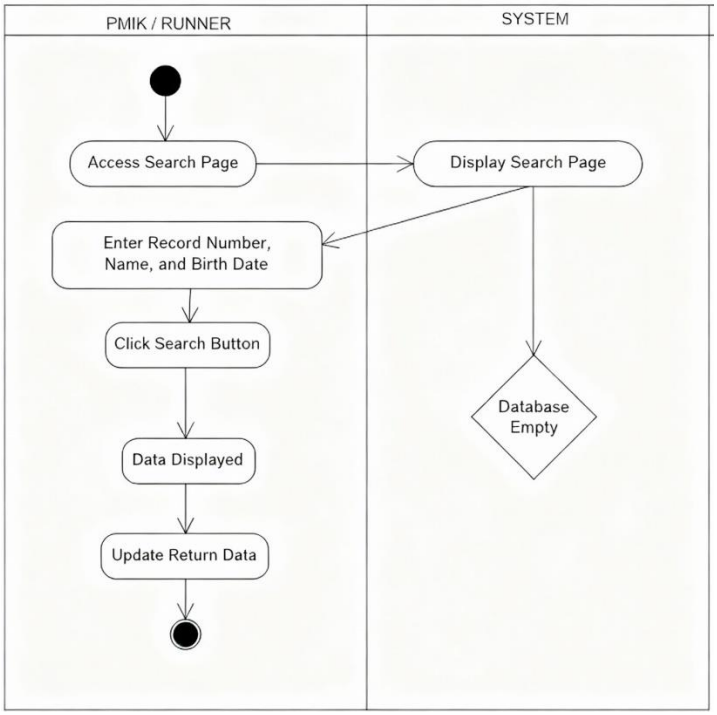


Figure 5. Search-Return Activity Diagram

Activity Diagrams Search-Return above states that the admin/runner relationship with the system begins with the officer accessing the search page, then the system displays the search page, the officer inputs data in the form of the medical record number, name and date of birth of the patient, then the admin clicks the search button, the system will display the data sought. . If the data you are looking for does not appear, the system will display a blank page, which means the database does not exist. If the data appears, the admin is asked to update the return data.

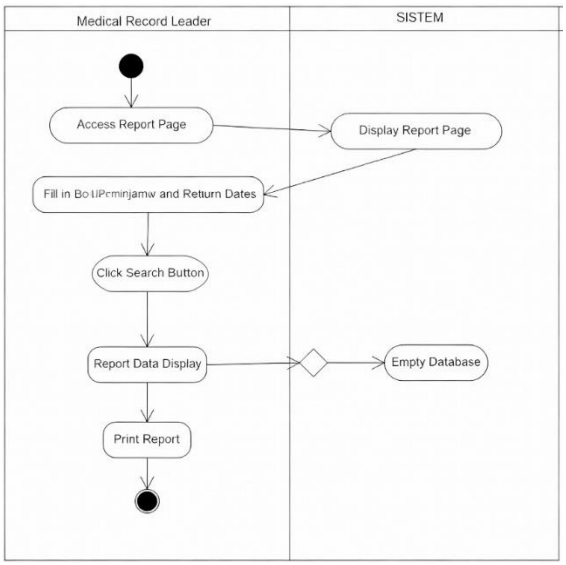


Figure 6. Activity Report Diagram

Activity Diagrams The report above states that the relationship between the admin/head of medical records and the system starts with the admin accessing the report page, then the system will display the report page, the admin inputs data in the form of borrowing and return dates, then the admin clicks the search button. If the search is successful the data will appear, if the search fails then the system will display an empty report which means the database is empty, then the admin prints the report.

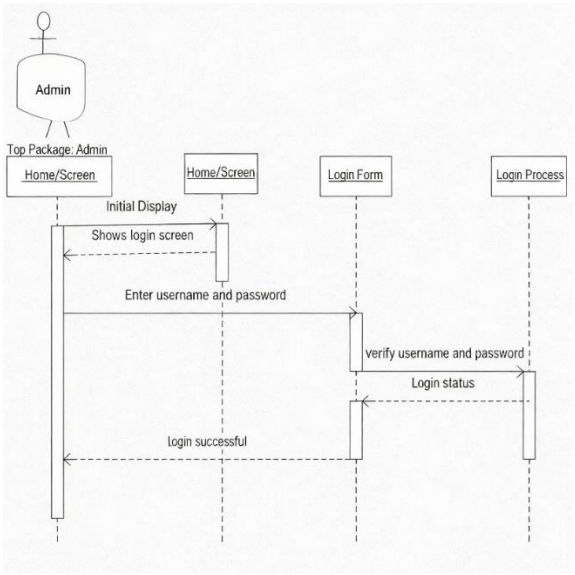


Figure 7. Sequence DiagramsLogin

Login Sequence Diagram The above mentions the process when the admin or officer logs in to the website, where the admin inputs the username and password, the system will process the login by verifying the username and password, the login is successful if the dashboard screen appears.

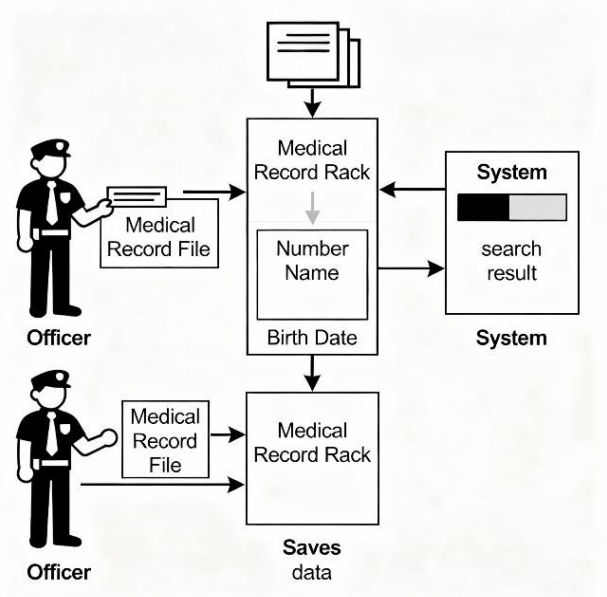


Figure 8. Sequence Diagram of Outpatient Medical Record Search

Sequence Diagrams The search above states that the process when officers search for medical records using a search application begins by filling in the patient's RM number, name and date of birth, the system will display proof of the search for data on borrowing and returning medical records, then the officer saves the data that has been used.

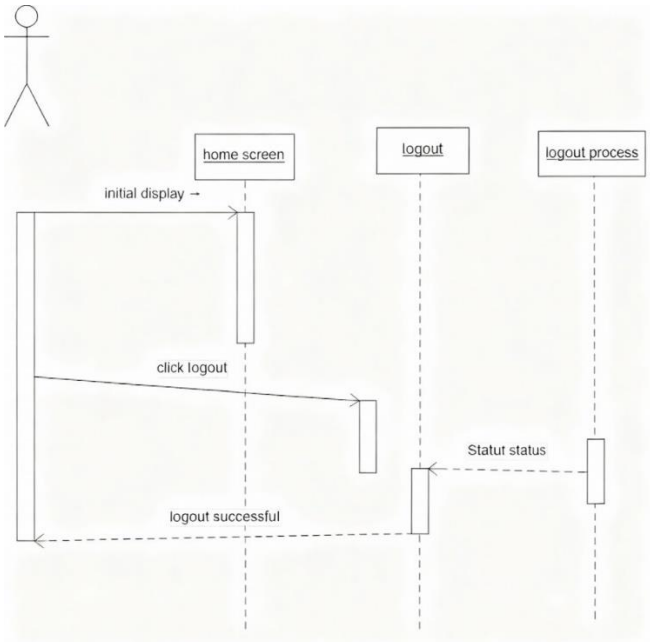


Figure 9. Logout Sequence Diagram

Sequence Diagrams The logout above explains the technicalities when an admin or officer logs out, where the officer accesses the website and the gadget displays the home screen, the officer logs out by clicking the logout button on the home dashboard, if the logout is successful then the device will display a login form.

After creating UML, the application design is carried out, following is the appearance of the application that has been created

1. Login Page

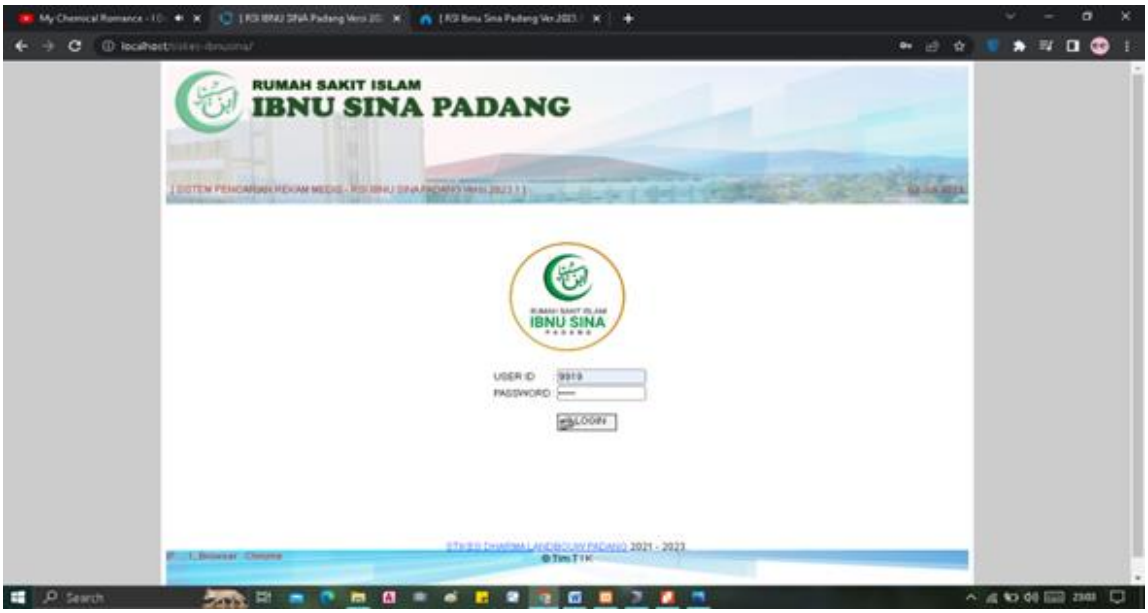


Figure 10. Login page

2. Search Application Dashboard

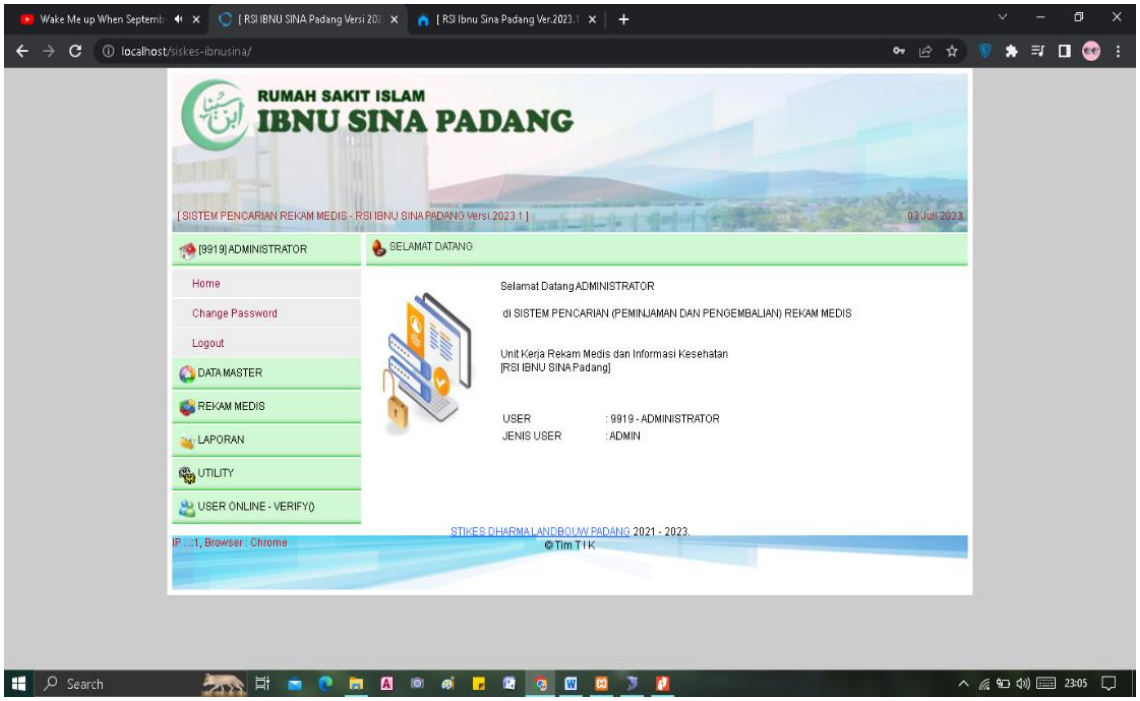


Figure 11. Search Application Dashboard

3. Medical Record Search Data Form

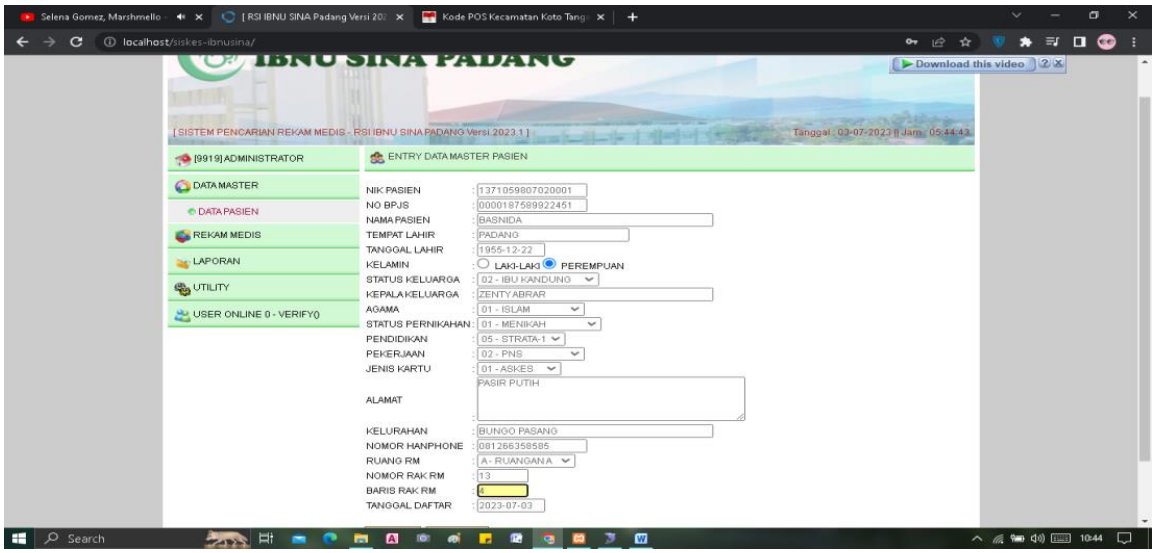


Figure 12. Medical Record Search data form

4. Medical Records Search Data Page

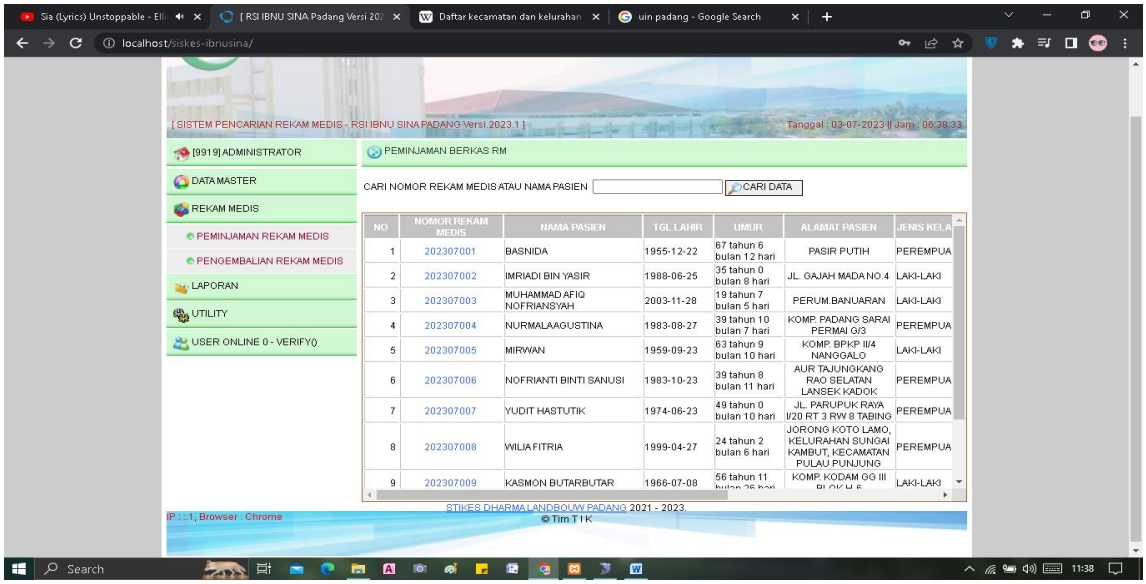


Figure 13. Medical Records Search Data Page

5. Medical Records Borrowing Form Page

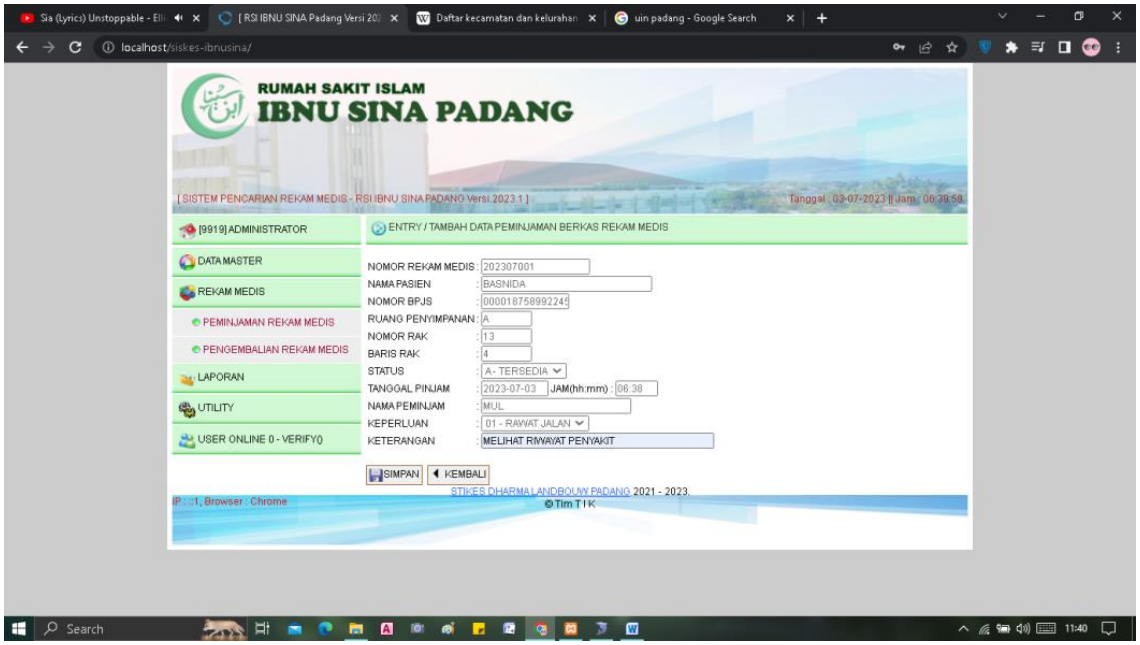


Figure 14. Medical Records Borrowing Form page

6. Medical Record Return Form

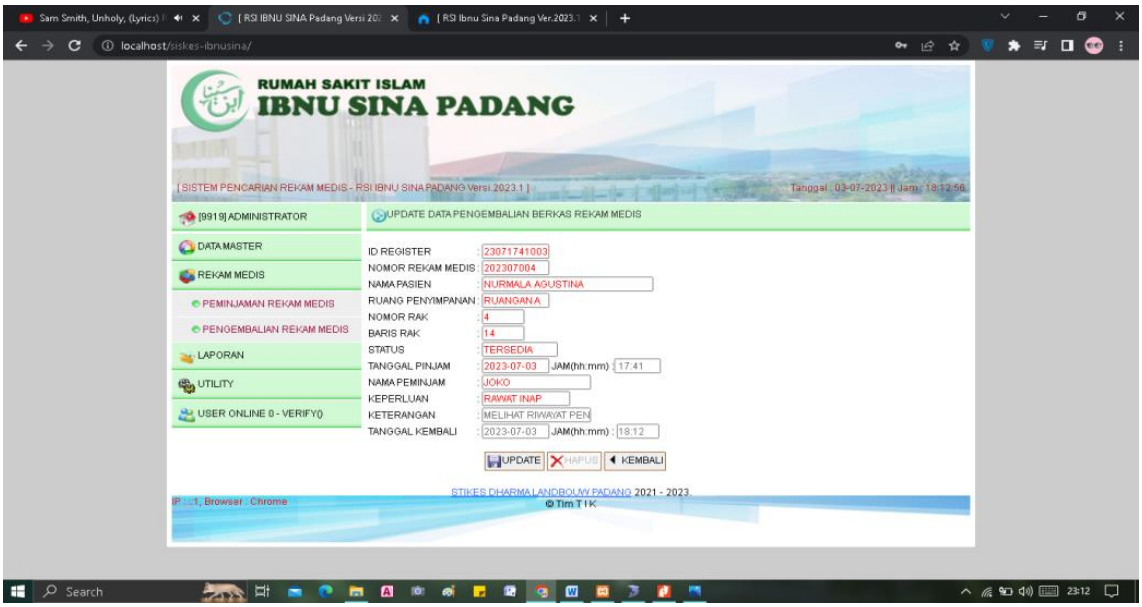
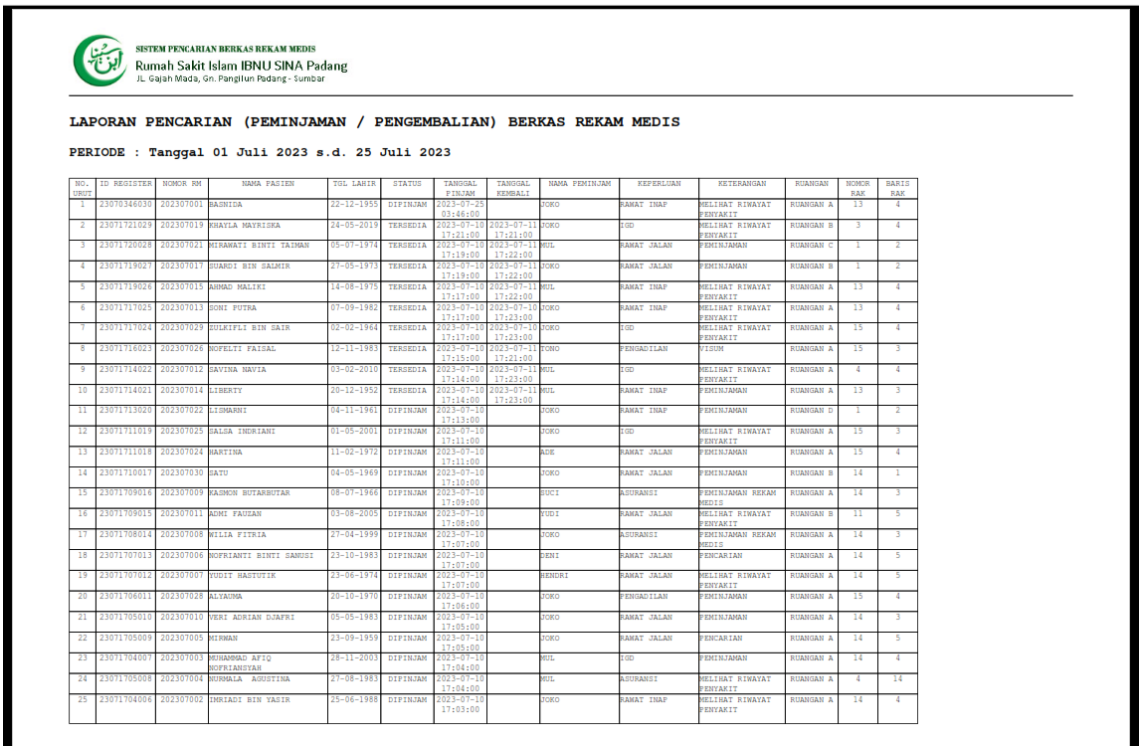


Figure 15. Medical Record Return Form

7. Report Sheet for Borrowing and Returning Medical Records



SISTEM PENCARIAN BERKAS REKAM MEDIS
Rumah Sakit Islam IBNU SINA Padang
JL. Gajah Mada, Gn. Pangilun Padang - Sumbar

LAPORAN PENCARIAN (PEMINJAMAN / PENGEMBALIAN) BERKAS REKAM MEDIS

PERIODE : Tanggal 01 Juli 2023 s.d. 25 Juli 2023

NO. URUT	ID REGISTER	NOMOR RM	NAMA PASIEN	TGL LAHIR	STATUS	TANGGAL PINJAM	TANGGAL KEMBALI	NAMA PEMINJAM	KEPERLUAN	KETERANGAN	RUANGAN	NOMOR RAK	BARIS RAK
1	23070346030	202307001	BASNIDA	22-12-1955	DIPINJAM	2023-07-25 03:46:00		JOKO	RAWAT INAP	MELIHAT RIWAYAT PENYAKIT	RUANGAN A	13	4
2	23071721029	202307019	KHAYLA MAYRISKA	24-05-2019	TERSEDIA	2023-07-10 17:21:00	2023-07-11 17:21:00	JOKO	IGD	MELIHAT RIWAYAT PENYAKIT	RUANGAN B	3	4
3	23071720028	202307021	MIRAWATI BINTI TAIMAN	05-07-1974	TERSEDIA	2023-07-10 17:19:00	2023-07-11 17:22:00	MUL	RAWAT JALAN	PEMINJAMAN	RUANGAN C	1	2
4	23071719027	202307017	BUANDI BIN SALMIR	27-05-1973	TERSEDIA	2023-07-10 17:19:00	2023-07-11 17:22:00	JOKO	RAWAT JALAN	PEMINJAMAN	RUANGAN B	1	2
5	23071719026	202307015	AHMAD MALIKI	14-08-1975	TERSEDIA	2023-07-10 17:17:00	2023-07-11 17:22:00	MUL	RAWAT INAP	MELIHAT RIWAYAT PENYAKIT	RUANGAN A	13	4
6	23071717025	202307013	SONI PUTRA	07-09-1982	TERSEDIA	2023-07-10 17:17:00	2023-07-10 17:23:00	JOKO	RAWAT INAP	MELIHAT RIWAYAT PENYAKIT	RUANGAN A	13	4
7	23071717024	202307029	ZULKIFLI BIN SAIR	02-02-1964	TERSEDIA	2023-07-10 17:17:00	2023-07-10 17:23:00	JOKO	IGD	MELIHAT RIWAYAT PENYAKIT	RUANGAN A	15	4
8	23071716023	202307026	NOFELTI FAISAL	12-11-1983	TERSEDIA	2023-07-10 17:15:00	2023-07-11 17:21:00	TONO	PENGADILAN	VISUM	RUANGAN A	15	3
9	23071714022	202307012	SAVINA NAVIA	03-02-2010	TERSEDIA	2023-07-10 17:14:00	2023-07-11 17:23:00	MUL	IGD	MELIHAT RIWAYAT PENYAKIT	RUANGAN A	4	4
10	23071714021	202307014	LIBERTY	20-12-1952	TERSEDIA	2023-07-10 17:14:00	2023-07-11 17:23:00	MUL	RAWAT INAP	PEMINJAMAN	RUANGAN A	13	3
11	23071713020	202307022	LISMARNI	04-11-1961	DIPINJAM	2023-07-10 17:13:00		JOKO	RAWAT INAP	PEMINJAMAN	RUANGAN B	1	2
12	23071711019	202307025	SALSA INDRIANI	01-05-2001	DIPINJAM	2023-07-10 17:11:00		JOKO	IGD	MELIHAT RIWAYAT PENYAKIT	RUANGAN A	15	3
13	23071711018	202307024	MARTINA	11-02-1972	DIPINJAM	2023-07-10 17:11:00		ADE	RAWAT JALAN	PEMINJAMAN	RUANGAN A	15	4
14	23071710017	202307030	BATU	04-05-1969	DIPINJAM	2023-07-10 17:10:00		JOKO	RAWAT JALAN	PEMINJAMAN	RUANGAN B	14	1
15	23071709016	202307009	KASMON BUTARBUTAR	08-07-1966	DIPINJAM	2023-07-10 17:09:00		SUCI	ASURANSI	PEMINJAMAN REKAM MEDIS	RUANGAN A	14	3
16	23071709015	202307011	ADMI FAUZAN	03-08-2005	DIPINJAM	2023-07-10 17:08:00		YUDI	RAWAT JALAN	MELIHAT RIWAYAT PENYAKIT	RUANGAN B	11	5
17	23071708014	202307008	WILIA FITRIA	27-04-1999	DIPINJAM	2023-07-10 17:07:00		JOKO	ASURANSI	PEMINJAMAN REKAM MEDIS	RUANGAN A	14	3
18	23071707013	202307006	NOFRIANTI BINTI SANUSI	23-10-1983	DIPINJAM	2023-07-10 17:07:00		DENI	RAWAT JALAN	PENCARIAN	RUANGAN A	14	5
19	23071707012	202307007	YUDIT HASTUTIK	23-06-1974	DIPINJAM	2023-07-10 17:07:00		RENDRI	RAWAT JALAN	MELIHAT RIWAYAT PENYAKIT	RUANGAN A	14	5
20	23071706011	202307028	ALYAUMA	20-10-1970	DIPINJAM	2023-07-10 17:06:00		JOKO	PENGADILAN	PEMINJAMAN	RUANGAN A	15	4
21	23071705010	202307010	VERI ADRIAN DJAFRI	05-05-1983	DIPINJAM	2023-07-10 17:05:00		JOKO	RAWAT JALAN	PEMINJAMAN	RUANGAN A	14	3
22	23071705009	202307005	MIRWAN	23-09-1959	DIPINJAM	2023-07-10 17:05:00		JOKO	RAWAT JALAN	PENCARIAN	RUANGAN A	14	5
23	23071704007	202307003	MUHAMMAD AFIQ NOFRIANSYAH	28-11-2003	DIPINJAM	2023-07-10 17:04:00		MUL	IGD	PEMINJAMAN	RUANGAN A	14	4
24	23071705008	202307004	NURMALA AGUSTINA	27-08-1983	DIPINJAM	2023-07-10 17:04:00		MUL	ASURANSI	MELIHAT RIWAYAT PENYAKIT	RUANGAN A	4	14
25	23071704006	202307002	IMRIADI BIN YADIR	25-06-1988	DIPINJAM	2023-07-10 17:03:00		JOKO	RAWAT INAP	MELIHAT RIWAYAT PENYAKIT	RUANGAN A	14	4

Figure 16. Report on Borrowing and Returning Medical Records

Then it can be tested on the system using Black Box testing which can be seen in the following table:

Table 1. Black Box Testing on the System

No	Scenario	System Reaction	Results
1.	Login Enter the user ID Username and Password	1. See whether the data entered is valid or not by checking user data. 2. Enter the Outpatient Medical Record Borrowing and Returning Data Search application	√
2.	Input Patient Data -Enter patient data according to the existing columns -Display data saved successfully	Tests whether the information entered is valid or not, saves data to the database.	√
3.	Loan data input -Enter loan data according to the existing columns	Test whether the information entered is valid or not	√

	-Displays data saved successfully	save mortgage facts to database	
4.	Return data input -Enter return data according to the existing columns -Displays data saved successfully	Check whether the entered data is valid or not Save return data to database	
5.	Searching for Data -Enter keywords in the form of the patient's medical record number, patient's name and patient's date of birth -Clicking on the search data you want to search for	Select the data to search Displays the searched search data Save search data from database	√*
6.	Report -Select the report menu in the application -Enter keywords in the form of the start date and end date of the report. Search for data on borrowing and returning outpatient medical records. -Select the print report menu	Displays the report menu Displays report data according to the keywords entered Print Report	√
7.	Logout Select the logout menu	Logout	

From the table above, it can be seen that the results of each examination starting from the login process, how to enter statistics and update statistics as well as displaying outpatient medical record search reports have gone quite well and are in accordance with the desired wishes.

DISCUSSION

The design of the outpatient medical record search application at RSI Ibnu Sina Padang in 2023 demonstrates that shifting from a manual search system to a web-based information system can significantly improve efficiency and accuracy in medical record retrieval. In the previous condition, runner officers required approximately 10 minutes to search for one medical record file,

mainly due to disorganized storage locations and scattered shelf placements. With the prototype application, officers can now search outpatient medical records using the patient's medical record number, name, and date of birth, which reduces both search time and the risk of misplacement. This finding is in line with previous studies on medical record storage systems, which report that misfiled documents and poor archive organization lead to delays in patient services and increased workload for health workers (Ritonga et al., 2019; Sari & Nugroho, 2021; Wibowo et al., 2020; Arini et al., 2022; Oetari et al., 2022).

The application design, developed using the Research and Development (R&D) method with a prototype approach, follows a structured development process that includes problem identification, information gathering, product design, validation, refinement, and product testing. The resulting system interface is simple and user-friendly, with clear navigation for login, patient data input, search, borrowing, return, and report generation. The use of Unified Modeling Language (UML) diagrams such as use case, activity, and sequence diagrams—helps visualize the interaction between officers (runner, IT, and head of clinical information) and the system, ensuring that functional requirements are clearly defined and systematically met. This approach is consistent with the prototype method, which is recommended when stakeholders cannot fully articulate system requirements at the beginning of development (Kurniati, 2017; Yurindra, 2017).

The Black Box testing results indicate that all main functions of the application perform as expected: login authentication, input of patient data, loan data, return data, search, and report generation operate correctly and in accordance with the intended workflow. Reports can be generated based on borrowing and return dates, which supports documentation and monitoring activities in the medical records installation. These findings show that the application not only simplifies the search process but also supports the creation of an organized electronic record of outpatient medical record borrowing and returning activities. Similar benefits have been observed in studies that implement web-based information systems for document management and internship registration, where structured design and iterative validation lead to reliable and usable systems (Zulfallah & Hidayatuloh, 2021; Iqromi Nugraha, 2020).

Compared to the previous manual system, the web-based outpatient medical record search application at RSI Ibnu Sina Padang offers several advantages: (1) reduced search time, (2) integrated digital storage of borrowing and return data, and (3) improved clarity of storage locations and status of each medical record. However, some limitations remain, including the current scope being limited to outpatient files and the use of a local server (XAMPP), which may restrict remote access and scalability. Future developments could expand the system to inpatient records, integrate it with hospital information systems (HIS), and migrate it to a centralized server or cloud-based environment to enhance accessibility and data security. In addition, further research could evaluate the long-term impact of the application on service quality, patient waiting time, and officer workload in a wider context of health facilities in Indonesia.

In conclusion, the design of the outpatient medical record search application at RSI Ibnu Sina Padang in 2023 is feasible, efficient, and aligned with hospital operational needs. The system supports the principles of effective medical record management as outlined in the Indonesian

Minister of Health Regulation No. 24 of 2022 and provides a practical foundation for digital transformation in small- to medium-sized Islamic hospitals. It is recommended that this application design be implemented and continuously evaluated, and that similar systems be developed and adapted in other healthcare institutions facing comparable challenges in medical record retrieval and storage management.

CONCLUSIONS

The process of identifying the input and output components in the system process flow, which was obtained through electronic searches, has proven to save time and improve service processes. The design of the medical record search application has been effective and efficient, as it allows officers to search for outpatient medical records more easily, eliminating the need to search through various storage locations and significantly reducing search time. Component testing and evaluation showed that the application's displays and menus were well-designed, intuitive, and easy to understand. The outpatient medical record search process is now faster compared to the manual method, thanks to the application's components, which have been proven to streamline the officer's tasks and enhance efficiency.

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