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Electronic Outpatient Registration Information System Using Fingerprints at Hospital X

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Abstract : The aim of this research is to determine the electronic-based outpatient registration information system that uses fingerprints at Hospital Data collection in this research was through observation and interviews with officers and staff in the patient registration section, namely the Head of the Medical Records Unit and the Medical Records Officer. The data analysis techniques in this research were carried out by means of data reduction, data presentation, and drawing conclusions. The results of this research show that this research has succeeded in identifying the advantages and disadvantages of using the fingerprint system in hospitals, including its security in preventing identity fraud and speeding up the patient identification process, even though it faces technical obstacles such as unsuccessful finger scanning due to certain physical conditions. Suggested solutions include the use of more sophisticated fingerprint technology, better integration with the BPJS system, and the implementation of alternative technologies such as facial scanning. The conclusion of this research is that the fingerprint-based information system has worked well and can overcome inaccuracies in searching patient data and offers many benefits including increased security, efficiency and patient satisfaction. However, it is important to consider the challenges and considerations before implementing a fingerprint system in a hospital.

IndexTerms **- Information System, Outpatient Registration, Fingerprint**

I. INTRODUCTION

Efforts to improve medical quality, especially BPJS outpatient services, are based on public awareness and demands. Where, the outpatient visit flow implemented by hospitals must follow BPJS Kesehatan regulations. (Chotimah, 2022)

The bridging system application implemented by BPJS is quite good so that every hospital is required to integrate it with the system. However, the hospital is constrained by the development of the "Hospital Information System for Hospital Services" for BPJS patients which is an obligation to minimize patient waiting time during doctor's examination. (Febrianti & Henny Maria Ulfa, 2022)

The current system is not new in the health world because it must be adjusted or "Integrate the Hospital Management Information System (SIMRS)" with better performance or insight is needed when implementing it. In addition, a report is needed to form the basis of an agile, innovative, efficient, and effective organization as a reference for assessment. (Rijali & Nadiya, 2021).

Medical records are written evidence given to patients by doctors or nurses as a form of medical responsibility to support orderly administration in efforts to improve health services (Salsabila et al., 2021)

The Outpatient Registration Place (TPPRJ) is a unit that functions to handle patient admissions, both outpatient and inpatient, at the hospital. Services at TPPRJ patients are first processed at the ticket counter by the Outpatient Medical Records section. Where, patient waiting time is an assessment of the quality of health services which will later result in patient satisfaction or can be said to determine the initial image of the hospital as seen from the Medical Records in the Outpatient Registration. Therefore, this position is very potential that patients will think badly if their illness does not recover, the queue is long, and the officers are not friendly even though they are professional (Putra, 2022)

The implementation of SIMRS can help management to improve services and win business in addition to resolving existing service issues. This system is implemented with information technology integrated with manual procedures with the aim of obtaining timely and effective information related to decision making by management. (Molly & Itaar, 2021)

SIMRS is characterized by information and services offered, supporting patient administration in a proper, correct, relevant, updated manner, customized format and easily accessible to people who are on site or not. Where, in the process, available service data will be collected, stored, processed, and documented in order to obtain patient data, performance, quality, and treatment costs. If this system is implemented, it can be said that the hospital is able to provide high quality between its units. The purpose of implementing SIMRS is the exchange of electronic data between health service providers (practicing doctors, primary facilities and hospitals), so that the information presented is aligned or comprehensive and efficient in its services. The information system is interpreted as a provider of information specifically to support the policy or decision-making process at every level of the organization. (Kristanti & Ain, 2021)

The health information system that has been stipulated in PP RI No. 46 of 2014 states "The Health Information System is a set of arrangements that include data, information, indicators, procedures, devices, technology and human resources that are useful in health development, which are connected and managed holistically". Procedures related to outpatient services include electronic reporting in hospitals, clinical examinations, and outpatient registration. (Anggela Wulan et al., 2022)

Fingerprints are mandatory for every BPJS patient during registration, one of which is at Hospital X which has implemented fingerprint recording on BPJS patients in all Outpatient polyclinic services. Before implementing the fingerprint system, Hospital X also encountered obstacles related to outpatient registration due to patients who did not understand the registration flow and the completeness of the requirements that must be brought. Then when the fingerprint system was implemented, there were obstacles such as when registering only guardians who registered or elderly patients who usually had fingerprint lines that were less readable by the fingerprint device (Basuki, 2019)

The problem of registration that takes a long time has an impact on creating long queues. This condition is due to obstacles in fingerprints that are difficult to perform fingerprints so that fingerprints always fail. Based on the existing problems, the solution that can be provided is to use a fingerprint-based system with the aim of facilitating and accelerating services for outpatients. In addition, this method can aim to increase data accuracy which will later avoid errors in patient identification (Hutauruk & Gurning, 2019)

Based on these problems, the researcher took the title "Electronic Outpatient Registration Information System Using Fingerprints at Hospital X". Where, this system will also be applied to officers to log in using fingerprints in order to maintain security and confidentiality in the hospital. In addition, an automatic poly queue number system will be implemented for patients so that the service can be fair and sequential.

II. RESEARCH METHODOLOGY

The "Electronic Outpatient Registration Information System Using Fingerprints at Hospital X" is the research object, and the researcher utilized a qualitative descriptive approach to examine and describe it. The author then gathered information by watching and speaking with police and employees working in the patient registration area.

The author conducted a direct review of the problems with the research object, namely "Electronic Outpatient Registration Using Fingerprint Technology Through BPJS Vclaim". In addition, the author conducted interviews with a direct question and answer method related to the research.

The interviews that were carried out were aimed at the Head of the Medical Records Unit and Medical Records officers with the aim of seeing the BPJS Kesehatan outpatient admission process after using the BPJS vclaim. In addition, the system implemented aims to improve the process flow of BPJS Kesehatan outpatient facilities for outpatient registration.

Both observations and interviews were used in this study. To ascertain the true waiting time for each hospital service, two parts are conducted: the first is an interview about patient flow, and the second is an interview about difficulties that arise during registration and during patient fingerprint sample.

The author provides a series of questions, and the interviews that are conducted include a list of questions for specific sources (patients) in accordance with the criteria. In certain cases, the guidelines employed in the current study were modified by the interviews.

III. RESULTS AND DISCUSSION

Fingerprint-based information system to improve outpatient registration through the chart in the following image:

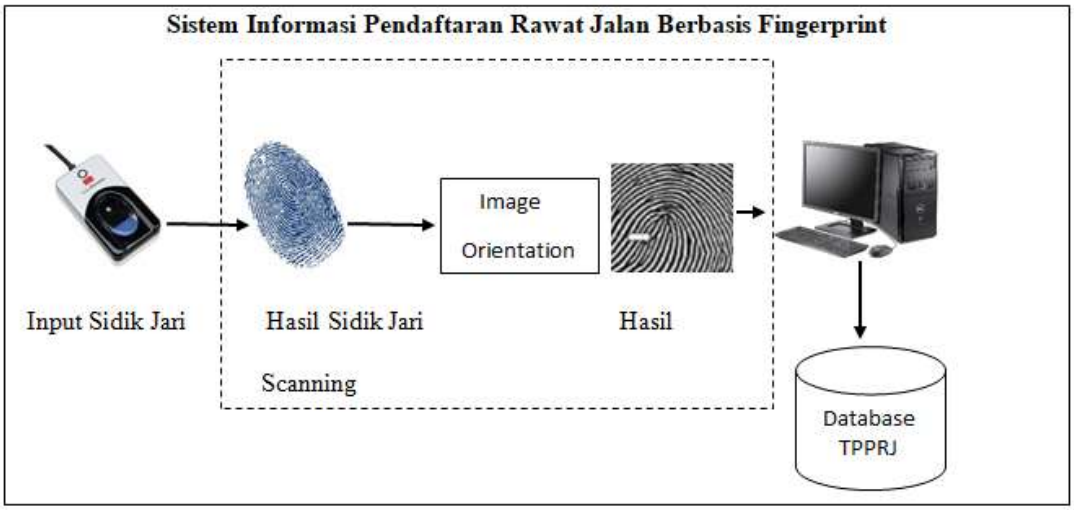


Figure 1. Picture

According to the mentioned earlier design system, patients must place their finger on the fingerprint machine in order to be registered at the registration counter. Whether the patient is new or old, the system will later show the matched results. Where the presence of an elderly patient is indicated if the matching matches, and vice versa.

The flowchart below shows the process used in connection with the fingerprint-based outpatient registration system:

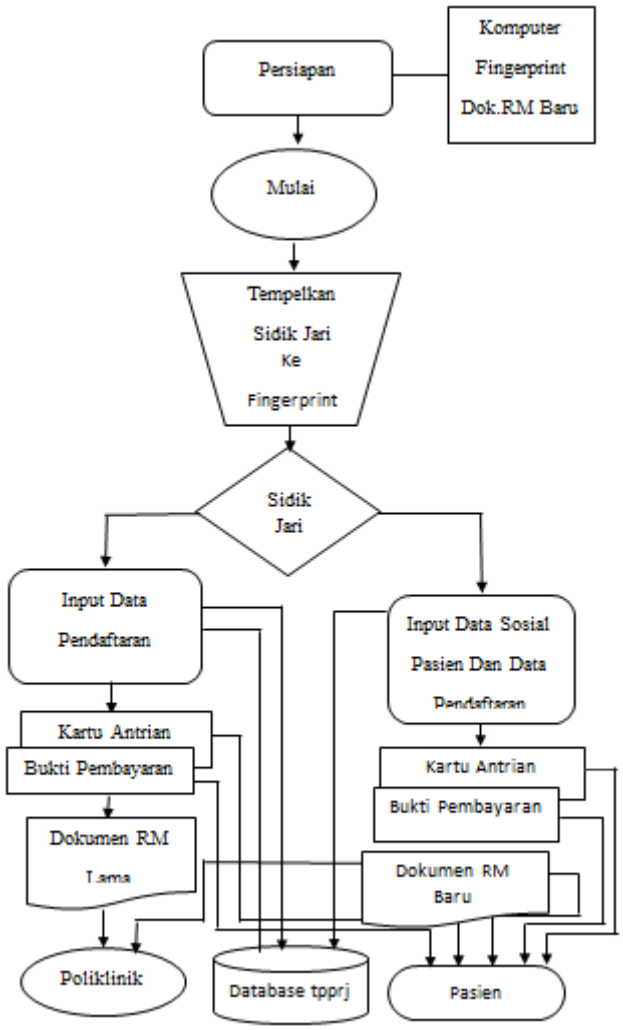


Figure 2. System Flowcart

Preparation and Identification Stage:

1. Preparation : The process begins with preparing the computer and fingerprint scanner.
2. Begin : Officer or Patient starts the registration process
3. Attach fingerprint : Patients are asked to place their finger on the fingerprint scanner.
4. fingerprint : The system will scan and record the patient's fingerprints.

Data Input and Document Creation

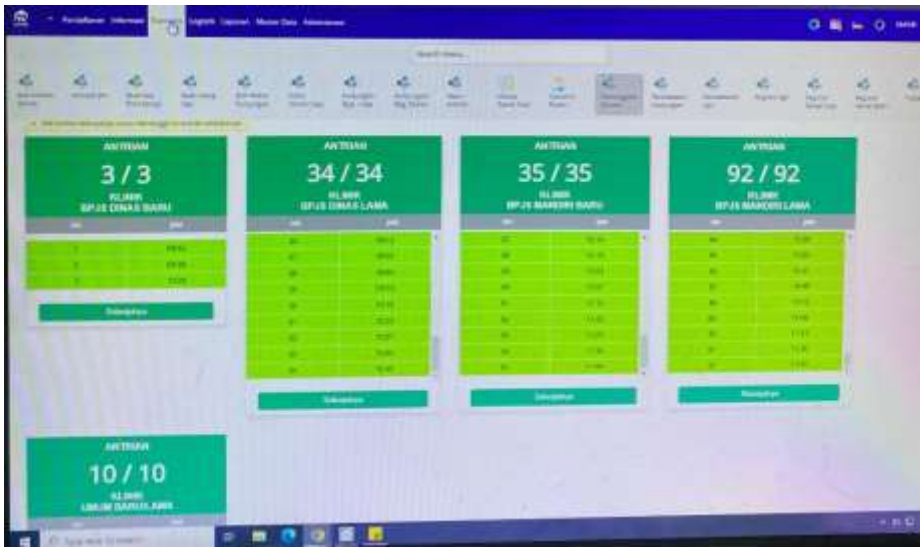
1. Input Registration Data : The patient's personal data, such as name, date of birth, address, and other information, is entered into the system.
2. Input Social Data : Patient social data, such as employment, phone number, and insurance information, is also included.
3. Queue card and proof of payment : The system will print a queue card and proof for the patient.
4. Old RM documents : If the patient has previously received treatment, the old medical record documents will be retrieved.
5. New RM documents : The system will create a new medical record document for the patient.

Penyimpanan Data dan Pengarahan

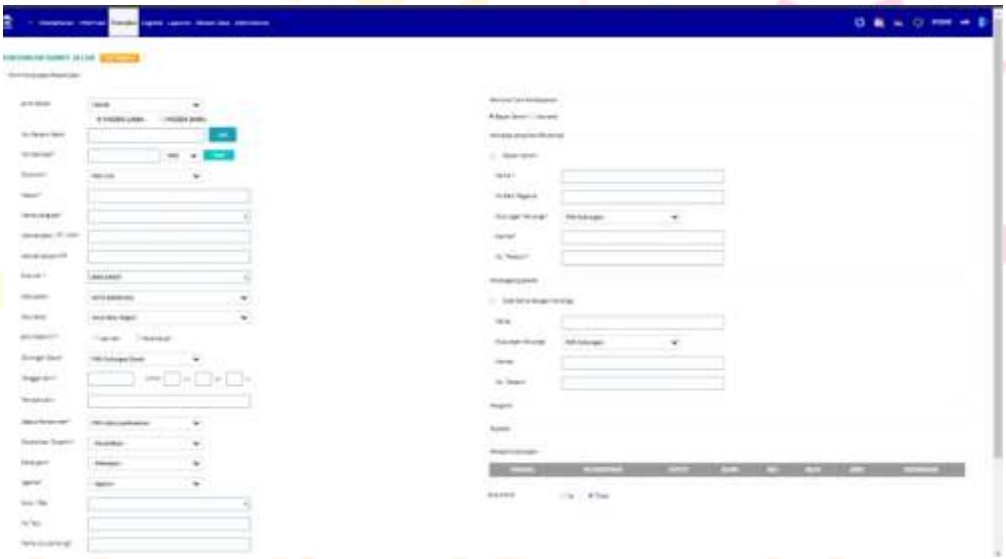
1. TPPRJ Database: All patient data, including fingerprints, will be stored in a centralized database.
2. Polyclinic: After the registration process is complete, patients will be directed to the appropriate polyclinic.

Sistem Informasi Pendaftaran Rawat Jalan

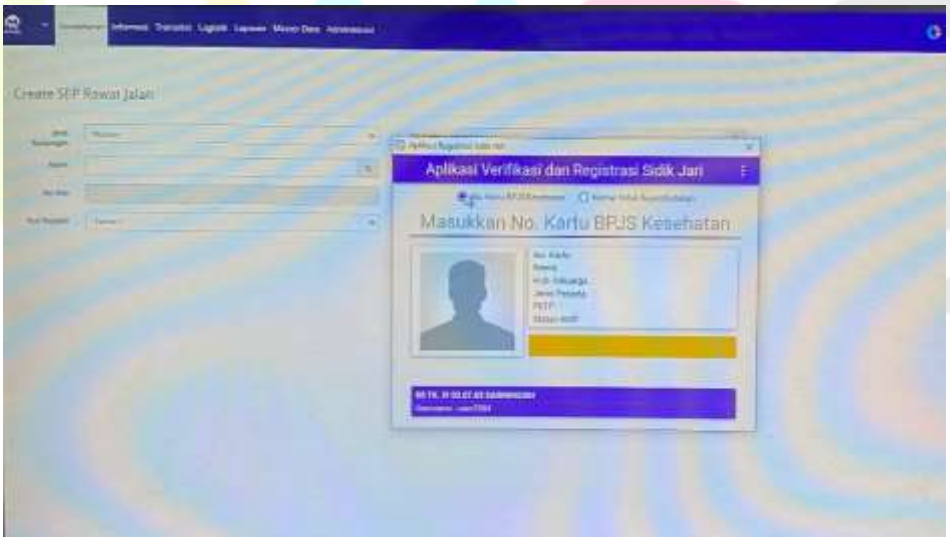
The "login" display or user enter page is the first outcome of the information system design on the web. Those that successfully enter their login and password will then be able to access the dashboard page right away. This is the screen that is displayed:



The screen that appears after you log in is seen above. Use the Morbis application to call the queue after logging in by heading to transactions and choosing the queue call menu.

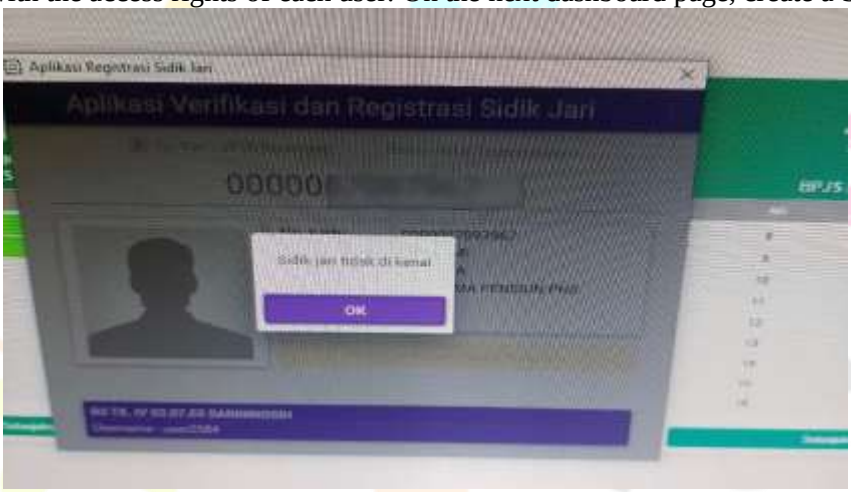


The patient will be requested for an identity card, KTP, and BPJS after the queue is called. The data of the patient will be entered by the medical records officer.



The patient and family will be expeditiously validated and transferred directly to the assigned polyclinic upon registration. Enter the BPJS card number and connect your thumb to the hospital-provided fingerprint to finish the fingerprint scan.

After successfully performing Fingerprint, the user will be directed to the Vclaim page. The Vclaim that will appear is in accordance with the access rights of each user. On the next dashboard page, create a SEP.



The image above illustrates an obstacle to undetected fingerprints due to dirty, oily, and dry finger conditions that make the fingerprint surface uneven and difficult for the sensor to read. Wet fingers can block the sensor and render fingerprints unreadable, making fingerprints difficult to recognize. Other issues that frequently arise include failing to take fingerprints and placing the fingers incorrectly in relation to fingerprint obstacles. Hospital X enforces the requirement that fingerprints be taken at every polyclinic, with the exception of children's polyclinics, where fingerprints are difficult to take.

Hospital X will re-register via vclaim, check the fingerprint, submit fingerprint problems, and retake fingerprints if the fingerprint is not identified. A snapshot of the undiscovered fingerprint results will be given to the BPJS team for re-verification.

Hospital X's fingerprint restrictions may make it more difficult to supply patients with hospital services in the future. For speedier service, Hospital X will use face ID in place of the fingerprint approach. Every polyclinic, including ENT, surgery, internal medicine, eyes, medical rehabilitation, mental health, obgyn, nerves, lungs, and oral surgery, will do a face ID scan to confirm the identify of the patient.

Benefits of Hospital Fingerprint Technology

1. Every person's fingerprints are extremely difficult to forge, guaranteeing that the patient's identity is preserved.
2. Fingerprint scanning is a rapid and simple method of patient identification.
3. Patient medical data can be more safely stored and shielded from unwanted access by employing fingerprints as an access key.
4. The use of fingerprints has the potential to reduce identity fraud, particularly when it comes to insurance claims and improper use of patient data.

The drawbacks of using fingerprints in medical facilities

1. Certain physical ailments, such burns, certain skin illnesses, or advanced age, might deteriorate a fingerprint's quality and make it harder to scan.
2. It is expensive to purchase fingerprint scanner equipment and integrate it with hospital information systems.
3. It is necessary to take into account the data's security and privacy concerns. If the system is not adequately controlled, there is a possibility for data misuse.

4. The process of identifying patients may be hindered if there is an issue with the fingerprint scanner or information system.

The advantages of fingerprinting patients in hospitals
The following are a few of the principal advantages:

1. The use of fingerprints as an access key aids in preventing unauthorized parties from misusing medical data.
2. The integration of fingerprint data with electronic medical records facilitates the retrieval of patient health history.
3. Since fingerprints are hard to forge, they can stop identity theft, which frequently happens in insurance claims or when medical services are misused.
4. Quicker treatment and registration procedures can shorten patient wait times. All things considered

Solutions for Using Fingerprints in Hospitals:
The following are some ideas that may be taken into consideration to get around fingerprint restrictions that arise in hospitals:

1. Make use of a more advanced and precise fingerprint reader, particularly for damp or damaged patient fingertip detection.
2. Use alternate or complementary identity verification technologies, such as PINs or facial scans, in addition to fingerprints.
3. To prevent data inconsistencies and processing delays, make sure the fingerprint system is properly integrated with the hospital's internal system, the BPJS system, and both.

By putting the aforementioned suggestions into practice, hospital fingerprint policies can be less restrictive, patient care for BPJS Kesehatan patients can be enhanced, and the fingerprint system can be regularly assessed and updated.
Ideas for Hospital Fingerprint Utilization:

1. As a preventative precaution against kidnapping, institute a fingerprint system for infants.
2. Use a fingerprint system to restrict access to critical locations including the operating room, intensive care unit, and medication storage.
3. Use a fingerprint system to keep an eye on who has access to expensive items like medical equipment.
4. Record staff entry and departure timings, as well as the beginning and ending of shifts, using fingerprints.
5. To prevent misidentification, select a fingerprint device with a high degree of accuracy.
6. Verify the ease of use of the fingerprint system.

IV. CONCLUSION

Fingerprint-based information systems have been performing well enough to correct errors in patient data searches and provide numerous advantages like better security, more effectiveness, and happier patients. Nevertheless, before putting a fingerprint system in place in a hospital, it's crucial to take the difficulties and factors into account.

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