

Design of Information System for Outpatient Emergency Room Eligibility Letter to Support BPJS Claim Reporting

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Article Information

Article history:

No. 717

Rec. April 27, 2023

Rev. August 9, 2023

Acc. September 16, 2023

Pub. September 24, 2023

Page. 139 – 155

Keywords:

- Outpatient
- Emergency Room
- Eligibility Letter
- BPJS
- Claim Reporting

ABSTRACT

Technological advances in this era have a significant impact in various fields, including the health sector. A good hospital can be seen from the services provided to its patients. In the hospital, there are still several problems in the processing of making patient eligibility letters (SEP), namely making patient eligibility letters still using claims that have not been bridged with sims, causing the process of making patient eligibility letters to take a long time, thus affecting the quality of health services in the hospital emergency department. So it is necessary to design a system for making patient eligibility letters in the Emergency Installation unit. The method used in this study is a qualitative method with a descriptive approach by conducting data collection stages through interviews, observations, and literature studies, and the method used for device development is the System Development Life Cycle (SDLC) method. The result of this design is a system for making patient eligibility letters in emergency installations that can facilitate health workers in making SEPs.

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1. INTRODUCTION

In 2011 the world entered the era of Industry 4.0 where technology is born and developed rapidly. Computers, the internet, software, and the like have begun to be used and various kinds of advanced technologies were born and continue to grow. On January 21, 2019, the world entered the era of Society 5.0, this era is the development of the industrial revolution 4.0. What is Society 5.0? Citing the BINUS University Online Learning website, Society 5.0 is a concept that allows mankind to use modern technology-based science such as AI and robots to meet the needs and facilitate human life [1].

Information technology is a general term for the various types of technology available with the aim of helping humans to live life more easily and better by creating, converting, storing, communicating, and disseminating information [2]. Technological advances in the current era greatly affect various fields, including the health sector. The health sector is very important for human life, therefore the health sector must follow the flow of changing times, entering the 5.0 era has a considerable influence on technological and information advances in the health sector, especially for hospitals as health service providers, where the service system must continue to be improved so that the quality of quality is maintained, A public hospital is an institution that provides health services to the public professionally for all types of diseases by doctors, nurses, and other medical personnel. The hospital strives to provide the best service to its patients so that patients can get the best solution for the disease suffered. A good hospital can be seen from the services provided to its patients [3]. Based on the Decree of the Minister of Health of the Republic of Indonesia No.983 / Menkes / SK / XL / 1992 states that public hospitals are hospitals that provide basic, specialist, and subspecialty health services. A hospital is a sophisticated, expensive, and expert-intensive healthcare facility. This complexity 2 results from the fact that hospital services encompass a wide range of service, education, and research roles, as well as different degrees and types of disciplines, enabling hospitals to carry out professional tasks in the fields of medical technology and health administration. A measure that guarantees quality improvement at all levels must be in place for the hospital to maintain and improve its quality [4].

According to the Republic of Indonesian Minister of Health's Regulation No. 47 of 2018 about emergency services, emergency services are medical interventions required by patients in a time-sensitive manner in order to save lives and avoid disabilities. Instalasi Gawat Darurat (IGD) has seen an increase in the number of visitors each year. The increase in the number of new arrivals can prevent a variety of problems from occurring, whether they are affecting individuals or the Rumah Sakit and professional kesehatan organizations [5]. For this reason, emergency room services must be considered accurate and in detail to provide good service. Quality, accuracy, speed, and accuracy are needed in emergency room services.

Quick treatment is needed when a person experiences an emergency. This condition is also one of the conditions that will be borne by BPJS Health. However, it's a good idea to understand in advance what criteria fall into the emergency department. Emergency Criteria. First, it is life-threatening, endangering oneself or others. Second, there are disorders of the airway, breathing, or circulation. Third, there is a decrease in consciousness. Fourth, the presence of hemodynamic disorders. Fifth, requires immediate action When someone experiences the above conditions, emergency treatment must be given immediately.

BPJS Kesehatan is a public legal body created in accordance with Law Number 24 of 2011 about Social Security Organizing Bodies to organize health insurance programs.

According to Law Number 40 of 2004 concerning the National Social Security System, health insurance is a guarantee that is organized on a national level based on the principles of social insurance and equity, to ensure that all Indonesians receive health care benefits and protection in order to meet basic health needs. In order to realize the national social security system in the health sector, BPJS Kesehatan's presence is crucial [6].

SEP (Participant Eligibility Letter) is a new product from BPJS Kesehatan. The launch of this SEP is to expand coverage and make it easier for BPJS participants to obtain health services. The health services in question are advanced health services, such as hospitals for example. [7]BPJS Kesehatan launched independent participant eligibility (SEP) to make it easier for participants to obtain health services, Participant Eligibility Letter (SEP) Contains information about SEP Number, SEP Date, Card number, Participant name, Date of birth, Gender, Poly purpose, Type of treatment, Patient / Family signature, Signature of the patient / Family of the patient and Signature of BPJS Health officers. Participant Eligibility Letter (SEP) is obtained when the patient registers at the outpatient registration department[8].

There are already many hospitals that use electronic systems in all their service systems but there are still few hospitals that use it plenary system, let alone make updates that can be very useful for supporting services at the hospital.

In a previous study conducted by Raina & Samodra in their journal entitled "Quality of BPJS services in hospitals" elaborated that some provisions such as the use of drugs that must be adjusted to INA-CBGs are still considered burdensome. Likewise, the slow issuance time of SEP (patient eligibility letter) and also late payment of claims [9].

In another study conducted by Alya Hazfiarini, Ernawaty in her journal entitled "BPJS Health Patient Satisfaction Index On East Java Community Eye Hospital Services" explained that one of the indicators in assessing community satisfaction is the speed of service. The speed of service is based on the standard time in completing the service that has been determined by the service delivery facility [10].

Based on the two studies above, there is the same problem, namely the speed of health service time for the community. In the first study, it was stated that the slow issuance time of SEP was considered burdensome for patient satisfaction, while in the next study it was mentioned that the standard of service time was one of the indicators in assessing patient satisfaction.

Based on the description of the problem above, it is concluded that the design of the SEP making system by Bridging is very necessary to facilitate the process of making SEP to support the speed and accuracy of health services in hospitals and facilitate the process of reporting BPJS claims.

The results of observations in hospitals, especially emergency service units, were found to have used stem emergency room registration using Simrs or have been computerized, while to make the SEP itself still have to log-in vclaim first, thus affecting the time services in the emergency installation, therefore the emergency installation department requires the design of a new system where the making of SEP is combined with the

registration system so that officers do not need to log in to VClaim every time they will make SEP with the bridging method.

The design of this system aims to improve the quality of service and streamline the time of claiming BPJS in the emergency room unit, thus creating patient satisfaction with the emergency room unit services in the hospital. Officers will also find it helpful the design of this system because it simplifies and streamlines work time.

2. RESEARCH METHOD

A qualitative research methodology was applied in this study. The definition of qualitative research by Koentjaraningrat (1983) is research in the humanities and humanities with activities based on scientific disciplines to gather, classify, analyze, and interpret facts and relationships between natural facts, society, behavior, and spiritual man in order to find new principles of knowledge and methods to achieve these goals [11]. This qualitative method is more detailed and in-depth, considering that this research focuses on quality. The data collection process is flexible according to the circumstances in the field [12].

This research uses a descriptive approach by conducting data collection stages through interviews, observations, and literature studies, and for the method used for device development, namely the System Development Life Cycle (SDLC) method. The following collection techniques are carried out:

Data collection techniques in this study are interviews, observations, and literature studies. Interviews were conducted directly with officers to be asked for explanations to find out the system run at the hospital. Observation is a case study observation carried out to find the information needed to then be used as the object of the research study [13]. This observation is carried out by directly observing the process of receiving patients and making SEP in hospitals, thus producing data that becomes research material for designing software systems. And the literature study is carried out through the analysis of several articles and websites related to this research to be used as material for research development.

System Development Life Cycle (SDLC) is a general method used to develop an information system. SDLC consists of several stages, starting from the planning stage, analysis stage, design stage, implementation stage, testing and integration stage, and system maintenance stage (maintenance) [14]. As in Figure 1.

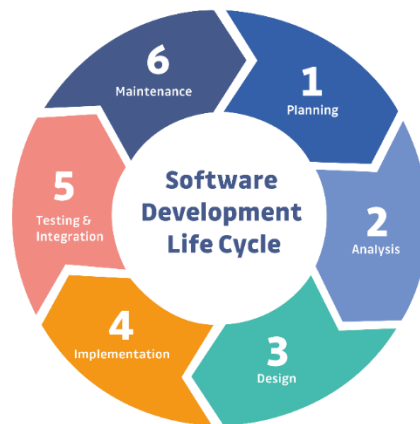


Figure 1. SLDC Method

- 1) The planning stage is the first step in realizing that a system has to be constructed. At this point, the writers create a system that addresses the current issue. Designing the elements that will be incorporated into the system comes first in the planning process [15]. At this stage Qa will review which documents or data data are included in making the program. The picture at this stage is that when covering emergency room patient data, you can immediately make sep in the simrs application no need to open vclaim, because both are automatically connected to each other.
- 2) The system analysis stage is the stage where the running system is studied and a new system is proposed, so the content of this stage is to determine the details related to what will be done by the proposed system [16]. At this stage, an analysis of the sep making program and bridging analysis will be carried out as needed.
- 3) Design In order to comprehend the overall picture of what is being done at this point, the development team will build and model the system architecture, focusing on developing data structures, software architecture, interface displays, and program algorithms [17]. At this stage, it is to make a program design as expected where on the emergency room patient input page there is a menu for sep which will be directly connected.
- 4) Stage implementation entails carrying out experiments and putting the preceding stages' designs into practice. The following actions are taken during implementation: Application development based on system design and database construction in accordance with the design plan. testing and debugging of applications [18]. At this stage, system design has begun to be formed and then coordinated whether it is in accordance with the applicable provisions in the hospital.
- 5) Testing
At this stage, the program that has been completed will be checked, trying to cover emergency room patient data and making sep directly on the hospital sim application, whether the data is correct or there are still shortcomings.

6) Maintenance

After this sep making program has been completed and runs according to the desired provisions, qa still has to stand by to do testing again if one day this sep making program experiences problems.

This SDLC stage will involve software Quality Assurance (QA) to test the system which will assess whether the software can work according to the expected functionality. [19].

The last stage of SDLC is the maintenance process or software maintenance. At this stage, perform periodic system maintenance and update so that software performance can be optimal [20].

3. RESULTS AND DISCUSSION

3.1 Planning

Making outpatient SEP in the ER still uses Simrs and Vclaim separately, the design that will be made is by system bringing the Simrs application and vclaim where officers only need to log in to the Simrs application. The officer will cover patient data that has been filled in by the patient through the emergency room registration form to the Simrs application, if the indication that the patient is eligible to use BPJS, the officer immediately makes a Patient Eligibility Letter (SEP), prints the SEP, then gives it to the case-mix team for the claim and reporting process.

3.2 Analysis

Pada tahap ini dilakukan analisis pengabungan antara Simrs dengan Vclaim dimana simrs ini akan memuat data yang akan diambil pada Vclaim, yaitu : no sep, no bpjs yang akan terkoneksi langsung datanya pada aplikasi simrs

3.3 Design

The system that will run in this research consists of a Flowmap design, Cortex Diagram, Data Flow Diagram (DFD), Level 0, Entity Relationship Diagram (ERD), and Database Specifications.

Figure 2 shows, the flow map of the system to be run, Flowmap itself is a combination of a map with a flowchart, which shows the movement of objects from one area to another, for example, such as the number of individuals moved, the number of goods exchanged, or the number of packets in the network [21]. This study explains the flow map system that will run from the time the patient arrives, then fills out the available forms, then the officer will put patient data, make SEP and print SEP, and finally will be submitted to the Hospital Case-mix team for the claim process and BPJS reporting.

Next is the Cortex Diagram. Cortex Diagram is a level part of a Data Flow Diagram (DFD) used to establish context and constraints on a system that exists in a system modeling design [22]. Figure 3 is a Cortex Diagram in this study.

A data Flow Diagram or DFD is a technique to create a system framework that is oriented to data flow that moves in another system design [23]. And Figure 4 is DFD Level 0 on the system that will run on this study.

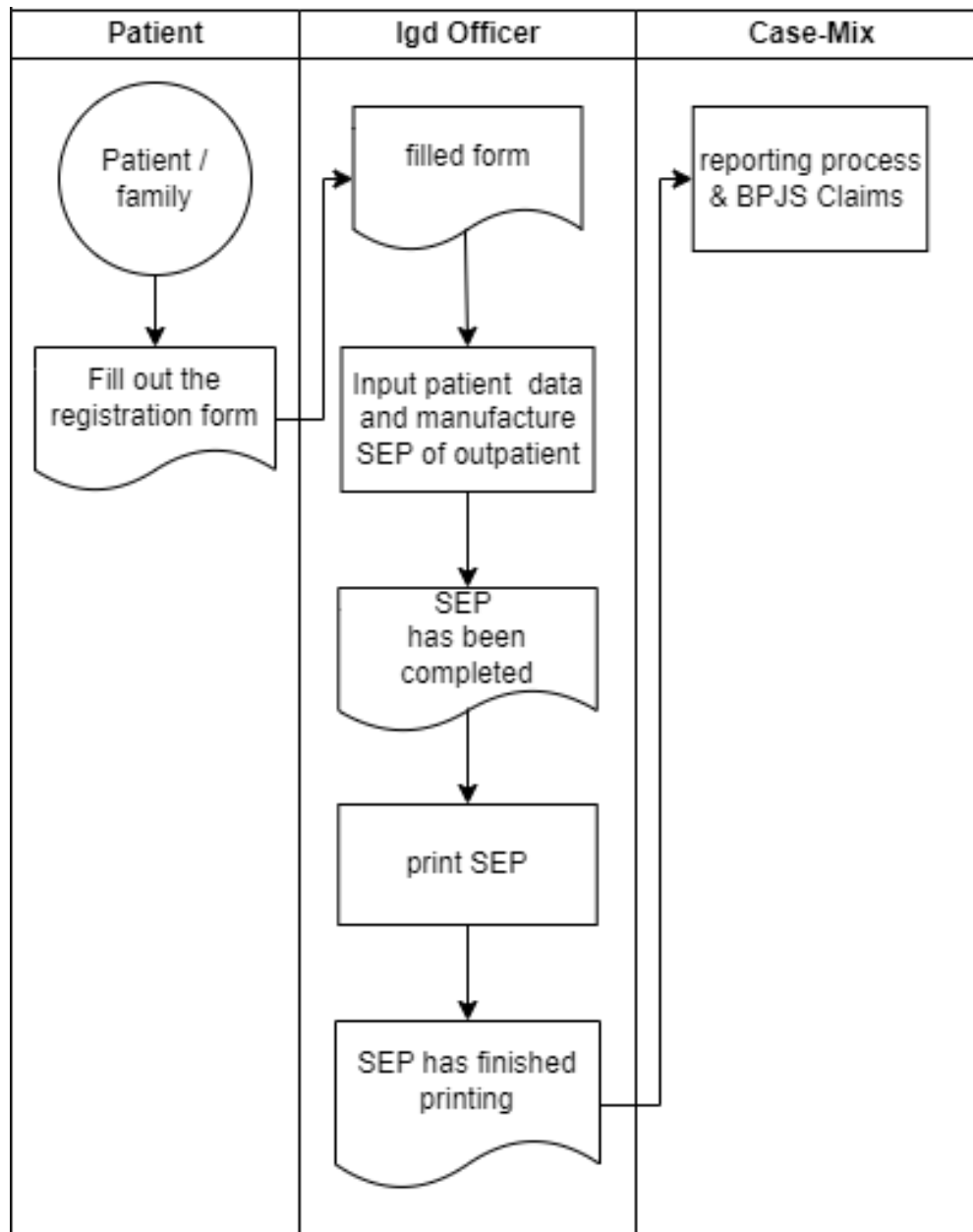


Figure 2. System Flowmap to Run

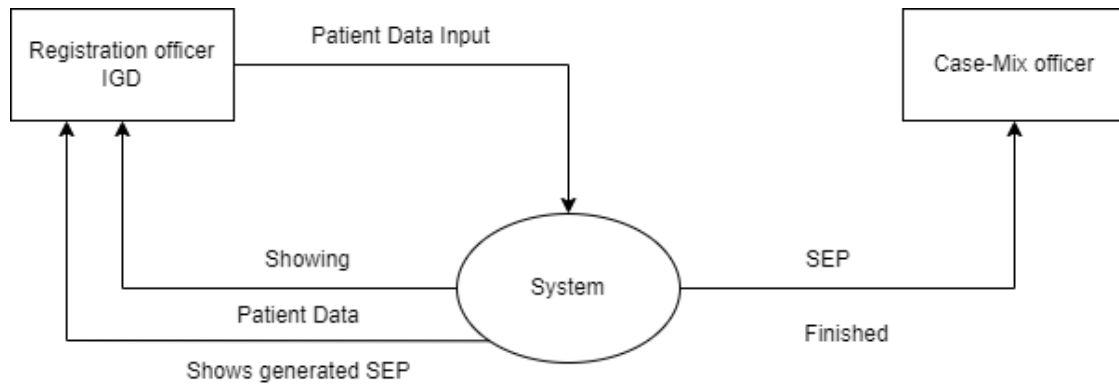


Figure 3. Cortical Diagram of the System to Run

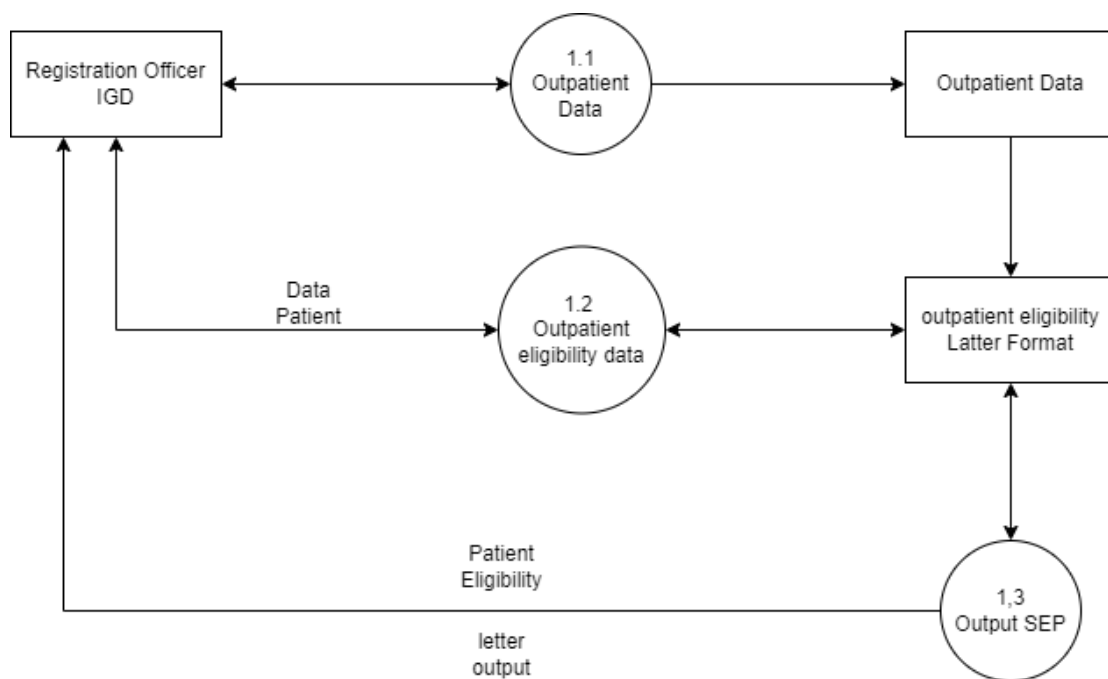


Figure 4. Data Flow Diagram (DFD) Level 0 System to be Running

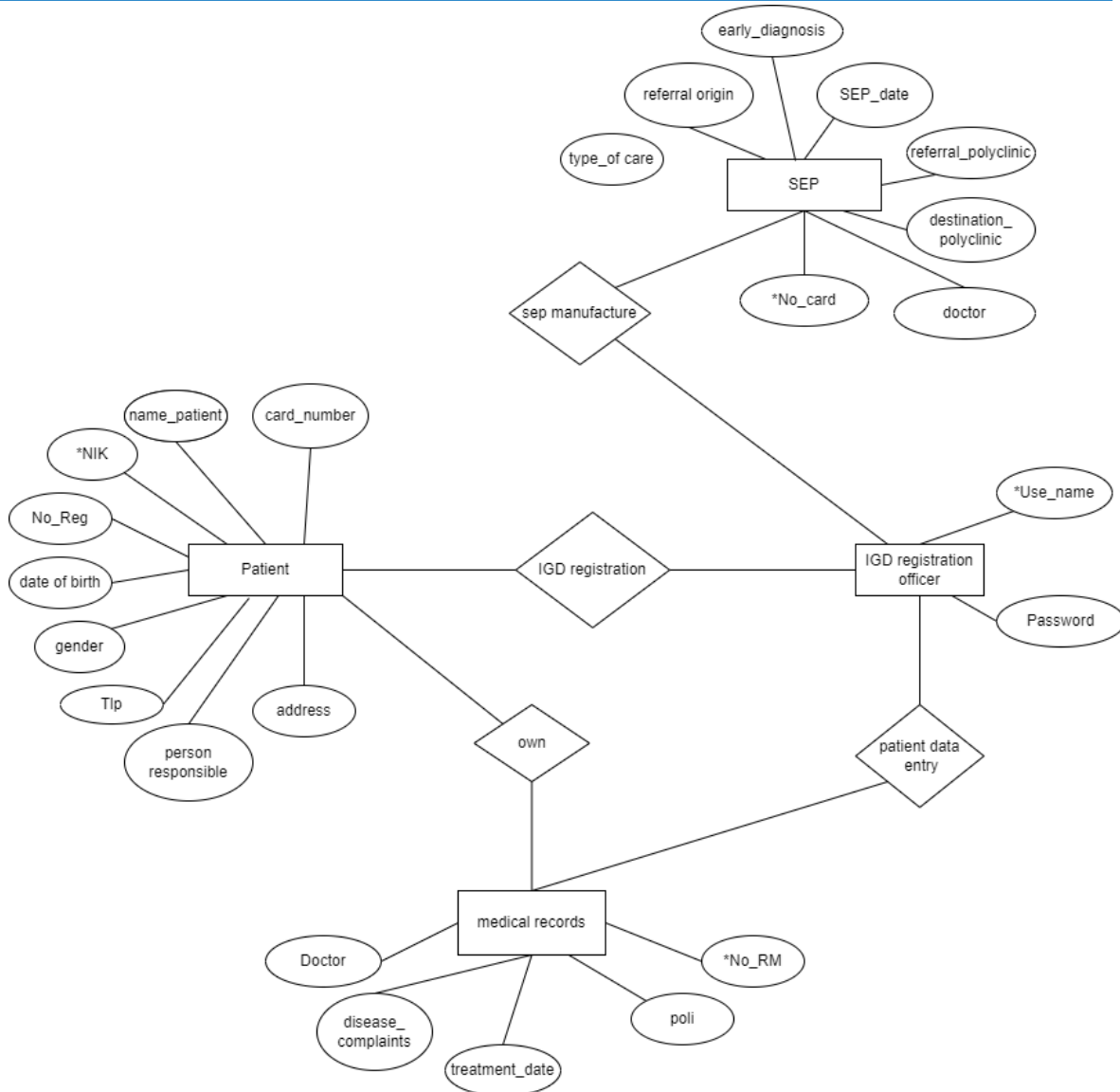


Figure 5. Entity Relationship Diagram (ERD) of the System to Run

ERD describes the relationship between entities that have attributes in an integrated system. Database design requires an Entity Relationship Diagram (ERD) to describe the entities (actors) that play a role in a database and the relationships between actors that play a role.[2]

And Figure 5 is the ERD system that will run in this study. Next is the Database Specification (Database) stage, Database is a collection of interrelated data. Data itself is a fact about objects, people, and others. According to Sutarman, Database is a collection of interconnected and organized files or a collection of records that store data and relationships between them. The database used in the creation of this system is using

Microsoft Access. Here are the database specifications on the system that will run, consisting of 4 tables used in creating databases for this system, namely: User Table, P asien Table, Registration Table, and SEP Table.

Table 1. Spesifikasi Database Table User

Field	Type	Length	Information
Username	Short Text	30	Officer username
Password	Short Text	30	Officer password

Tabel User; is a database table that will function to store data on users of the system. Table 1 Table name: tb_user, Contents: User data, Primary key: Kd_user.

Table 2. Patient Table Database Specification

Field	Type	Length	Information
Nik	Auto Number	16	Nik
No_reg	Auto Number	4	No registration
Name_Patient	Short Text	30	Patient name
Date_ofbirth	Date / Time	25	Date of birth
gender	Short Text	13	Gander
Card_Number	Auto Number	7	BPJS Number
Address	Short Text	30	Address
Tlp	Auto Number	12	Phone number
Person_responsible	Short Tex	10	Person responsible

Patient Table; is a table for patients that serves to store data on patients who seek treatment in the emergency room. Table 2 Table name: tb_pasien, Contents: Patient identity, Primary Key: Nik

Table 3. Medical Record Table Database Specification

Field	Type	Length	Information
No_RM	Short Text	10	Medical record number
Poli	Short Text	30	Patient name
Treatment_Date	Short Text	30	Diagnosis
Doctor	Short Text	30	Name of doctor
Disease_complain	Short Text	30	Disease complain

Medical Record Table; is a table that serves to store data on patient medical record numbers, along with patient medical information. Table 4 Table name: rekam_medis, Contents: Medical information, Primary Key: No_RM.

Table 4. Sep Table Database Specification

Field	Type	Length	Information
No_Card	Short Text	30	BPJS number
Sep_Date	Date / Time	15	Date sep
Doctor	Short Text	30	Dokter
Destination_polyclinic	Short Text	30	Polyclinic desnation
Referral_polyclinic	Short Text	20	Polyclinic Referral
Early_Diagnosis	Short Text	20	Diagnosis
Referral_Origin	Short Text	15	Referral Origin
Type_of_care	Short Text	20	Type of care

SEP table; is a table for making patient eligibility letters. This table serves to store BPJS patient data. Table 5 Table name: tb_sep, Contents: Patient legitimacy letter data, Primary Key: No_Card

3.4 System Implementation

Design of a system program created by using a Microsoft Visual Studio 2012 application using the Microsoft Access database.

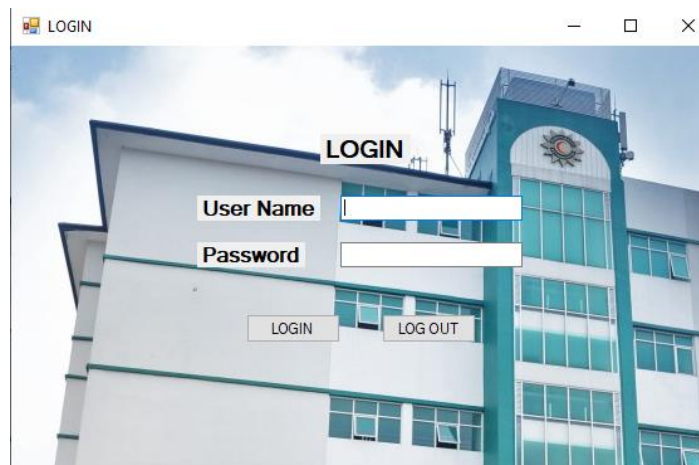


Figure 6. the login page

Figure 6 is the login page, which serves officers who will use the application by entering the username and password on the system.



Figure 7. Main Menu Page Containing

Figure 7 is the main menu page containing the user page, log out, patient page, and SEP creation page.

A screenshot of a web application window titled "REGISTRASI IGD". The window contains a registration form for emergency room patients. The form is titled "Pendaftaran pasien" and includes the following fields: "No_Reg" (text input), "Tanggal Berobat" (date picker set to 8/8/2023), "Nama Pasien" (text input), "No RM" (text input with a "CARI" button), "NIK" (text input), "Tanggal Lahir" (date picker set to 8/8/2023), "Jenis Kelamin" (text input), "Alamat" (text input), "Poli" (dropdown menu), "No Kartu" (text input), "No Telepon" (text input), "Penanggung Jawab" (text input), and "Dokter" (text input). At the bottom of the form, there are four buttons: "SIMPAN", "HAPUS", "BATAL", and "TUTUP".

Figure 8. page for emergency room patient registration

Figure 8 is a page for emergency room patient registration, with a function to enter patient data for treatment in the emergency room.

Pembuatan SEP

PEMBUATAN SURAT ELEGIBILITAS PESERTA RAWAT JALAN

Nama Pasien No_Rm Cari

Tgl. Rujukan 4/12/2023 Peserta

Tgl. SEP 4/12/2023 Asal Rujukan

No. Kartu Kelas

Tgl. Lahir 4/12/2023 PPK Pelayanan

Jenis Kelamin Jns Pelayanan

No. Telepon Dokter DPJP

Poli Tujuan

PPK Rujukan

Diagnosa Awal

SIMPAN BATAL HAPUS CETAK

Figure 9. Page For Making SEP

Figure 9 is a page for making SEP which serves to fill in BPJS patient data by officers at the hospital.

Cetaksep

BPJS Kesehatan Badan Penyelenggara Jaminan Sosial

SURAT ELEGIBILITAS PESERTA RUMAH SAKIT MUHAMMADIYAH BANDUNG

No. SEP	: 1001R001012V012396	Peserta	: PEKERJA MANDIRI
Tgl. SEP	: 2023 -02-15	COB	: -
No. Kartu	: 0002323886882 (MR. 856266)	Jns. Rawat	: R. JALAN
Nama Peserta	: YANTI HARTINI	Kls. Rawat	: -
Tgl. Lahir	: 1998-12-05 Kelamin : Perempuan	Penjamin	:
No. Telepon	: 083127809754	Dokter	: YULIA., dr. Sp. M. Mkes
Sub/Spesialis	: INSTALASI GAWAT DARURAT		
Faskes Perujuk	: RSMB		
Diagnosa Awal	: J45.1 - Nonallergic asthma		
Catatan	: -		

* Saya menyetujui BPJS Kesehatan menggunakan informasi medis pasien jika diperlukan SEP bukan sebagai bukti penjamin peserta

Pasien / Keluarga Pasien

Cetakan Ke 1 5-02-2023

Figure 10. SEP page which is the output

Figure 10 is the SEP page which is the output of the program that has been created. This image is the result of creating SEP from an application that has been created.

3.5 Testing

Login page test results

No	Test Scenarios	Test	Expected results	Test results
1	Filling in User Officer name and password, click the "Login" button	Username : (Fill) Password: (Fill)	The system will process login access then directly to the main page	As expected
2	Close the application by clicking the "Logout" menu	Username : Password:	The system will process to close the application	As expected

Main page test results

No	Test Scenarios	Test	Expected results	Test results
1	Open the IGD registration menu on the main page	Click the menu "IGD registration"	The system will process access to the IGD registration page	As expected
2	Open the SEP creation menu	Click the menu "SEP"	The system will process access to SEP page	As expected

Test results of patient registration page

No	Test Scenarios	Test	Expected results	Test results
1	Impersonate patient data	Nik (fill) No_reg (fill) Name_Patient (fill) Date_ofbirth (fill) Gender (fill) Card_Number (fill) Address Phone (fill) Person Responsible (fill)	The system will save all data into a medical record	As expected

Test results of SEP manufacturing page

No	Test Scenarios	Test	Expected results	Test results
1	Fill in all data	No_Card (fill) Sep_Date (fill) Doctor (fill) Destination (fill) Polyclinic (fill) Referral_polyclinic (fill) Early Diagnosis (fill in) Referral Origin (fill) Type_of care	The system will save SEP data in the appropriate format because it has been automatically connected to the BPJS Vclaim	As expected
2	Print SEP	Find the sep data to print	The system will automatically print SEP	As Expected

4. CONCLUSION

Based on the results of research that has been carried out, it is concluded that hospitals must optimize services to patients. the process of making a Patient Eligibility Letter (SEP) is still carried out with two applications at once which hampers service time to patients and affects the BPJS claim process so that data processing is less effective causing claims to be hampered. For this reason, it is necessary to design an outpatient emergency room patient eligibility letter system designed using Microsoft Visual Studio 2010 and to create a database using Microsoft Access 2010 is expected to assist officers in managing effective and efficient management for patients, as well as supporting optimal data claims and improving quality in BPJS claims. This designed information system can already be used by officers both for input and making SEPs.

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