



Design of an Insurance Patient Visit Information System Using The V-Model Method

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Abstract

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The objective of this study is to use object-oriented programming to develop an insurance patient visit information system. A qualitative research strategy with a descriptive focus was adopted in this study. A qualitative research strategy with a descriptive focus was adopted in this study. Both observation and a literature review are employed as the data-gathering techniques. Software modeling is done using the Unified Modeling Language and the v-model software development process. The issues identified are as follows: reporting insurance patients is only sometimes ideal, and Delays frequently occur when insurance patient final reports are submitted. The creation of more effective information systems and the use of information technology to create accounts to make them simpler and ensure that the final report of insurance patient visits is not delayed are suggestions made.

Keywords: Design, Information system, Insurance patient visit, Object-Oriented

Abstrak

Tujuan dari penelitian ini adalah untuk menggunakan pemrograman berorientasi objek untuk mengembangkan sistem informasi kunjungan pasien asuransi. Strategi penelitian kualitatif dengan fokus deskriptif diadopsi dalam penelitian ini. Strategi penelitian kualitatif dengan fokus deskriptif diadopsi dalam penelitian ini. Pengamatan dan tinjauan literatur digunakan sebagai teknik pengumpulan data. Pemodelan perangkat lunak dilakukan dengan menggunakan Unified Modeling Language dan proses pengembangan perangkat lunak v-model. Permasalahan yang teridentifikasi adalah sebagai berikut: pelaporan pasien asuransi tidak selalu ideal, Keterlambatan sering terjadi saat penyerahan laporan akhir pasien asuransi. Pembuatan sistem informasi yang lebih efektif dan penggunaan teknologi informasi untuk membuat laporan agar lebih sederhana dan memastikan laporan akhir kunjungan pasien asuransi tidak tertunda merupakan saran yang dapat dilakukan.

Kata-kata kunci: Desain, Sistem informasi, Pasien asuransi, Object-Oriented



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1. Introduction

The world of health today cannot be separated from computer and data technology. Medical and patient information processing was made manually using handwriting, but it is now more automated with a data system. The aim is that the work process of doctors and medical service personnel be faster and more accurate in obtaining patient medical information. Only a few hospitals already have a medical record data system, but there are still hospitals that still need a system, either in all units or in one of them. Hospitals, as institutions engaged in health services, must always provide satisfaction to every patient who needs service. Therefore, hospitals must continually improve the quality of their work and services.

Improvements in the services provided by the hospital, one of which is from the medical record service. Medical records are part of the hospital which is also essential in its role in the health service. Medical records are written evidence of a patient who has received treatment, service or treatment in a hospital.

A medical record contains records and documents regarding patient identity, examination, treatment, actions and other services provided to patients [1]. In addition, medical records are also used to protect the legal interests of patients, hospitals and other health workers. Medical records also provide information for the study, research and decision-making. It must be by the applicable procedures [2].

Health Care accepts patients with BPJS referrals from Puskesmas, hospitals or other health services. Not a few patients come using the BPJS facilities. With a large number of patients every day, data collection on BPJS patients also takes a long time and the correct accuracy so that the data entered is corrected and inputted correctly.

BPJS participants consist of PBI participants (Recipients of Contribution Assistance), namely for participants who have no income or source of livelihood, and non-PBI participants or Non-Contribution Assistance Recipients, namely participants who have income or wage recipients [3]. BPJS Kesehatan membership is divided into two categories: BPJS participants who are recipients of contribution assistance (PBI) and BPJS non-recipients of contribution assistance, commonly referred to as BPJS Non-PBI. What distinguishes the two, and what are the facilities offered in the non-PBI program? It is referred to as BPJS PBI membership because the participants receive contribution assistance from the government, whose monthly contributions are also paid by the government. Whereas what is meant by Non-Contribution Assistance Beneficiary

participants are BPJS participants whose monthly contributions are paid by the participants themselves. Below is a table of differences between Non-PBI and PBI.

Table 1. Differences between Non-PBI and PBI [4]

Non-PBI	PBI
Non-PBI participants are entitled to class 1, class 2 and class 3 BPJS facilities.	BPJS PBI participants are only entitled to class 3 BPJS.
Non-PBI BPJS participants can choose health facilities that have been determined and have collaborated with BPJS according to their domicile.	Non-PBI BPJS participants can choose health facilities that have been determined and have collaborated with BPJS according to their domicile.
The Non-PBI Program is specifically for residents who include Non-Paid Workers (PBPU), non-workers such as company owners and wage-earning workers.	The Non-PBI Program is specifically for residents who include Non-Paid Workers (PBPU), non-workers such as company owners and wage-earning workers.
Non-PBI BPJS participants who specifically take class 1 and class 2 can upgrade to a treatment class if the room conditions they are entitled to in the hospital are full.	Non-PBI BPJS participants who specifically take class 1 and class 2 can upgrade to a treatment class if the room conditions they are entitled to in the hospital are full.
Non-Contribution Assistance Beneficiary Members must pay monthly dues even though the member concerned comes from workers receiving wages from participating companies.	Non-Contribution Assistance Beneficiary Members must pay monthly dues even though the member concerned comes from a class of workers who receive wages that the participating companies partly bear.
Non-recipient contribution assistance recipients who take class 1 and class 2 must have a bank account when registering.	Non-recipient contribution assistance recipients who take class 1 and class 2 must have a bank account when registering.
Become a BPJS PBI participant, and the membership will stop only by recommendation by reconciliation data from the Ministry of Social Affairs on references from the local social service. If it fits the poor and underprivileged category, the participant will be registered as a BPJS PBI participant.	To become a BPJS PBI participant and the membership will stop only by recommendation by reconciliation data from the Ministry of Social Affairs on references from the local social service. If it fits the poor and underprivileged category, the participant will be registered as a BPJS PBI participant.

In hospitals, reports made by medical record officers, especially in making reports for BPJS PBI participants and non-PBI participants, have yet to use the information system optimally. So that entering and sorting data for BPJS PBI and Non-PBI participants takes a long time and must be careful so that the data entered is correct. Especially in the calculation of the final recapitulation of the report.

Previous studies that discussed patient registration were Maria Meda Goda, et. al. [5], discusses patient management in web-based health centers; Hendra Rohman, et. al. [6], discusses web-based outpatient registration; Syahidin, Y et. al. [7], discuss registration by appointment web-based.

Based on the facts and data obtained from the results of research in the field, the main problem is that the input of BPJS PBI and Non-PBI patients is still carried out using office applications. Moreover, the final report produced must be recapitulated per date according to the existing number one by one. So that when the officer sorts out, enters BPJS PBI and Non-PBI patient data, and makes the final report, it takes quite a long time.

The objectives of this study are 1) to analyze problems or obstacles when entering BPJS patient data (PBI and Non-PBI), especially when recapitulating the number of outpatients BPJS patient visits and the final report of outpatient BPJS patient visits (PBI and Non-PBI). 2) Designing a computerized outpatient BPJS patient visit information system (PBI and Non-PBI) to overcome problems in the previously existing information system. Contributions that can be given from the results of this study are:

- a. Assist in dealing with problems that arise regarding inputting and making reports on patient visits of BPJS PBI and BPJS Non-PBI in hospitals, health centers and other health services.
- b. Help provide positive and constructive input to improve services in hospitals, health centers and other health services so that they are more qualified and qualified in serving health service users.
- c. As a consideration for hospitals, health centers and other health services, especially in medical record units, in developing medical record information systems in outpatient units [8].

2. Method

a. Research Methodology

The research method is a scientific method to collect information with a specific purpose and interest. Based on this, four keywords must be considered: scientific method, informative, objective, and efficient. The scientific method refers to the scientific identity, namely research activities that are rational, empirical, and systematic. Rational means that research activities are carried out rationally and can be carried out by the human mind. Experimenting means being able to observe and recognize the methods used by others [9].

b. Software Methodology

SDLC, or Software Development Life Cycle, often called the System Development Life Cycle, is the process of developing or changing a software system by using the models and methodologies used by people to develop previous software and be well tested).

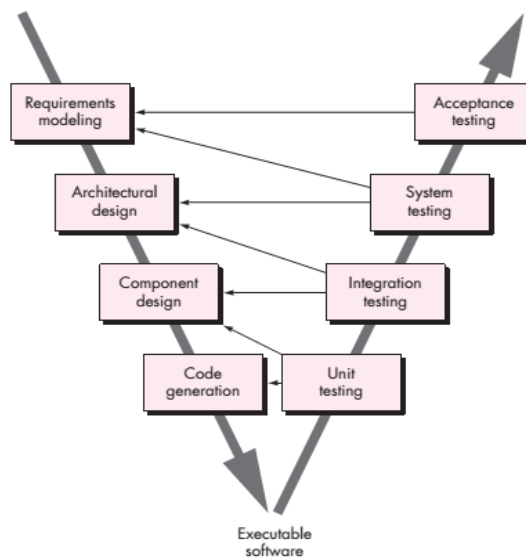


Figure 1. Model V-Model [10]

Taking into account the software development method discussed above, which in this study uses the V-Model, which is a variation of the waterfall form by looking at the advantages of this method, this study decided to use it because this model represents the quality and assurance of the software. Through communication, modeling and earlier construction stages. The V-Model allows the validation and verification stages earlier in taking actions for software work [10].

c. Object-Oriented Methodology

It is a stage that performs system analysis and design from the point of view of object orientation [10]. The unified modeling language is a visual language for modeling and communicating a system using diagrams and supporting texts [11].

1) Use Case

It is a modeling used for the behavior of the information system to be created and describes the interaction between one or more actors and the system to be created [11].

2) Class Diagram

Class diagrams or class diagrams describe a collection of similar objects in a single unit in the system [11].

3) Component Diagram

Component diagrams or component diagrams are made to show components that will later be used in the system, which will be converted into the software. The component diagram focuses on the library object used in the system [12].

4) Deployment Diagram

Deployment diagrams or deployment diagrams illustrate the visualization of components that will later be implemented in the physical form of software and networks. Deployment diagrams can also describe the relationship between nodes and devices that describe client-server and stand-alone systems [11].

3. Results and Discussion

a. Analysis Process

Requirements Modeling can be seen from the ongoing process of system requirements in further development. Figure 2 and Figure 3 below are the system processes currently running.

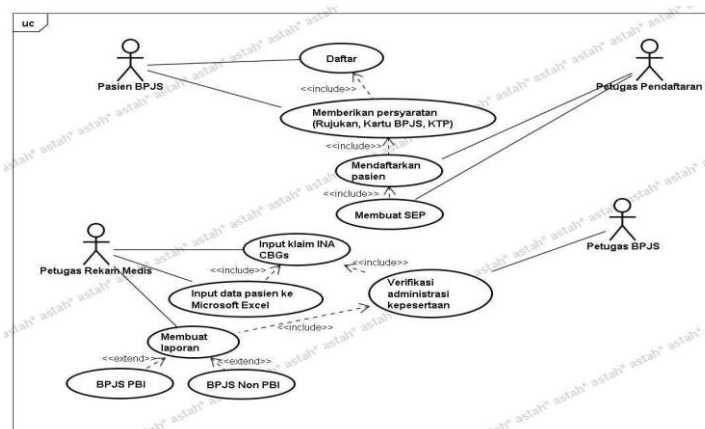


Figure 2. Use case business current system

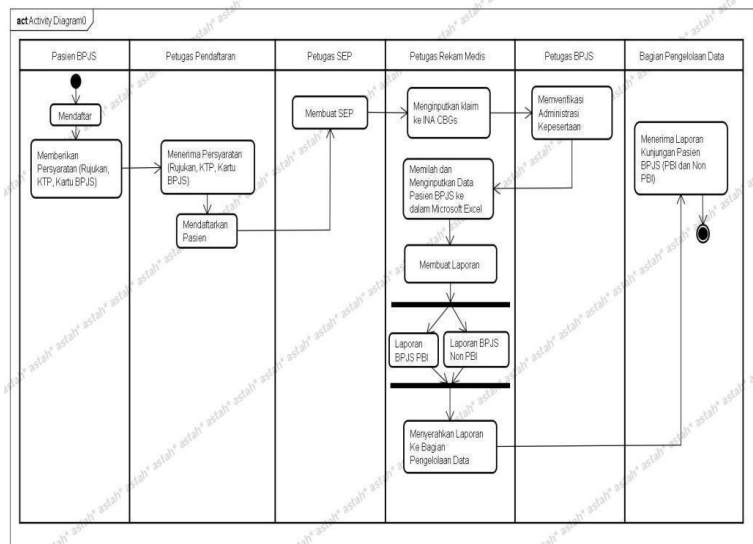


Figure 3. Activity Diagram admission

Based on the description of the analysis above, it can be concluded that hospitals, health centers and health services need an information system that is useful for facilitating all work, especially for outpatient BPJS patient visits.

It is necessary to create a database structure in order to provide convenience in data processing and report generation through information system design [8], [13] which is better than the current system, namely by designing a new, more integrated information system so that the data processing and reporting of BPJS outpatient visits can run quickly, precisely, accurately, and efficiently.

b. Design System

The Unified Modeling Language (UML) is the technique for designing the system. UML is a modeling or visualization language in an object-oriented paradigm. In this design, a system architecture is made, in this case designing from the business process side regarding BPJS patient registration in the form of use cases, class diagrams, component diagrams and deployment diagrams. System Architecture is an integrated structural design of a system whose elements and interrelationships depend on the requirements of a given system [14].

1) Use Case Diagram

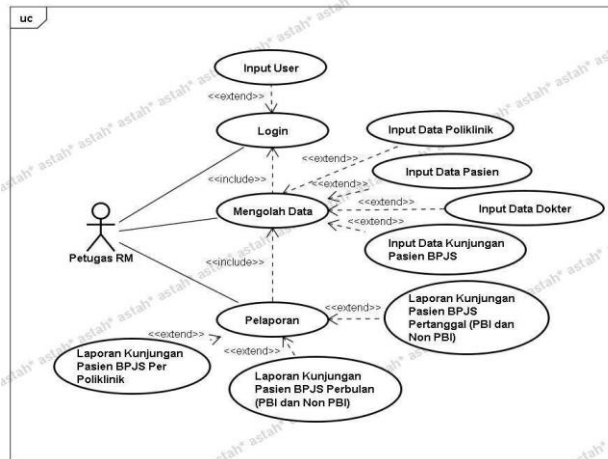


Figure 4. Use Case Diagram Admission Patient

2) Activity Diagram

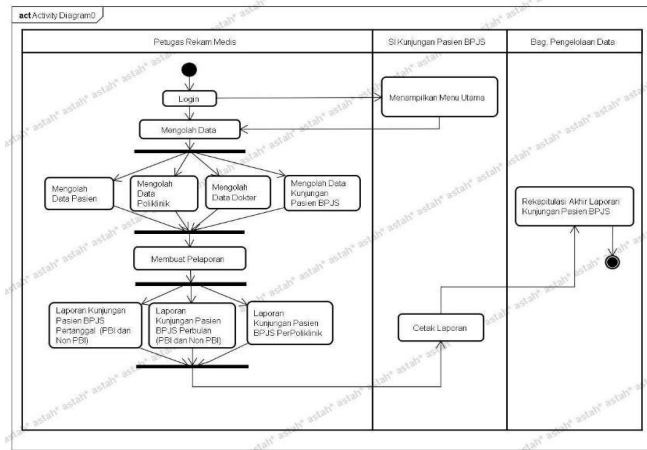


Figure 5. Activity Diagram Admission Patient

3) Class Diagram

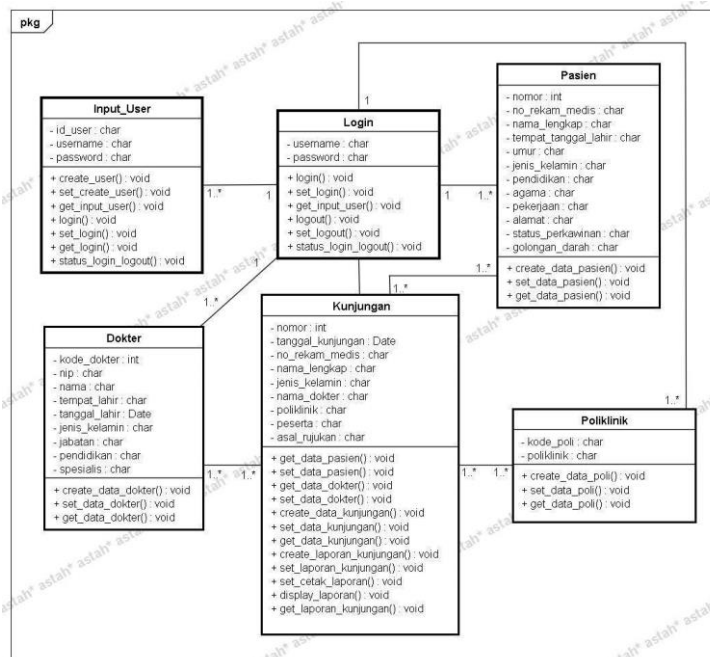


Figure 6. Class Diagram Admission Patient

4) Sequence Diagram

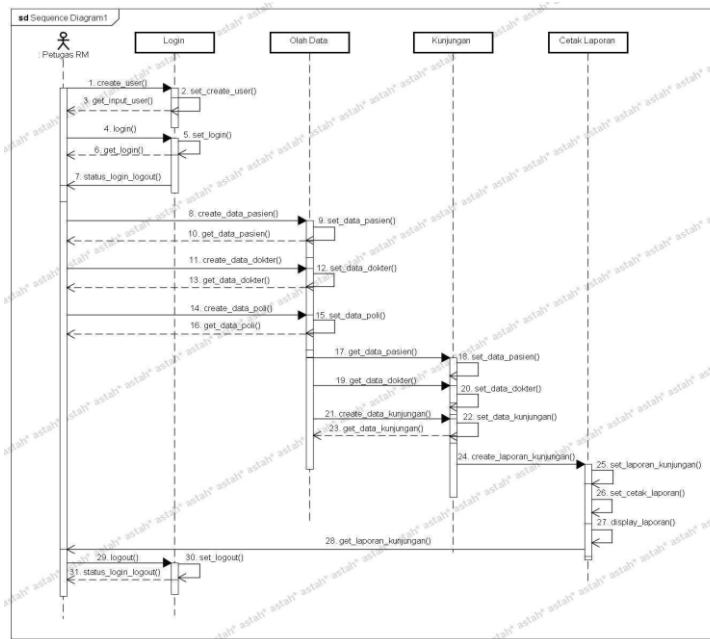


Figure 7. Sequence Diagram Admission Patient

5) Collaboration Diagram

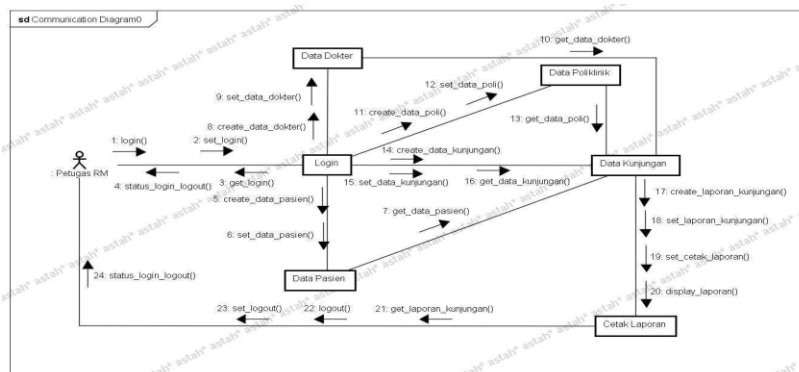


Figure 8. Collaboration Diagram Admission Patient

6) State chart Diagram

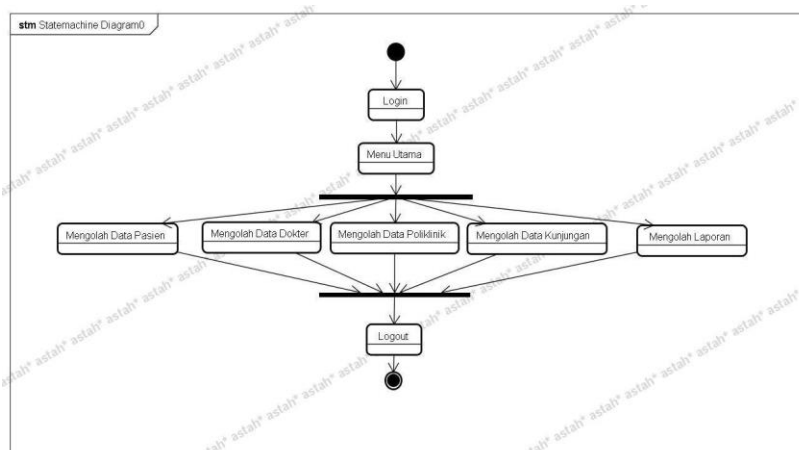


Figure 9. State chart Diagram Application

7) Component Diagram

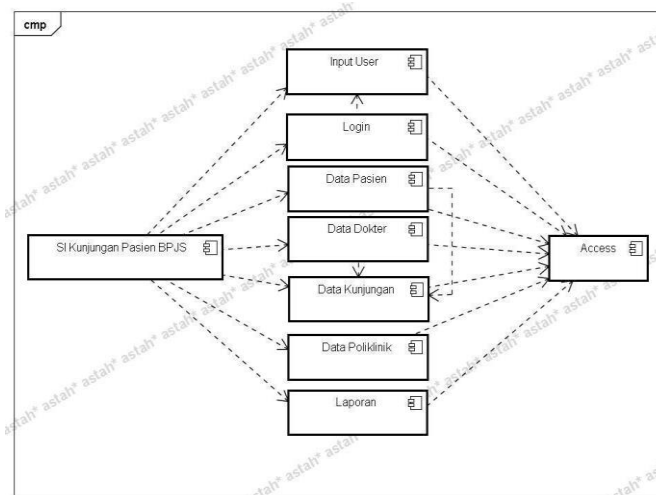


Figure 10. Component Diagram Application

8) Deployment Diagram

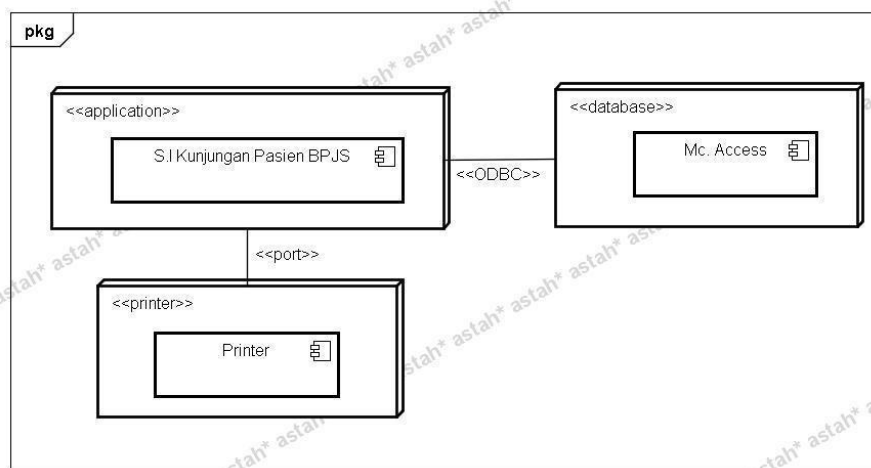


Figure 11. Deployment Diagram

An interface implementation is a pre-built view design type application. Here are some interface implementations for designing outpatient insurance information systems in the form of screenshots. The design of the program module aims to make it easier to group program algorithms related to the system to be designed. The following explains the Program Module:

Table 2. Program Design Modul

No	Method	Description
1	setLogin()	The officer entered the system.
2	Setloginval()	The system validates the login process.
3	GetloginQuery()	Retrieves the data of users who are already logged in.
4	set logout ()	The system displays the status of successfully logged in or not.
5	CreatePasien()	Create patient data.

No	Method	Description
6	SetPasiien()	The system validates the process of creating patient data.
7	GetPasiien()	Retrieve patient data.
8	CreateDokter()	Create a doctor's data.
9	Setdokter()	The system validates the process of creating doctor data.
10	Getdokter()	Retrieve doctor's data.
11	Createpoli()	Create polyclinic data.
12	Setpoli()	The system validates the process of creating polyclinic data.
13	Getpoli()	Retrieve polyclinic data.
14	Createkunjungan()	Create visits data.
15	Setkunjungan()	The system validates the process of creating visit data.
16	Getkunjungan()	Retrieve visit data.
17	Createkunjungan()	Create a visits report.
18	Setkunjungan()	The system validates creating a visit report.
19	Setlaporan()	The system validates creating a printed report.
20	Dlaporan()	View the report.
21	Rkunjungan()	Take a visit report.
22	setLogout()	The clerk exited the system.
23	Selogoutval()	The system validates the logout process.
24	Status_login_logout()	The system displays the status of successfully logged out.

The following interface of the design of the insurance patient visit information system can be seen below:



Figure 12. Main Menu

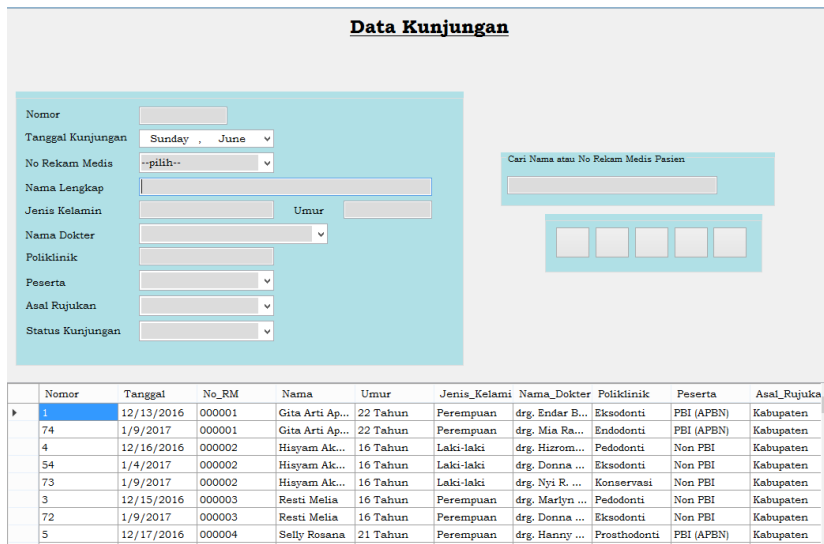


Figure 13. Patient Visit

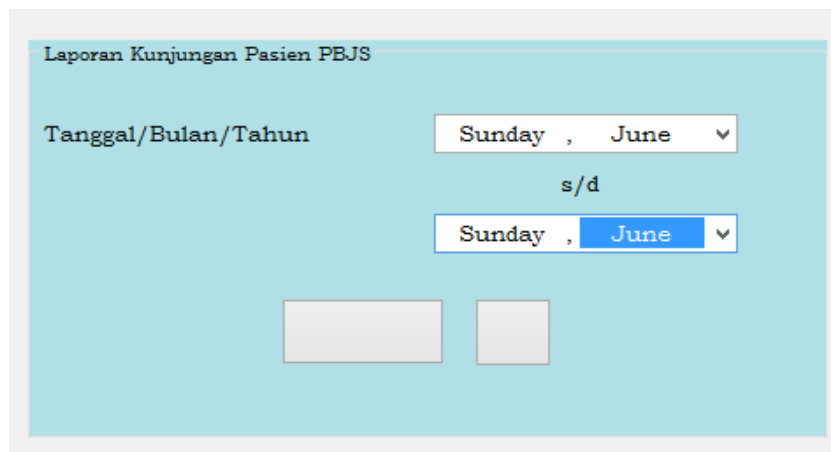


Figure 14. Report Filter Visit by patient insurance

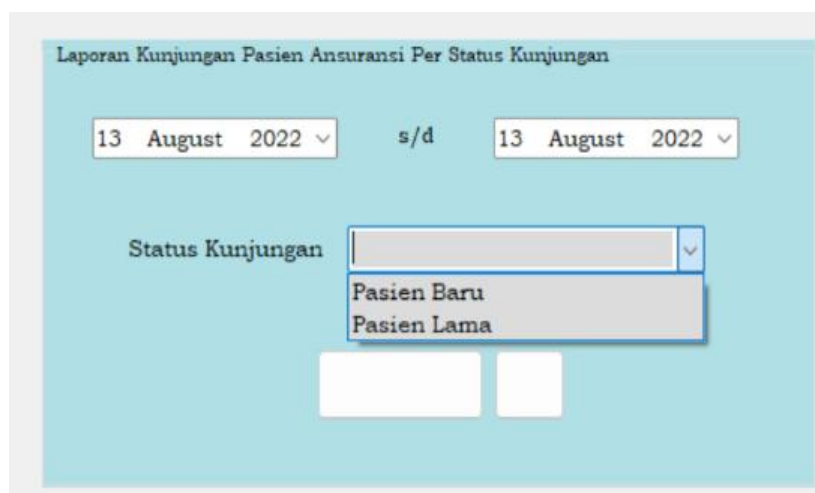


Figure 15. Report Filter Visit by State

LAPORAN KUNJUNGAN PE SERTA BPJS KE SEHATAN (PBI DAN NON PBI)

Tanggal Cetak : 20-June-2021

No	Tanggal	No RM	Jenis Kelamin	Umur	Poliklinik	Peserta	Asal Rujukan
52	5-Jan-17	000030	Perempuan	39 Tahun	Prosthodonti	PBI (APBN)	Luar Kota
53	5-Jan-17	000037	Perempuan	8 Tahun	Pedodonti	PBI (APBD)	Dalam Kota
54	5-Jan-17	000027	Laki-laki	17 Tahun	Endodonti	PBI (APBD)	Kabupaten
55	5-Jan-17	000032	Laki-laki	28 Tahun	Prosthodonti	PBI (APBN)	Luar Kota
56	6-Jan-17	000025	Perempuan	28 Tahun	Prosthodonti	PBI (APBN)	Kabupaten
57	5-Jan-17	000029	Laki-laki	30 Tahun	Endodonti	Non PBI	Kabupaten
58	6-Jan-17	000024	Perempuan	33 Tahun	Oral Surgery	PBI (APBD)	Dalam Kota
59	7-Jan-17	000011	Perempuan	37 Tahun	Konservasi	PBI (APBD)	Dalam Kota
60	7-Jan-17	000016	Laki-laki	22 Tahun	Oral Surgery	PBI (APBD)	Kabupaten
61	7-Jan-17	000038	Perempuan	29 Tahun	Prosthodonti	PBI (APBN)	Dalam Kota
62	7-Jan-17	000017	Perempuan	22 Tahun	Oral Surgery	PBI (APBD)	Dalam Kota
63	8-Jan-17	000022	Perempuan	22 Tahun	Endodonti	PBI (APBD)	Luar Kota
64	8-Jan-17	000026	Laki-laki	18 Tahun	Endodonti	PBI (APBN)	Kabupaten
65	9-Jan-17	000004	Perempuan	21 Tahun	Prosthodonti	PBI (APBN)	Kabupaten
66	9-Jan-17	000003	Perempuan	16 Tahun	Eksodonti	Non PBI	Kabupaten
67	9-Jan-17	000002	Laki-laki	16 Tahun	Konservasi	Non PBI	Kabupaten

Figure 16. Reporting Insurance Patient

4. Conclusion

Based on the study results, the problems in hospitals, health centers and health services are filling in insurance patient data using Microsoft Excel. The final report produced must be recapitulated per date according to the existing number one by one. So that when officers sort out, enter BPJS PBI and Non-PBI patient data, and make the final report long enough to overcome this problem. The information system development can facilitate input of BPJS patient visit data. It is carried out and makes a final recapitulation of BPJS patient visit reports quickly and easily. It is necessary to have a better and safer database so that the stored data is more secure and not easily lost so that, if needed, the data sought is easier to find. This outpatient BPJS patient visits information system can help provide an overview that health services need the application of information technology.

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