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Design of BPJS Claim Information System for Hemodialysis Patients using the V-Model method

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Abstract

This study aims to describe the information system for filing outpatient BPJS claims for hemodialysis poly and identify databases, inputs and outputs, and interfaces that are adjusted to process the outpatient BPJS claim filing data. The research method applied is the V-Model method. The tools used in the process of system planning and development are Flowchart, Data Flow Diagram (DFD), and Entry Relationship Diagram (ERD). The results of the analysis of the design of this system will be tested for feasibility using Microsoft Visual Studio-based applications. Based on this research, it can be concluded that there are still much incomplete patient data, in the hemodialysis poly unit, which affects the activities in claiming BPJS files for hemodialysis patients.

Keywords: Hemodialysis; BPJS claims; Visual Studio

1. Introduction

Technology today is growing rapidly in all fields, including the health sector. Technology itself can contain information. Information technology is an important part of an organization, especially in times of disruption and dynamics today (Agustiono, Fajrin, & Rachman, 2021).

Indonesia has a very high prevalence of chronic kidney disease due to the lack of attention from the public regarding this disease as well as from healthcare facilities that are still not responsive in serving hemodialysis patients. Therefore, to avoid delays in service to hemodialysis patients, the authors create a solution to this problem by designing a BPJS claim application for hemodialysis patients using the Microsoft Visual Studio application.

Visual Studio is software for developing applications. Visual Studio lets you write code, run code, test code, debug code, and package code into self-contained applications (Enterprise, 2019).

BPJS claim is a fee submission treatment of patients participating in BPJS by the hospital to the Social Security Organizing Agency (BPJS) Health, which is carried out collectively and billed to BPJS every month (Valentina & Halawa, 2018).

Hemodialysis is the most common treatment for patients with Chronic Kidney Disease (CKD) worldwide and in Indonesia. Hemodialysis or the washing process is an action that helps CKD patients to extend the patient's life (Husna, Rohmah, & Pramesti, 2021).

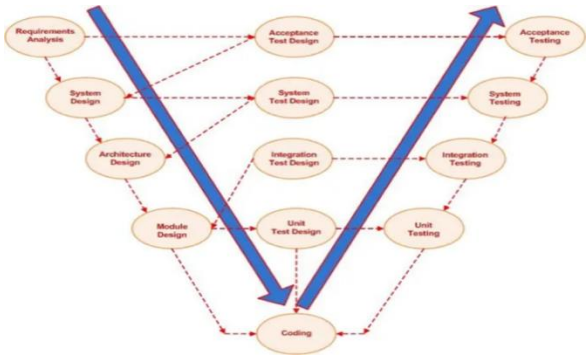
In the medical record, there is the administration of medical record filing which can be converted into electronic filing over time, so that you can see complete and incomplete files which will then be claimed. The results of this study at the Muhamadiyah Hospital in Bandung, the medical record filing system is still experiencing delays in claims due to manual file checks. Therefore, many files are late, missing, and not a few incomplete files in every existing poly, especially in the hemodialysis poly.

2. Methodology

The method used is the v-model method which is designed based on the relationship between the stages of testing between phases, that each phase in one cycle has related tests as well as

the waterfall method. In the v-model method, there are the phases (Chandra, Kosdiana, & Riastuti, 2022):

a. Verification proses, in the verification process there are phases such as requirement analysis, system design, architectural design, and module design.
b. Validation proses, in the validation proses there are phases such as acceptance testing, system testing, integration testing anad and unit testing.
c. Coding



Picture 1. The v-model method

Data collection techniques for designing this module were carried out by :

a. Observation
   Observation is the observation of data carried out by observing directly to the research location at the Bandung Muhammadiyah Hospital.
b. Interview
   While the collection of interview data that was carried out directly was carried out by conducting a question and answer system to the field supervisor who served in the casemix section.

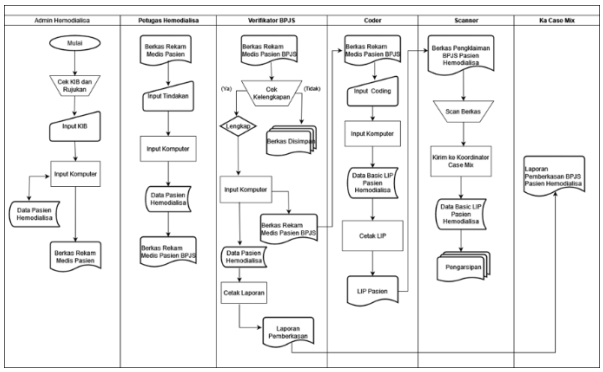
3. Results and Discussion

3.1 Information Systems Used

The design of this system is formed from several elements that are interconnected in order to produce a sketch of the information system process for filing BPJS Poly Hemodialysis claims.

The BPJS claims information system that will be designed in this study uses flowcharts, data flow diagrams (DFD) and entity relationship diagrams (ERD).

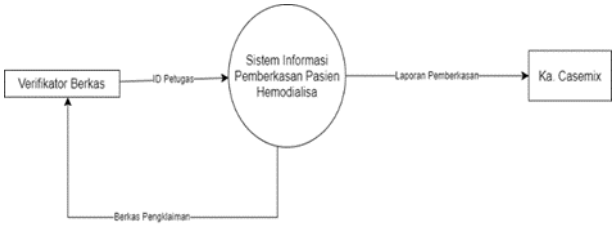
3.1.1 Flowchart



Picture 2. Flowchart of the designed system

The filing flow starts from the hemodialysis admin checking the completeness of KIB (referral) and patient identity in the form of KTP and BPJS. After that, register (input and register) patients admitted to outpatient hemodialysis. Furthermore, the complete and registered files are then handed over to the officer (Hemodialysis nurse assistant) who will see the completeness of filling out the medical resume and inputting hemodialysis actions. The complete file is then submitted to the one billing officer to print details of the BPJS treatment costs for outpatient hemodialysis patients. After that, the file is submitted to the BPJS verifier to check the completeness of the Hemodialysis file (complete and incomplete files). Next, coding the file and attaching the LIP (individual patient sheet), after the file is complete then the file is submitted to the scan officer to scan the file and report. The complete file is then stored in SIMRS.

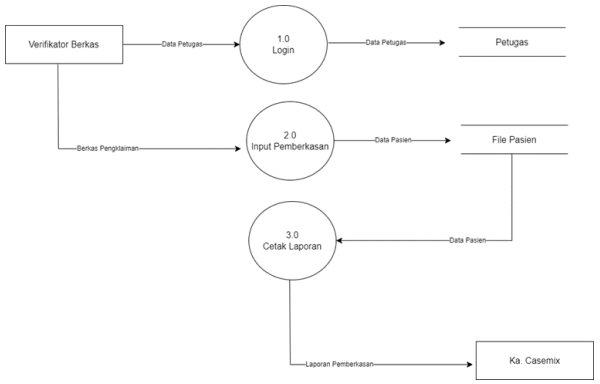
3.1.2 Context Diagram



Picture 3. Designed Context Diagram

The designed hemodialysis patient filing information system describes a context diagram that consists of a process and describes the scope of a system.

3.1.3 Data Flow Diagram (DFD)



Picture 4. The designed DFD

Data Flow Diagram or DFD provides an overview of system or software input or output processes. That is, data objects flow into the software, are transformed by processing elements, and consequently, flow out of the system or software.

According to the above diagram, the officers will log in and apply based on the existing data of the person in charge, and after logging in, enter the patient data according to the requested hemodialysis patient data. The collected and complained data will be printed and reported to the person responsible for case mix.

3.1.4 Entity Relationship Diagram (ERD)

Picture 5. Planned ERD

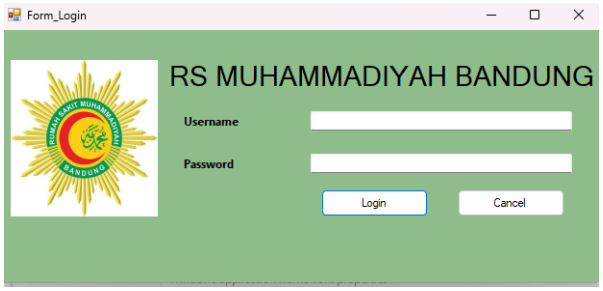
Entitty Relationship Diagram or ERD is a design or format that associates activities directly related to describing relationship between data in a database based on the underlying data objects that have relationships between them (Nurmalasari, Anna, & Arissusandi, 2019).

In picture 5 shows the data associations between hemodialysis patients, officers, and record data. The clerk reviews patient information, including hemodialysis patient information entered, and returns results that are hemodialysis patient credentials.

3.2 System Implementation

Based on the level of plans made on this system using Microsoft Visual Studio 2012 and with a database made using Microsoft Access 2019.

3.2.1 Login Form



Picture 6. Login Form

This login form is intended to allow administrators to enter the application by entering their administrator username and password.

Officers can enter using their previously created username and password. Alternatively, if you have a new administrator, you can create a username and password or register as an administrator and create a username and password in the executive form as shown in picture 8.

3.2.2 Main Menu Form

Picture 7. Main Menu Form

After successfully logging in to this application, the administrator will see the main menu form as shown in picture 7.

This main menu includes patient data, archived data, patient reports, and verified file

reports. Also, the theme displayed in the main menu is the front view of the Muhammadiyah Bandung Hospital building, with the logo and hospital address.

3.2.3 Officer Forms

Picture 8. Officer Forms

As shown in the image above, we will use the Officer Menu form to display the details of an existing officer along with the username and password that we have created and allow access to the home page of the BPJS Patient Application for that hemodialysis patient.

There is also an official form, as shown in picture 8, where new officials can become administrators by providing the required data and registering here.

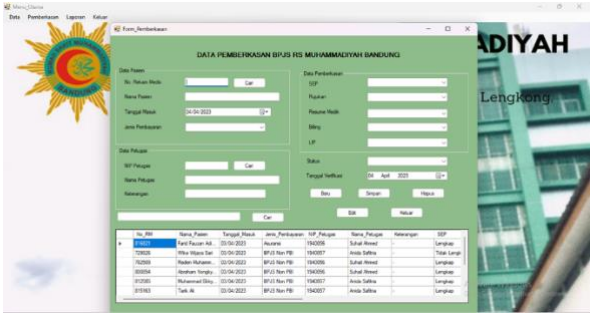
3.2.4 Patient Forms

Picture 9. Patient Forms

The patient form contains important data such as name data, patient record number, patient address, patient visit date, patient payment type, and other important data, i.e.

Hemodialysis administrators can review patient information and add new patients in this patient form. This data is stored for later review and reporting to the reporter officers.

3.2.5 Filing Form

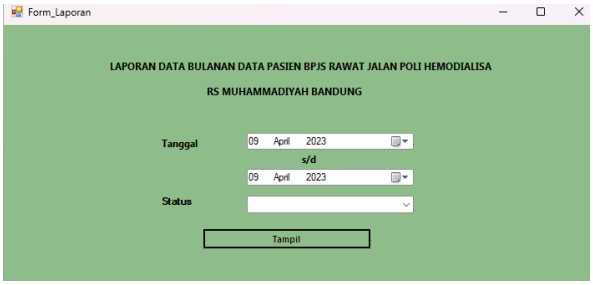


Picture 10. Filing Form

On the filing form, this form contains patient data, officer data and filing data, namely the data that will be seen in complete or not, such as SEP numbers and other data.

In this filing form we can also see patient data and check other data again if the data is incomplete, then it will be seen what data has not been completed.

3.2.6 Report Form

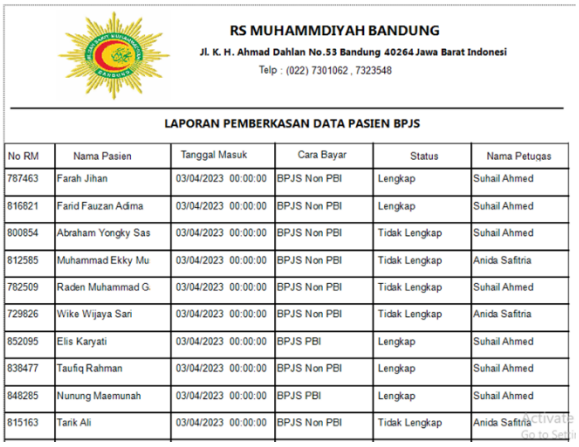


Picture 11. Report Form

A report form like the one pictured above allows executives to view monthly BPJS hemodialysis patient data. Displays the name of the patient who received treatment that month.

When the representative clicks “View”, the report appears with the patient's name, allowing them to see which patients have completed and which have not.

3.2.7 BPJS patient filing reports



RS MUHAMMDIYAH BANDUNG
Jl. K. H. Ahmad Dahlan No.53 Bandung 40264 Jawa Barat Indonesi
Telp : (022) 7301062 , 7323548

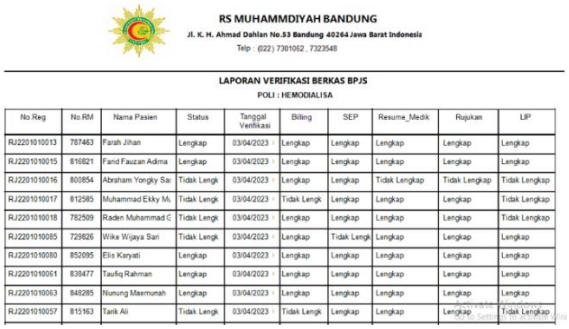
LAPORAN PEMBERKASAN DATA PASIEN BPJS

No RM	Nama Pasien	Tanggal Masuk	Cara Bayar	Status	Nama Petugas
787463	Farah Jihan	03/04/2023 00:00:00	BPJS Non PBI	Lengkap	Suhail Ahmed
816821	Farid Fauzan Adima	03/04/2023 00:00:00	BPJS Non PBI	Lengkap	Suhail Ahmed
800854	Abraham Yongky Sas	03/04/2023 00:00:00	BPJS Non PBI	Tidak Lengkap	Suhail Ahmed
812585	Muhammad Ekky Mu	03/04/2023 00:00:00	BPJS Non PBI	Tidak Lengkap	Anida Safitria
782509	Raden Muhammad G	03/04/2023 00:00:00	BPJS Non PBI	Tidak Lengkap	Suhail Ahmed
729826	Wike Wijaya Sari	03/04/2023 00:00:00	BPJS Non PBI	Tidak Lengkap	Anida Safitria
852095	Elis Karyati	03/04/2023 00:00:00	BPJS PBI	Lengkap	Suhail Ahmed
838477	Taufiq Rahman	03/04/2023 00:00:00	BPJS Non PBI	Lengkap	Suhail Ahmed
848285	Nunung Maemunah	03/04/2023 00:00:00	BPJS PBI	Lengkap	Suhail Ahmed
815163	Tarik Ali	03/04/2023 00:00:00	BPJS Non PBI	Tidak Lengkap	Anida Safitria

Picture 12. Filing Report BPJS patient

Picture 12 shows the patient data as well as the data of the officer who submitted the patient, this is a patient data report that was in April 2023, but this data has not yet been verified.

3.2.8 BPJS File Verification Report



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Telp : (022) 7301062 , 7323548

LAPORAN VERIFIKASI BERKAS BPJS
POLI : HEMODIALISA

No.Reg	No.RM	Nama Pasien	Status	Tanggal Verifikasi	Billing	SEP	Resume_Medik	Rujukan	LIP
RJ2201010013	787463	Farah Jihan	Lengkap	03/04/2023	Lengkap	Lengkap	Lengkap	Lengkap	Lengkap
RJ2201010015	816821	Farid Fauzan Adima	Lengkap	03/04/2023	Lengkap	Lengkap	Lengkap	Lengkap	Lengkap
RJ2201010016	800854	Abraham Yongky Sas	Tidak Lengk	03/04/2023	Lengkap	Lengkap	Tidak Lengkap	Tidak Lengkap	Tidak Lengkap
RJ2201010017	812585	Muhammad Ekky Mu	Tidak Lengk	03/04/2023	Tidak Lengk	Lengkap	Lengkap	Lengkap	Tidak Lengkap
RJ2201010018	782509	Raden Muhammad G	Tidak Lengk	03/04/2023	Lengkap	Lengkap	Lengkap	Lengkap	Tidak Lengkap
RJ2201010085	729826	Wike Wijaya Sari	Tidak Lengk	03/04/2023	Lengkap	Tidak Lengk	Lengkap	Lengkap	Lengkap
RJ2201010080	852095	Elis Karyati	Lengkap	03/04/2023	Lengkap	Lengkap	Lengkap	Lengkap	Lengkap
RJ2201010061	838477	Taufiq Rahman	Lengkap	03/04/2023	Lengkap	Lengkap	Lengkap	Lengkap	Lengkap
RJ2201010063	848285	Nunung Maemunah	Lengkap	03/04/2023	Lengkap	Lengkap	Lengkap	Lengkap	Lengkap
RJ2201010057	815163	Tarik Ali	Tidak Lengk	03/04/2023	Tidak Lengk	Lengkap	Lengkap	Lengkap	Tidak Lengkap

Picture 13. File Verification Report BPJS

The verified BPJS report as shown in picture 13 contains complete patient data and does not include the date of verification of the patient's file. Finally, this report will be sent to the head of casemix.

3. Conclusion

Based on research conducted in Bandung Muhammadiyah Hospital, it is concluded that the Hospital claims process for BPJS Poly Hemodialysis is still manual and only uses Microsoft Excel processing is less effective which causes claims to be hampered. For this reason, it is necessary to make an information system design that is designed using Microsoft Visual Studio 2012 and to create a database so that Microsoft Access 2019 is expected to be able to help officers so that the management of hemodialysis patient data is more effective and supports more optimal data claims.

4. Suggestion

On this occasion, the author will provide useful input and suggestions among others :

1. It is hoped that in the future this filing system can be further developed
2. There is an addition of items that are more complete and easier for the staff/admin.

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