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Designing an application for recording data on incoming and outgoing medicines using the first in, first out method

(Case study at one health service center in Bandung Regency)

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ABSTRACT

The health service center in Bandung Regency is a place for taking medicine for sick residents. The pharmacy is responsible for procuring, ordering, receiving, storing, distributing, recording, and reporting medicine supplies. The series of drug data processing activities for health services starts from ordering drugs, collecting drug data, dispensing drugs, and recording and reporting. To make it easier to record transactions and report drug supplies, a particular application based on PHP programming and a MySQL database was created, which is expected to assist in recording drug purchase and sale transactions, as well as creating reports so that it can further increase the effectiveness of work at pharmacies in providing services, towards citizens.

Keywords: ordering, data collection, expenditure, recording, and reporting

INTRODUCTION

Computer technology development today is meaningful for all groups and is widely used in various fields of work. Computers play a very decisive role, both in the household environment and in the professional work environment. (Sembiring et al., 2019) One of the benefits of computer technology that can be felt in the work environment is as a tool for processing data in companies, institutions, or other agencies. (Yun et al., 2020) Computers play an essential role in information technology, one of which is speeding up data processing for decision-making to obtain information with good precision, accuracy, and timeliness. (Sri Rezeki et al., 2022)

Health service locations in Bandung Regency are one of the providers of medicines and medical equipment, responsible for procurement, ordering, receiving, storing, distributing, recording, and reporting medicine supplies. A series of drug data processing activities for health services in the community, starting from ordering drugs, collecting drug data, and dispensing drugs to recording and reporting. (Ade Elsa Betavia, 2022)

Health service locations in Bandung Regency provide drug services to the local community. Transactions ordering, receiving, and recording incoming and outgoing medicines are routine, both weekly and daily, and the intensity of dispensing for each type of medicine varies according to the needs of the local community. (Jamil et al., 2019)

In processing drug data, health services in Bandung Regency still use manual recording methods. Namely, all data is recorded in a book or archive. There needs to be a computer-based system to handle data processing, which causes the required information and reports to be late. (Shweta & Kumar, 2023) This condition is, of course, felt very unprofitable, and problems arise in the data search process. (Mahmud et al., 2021) Also, manual recording activities in books and archives can be lost, whether wasted because of a pile of archives or the archive paper is damaged so that the data in the archive cannot be detected. Another problem is that making reports takes a long time because of the pile of archive data, which is challenging to arrange. (Saxena et al., 2020)

Based on the description above, an application or system is essential in an agency, especially in a health service center in Bandung Regency, so the author conducted research and put it in the form of a thesis with the title "Designing an Application for Recording Incoming and Outgoing Drug Data Using the First in First Out Method (Case study at one of the health service locations in Bandung Regency)."

METHOD

Research methodology is a process used to solve a logical problem, which requires data to support the implementation of research. The method used in the research uses descriptive methods. The descriptive method is a method that uses facts and information in current situations or events systematically, factually, and accurately. This research method has two stages: data collection and software development.

This research uses observation, interviews, and documents for data collection techniques. Meanwhile, the system development method used is OOSE (Object Oriented Software Engineering, with the following stages:

1. Create requirements models and analysis
2. Design and implementation
3. Testing model

With UML, the Booch, OMT, and OOSE methods are combined by building impractical elements plus elements from other more effective methods and new elements that do not exist in previous methods so that UML is more expressive and uniform than other methods.

RESULTS AND DISCUSSION

DESIGN SYSTEM
Sequence Diagrams
1. Login Sequence Diagram
   The Sequence Diagram for the Login process describes the flow to enter the system. The processes that occur include:
   1. User enters username and password.
   2. The system checks login validation.
   3. The user will visit the main page if the login is valid.
2. Sequence Diagram of Drug Data
   The Sequence Diagram for the drug data process describes the flow for entering data into the system. The processes that occur include:

    1. User enters drug data

    2. If it does not exist, the drug data will be saved into the database, and a drug data table will appear.

    3. The save action will be immediately saved in the database.

3. Supplier Data Sequence Diagram

The Sequence Diagram for the supplier data process describes the flow for entering supplier data into the system. The processes that occur include:

    1. User enters supplier data

    2. If the data does not yet exist, the data will be saved into the database, and the supplier data entered will appear.

    3. The save action will be immediately saved in the database.

4. Sequence Diagram of Incoming Drug Data

The Sequence Diagram for the incoming drug data process describes the flow for entering incoming drug data into the system. The processes that occur include:

    1. User enters incoming drug data.

    2. If it does not exist, the data will be saved into the database, and the class data entered earlier will appear.

    3. The save action will be immediately saved in the database.

5. The Sequence Diagram for the outgoing medicine data process describes the flow for entering outgoing medicine data into the system. (Wang et al., 2021) The processes that occur include others.

    1. User enters outgoing medication data.

    2. If it does not exist, the data will be saved into the database and display the class data entered earlier.

    3. The save action will be immediately saved in the database.

6. The Sequence Diagram for the drug prescription data process describes the flow for entering outgoing drug data into the system. The processes that occur include:

    1. User enters drug prescription data.

    2. If it does not exist, the data will be saved into the database, and the class data entered earlier will appear.

    3. The save action will be immediately saved in the database.

7. The Sequence Reporting process diagram illustrates the flow of printing drug inventory system reports at one of the health service locations in Bandung Regency. The processes that occur include:

    1. Users view existing data.

    2. The user will select the report needed by the pharmacy owner.

    3. If the report has been selected, the report will be printed.

8. The Sequence Diagram for the password change process illustrates the flow for entering password change data into the system. (Berk et al., 2020) The processes that occur include:

    1. User enters password change data.

    2. The system checks the password change data entered, if the data entered is not appropriate, it must repeat the password and replace it with a new one.

    3. If the password change data selects update, the data will be saved into the database.

Class Diagrams

    The following is an image of the Class Diagram of the Medicine Supply System at one of the health service locations in Bandung Regency.
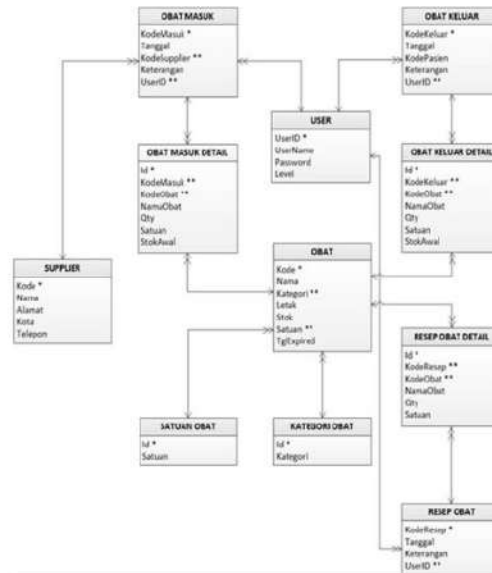
Figure 1. Class Diagrams

Database Design

A database or database is a collection of data organized to make the search process more accessible, and its organization provides user convenience and efficiency in processing or displaying data. (MOUKADDAM et al., 2019) The database used in this application is the MySQL server version 5 database. The database structure and tables created are as follows:

Database Name: pharmacy_db
Database Engine: MySQL Server 5
Table Engine: MyISAM
Character Set: UTF-8
Number of Tables: 11 Tables (Supplier, Medicine, Category, Unit, In, InD, Out, OutD, Prescription, PrescriptionD, Users)

Program Structure Design
The following is the structure of the program created:
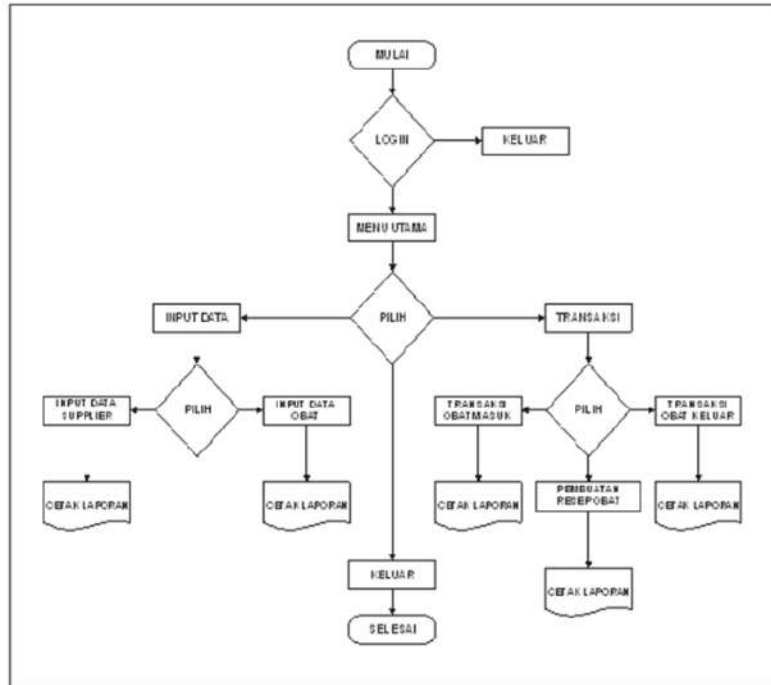
Figure 2. Program Structure

SYSTEM IMPLEMENTATION

This system program is only for processing drug supplies, and in it, there is a file menu that contains a login form, drug data form, supplier data form, incoming drug data form, outgoing drug data form, prescription data form, from reports and reports. (Ngo et al., 2019) This section describes the appearance of the system program, which is designed according to the design made at the system design stage. (Jiang et al., 2020)

Application Form Display (Web Page)

1. Login Page

Figure 3. Login page display

Before being able to use the application, the user/application user will be directed to the login page and asked to enter a User ID and Password. If the User ID and Password are correct, the user will be directed to the application's main menu page.

2. Home Page (Application Main Menu)

Figure 4. Main Page Views

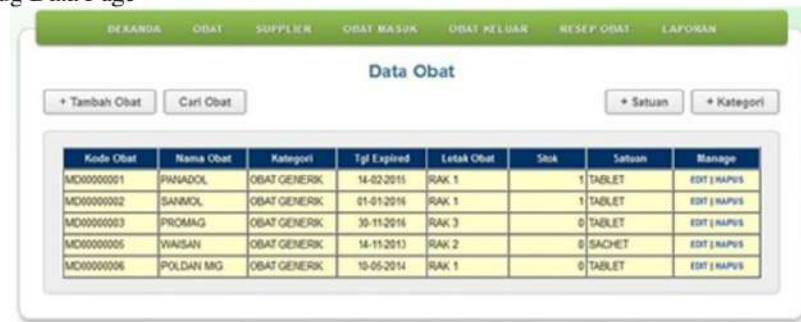This page displays links (shortcuts) to other pages in the application.

3. Drug Data Page

Figure 5. Drug Data Pages

This page displays drug data that has been entered into the database, users can add new drugs, edit or delete data, as well as add drug categories and units.
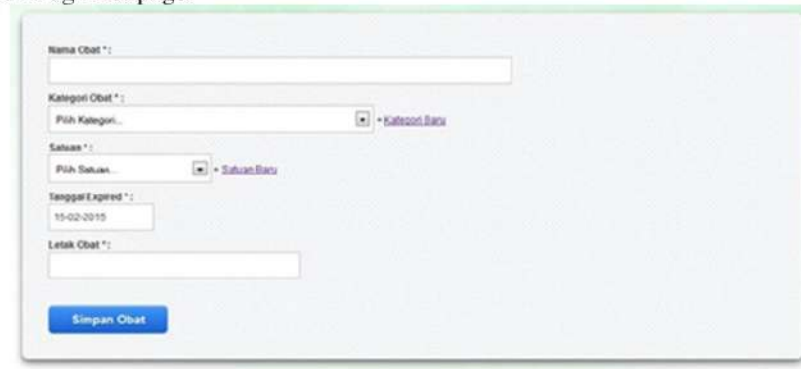
4. Add Drug Data page

Figure 6. Page Views for Adding Drug Data

To add a new medicine, the user must fill in the data completely on the form provided, then save it by clicking the "Save Medicine" button.

5. Add Drug Category Data page

Figure 7. Page Views for Adding Drug Category Data

To add a drug category. Fill in the drug categories, then click the "Add" button to add a new category.

6. Supplier / Medicine Provider Data Page

Figure 8. Display of the Drug Supplier/Provider Data Page

This page displays drug supplier/provider data entered into the database. Users can add new data and edit or delete it.

7. Add Supplier Data page

Figure 9. Appearance of the Add Supplier Data page

To add new supplier data, the user must fill in the data entirely in the form provided, then save it by clicking the "Save Supplier" button.

8. Entry Drug Data Page

Figure 10. Display of the Incoming Drug Data Page
This page displays incoming drug transaction data that has been entered into the database. This page also provides links to create and edit or delete new transactions.

9. Incoming Drug Transaction Page

Figure 11. Display of the Incoming Drug Transaction Page
This page is used to create new incoming drug transactions. The user must fill in supplier and drug data to create a new transaction.

10. Dispensed Medication Data Page

Figure 12. Outgoing Drug Data Page Views
This page displays outgoing drug transaction data input into the database. This page also provides links to create and edit or delete new transactions.

11. Outgoing Medicine Transaction Page

Figure 13. Display of the Outgoing Medication Transaction Page
This page is used to create new outbound medication transactions. The user must fill in patient, drug, and quantity data to create a new transaction.

12. Medicine Prescription Page

Figure 14. Views of the Medicine Prescription Page

This page displays drug prescription data that has been entered into the database. This page also provides links to create and edit or delete new recipes.

13. Drug Prescription Creation Page

Figure 15. Views of the Medicine Prescription Creation Page

This page is used to create new drug prescriptions. The user must fill in drug data and quantity to create a new transaction.
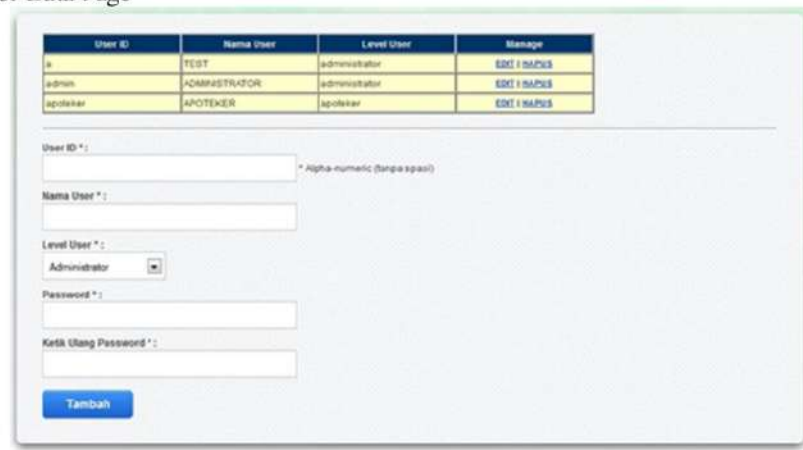
14. User Data Page

Figure 16. User Data Page Display

This page displays user data/users who can use the application.
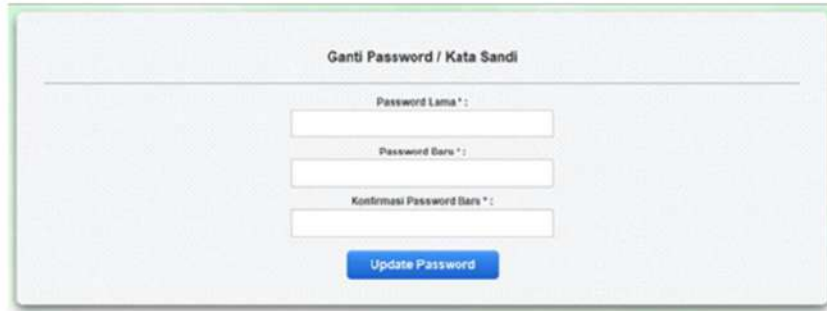
15. Change Password page

Figure 17. Views of the Change Password Page
This page is used to change the user/application user password.

16. Report Main Menu Page

Figure 18. Report Menu Page Display
This page displays links (shortcuts) to each report/issue in the application.

17. Drug Data Report Print Page

Figure 19. Printed Page Display of Drug Data Report
This page is used to display/print Drug Data Reports. The resulting report can be selected based on the Drug Category.

18. Supplier Data Report Print Page

Figure 20. Display of the Printed Medication Entry Page
This page is used to display / print Supplier / Medicine Provider Data Reports.

19. Print page for incoming drug data report

Figure 21. Display of the Printed Page for the Incoming Drug Data Report
This page is used to display/print the Incoming Drug Data Report. The reports generated can be selected based on the transaction date or supplier.

20. Print page for outgoing drug data report

Figure 22. Printed Page Displays of Outgoing Medication Report Data
This page is used to display/print the Exit Medication Data Report. The resulting report can be selected based on the transaction date.

CONCLUSION

The application of a computerized system to replace manual processes in the form of archives supports the fulfillment of information needs that are relatively fast, accurate, and precise. This Medicine Inventory Information System minimizes the error rate in recording and managing medicine inventory data to make the data presented more accurate. With this auxiliary software, errors due to double recording will be reduced by data validation so that the data presented can be accounted for accurately by management.

From the results produced, many things could still be improved. Therefore, the author suggests that the software can be further developed to support precise, fast, and accurate data processing. To operate a computer optimally, human resources are needed to use computers so that the system can be utilized optimally. It is best to back up files periodically to prevent damage or loss of data in the database.

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