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DESIGN AND BUILD A WEBSITE-BASED DRUG SUPPLY INFORMATION SYSTEM (Case Study at Apotek Salam)

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ABSTRACT

Information technology has an important role in improving the efficiency of services in the health sector, including the management of drug supplies in pharmacies. Apotek Salam faces several obstacles in manual drug stock management, such as lack of stock accuracy, improper inventory counting, and difficulty tracking expired drugs. To overcome this problem, it is necessary to design a website-based drug inventory information system using PHP and Ajax programming languages as data integration with MySql databases that can display drug stock, price, and expiration date information well. The application of the First Expired First Out (FEFO) method in the drug supply system at the Salam pharmacy in order to facilitate stock management in ensuring that drugs with an expiration date that is close to being prioritized are sold first. The results of this implementation by being website-based can increase efficiency in pharmacy services, get better quality of drug stock with alerts on drug stock that will be yellow and expired in red and stock taking to maintain the quality of drug stock and medical devices in salam pharmacies.

KEYWORDS *First Expired First Out (FEFO), Information System, Pharmacy, Website.*

INTRODUCTION

In the current era of globalization, the development of technology has been very rapid. This requires that every activity in daily life will always use computer-based technology. One of the fields that uses information technology is the health sector. Information Technology is able to change the distribution of information and make the world more connected. One of the common applications of technology is the implementation of information systems in an organization. Information systems are used to collect, analyze and present information faster (Bangun et al., 2023)

In improving information and health services, pharmacies are one of the important elements in meeting the needs of the community. Pharmacies provide various types of drugs that are closely related to the medical and health fields.

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Therefore, good pharmacy services to ensure that it can provide good quality drugs and medical devices (Husada et al., 2021)

XYZ Pharmacy Research is one of the pharmacies located in Purbalingga facing several problems in drug inventory management that can negatively impact the efficiency of the drug supply information system. Some of the issues faced include lack of accurate visibility of drug stock, inventory miscalculations, difficulty in tracking drug expiration dates (Bangun et al., 2023)

In the next study, the drug inventory system at Asy-Syifaa Yukum Jaya Islamic Hospital is still manual. The obstacles include errors in checking drug stocks, each report has data redundancy and is not thorough in recording incoming and outgoing drug stocks so that errors occur in recording the final stock (Susilowati et al., 2019)

Salam Pharmacy which provides more than 500 types of drugs and medical devices. Currently, the process of managing inventory data at this pharmacy is still carried out using a simple desktop application. The disadvantages of the current system include the difficulty of directly seeing the product items available in the storefront, the price of the product, and the stock of drugs that are about to expire or have expired (Maulana & Lubis, 2021). The processing of data relevant to the stock of goods greatly benefits, due to the precision and accuracy offered by modern information systems. The method applied is First Expired First Out (FEFO) which is useful for drug inventory management strategies where goods that are close to expiration in the warehouse will be sold first (F. Sembiring et al., 2019).

Based on these problems, it is necessary to design a website-based drug supply information system that is expected. Apotek Salam can make it easier to manage drug stock information by displaying drug information, drug stock, drug prices and drugs that will or have expired (Hermiati et al., 2021). This solution is expected to be able to improve the quality of drug supplies at Salam Pharmacy.

The objectives of the Salam Pharmacy drug information system research are as follows:

1. Designing a website-based drug supply information system so that there is no redundancy of data
2. Providing information on medications that are about to expire
3. Building a website-based Stock Taking System

The benefits of the Salam Pharmacy drug supply information system research are as follows:

1. Facilitate access when calculating drug stocks
2. Reduce errors when recapping data.
3. Facilitate the preparation of reports on drug stock, drug entry, drug dispensing, best-selling drugs and drugs that have or will expire.
4. Facilitating access and management of drug stock at Apotek Salam

Previous Research

Table 1. Previous Research

It	Research Title	Research Results	Relevance to research
1.	Design and Build a Drug Inventory Information System Using the Website-Based Safety Stock Method (Mikharani et al., 2022)	The results of the system test on the usability aspect obtained a result of 88.22% and it can be concluded that according to the respondents, namely strongly agree, based on the functionality test obtained 99.69%.	The waterfall method with the application of website-based safety stock inventory management.
2.	Design and Build a Web-Based Pharmacy Management Information System (Muhammad Khulaimi & Mufti Syawaludin, 2023)	Producing the information needed includes reports on purchases, sales, and existing drug stocks so that an effective, efficient, and productive pharmacy management is created.	The design method used is the SDLC (System Development Life Cycle) method with a waterfall model.

RESEARCH METHOD

Time and Place

The research time starts from February 2024. The place of research was carried out at Apotek Salam located on Jl. Kel. Pabuaran No. 16 RT 02 RW 09, Pabuaran, Cibinong, Bogor, West Java.

Waterfall *Development Methods*

Analysis

Gathering complete needs to be analyzed and defining what needs must be achieved by the program. Information can be obtained through surveys and drug databases for the last 1 year from Salam Pharmacy.

Design

Designing software designs as an estimate before the code is created. System designs can be created using Flowcharts, Flowmaps, or Unified Modeling Language (UML)

Implementation

At the stage where all the designs that have been previously made are converted into program codes. The generated code is still in the form of modules that must be combined at a later stage.

Testing

At this stage, the modules that have been made before are combined and tested to find out whether the software is in accordance with its design and function or not.

Deployment

At this stage, it can be said that it is final in the creation of software or systems. After testing with a Apotek Salam pharmacist to make drug purchase transactions, stock taking, drug sales, and expiration alerts.

Maintenance

This maintenance stage is the last stage of the waterfall model. The system has been completed and maintained. Maintenance is in the form of fixing errors that were not found in the previous step.

RESULT AND DISCUSSION

Planning

Use Case Diagram

A use case diagram is a scenario description of the interaction between the user and the system. Use case diagrams illustrate the relationship between actors and the activities they can do to the application. Based on the results of the needs analysis carried out by the researcher of the system to be designed, it can be shown in Figure 1.

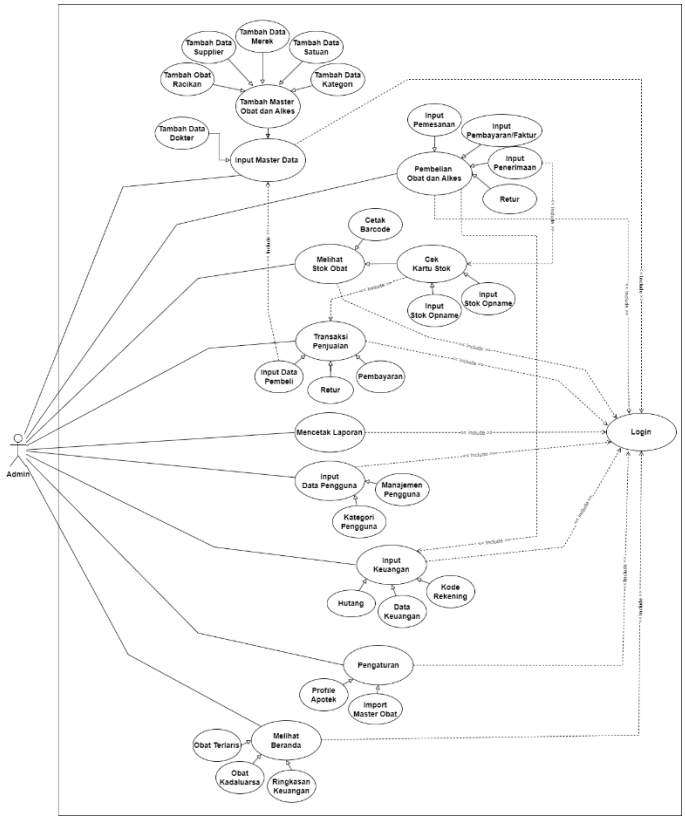


Figure 1. Use Case Diagram – Admin

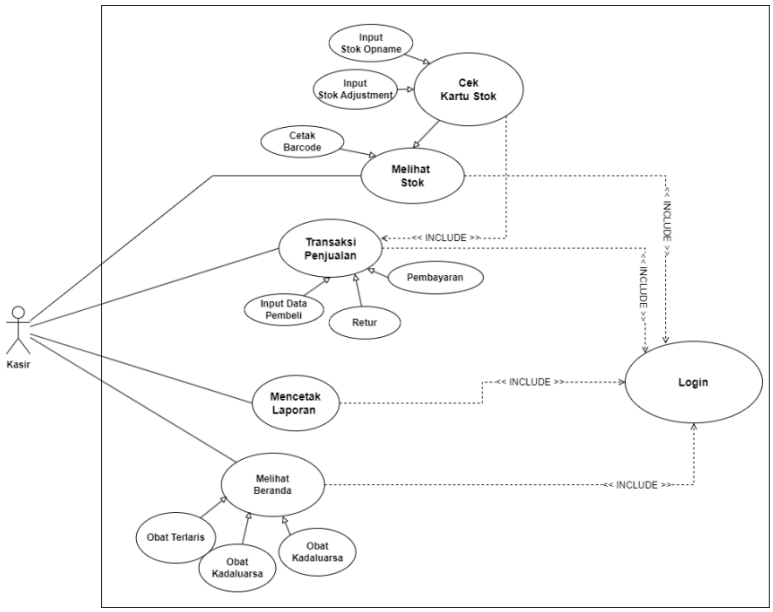


Figure 2. Use Case Diagram - Cashier

Activity Diagram

An activity diagram is a graphical representation of all stages of a workflow that contains activities, action choices, iterations and outcomes from those activities.

1. *Activity* Diagram *Login*

Login is the initial page that appears when the application is opened. The users who run the system are the admin and cashier at the Salam Pharmacy (N. S. B. Sembiring, 2023). By default, the cashier on the initial menu will appear directly to the sales menu and on the admin will appear a dashboard to see data on money in or out, best-selling drugs and expired or about to expire drugs. This activity diagram can be seen in Figure 3.

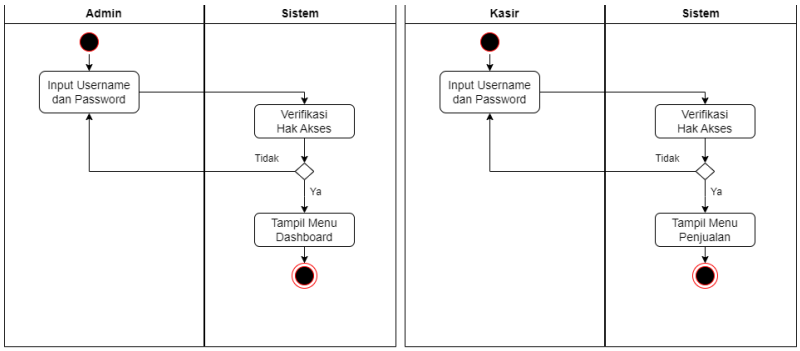


Figure 3. Activity Diagram Login

2. *Activity* Diagram Master Data Obat

The Master Menu is the core page of the Salam Pharmacy website which consists of the following:

a. Master Doctor

At this stage, register the doctor's name as a reference on the Salam pharmacy website.The activity diagram can be seen in Figure 4.

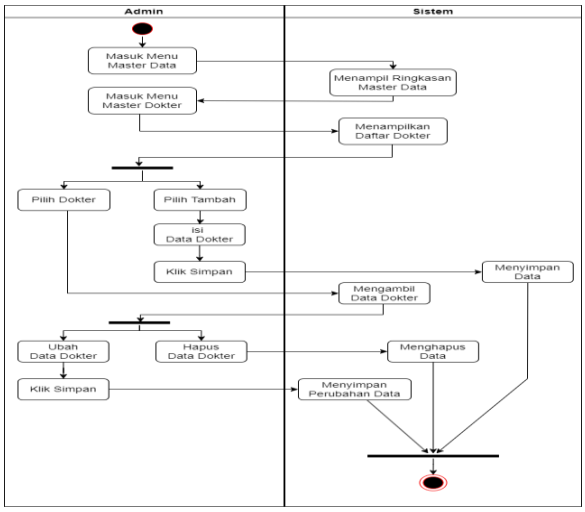


Figure 4. Activity Diagram Master Doctor

b. Master of Medicine and Medical Devices

This stage is to make a list of medicines and health equipment (alkes) on the Salam pharmacy website.The activity diagram can be seen in Figure 5.

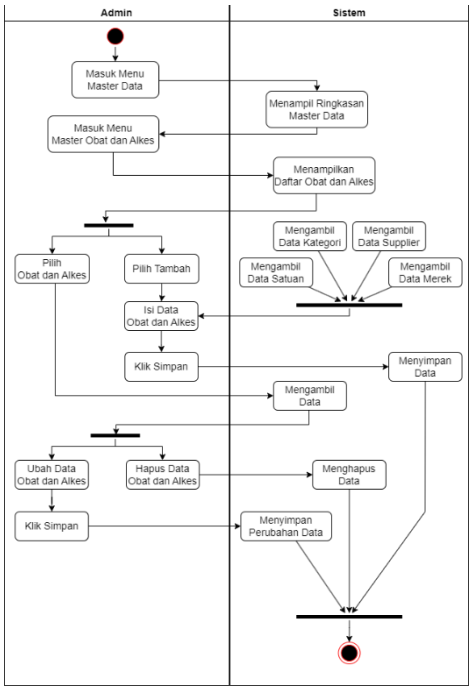


Figure 5. Activity Diagram Master of Medicine and Medical Devices

c. Master of Medicinal Ingredients

This stage is to make a concoction drug from several patent drugs so that it becomes a drug unit. This activity diagram can be seen in Figure 6.

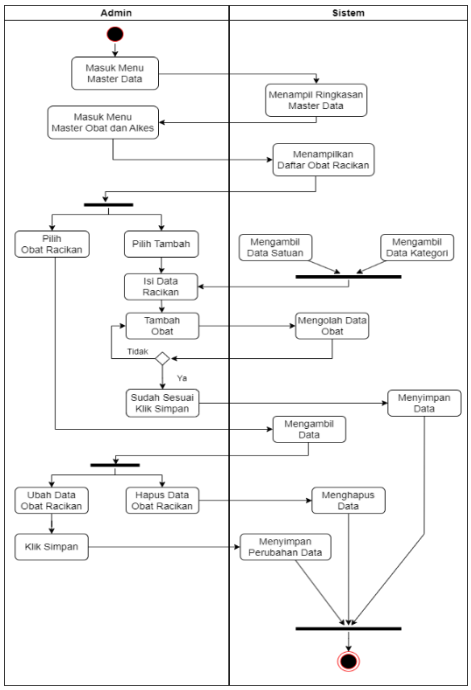


Figure 6. Activity Diagram of Compound Drugs

d. Master Merek

This stage is to make a list of brands as a reference for drugs or medical devices (medical devices). The activity diagram can be seen in Figure 7.

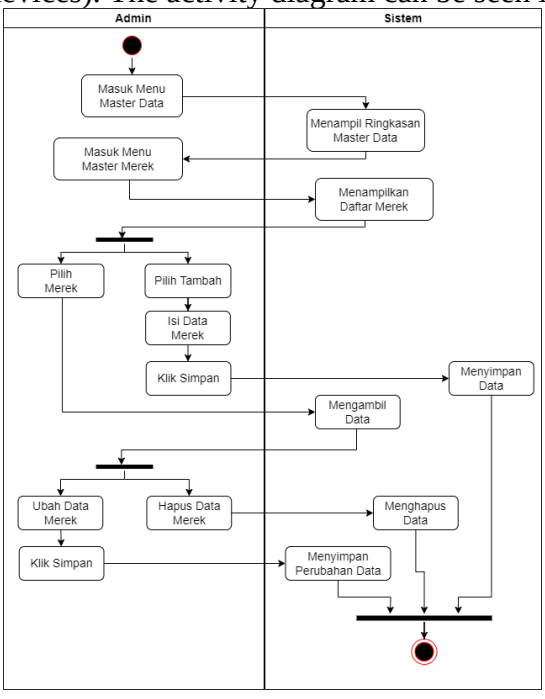


Figure 7. Brand Master Activity Diagram

e. Unit Master

This stage is to make a unit reference in buying or selling drugs. *The activity* diagram can be seen in Figure 8.

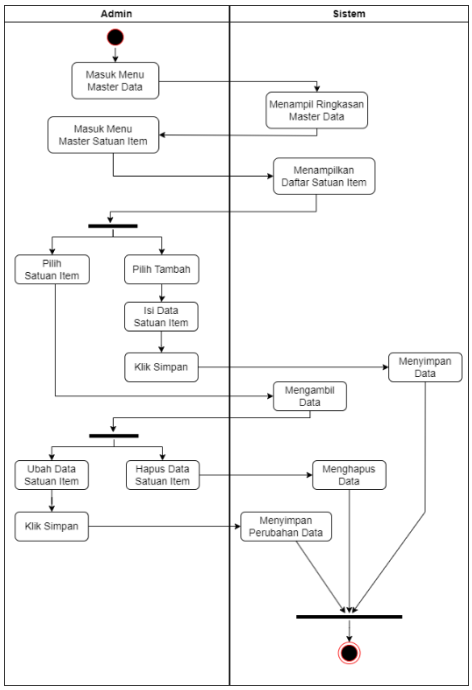


Figure 8. Activity Diagram Master Unit

f. Master Category

This stage is to make a reference for the drug class category. This activity can be seen in Figure 9.

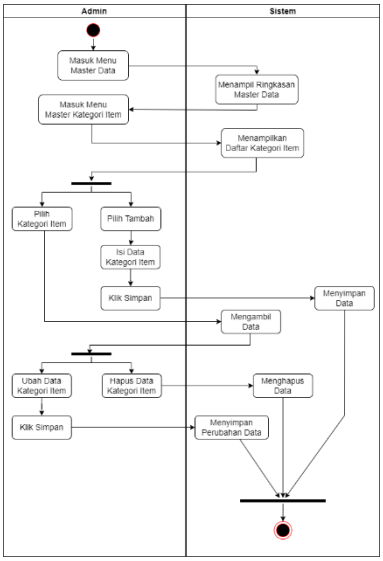


Figure 9. Activity Diagram Master Category

g. Master Supplier

This stage is to make a reference for drugs or medical devices. The activity diagram can be seen in Figure 10.

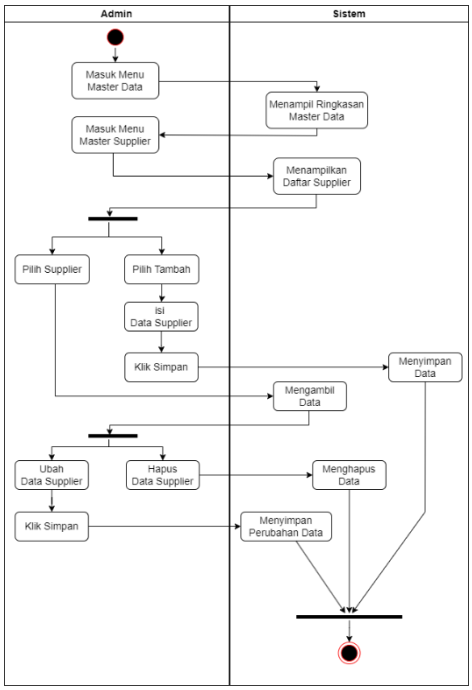


Figure 10. Activity Diagram Master Supplier

3. Activity Purchase Diagram

The menu for ordering drugs and medical equipment is used to purchase drugs to suppliers. The following are the stages of the activity diagram of drug purchase:

h. Most recent booking

The ordering stage or better known by the user of the Purchase Order (PO) of drugs or medical devices (medical devices) to the supplier and at the same time the beginning of recording the expiration date of drugs and medical devices. The activity diagram can be seen in Figure 11.

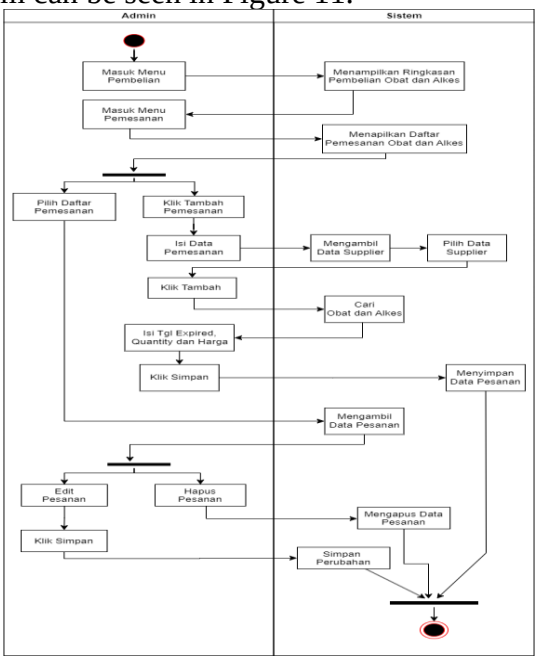


Figure 11. Activity Diagram Booking

i. Payment

This stage uses order data as a reference as a record of the pharmacy paying in Cash or term (debt within a day). This activity diagram can be seen in Figure 12.

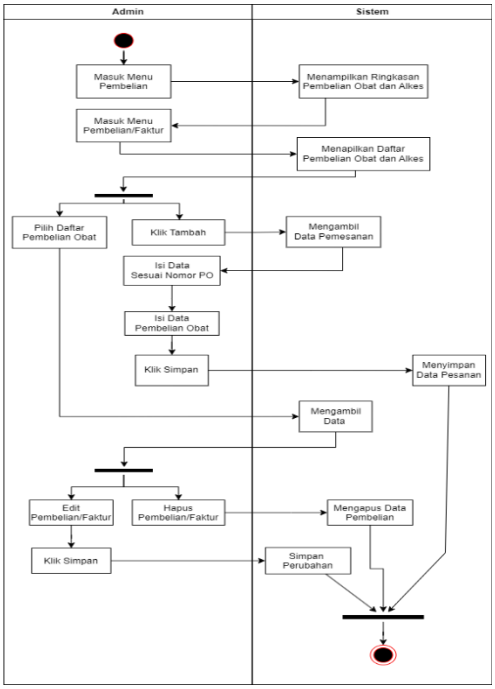


Figure 12. Activity Payment Diagram

j. Acceptance

This stage is the last check that will be recorded as a reference for stock card data. The activity diagram can be seen in Figure 13.

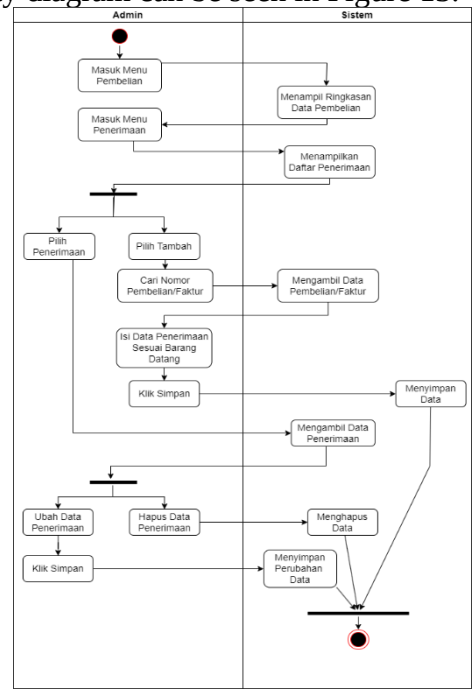


Figure 13. Activity Diagram Receipt

4. Activity Stock Charts

This stock menu aims to regulate and maintain the inventory in the pharmacy can run well from the quantity of drugs or medical devices (medical devices) to the expiration date. The activity diagram on the stock menu is as follows:

k. Print Barcode

At this stage, it helps users to print barcodes in order to speed up the sales process. This activity diagram can be seen in Figure 14.

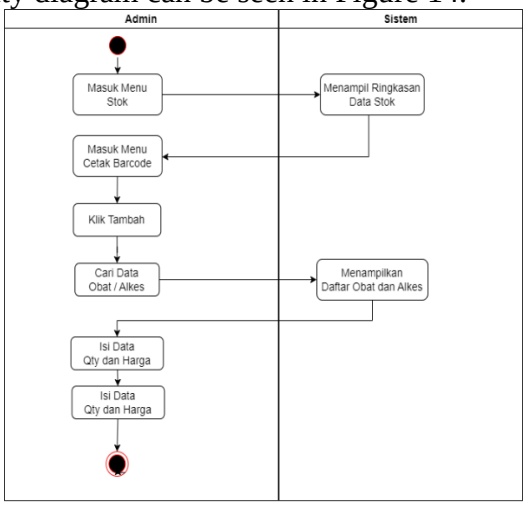


Figure 14. Activity Diagram Print Barcode

l. Stock Card

This stage aims to maintain the quantity and expiration date of the stock card on the drug. There is a sub-menu to support the stock card, namely Stock Taking to add the quantity of drugs based on the expiration date and Stock Adjustment to reduce the excess stock quantity based on the expiration date. The activity diagram can be seen in Figure 15.

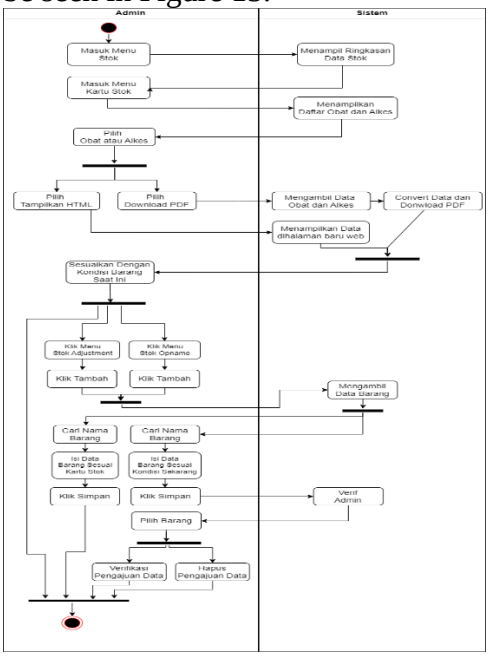


Figure 15. Activity Diagram Stock Card

5. Activity Transaction Sales Diagram

This activity aims to explain the flow diagram of the Salam pharmacy website, as follows:

m. Payment Type

This stage makes a payment reference in the sales process. The activity diagram can be seen in Figure 16.

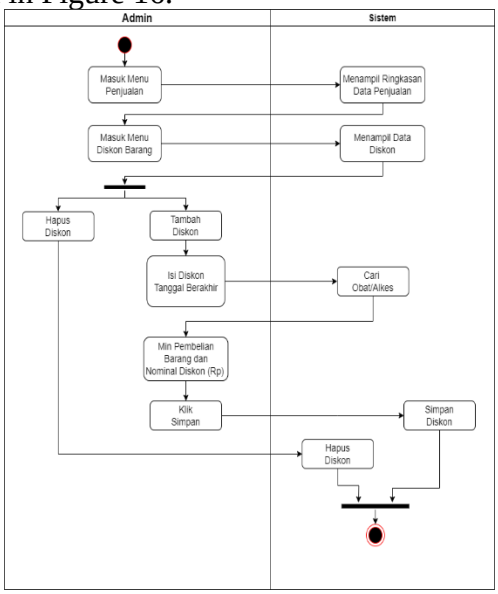


Figure 16. Activity Diagram Payment Type

n. Discount

This stage makes discounts on drugs or medical devices (medical devices) until a certain date at the minimum purchase. The activity diagram can be seen in Figure 17.

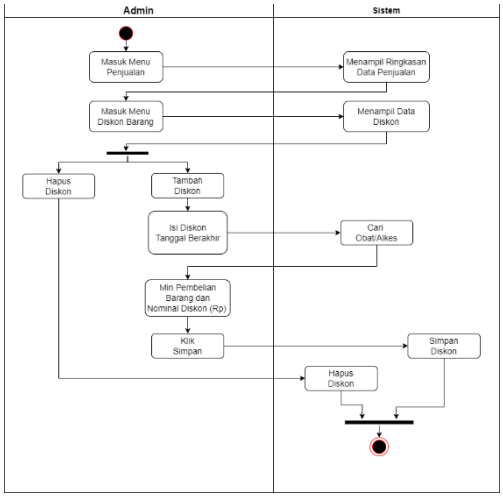
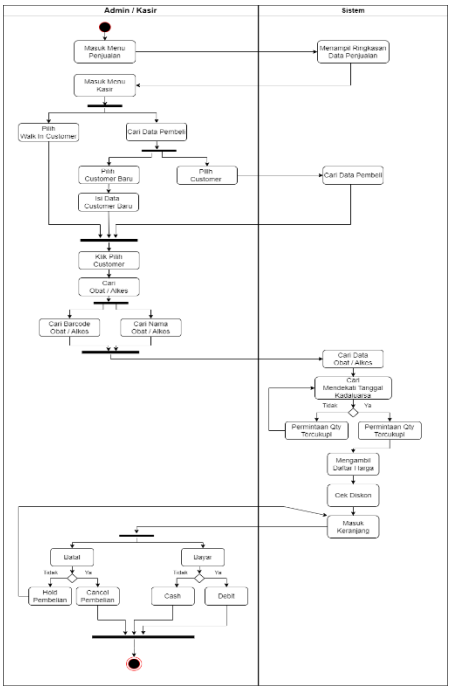


Figure 17. Activity Diagram Discount

o. Cashier

Stages in the process of selling drugs and medical devices (alkes) at the Salam pharmacy. The activity diagram can be seen in Figure 18.



Gambar 18. Activity Diagram Kasir

6. Activity Diagram Keuangan

p. Account Code

This stage is to create an account code reference. The activity diagram can be seen in Figure 19.

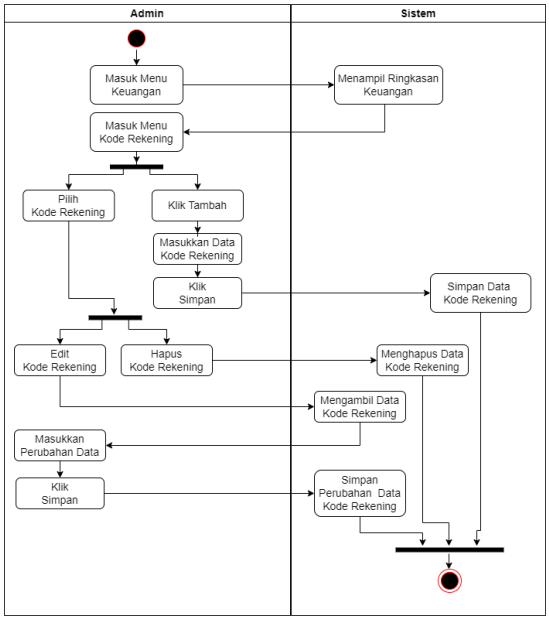
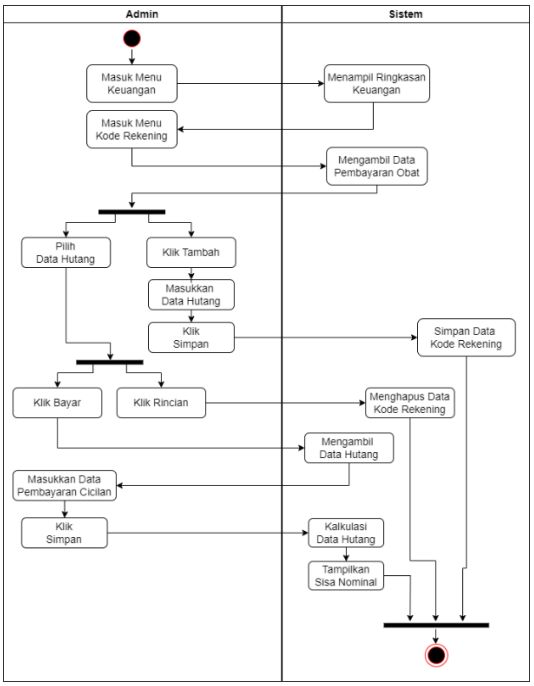


Figure 19. Activity Diagram Account Code

q. Debt

This stage is for recording debts or purchasing drugs on a term basis (within a certain period of time). The activity diagram can be seen in Figure 20.



Gambar 20. Activity Diagram Hutang

r. Financial Data

This stage is for recording as well as categorizing incoming and outgoing money. The activity diagram can be seen in Figure 21.

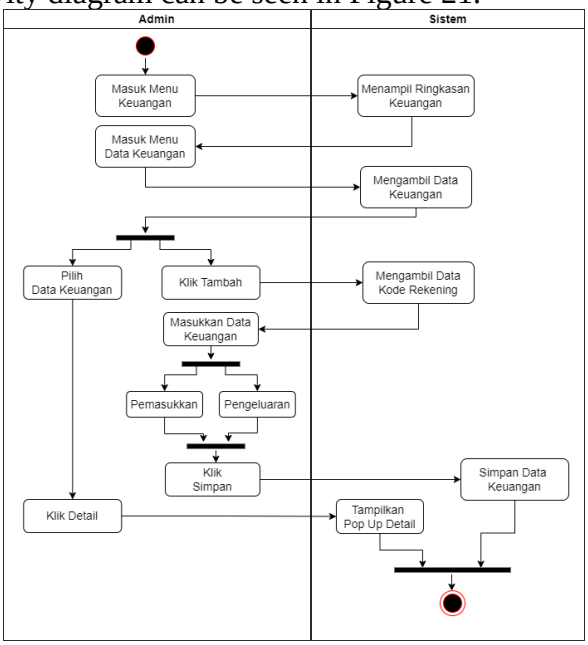
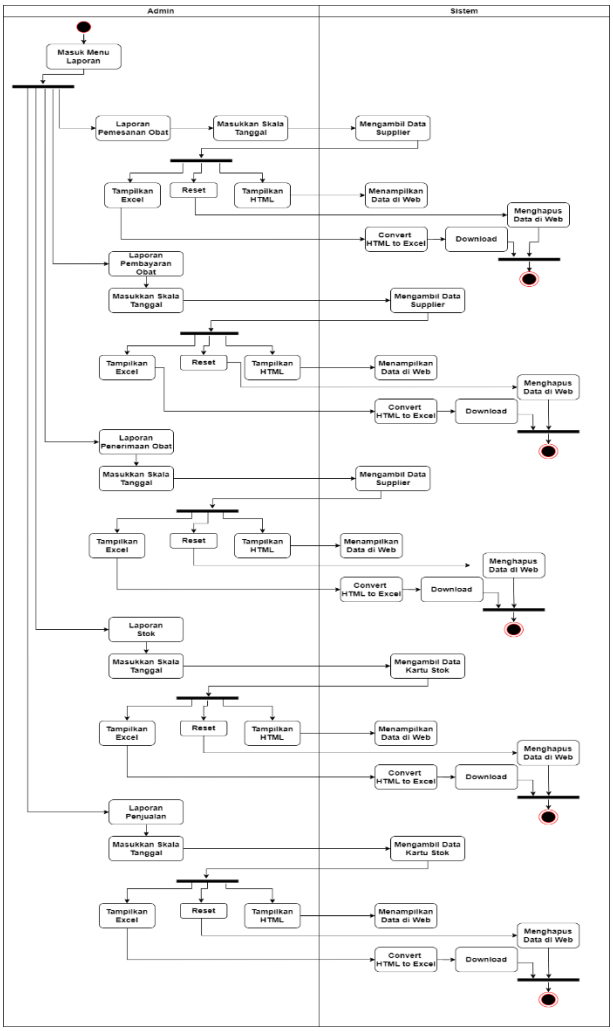


Figure 21. Activity Financial Data Diagram

7. Activity Diagram Laporan

This stage is to create a report. The activity diagram can be seen in Figure 22.



Gambar 22. Activity Diagram Laporan

8. Activity Diagram Pengguna

This stage creates the user and sets their access rights. The activity diagram can be seen in Figure 23.

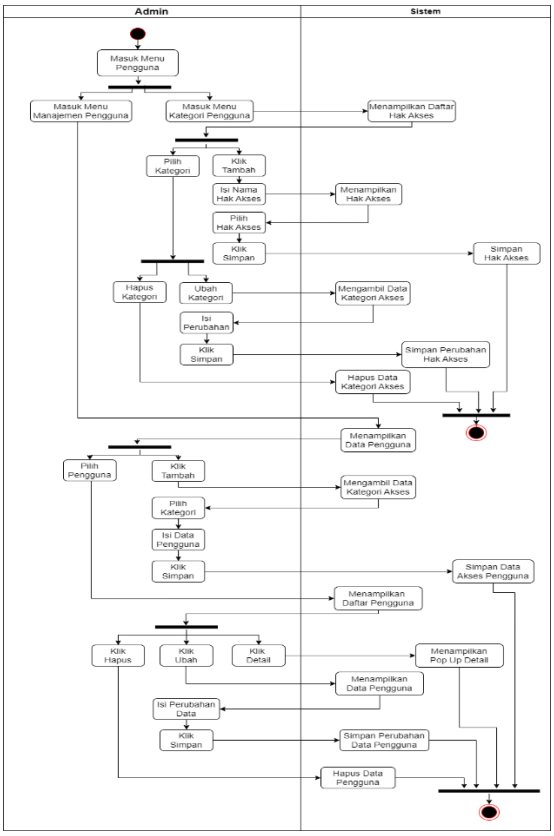


Figure 23. User Activity Diagram

9. Activity Diagram Settings

This stage makes settings on the website , namely for Pharmacy Profile and Import Bulk to Drug Master. The activity diagram can be seen in Figure 24.

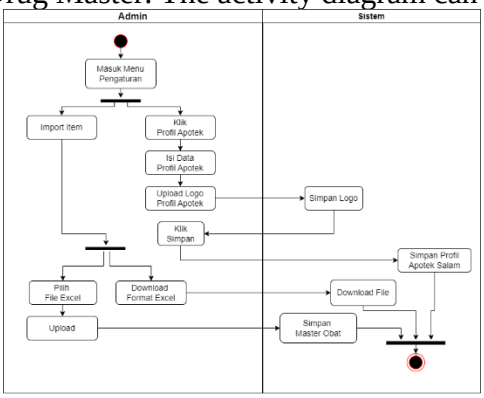


Figure 24. Activity Diagram Settings.

Implementation Results

The implementation of the Salam pharmacy website application is operated by two users, namely, the admin and the cashier. In this section, the implementation will be explained according to the needs of the user (Cahyanti et al., 2021).

Login Menu

The login menu is the main entrance to the system where there is a simple username, password and login button columns to make users can access the website faster to access the menu as needed. As well as to maintain the security of user

password data generated using bcrypt hash and the security codeigniter method with tokens .

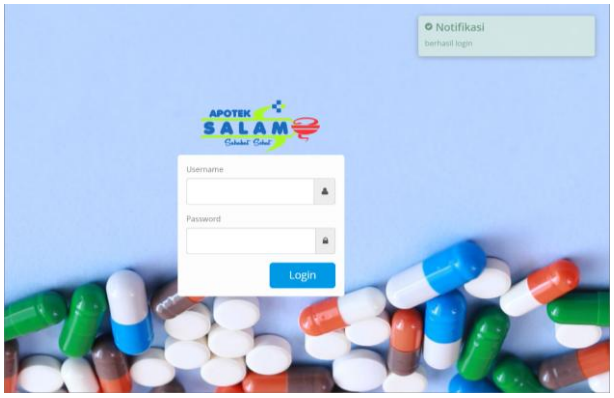


Figure 25. Login Menu

Home Menu

This menu informs the admin of a summary of Salam Pharmacy data consisting of best-selling drugs, expired drugs and other summaries.

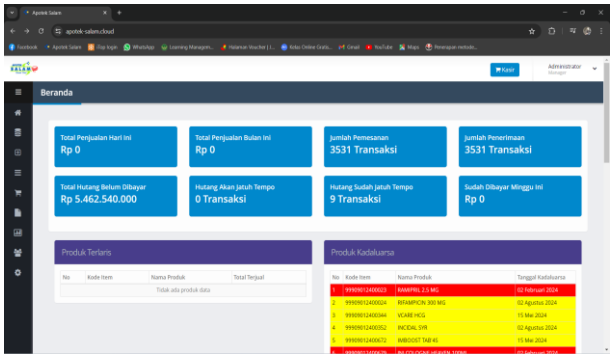


Figure 26. Admin Home Menu

Master Menu of Medicines and Medical Devices

This menu is used to make a list of drugs on the Salam Pharmacy website.

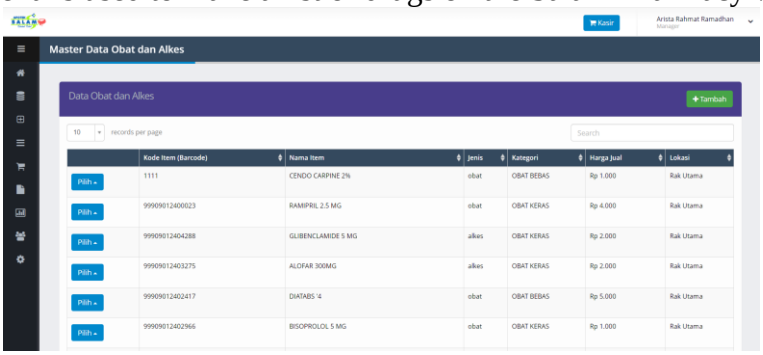


Figure 27. Master Menu of Medicines and Medical Devices

Purchase Menu

This page makes purchases to suppliers from ordering, payment, receipt and return of drugs or medical devices. This menu is the beginning of the stages of the Fisrt Expired First Out (FEFO) method, which is the recording of drugs or medical devices with quantities based on their expiration dates.

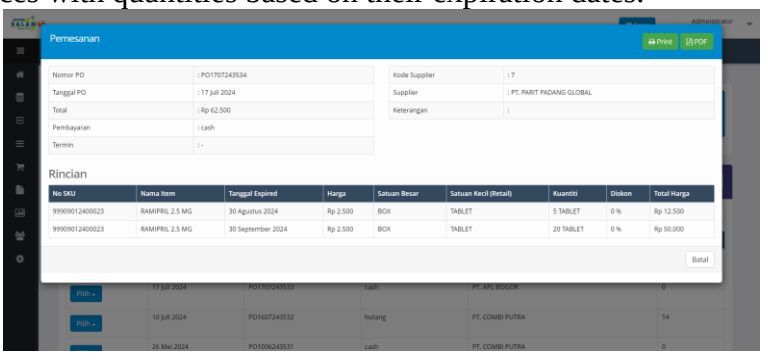


Figure 28. Booking Menu

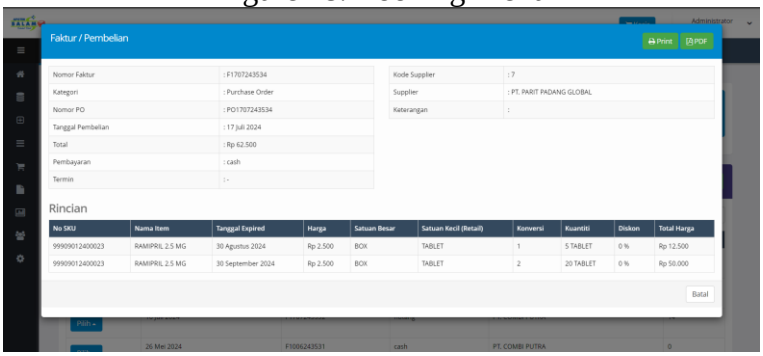


Figure 29. Payment/Invoice Menu

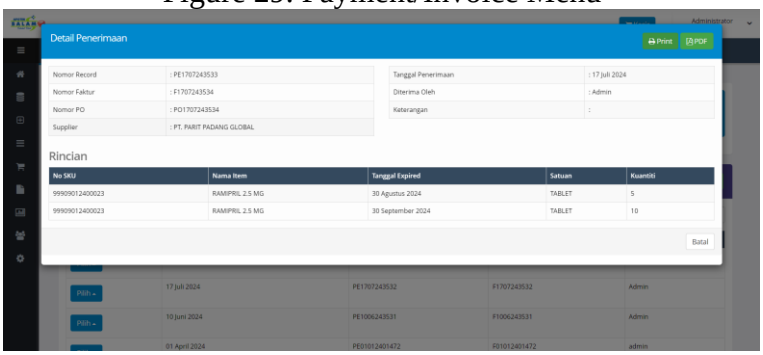


Figure 30. Admission Menu

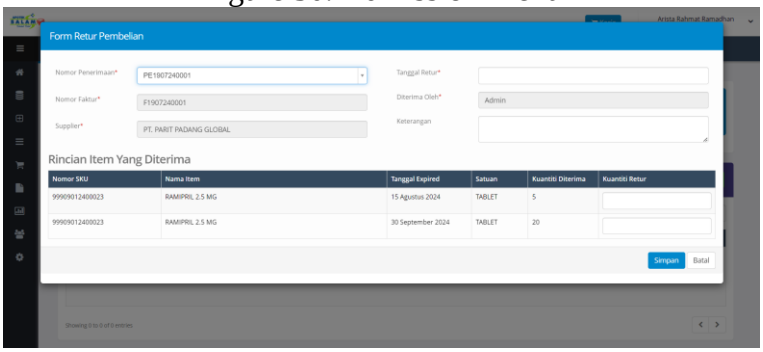


Figure 31. Return Menu

Sales Menu

This page sells drugs or medical devices to customers. This menu is in the Fisrt Expired First Out (FEFO) method, which is the issuance of quantities of drugs or medical devices based on their expiration dates.

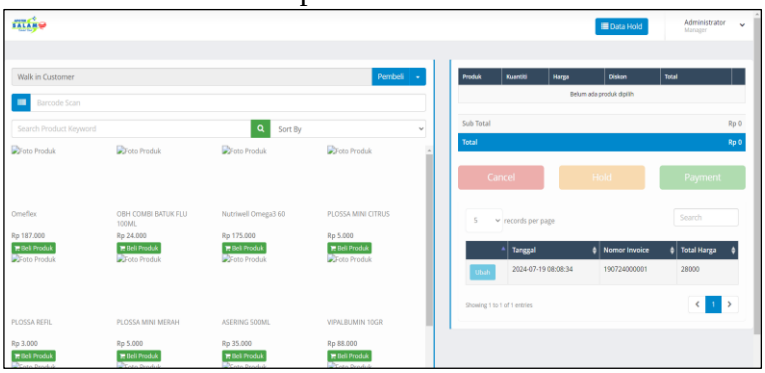


Figure 32. Sales Menu

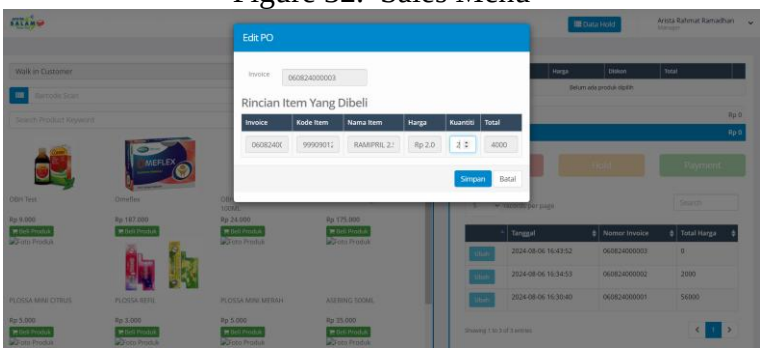


Figure 33. Sales Edit Menu

Stock Card Menu

This page checks drug or medical device data. In this menu, we can find out that the Fisrt Expired First Out (FEFO) method is in accordance with expectations.

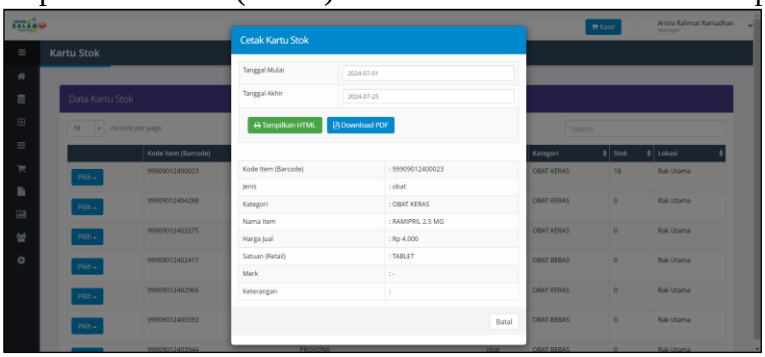
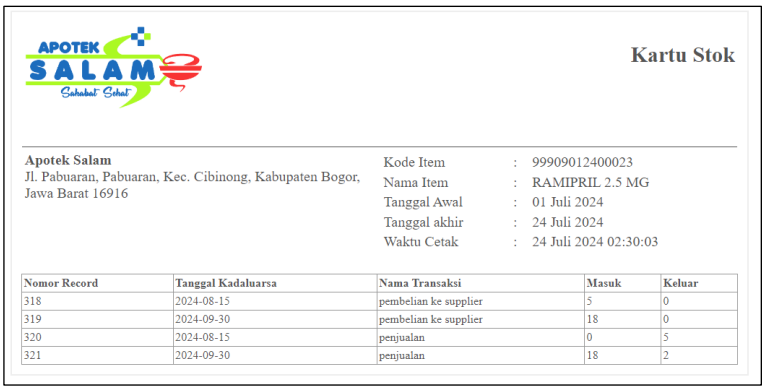


Figure 34. Stock Card Menu



APOTEK SALAM
Sahabat Sehat

Kartu Stok

Apotek Salam
Jl. Pabuaran, Pabuaran, Kec. Cibinong, Kabupaten Bogor, Jawa Barat 16916

Kode Item : 99090012400023
Nama Item : RAMIPRIL 2.5 MG
Tanggal Awal : 01 Juli 2024
Tanggal akhir : 24 Juli 2024
Waktu Cetak : 24 Juli 2024 02:30:03

Nomor Record	Tanggal Kadaluarsa	Nama Transaksi	Masuk	Keluar
318	2024-08-15	pembelian ke supplier	5	0
319	2024-09-30	pembelian ke supplier	18	0
320	2024-08-15	penjualan	0	5
321	2024-09-30	penjualan	18	2

Figure 35. Stock Card Print Display

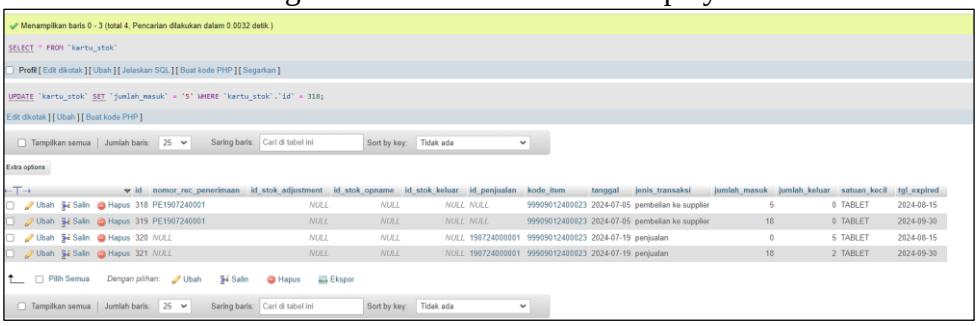


Figure 36. Stock Card Database

Menu Stick Recording

This page is used to increase the quantity of drugs based on their expiration date according to the conditions at the salam pharmacy. At the same time, to keep the supplies in the salam pot running well in accordance with the FEFO (First Expired First Out) method, checking drug or medical device data.

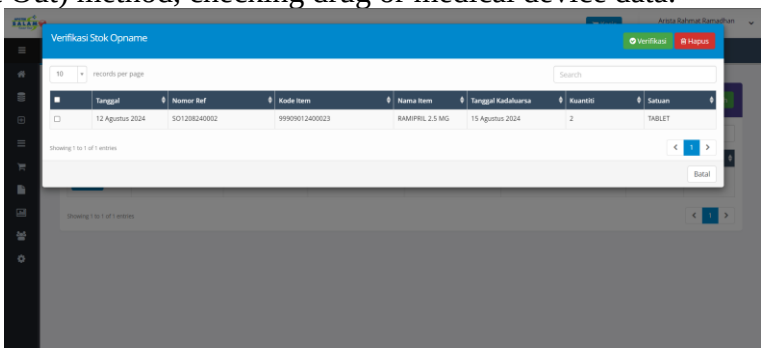


Figure 37. Stock Menu Opname

Menu Stok Adjustment

This page is used to reduce the quantity of drugs based on their expiration date according to the conditions in the salam pharmacy. At the same time, to keep the supplies in the salam pot running well in accordance with the FEFO (First Expired First Out) method, checking drug or medical device data.

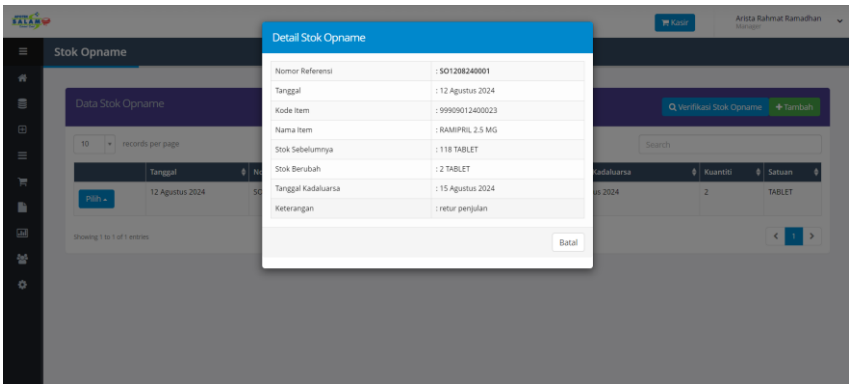


Figure 38. Stock Adjustment Menu

CONCLUSION

Based on the results of the case study research and discussion presented in the previous chapter, the conclusions that can be drawn in the Design and Construction of a Website-Based Drug Inventory Information System at Salam Pharmacy in Cibinong, are: 1. This system helps maintain the supply of medicines and medical devices at the salam pharmacy in terms of processing the expiration date on incoming and outgoing medicines. 2. This system can provide alerts on drugs that are about to expire or have expired in red and yellow on the home menu. 3. This system can be used on tablets and computers to facilitate user access in collecting drug stock data with the presence of a stock taking menu and stock adjustment.

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