Design of Cashier Information System and Sales of Jaya Putra 04 Store Based on Website Using Waterfall Method

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Article Info

ABSTRACT

In the digital era, the need for effective and efficient information systems has become increasingly important to support business operations. This study aims to design and develop a web-based cashier information system for Toko Jaya Putra 04 using the Waterfall method. The system is designed to address challenges in manual transactions, such as long queues, recording errors, and lack of stock visibility. The research stages include requirements analysis, system design using Unified Modeling Language (UML), implementation with PHP programming language and MySQL database, testing using the Black Box Testing method, and system maintenance. The results show that this cashier information system can improve transaction process efficiency, reduce customer waiting times, and simplify stock management and financial reporting. This system is expected to be further developed with additional features, such as digital payment integration, customer loyalty programs, and enhanced data security. By implementing this system, Toko Jaya Putra 04 can enhance service quality and support more strategic business decision-making.

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1. INTRODUCTION

The development of information technology in the era of modernization and advanced technology today, everyone is required to be able to present information quickly and accurately [1]. The many efforts made by every human being in various sales, both traditional and modern, make people do various ways by utilizing existing technology [2]. An information system is a system in an organization to summarize the needs of the process in the daily flow of information and will provide results in accordance with the information data that they need to be used as a reference for making a decision [3]. The website-based Cashier System is a system developed to support the smooth transaction process in a coffee shop, This system uses the website as a medium to make transactions and can be used by the Cashier at the coffee shop [4]. The method used in the development of this system is the Waterfall method, called waterfall because it provides a sequential or sequential approach to the software lifecycle starting from the analysis, design, coding, testing, and supporting stages [5].

Cashiers or shop owners of Jaya Putra 04 have difficulty knowing the data on the results of the process, and when the

transaction is about to take place, it can disappoint customers when queuing for too long, especially until it runs out of stock, because there is no special information to tell how much stock is available. Therefore, it is necessary to create an information system program or application for cashiers that is made in the form of a website to facilitate all sales and recapitulation and bookkeeping transaction processes at the Jaya Putra 04 wholesale and retail clothing store.

2. LITERATURE REVIEW

The application of sales cashiers to micro, small and medium businesses is the answer to the problems that exist in one of the micro, small and medium businesses of bag craftsmen in the Leles area, Garut Regency. As a result of observations and interviews with micro, small and medium business owners, the problem is that the transaction process is still manual using written notes so that it is very risky for notes to be lost or damaged, the profit calculation process is sometimes unbalanced due to human error during the recapitulation process and the absence of debt records so that the reseller debt payment process is sometimes out of sync. The purpose of making this application is to help the process of sales activities in micro, small and medium enterprises, help manage debts and receivables, and assist in the process of recapitulation of income statements. Rational Unified Process (RUP) where the implementation stages only include inception, elaboration, and construction are part of the methodology used. Then the Uinifbieid Miodeilling Lainguaige modderling and alpha testing using the Blacik Box Tiesiting method is carried out at the construction stage, so that the programming is PHP and MiySql as well as the database. The results of this research are in the form of a Web-Based Sales Cashier Application for Micro, Small and Medium Enterprises that chooses multi-user access rights and is equipped with transaction features, debt management and profit and loss statements [6].

In the context of the ever-evolving digital era, the management of cashier information systems is very important to support the operations of various businesses, including service units such as Toko Raya Computer. An effective cashier information system not only simplifies the transaction process, but also facilitates efficient inventory management and accurate sales tracking. This article explains the implementation of the cashier information system in the service unit of Toko Raya Computer which previously faced manual transaction problems that slowed down the process and affected employee performance. By implementing a cashier information system, Toko Raya Computer has succeeded in speeding up the transaction process and improving data accuracy. The system not only simplifies day-to-day transactions, but also provides the ability to generate accurate data reports to support strategic decision-making and improve overall operational efficiency. The decision to adopt a cashier information system helped Toko Raya Computer overcome manual limitations and opened the door for sustainable business growth in the future [7].

The rapid growth of the café business in Indonesia with a large number of visitors, so that cafes have difficulty paying attention to orders. Visitors wait too long to get their orders so there is less comfort for visitors. This cashier application information system is designed in the process of ordering food and beverage menus based on a website using a quick response code (QR) whose goal is to make café operations run faster, safer, more effective, and more accurate. The methodology used is Rational Unified Process, as one of the stages of application development with four stages used, namely inception, elaboration, construction, and transition using UML modeling. This cashier information system application results in better management of café sales reports because of the computerized process, so the data can be stored safely. This information system is based on the MySQL database and

is developed using the PHP programming language. [8]

This research activity was carried out because the checkout of grocery stores until now uses the manual method when entering information, so there is a long queue of customers. The manual transaction system has a lot of disadvantages, including recording transactions and searching for complicated data information, because when looking for information, cashiers have to record with quite a lot of records. There is no way to find inventory stock info, so store owners often find out when the transaction process has problems that disappoint customers. Because of these weaknesses, it is necessary to have a cashier sales system with a website/web basis which can facilitate the processing of information data statistics that will later be carried out by cashier servants. The method used is the waterfall method, which in the production of cash registers begins with the stages of analysis, application design, coding implementation, application testing, error evaluation and development. [9]

The development of information technology in the era of modernization and advanced technology today, everyone is required to be able to present information quickly and accurately, including the Xis Coffee Shop. XIS coffee shops that provide various kinds of coffee, snacks, and snacks still use cashiers manually in the transaction process. This can lead to calculation and recording errors that have an impact on time efficiency and data accuracy. Based on these problems, this research wants to solve these problems by developing a web-based cashier application. This application aims to simplify the process of payment transactions, ordering food menus, and drinks. The application was developed using the waterfall method. The waterfall method was chosen because the development of the system was carried out in a structured and orderly manner. In the design stage, the author uses several tools such as Unified Modeling Language (UML) and produces Use Case, Activity, and Entity Relationship Diagram (ERD) diagrams. The result of this research is a website-based

cashier application developed with the PHP programming language, a MySQL database with an automatic billing feature with the ability to change the amount, delete items, and payment systems, thus helping to reduce calculation errors. The application can be further developed by adding features such as stock management and financial reports that can help business owners monitor the development of their business and can be developed in the form of an Android or iOS application. 10]

From the literature review obtained, it was concluded that the sales information system is very important for business owners, both small and large-scale, because with the sales information system operated by the cashier, the owner will very easily control and monitor the sales results and the results of the bookkeeping recapitulation as a whole.

3. METHODS

3.1 Research Materials

The data used for the processing and design of the website-based cashier information system in this study is sales transaction data at Jaya Putra 04 clothing wholesale and retail stores from the beginning of the month to the end of the month of 2023

3.2 Research Tools

3.2.1 Hardware

Several pieces of hardware are required in program design and implementation. The main hardware needed includes a computer with a minimum processor specification with a frequency of 1 GHz and 500Mb memory.

3.2.2 Software

In addition to hardware support, software is also needed to design and implement the program. The software is used in designing activities with UML, PHPmyadmin, dreamweaver and mysql databases.

3.3 Research Procedures

The method used in this study is the Waterfall Method. The Waterfall method is a classical model that has sequential properties in designing the system [11]. An illustration of the Waterffal Method can be seen in figure 1.
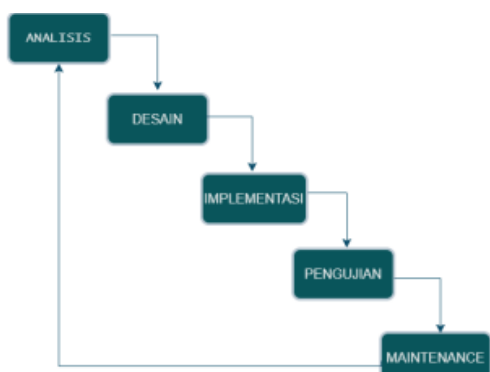
Figure 3.1. Illustration of the Waterfall Model

The waterfall method used in the development of this software uses a waterfall model which is divided into five stages:

3.3.1 Analysis

At this stage, the author outlines the requirements for the development of the sales application program, starting from the processing of goods data, sales transaction data, In addition, the author analyzes and collects information about the software needed to develop the application.

3.3.2 Design

At the design stage, design design is carried out by designing Use Case Diagrams, Entity Relationship Diagrams, Activity Diagrams, and UIs.

3.3.3 Implementation

Implement from the design results in programming languages and databases.

3.3.4 Testing

After the implementation stage is carried out, at this stage tests of the application that has been completed are carried out. Testing is carried out using Black Box Testing. Testing aims to reduce errors that occur in the system.

3.3.5 Maintenance

Performing web application maintenance by fixing existing problems and also backing up and updating data.

4. RESULTS AND DISCUSSION

4.1 Research Results

The results of the research in the form of a website-based cashier information system with the following display:

1) **Log In Display**

The initial login display below is the first view to log in by entering the password and username that has been determined
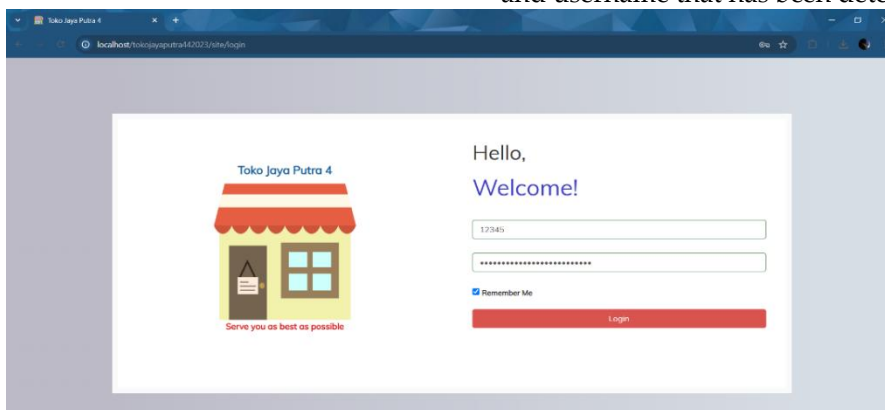

Figure 4.2 Login Display

2) **Cashier Display**

Below is the display on the cashier screen, in which there are several menus both for sales transactions and to see all suppliers with payment status in due or paid, as well as to determine purchases as wholesale or retail.
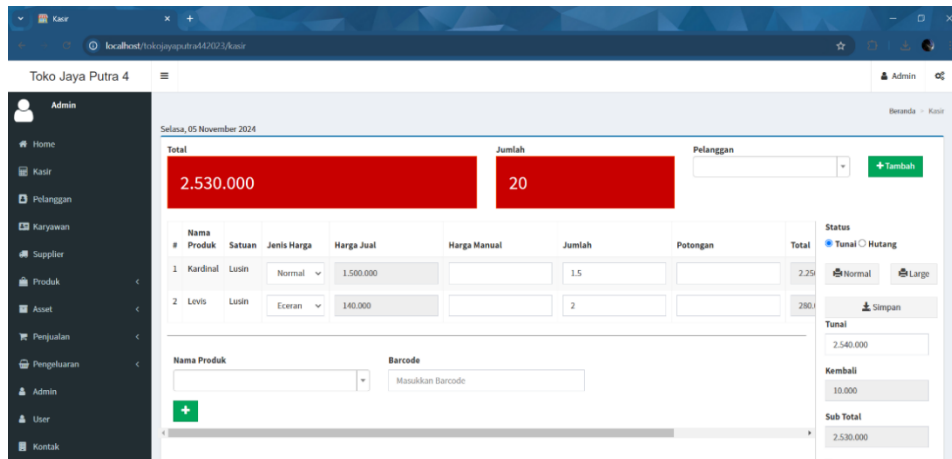
Figure 4.3 Cashier Display

3) **Product Display**

The next display is a list of available products, in this menu you can enter data on newly arrived goods and can find out the remaining stock available
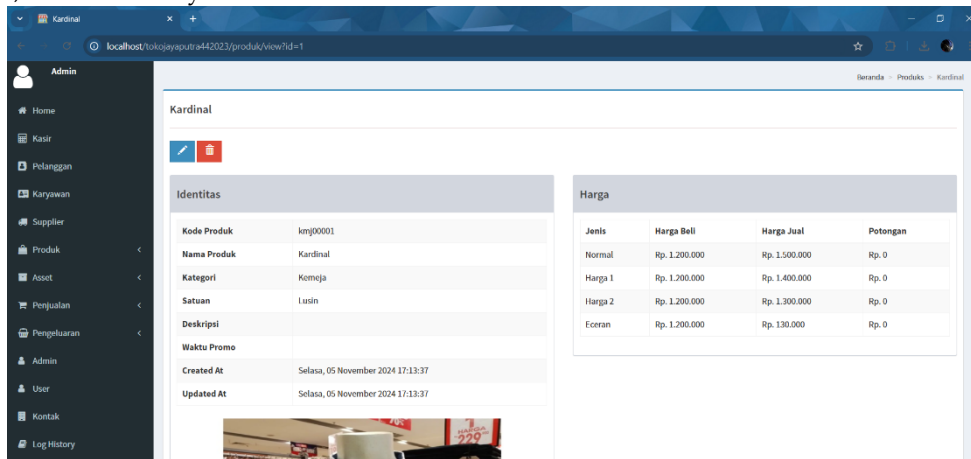

Figure 4.4 Product Display

4) **Transaction View**

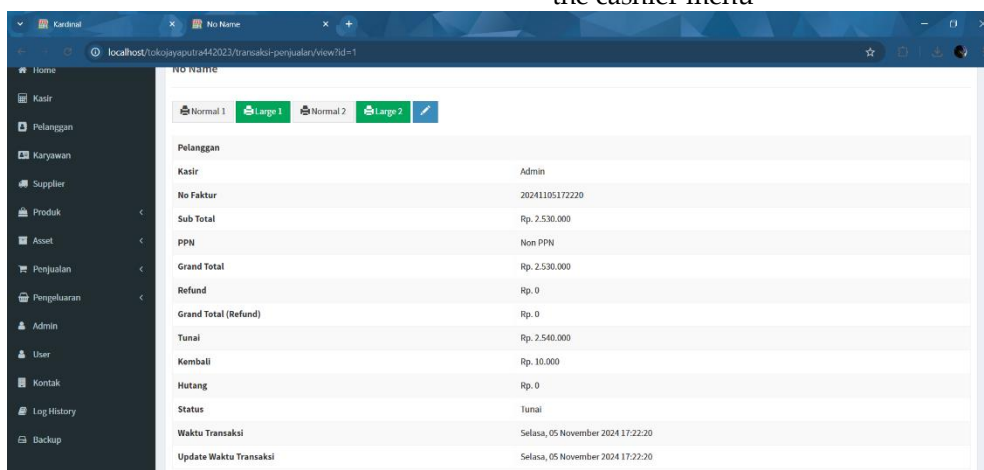In addition, there is also a transaction display as below, this transaction menu is in the cashier menu

Figure 4.5 Transaction Display

5) **View Transaction Details**

The transaction details can also be seen as shown in the display below
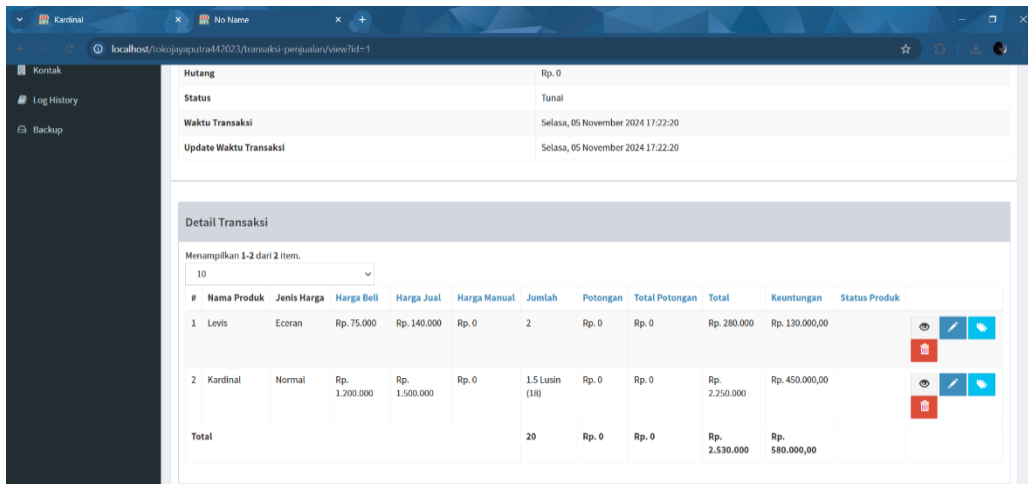
Figure 4.6 Transaction Details Display

6) Stock Asset View

The display below shows the available stock data, from this data it can be seen that the stock is small so that to make additional decisions so that there is no vacancy
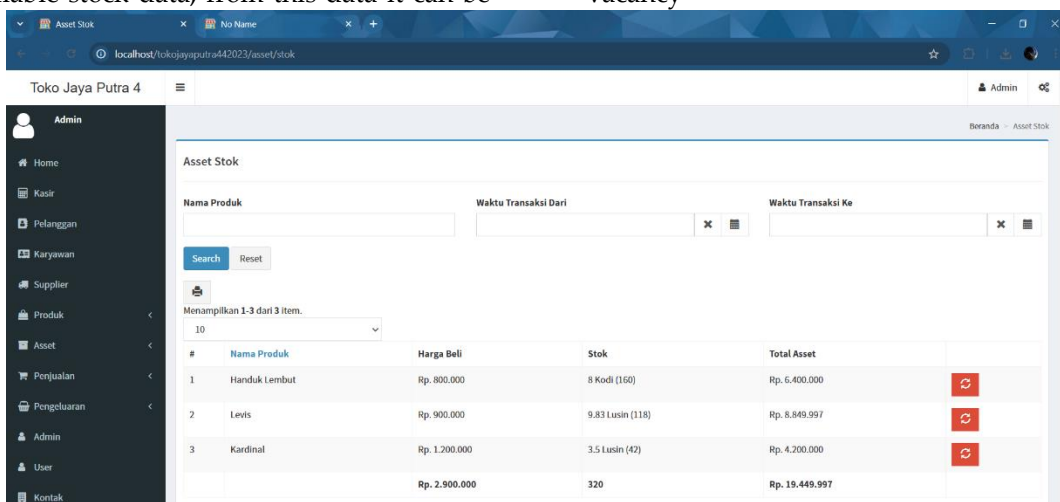
Figure 4.7 Stock Asset Display

4.2 Discussion

4.2.1 Data Flow Diagram (DFD
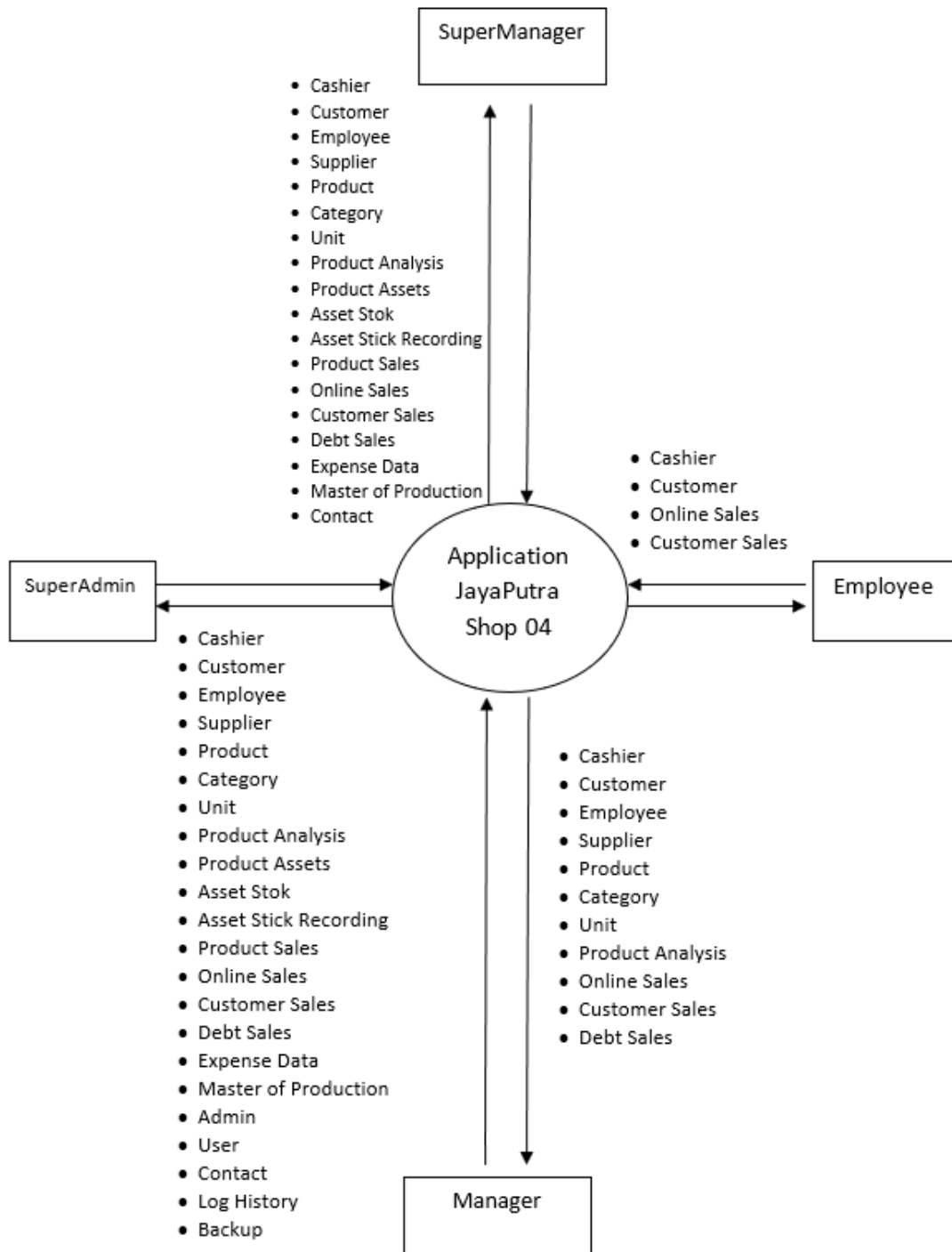
Figure 4.8. Context Diagram
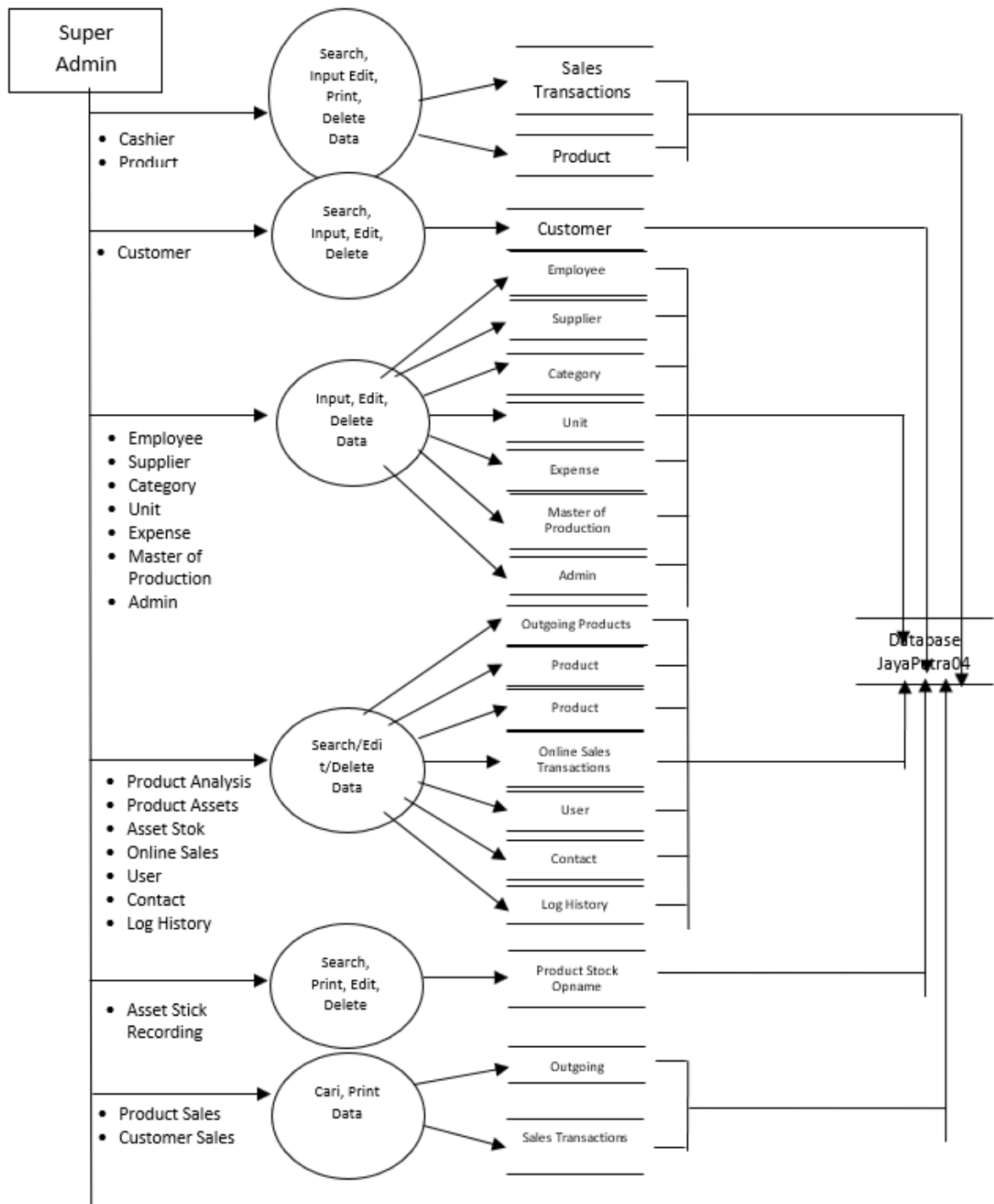
Figure 4.9. DFD Level 0 (SuperAdmin) – Part 1
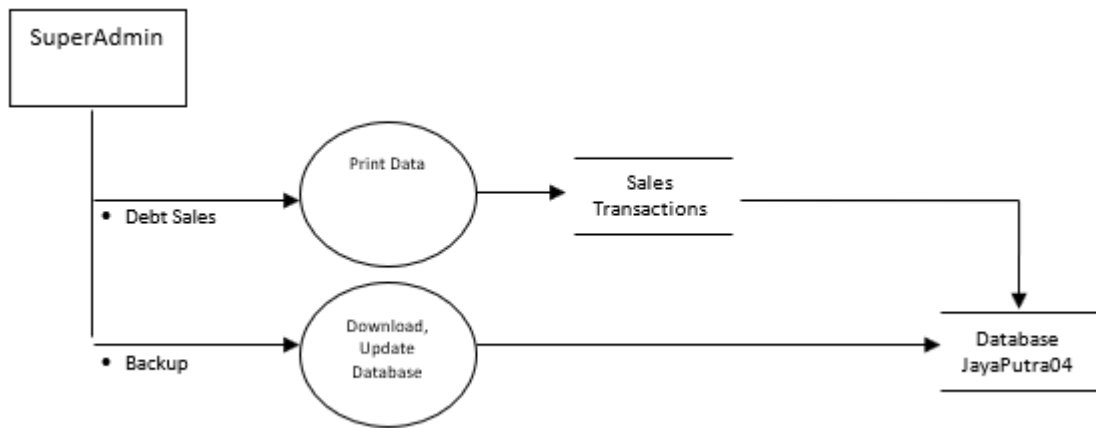
Figure 4.10. DFD Level 0 (SuperAdmin) – Part 2
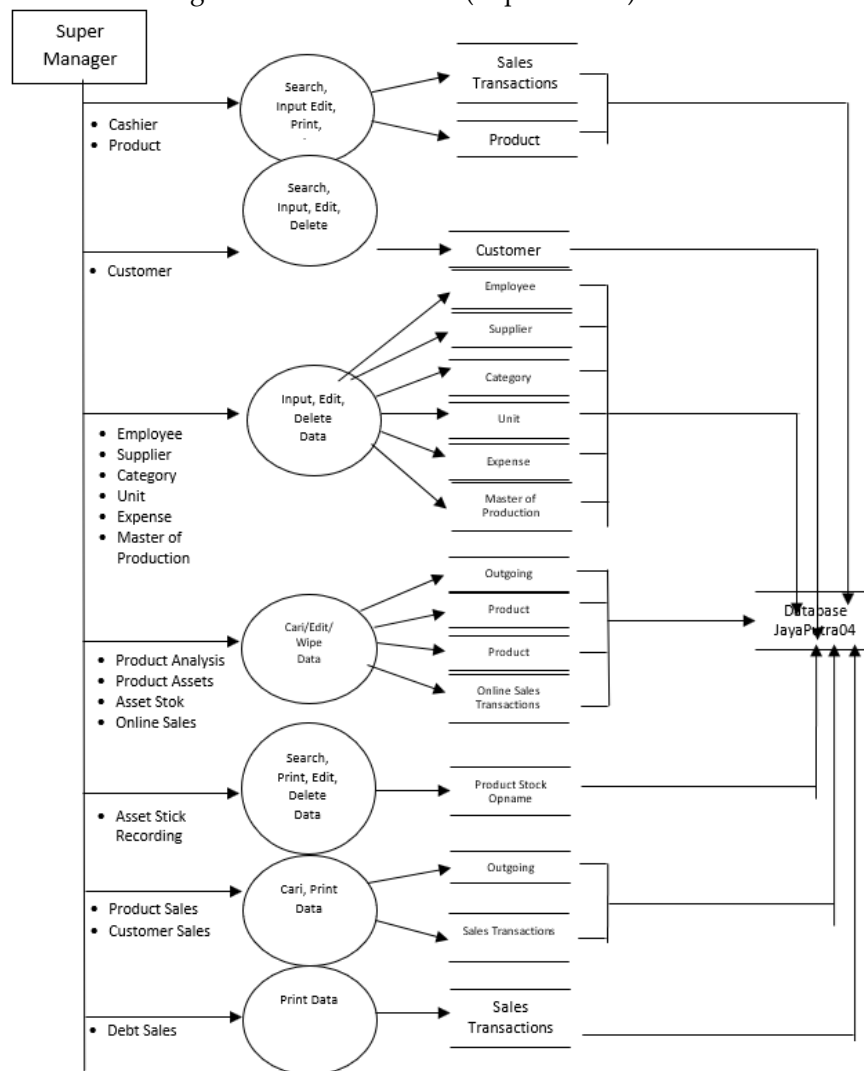
Figure 4.11. DFD Level 0 (Super Manager)
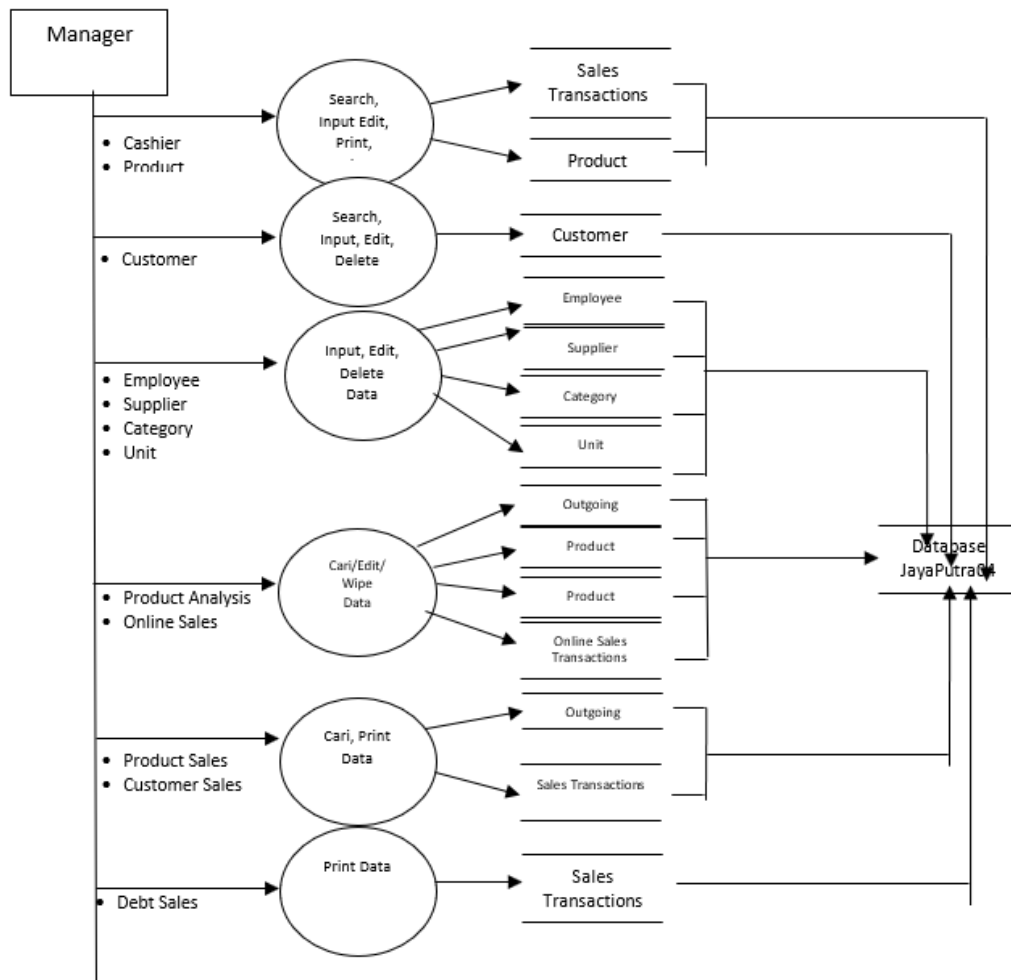
Figure 4.12. DFD Level 0 (Manager)
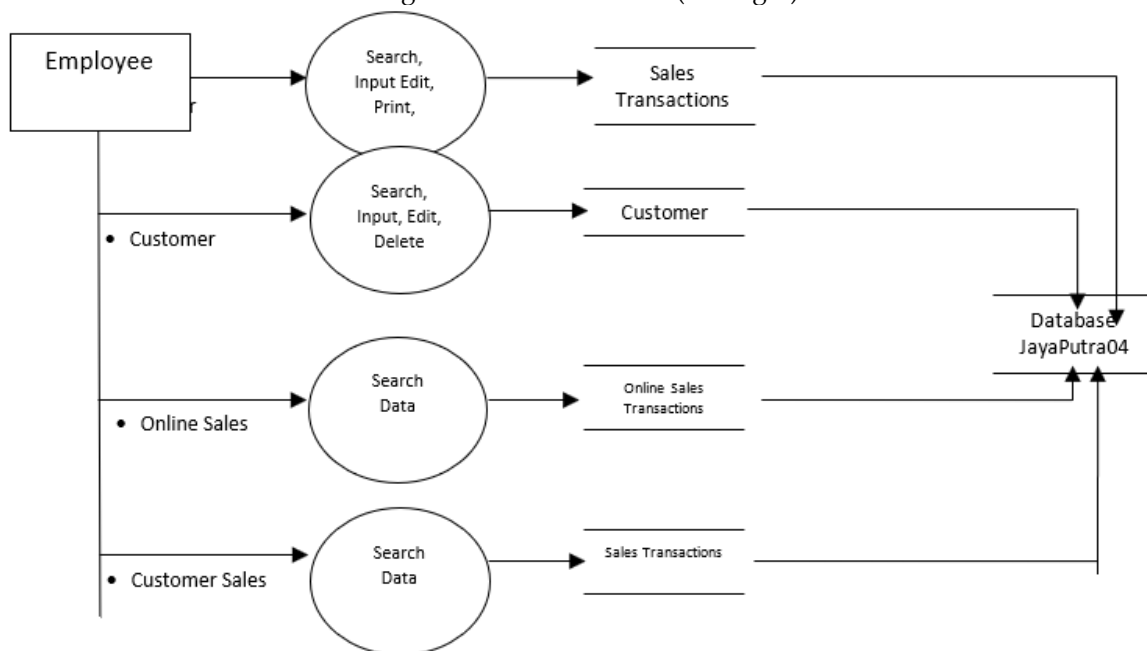
Figure 4.13. DFD Level 0 (Employee)

4.2.2 Flowchart
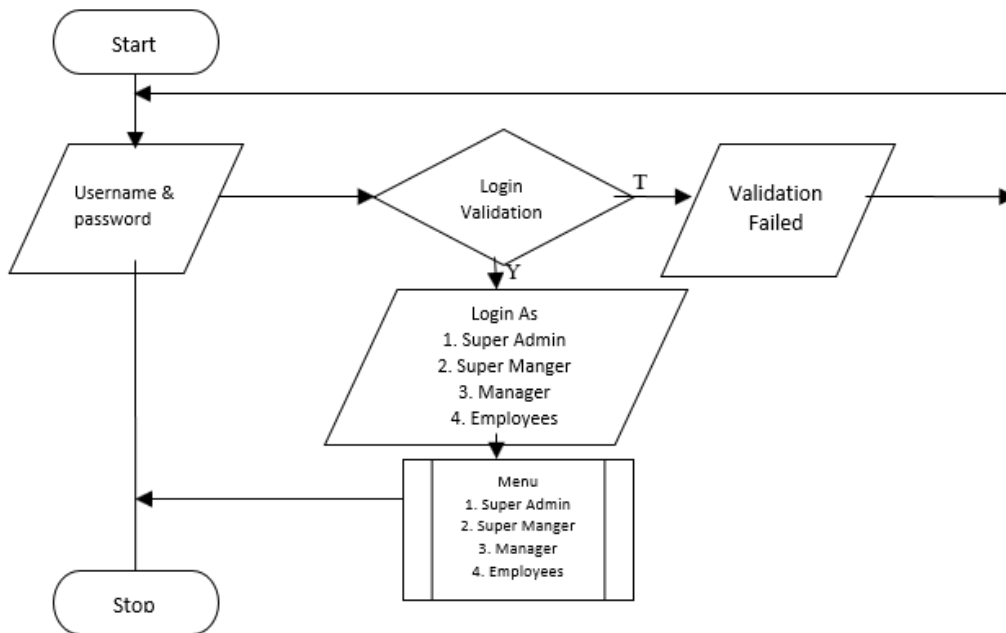
Figure 4.14. Flowchart Login
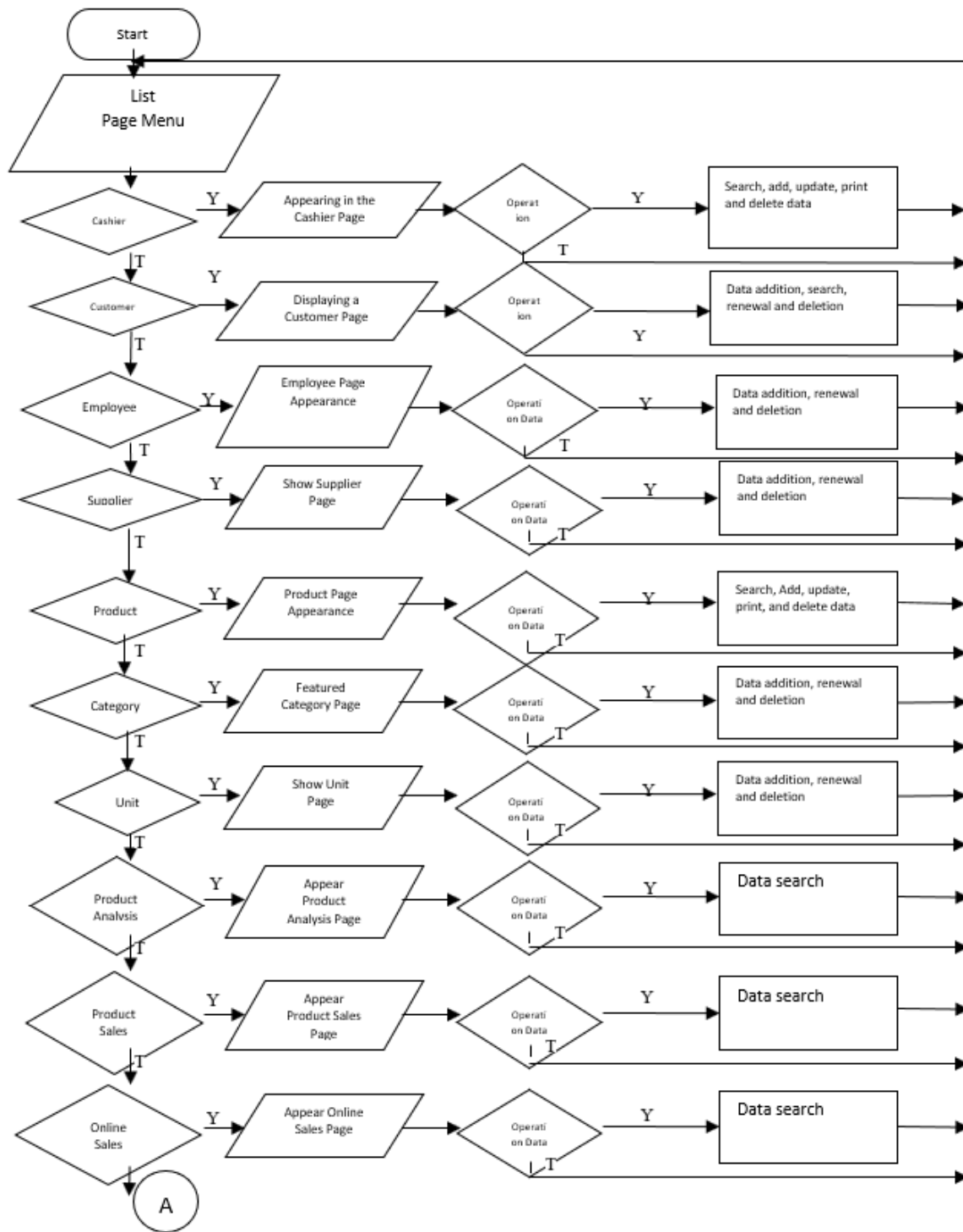
Figure 4.15. Flowcha rt Menu SuperAdmin (1)
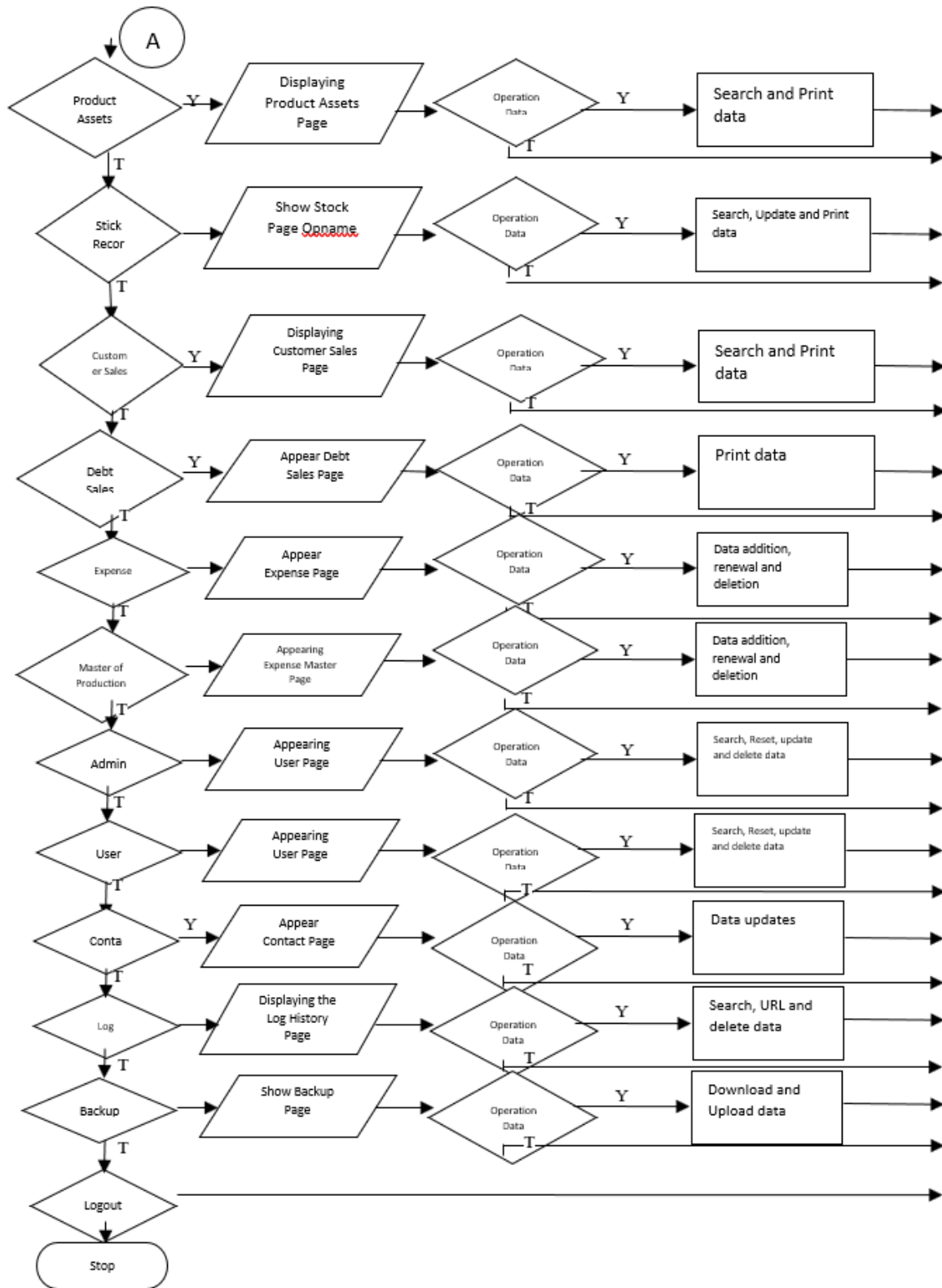
Figure 4.16. Flowchart Menu SuperAdmin (2)
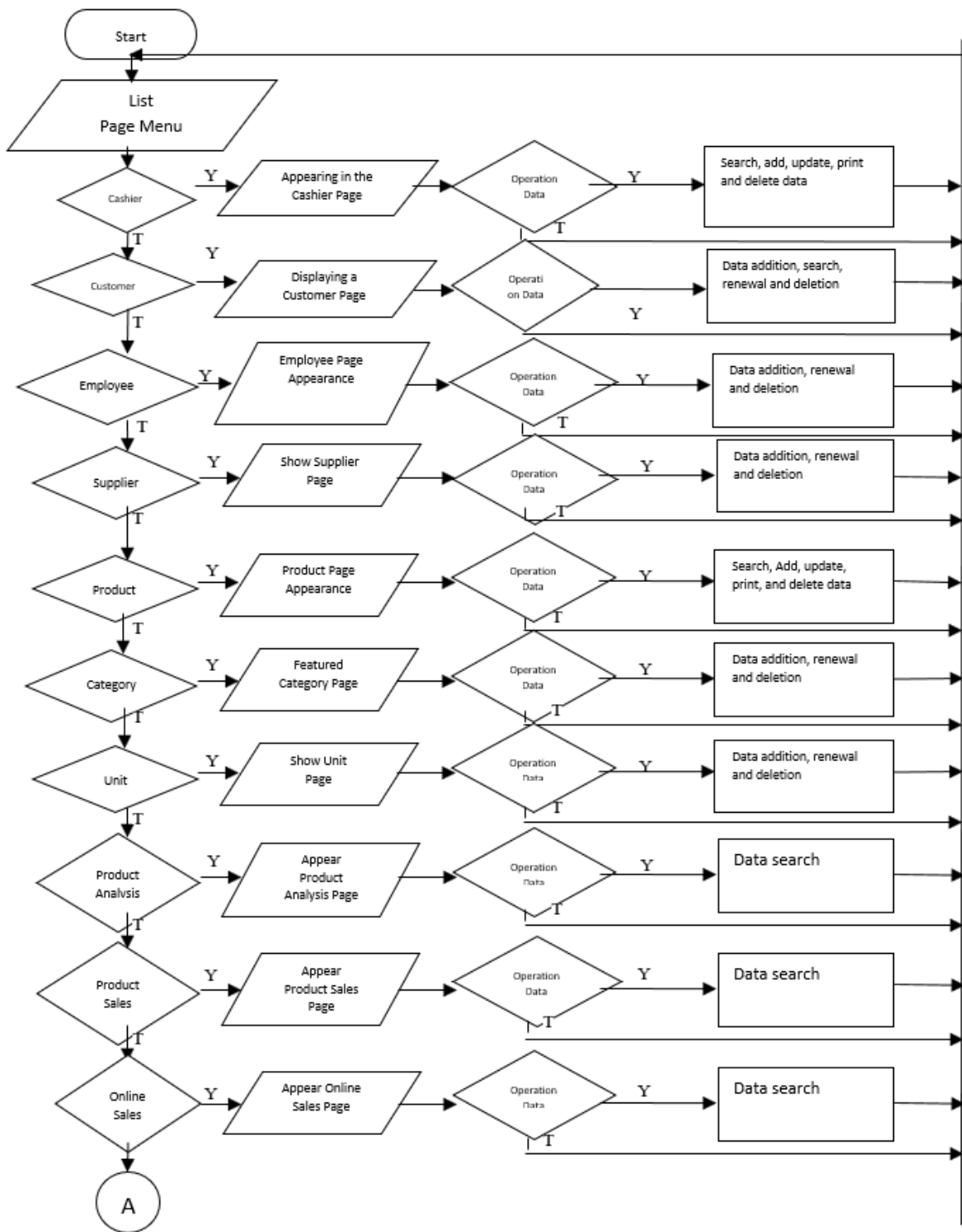
Figure 4.17. Flowchart Menu SuperManager (1)
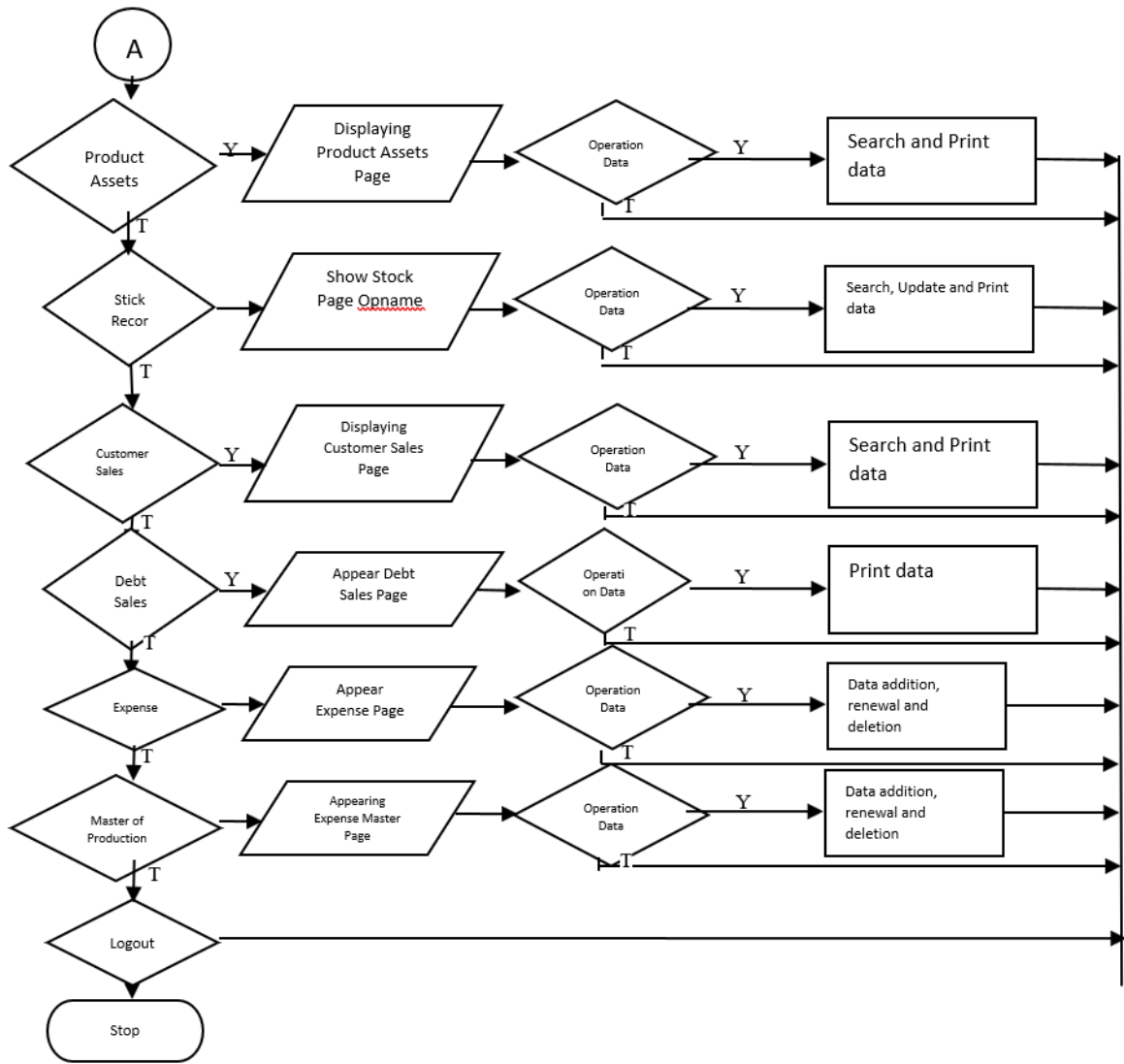
Figure 4.18. Flowchart Menu SuperManager (2)
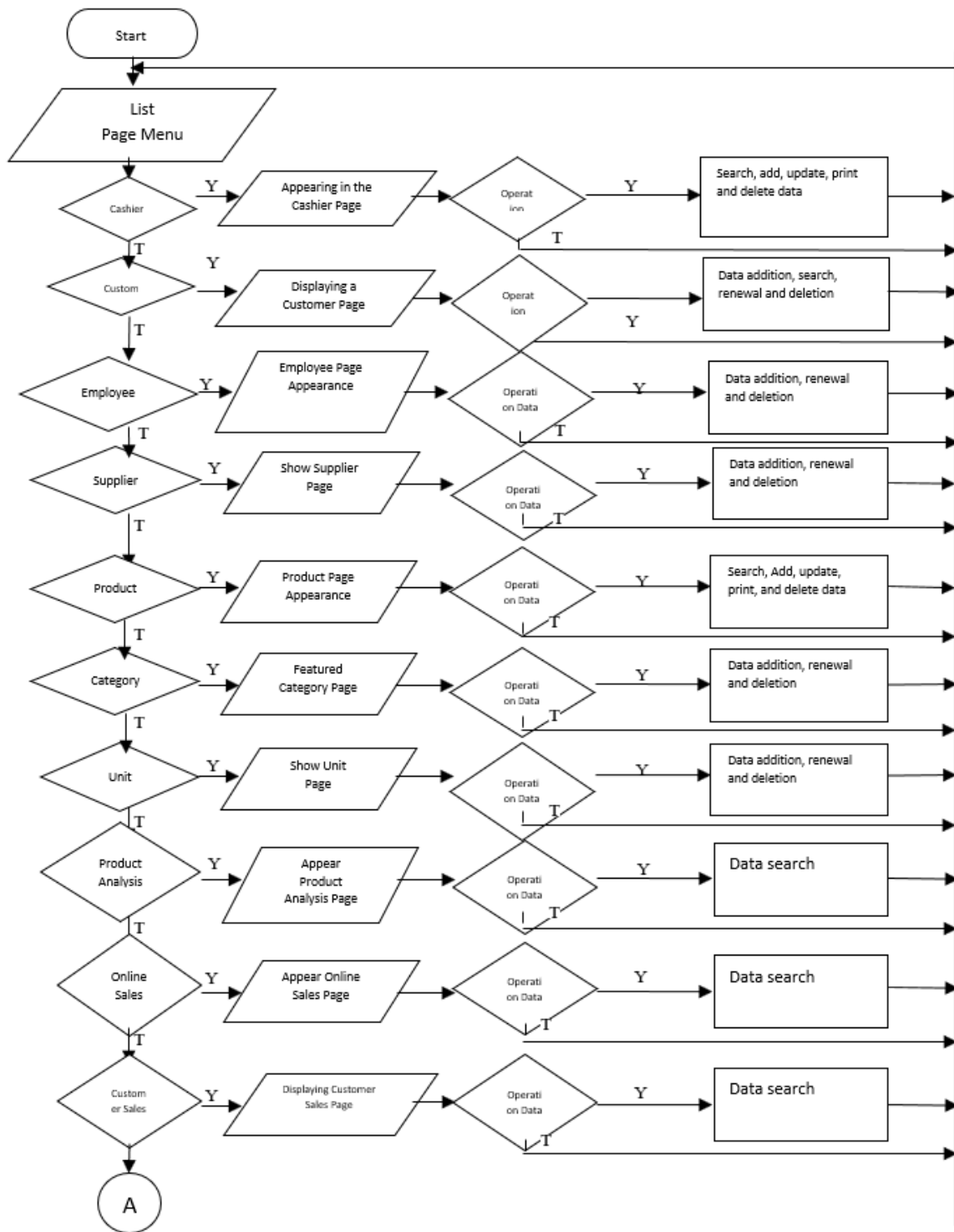
Figure 4.19. Flowchart Menu Manager (1)
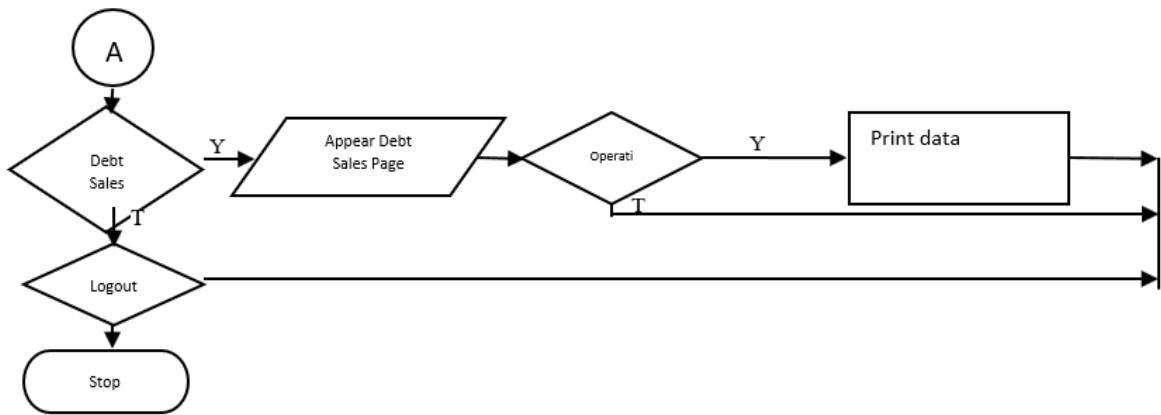
Figure 4.20. Flowchart Menu Manager (2)
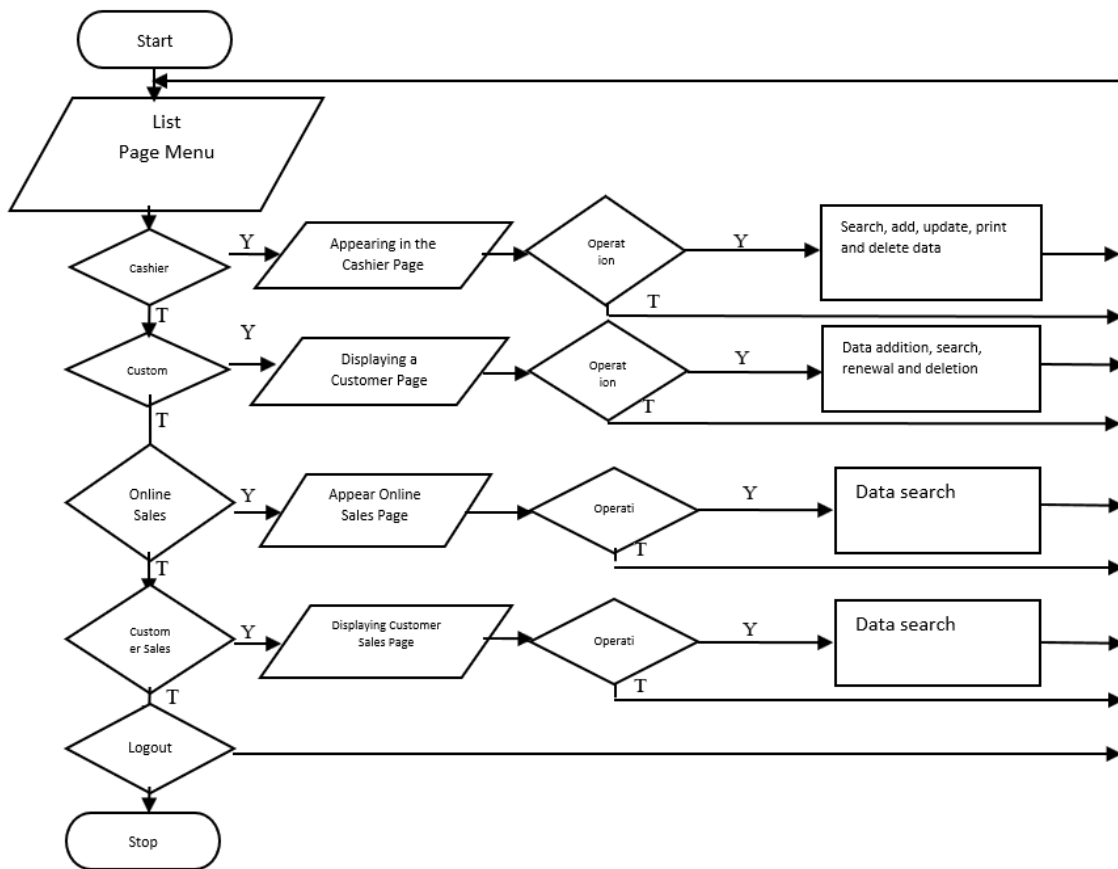
Figure 4.21. Employee Menu Flowchart

4.2.2 Database
1) Table 1.4 Tabel admin

Column	Type	Null	Default
id	Int (11)	No	
user_id	Int (11)	Yes	NULL
code	Varchar (250)	No	
name	Varchar (250)	No	

status	Tinyint (1)	No	
photograph	Varchar (250)	Yes	NULL

2) Table 2.4 Employee table

Column	Type	Null	Default
id	Int (11)	No	

user_id	Int (11)	Yes	NULL
nik	Varchar (250)	No	
name	Varchar (250)	No	
no_telepon	Varchar (250)	Yes	NULL
email	Varchar (250)	Yes	NULL
address	text	Yes	NULL
tanggal_masuk	date	Yes	NULL
photograph	Varchar (250)	Yes	NULL
status	tinyint(1)	No	

3) Table 3.4 Contact table

Column	Type	Null	Default
id	Int (11)	No	
nama_toko	Varchar (250)	No	
description	Varchar (250)	Yes	NULL
no_telepon	Varchar (250)	No	
email	Varchar (250)	Yes	NULL
facebook	Varchar (250)	Yes	NULL
twitter	Varchar (250)	Yes	NULL
instagram	Varchar (250)	Yes	NULL
address	text	No	
Remarks1	text	Yes	NULL
Remarks2	text	Yes	NULL
Remarks3	text	Yes	NULL
cover	Varchar (250)	Yes	NULL
deskripsi_sampul	text	Yes	NULL
status_perubahan	Tinyint (1)	Yes	NULL

4) Table 4.4 Tabel log_history

Column	Type	Null	Default
id	Int (11)	No	
created_by	Int (11)	No	
activity	Int (11)	No	
information	text	No	
url	Varchar (50)	No	
created_at	datetime	No	

5) Table 5.4 Customer table

Column	Type	Null	Default
id	Int (11)	No	
user_id	Int (11)	Yes	NULL
nama_pelanggan	Varchar (250)	No	
no_telepone	Varchar (250)	Yes	NULL
email	Varchar (250)	Yes	NULL
address	text	Yes	NULL
photograph	Varchar (250)	Yes	NULL
status_member	Tinyint (1)	No	
status_perubahan	Tinyint (1)	Yes	NULL

6) Table 6.4 Table pelanggan_hutang

Column	Type	Null	Default
id	Int (11)	No	
transaksi_penjualan_id	Int (11)	No	
jumlah_pembayaran	Int (11)	No	
description	text	No	
created_at	datetime	No	

7) Table 7.4 Expenditure table

Column	Type	Null	Default
id	Int (11)	No	

pengeluaran_master_id	Int (11)	No	
sum	Int (11)	No	
information	text	No	
date	date	No	

8)   Table 8.4 Table pengeluaran_master

Column	Type	Null	Default
id	Int (11)	No	
nama_pengeluaran	Varchar (250)	No	

9)   Table 9.4 Product table

Column	Type	Null	Default
id	Int (11)	No	
produk_kategori_id	Int (11)	No	
satuan_id	Int (11)	No	
kode_produk	Varchar (250)	Yes	NULL
no_produk	Varchar (250)	Yes	NULL
nama_produk	Varchar (250)	No	
description	text	Yes	NULL
waktu_promo	date	Yes	NULL
status_perubahan	Tinyint (1)	Yes	NULL
created_at	datetime	No	
updated_at	datetime	No	

10)   Table 10.4 Table produk_gambar

Column	Type	Null	Default
id	Int (11)	No	
produk_id	Int (11)	No	
picture	Varchar (250)	No	

11)   Table 11.4 table produk_harga

Column	Type	Null	Default
id	Int (11)	No	
produk_id	Int (11)	No	

jenis	Tinyint (1)	No	
harga_beli	Int (11)	No	
harga_jual	Int (11)	No	
piece	Int (11)	Yes	NULL

12)   Table 12.4 Table produk_kategori

Column	Type	Null	Default
id	Int (11)	No	
kode_kategori	Varchar (250)	No	
nama_kategori	Varchar (250)	No	
status_perubahan	Tinyint (1)	Yes	NULL

13)   Table 13.4 Table produk_keluar

Column	Type	Null	Default
id	Int (11)	No	
transaksi_penjualan_id	Int (11)	No	
produk_harga_id	Int (11)	No	
harga_beli	Int (11)	No	
harga_jual	Int (11)	No	
harga_manual	Int (11)	Yes	NULL
jumlah_satuan	float	No	
sum	Int (11)	No	
piece	Int (11)	Yes	NULL
total	Int (11)	No	
total_potongan	Int (11)	Yes	NULL
advantage	double	No	
status_harga	Tinyint (1)	No	
status_produk	Tinyint (1)	Yes	NULL
status_opname	Tinyint (1)	Yes	NULL
created_at	datetime	No	
updated_at	datetime	No	

14) Table14.4   Table produk_keluar_online

Column	Type	Null	Default
id	Int (11)	No	
transaksi_penjualan_online_id	Int (11)	Yes	NULL
pelanggan_id	Int (11)	No	
produk_id	Int (11)	No	
produk_harga_id	Int (11)	Yes	NULL
harga_beli	Int (11)	Yes	NULL
jumlah_satuan	float	No	
sum	Int (11)	No	
piece	Int (11)	No	
price	Int (11)	No	
status_harga	Int (11)	No	
total	Int (11)	No	
status	Tinyint (4)	No	

15) Table 15.4 Table produk_status

Column	Type	Null	Default
id	Int (11)	No	
produk_keluar_id	Int (11)	No	
jumlah_satuan_keluar	float	Yes	NULL
jumlah_keluar	Int (11)	Yes	NULL
total_keluar	Int (11)	Yes	NULL
keuntungan_keluar	Int (11)	Yes	NULL
jumlah_dikembalikan_satuan	float	No	
jumlah_dikembalikan	Int (11)	No	

uang_dikembalikan	Int (11)	No	
information	text	No	
created_at	datetime	No	
updated_at	datetime	No	

16) Table 16.4 Table produk_stok

Column	Type	Null	Default
id	Int (11)	No	
produk_id	Int (11)	No	
jumlah_satuan	float	No	
sum	Int (11)	No	
status	Tinyint (4)	Yes	NULL
status_opname	Tinyint (1)	Yes	NULL
created_at	datetime	No	
updated_at	datetime	No	

17) Table 17.4 table produk_stok_detail

Column	Type	Null	Default
id	Int (11)	No	
produk_stok_id	Int (11)	No	
jumlah_satuan	float	No	
sum	Int (11)	No	
jumlah_satuan_asset	float	No	
jumlah_asset	Int (11)	No	
created_at	datetime	No	
updated_at	datetime	No	

18) Table 18.4   Table produk_stok_opname

Column	Type	Null	Default
id	Int (11)	No	
produk_stok_id	Int (11)	No	
jumlah_satuan	float	No	
sum	Int (11)	No	
jumlah_satuan_opname	float	No	
jumlah_opname	Int (11)	No	

jumlah_pengurangan_satuan	float	Yes	NULL
jumlah_pengurangan	Int (11)	Yes	NULL
jumlah_penambahan_satuan	float	Yes	NULL
jumlah_penambahan	Int (11)	Yes	NULL
status_opname	Tinyint (1)	No	
created_at	datetime	No	
updated_at	datetime	No	

photograph	Varchar (250)	Yes	NULL
status	Tinyint (1)	No	

19) Table 19.4 table produk_supplier

Column	Type	Null	Default
id	Int (11)	No	
produk_id	Int (11)	Yes	NULL
supplier_id	Int (11)	Yes	NULL
tanggal_beli	date	Yes	NULL
expired	date	Yes	NULL

20. Table 19.4 Table of units

Column	Type	Null	Default
id	Int (11)	No	
nama_satuan	Varchar (250)	No	
sum	Int (11)	No	
status	Int (1)	Yes	NULL
status_perubahan	Tinyint (1)	Yes	NULL

21. Table 21. 4 Table supplier

Column	Type	Null	Default
id	Int (11)	No	
nama_supplier	Varchar (250)	No	
no_telepon	Varchar (250)	Yes	NULL
email	Varchar (250)	Yes	NULL
address	text	Yes	NULL

22. Table 22.4 table transaksi_penjualan

Column	Type	Null	Default
id	Int (11)	No	
pelanggan_id	Int (11)	Yes	NULL
created_by	Int (11)	No	
no_faktur	Varchar (250)	No	
sub_total	Int (11)	No	
Ppn	Tinyint (1)	Yes	NULL
grand_total	Int (11)	No	
cash	Int (11)	No	
return	Int (11)	No	
debt	Int (11)	No	
total_pembayaran_hutang	Int (11)	No	
sisa_pembayaran	Int (11)	No	
status_hutang	Tinyint (1)	No	
status_pembayaran	Tinyint (1)	No	
status_perubahan	Tinyint (1)	Yes	NULL
created_at	datetime	No	
updated_at	datetime	No	

23. Table 23.4 Table transaksi_penjualan_online

Column	Type	Null	Default
id	Int (11)	No	
pelanggan_id	Int (11)	No	
created_by	Int (11)	Yes	NULL
transaksi_penjualan_id	Int (11)	Yes	NULL

sum	Int (11)	No	
total	Int (11)	No	
status	Tinyint (1)	No	
status_pembayaran	tinyint(1)	No	
status_perubahan	tinyint(1)	No	
created_at	datetime	No	
updated_at	datetime	No	

24. Table 24.4 User table

Column	Type	Null	Default
id	Int (10)	No	
username	Varchar (250)	No	
password	Varchar (250)	No	
level	Int (2)	No	
login_terakhir	datetime	Yes	NULL
auth_key	Varchar (50)	No	
status	Tinyint (1)	No	

5. CONCLUSIONS

Based on the research that has been carried out, the following conclusions can be obtained:

a. The design and construction of the cashier information system developed is able to improve the efficiency of the transaction process, reduce customer waiting time, and minimize the risk of manual errors.

b. The cashier information system provides facilities for recording sales data, financial reports, and stock of goods in a structured manner, making it easier to make business decisions.

c. The simple interface design ensures that the system can be used by users with various levels of ability, both owners and cashiers

d. This Information System is designed to be further developed for more complex needs in the future, with security features to protect transaction data and inventory.

ADVICE

The suggestions for this research to develop better need to be done as follows:

a. Improving the functionality of the system, features such as digital payment integration (e-wallet), customer loyalty programs, and low stock alert systems can be added.

b. Conducting system testing with various field usage scenarios to ensure the system works optimally under real-world conditions.

c. Adding additional layers of security, such as data encryption and user rights-based access management, to ensure stronger data security

Evaluate and update the system regularly to keep up with business and technology needs.

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