JURNAL RISET INFORMATIKA **P-ISSN: 2656-1743 |E-ISSN: 2656-1735**
Vol. 2, No. 3 June 2020 DOI: https://doi.org/10.34288/jri.v2i3.138

USING THE MODEL VIEW CONTROLLER (MVC) METHOD IN MEDICAMENT SALES INFORMATION SYSTEM DESIGN

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Abstrak

Penjualan memiliki peranan penting dalam suatu organisasi, terutama penjualan obat di Apotik, khususnya di Apotik Bubulak Bogor. Penggunaan sistem informasi yang baik tentunya sangat diperlukan Apotik tersebut untuk mengelola data-datanya. Dalam mengelola data penjualannya, Apotik ini masih menggunakan sistem konvensional, sehingga muncul berbagai permasalahan seperti terjadinya kesalahan perhitungan dalam pembuatan laporannya, sering lupa dalam mencatat transaksi yang terjadi serta masih banyak menggunakan kertas sebagai alat dokumentasi. Sehingga perlu adanya rancang bangun sistem untuk diterapkan dalam sistem penjualannya. Dengan tujuan supaya dapat mengatasi berbagai permasalahan yang ada, serta sistem yang baru dapat lebih efektif dan data yang dihasilkan lebih akurat. Oleh karena itu untuk mencapai tujuan tersebut, perlu penggunaan metode yang tepat, yaitu dengan metode MVC (Model View Controller). Metode MVC ini dapat memperlihatkan kebutuhan-kebutuhan yang diperlukan dalam membangun sistem informasinya. Hasil yang baik dari metode MVC ini adalah untuk memisahkan proses logika aplikasi dengan user interface.

Kata kunci: MVC, Penjualan, Apotik

Abstract

Sales have an important role in an organization, especially medicament sales at Pharmacies, especially at Apotik Bubulak Bogor. The use of a good information system is certainly very necessary for the Pharmacy to manage its data. In managing its sales data, this Pharmacy is still using a conventional system, so that various problems arise such as the occurrence of miscalculations in making reports, often forgetting to record transactions that occur and many still use paper as a documentation tool. So it is necessary to design a system to be implemented in the sales system. To be able to overcome various existing problems, as well as the new system can be more effective and the data produced more accurately. Therefore, to achieve this goal, it is necessary to use the right method, namely the MVC (Model View Controller) method. This MVC method can show the needs needed in building the information system. A good result of this MVC method is to separate the application logic process with the user interface.

Keywords: MVC, Sales, Pharmacy

INTRODUCTION

The use of a good information system is needed by an organization, be it from a company, a cooperative to a pharmacy, to be able to help process its data correctly. And information systems that are neatly arranged will make it easier for company management to make decisions and can improve the efficiency and effectiveness of performance in an organization. Many business fields in organizations such as sales, purchasing, production, marketing, and so on, which require the application of a good system in it. Especially in the field of business sales, because sales have a very important role in an organization.

Sales can be interpreted as an activity or activity in selling merchandise owned either in the form of goods or services to the market, which is carried out by some people to achieve the desired goals. Sales are the heart of a company because sales are transactions that have the purpose of making a profit or profit, Himayati (Prasetyo & Susanti, 2016). Thus sales have a very important role in an organization. One type of goods that are needed by the community is in the form of medicine.

The need for drugs by the community is very high because people increasingly understand how important health is. Business fields related to medicament sales are called Pharmacies. Pharmacies provide a variety of medicines at prices that are affordable by the public compared to the prices of medicaments from the hospital (Rahmi & Muryani, 2018). However, at this time there are still many pharmacies that use conventional systems (Fatayat & Frieyadie, 2019) in processing data, especially in sales. As happened at the Apotik Bubulak, Bogor.

Sales data processing at this Pharmacy is still done manually (Frieyadie, 2015), so that it causes various problems, such as calculation error (Arizon et al., 2018)(Rusdi et al., 2019) when making daily sales reports and monthly sales reports, so the information generated is not accurate. Another problem is often to forget in recording transactions (Achyani & Muryani, 2016) happens, so that information affects the income obtained by the Pharmacy. And still use a lot of paper for the documentation tool, while the documents are not stored neatly, resulting in documents that can be lost or damaged.

Therefore, in the Apotik Bubulak, Bogor requires the development of the system, especially the sales system. System development (system development) can mean compiling a new system to replace the old system as a whole or improve an existing system. Usually, the development of this system is needed because of problems from the old system, the opportunity, and the existence of instructions from the Chairman or outside the organization (Tohari, 2014).

The development of the system or the design of this system aims to make the new system that will be produced later, can solve existing problems and also expected that the performance of the system becomes more effective and efficient so that the results desired by management can be achieved to maintain the survival of the organization. One of the methods used in the design of medicament sales information systems at this Pharmacy is to use the MVC (Model View Controller) method.

MVC method is widely applied in application development as has been done by previous researchers, as follows: Penerapan Konsep MVC Pada Aplikasi Web Menggunakan Framework Laravel (SY Hasyrif, 2018), Penerapan Arsitektur Model View Controller (MVC) Pada Sistem Informasi E-Skripsi STMIK Royal (Yesputra & Marpaung, 2018), Penerapan Model View Controller (MVC) Dengan Framework Codeigniter Pada Sistem Informasi Booking Wisata Klangon (Asroni, 2018), Implementasi Metode Model View Controller (MVC) In Designing the Website of SMK Bakti Prabumulih Foundation (Wijaya & Christian, 2019), Application of Concept Model View Controller In Designing Web-Based Management System Software (Suendri, 2018), and Application of Model View Controller (MVC) Architecture in the Design of an Adaptive Online Quiz System (Hidayat & Surarso, 2012).

RESEARCH METHODS

This research method contains the type of research, time and place of research, targets/ purpose, research subjects, procedures, data and instruments, and data collection techniques, and data analysis techniques. The explanation is as follows:

Types of Research

In researching the design of medicament sales information systems, the authors use this type of qualitative research, where the data obtained comes from observations, literature studies, and interviews.

Time and Place of Research

Research on information systems for medicament sales was conducted at the Apotik Bubulak Bogor in 2018.

Research Targets / Subjects

In conducting this research, to get the research subject, the author first surveyed several places. And found this place, namely Apotik Bubulak Bogor as a target for conducting research. Because at that time, the author saw the system that he applied, especially the sales system was still done conventionally so that several problems arose. This is what makes the writer interested in making the Apotik Bubulak Bogor as a research target.

Procedure

This research was conducted by conducting direct observations to obtain an overview of the workflow of the current medicament sales system and problems that arise. Besides, to find out more about the medicament sales system, the authors conducted interviews with parties directly related to the medicament sales system at the Apotik Bubulak Bogor.

Data, Instruments, and Data Collection Techniques

This data collection technique is done in several ways, such as interviews, observation, and literature study. An interview is a process to obtain information from sources using face to face meetings and using interview guides that have been prepared in advance. Observation is an activity that makes direct observations of the object under study. While literature study means searching the literature, where the literature can be used to assist in the discussion of case studies (Nazir, 2014).

Data Analysis Techniques

In conducting data analysis, the authors use the Model View Controller (MVC) Method to assist in solving problems in the medicament sales system at the Pharmacy, by creating a new automated system. Model View Controller (MVC) is a concept introduced by the inventor of Smalltalk (Trygve Reenkaug) to encapsulate data with processing (model), isolate it from the manipulation process (controller) and view (view) to be represented on the front view, according to Deacon in (Arochman & Arianto, 2017).

According to Burbeck (Arochman & Arianto, 2017), It is explained that the MVC architecture is divided into three layers, namely:

1. Model

The model used to manage information and notify observers when information changes. The model contains data and functions related to data processing.

2. *View*

View, is responsible for graphical mapping to a device.

3. *Controller*

Controller, accept input from the user and distribute the model and view to take action based on that input. So the controller is responsible for mapping end-user action to the application's response.

Model, *View*, and *Controller* related to one another, therefore all three must refer to each other. Broadly speaking, it can be concluded that the model describes the data structure, the View describes how it looks while the Controller is a bridge between the Model and View. The following in Figure 1 is an illustration of the basic relationship Model View Controller (MVC) can be described as follows:

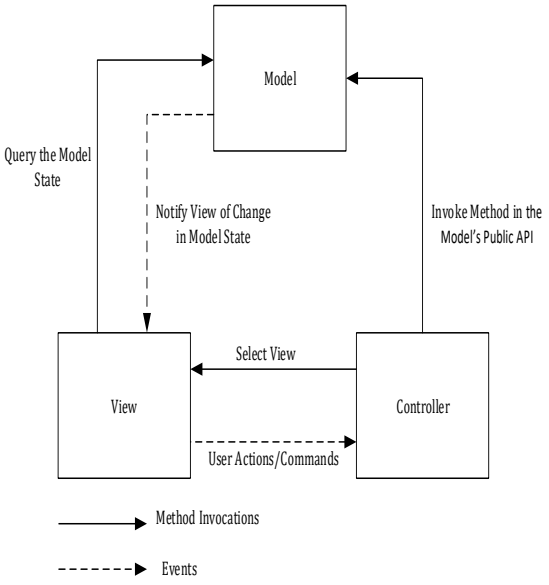

Figure 1. Illustration of Model *View Controller*

RESEARCH RESULTS AND DISCUSSION

Development of medicament sales information systems, especially at the Apotik Bubulak Bogor using the MVC (Model View Controller) method can be described using the Java programming language as follows:

1. Model

The model in the MVC method determines the data structure. In developing a medicament sales information system, the data structure can be determined in the form of a scheme as follows:

a. User(idUser, nmUser, hakAkses, passUser, jnsKel, almtUser)
b. Obat(kdObat, nmObat, jnsObat, satuan, hrgObat, stok)
c. Akun(noReff, nmAkun, jnsAkun, ketAkun)
d. Transaksi(noTrans, tglTrans, jmlItem, totalHrg, totBayar, kembali, kategori, keterangan)
e. DetailTrans(jmlJual, jmlHarga, kdObat, noTrans)
f. Jurnal(noJurnal,tglJurnal, noTrans)
g. DetailJurnal(debet, kredit, noJurnal, noReff)

Based on the schema in Figure 2 below, it can also be described in detail from the structure of the data in the form of class diagrams.

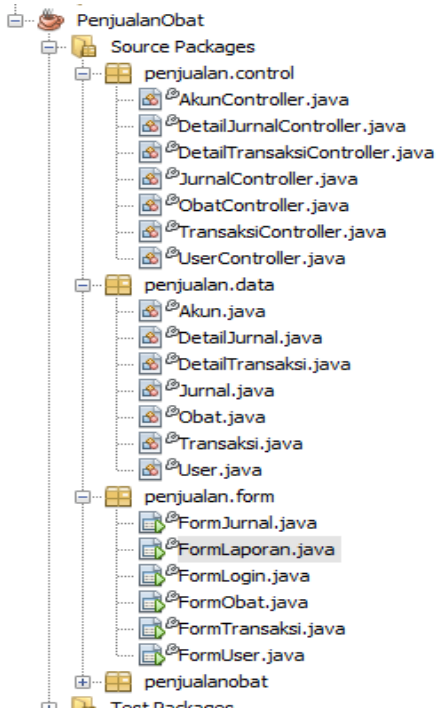

Figure 2. Model View Controller of Medicament Sales Information System

Class diagram, is one of the UML (Unified Modeling Language) diagrams, which can be defined as follows: class diagram illustrates the structure of the system in terms of defining the classes that will be made to build the system. Classes have what are called attributes and methods or operations, Sukamto and Shalahuddin in (Hidayati, 2019). As for the drawing of the class diagram, in figure 3, the following:

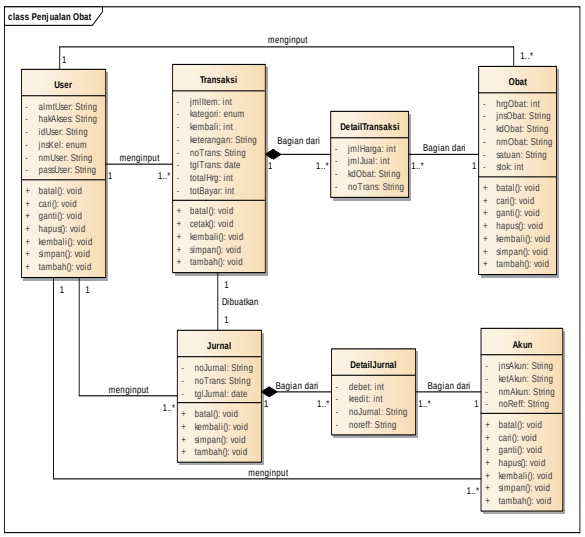

Figure 3. Class Diagram of Medicament Sales Information System

The class diagram above is used to determine the model (data structure) in the design of a medicament sales information system. Required classes like User class, Obat class, Transaksi class, detailTransaksi class, Jurnal class, DetailJurnal class dan Akun class. Each class has attributes and operations, as seen from the class diagram above.

The following figure 4 is an example of applying the Model for Users using the Java programming language.

```
public User(String idUser, String nmUser, String hakAkses, String passUser, String jnsKel, String almtUser){
    this.idUser = idUser;
    this.nmUser = nmUser;
    this.hakAkses = hakAkses;
    this.passUser = passUser;
    this.jnsKel = jnsKel;
    this.almtUser = almtUser;
}
public String getidUser() {
   return idUser;
}
public void setidUser( String idUSer){
this.idUser = idUser;
}
public String getnmUser() {
   return nmUser;
}
public void setnmUser( String nmUSer){
this.idUser = nmUser;
}
public String hakAkses() {
   return hakAkses;
}
public void sethakAkses( String hakAkses){
this.hakAkses = hakAkses;
}
   public String passUser() {
      return passUser;
   }
   public void setpassUser( String passUser){
   this.passUser = passUser;
   }
   public String getjnsKel() {
      return jnsKel;
   }
   public void setjnsKel( String jnsKel){
   this.jnsKel = jnsKel;
   }
   public String almtUser() {
      return almtUser;
   }
   public void setalmtUser( String almtUSer){
   this.almtUser = almtUser;
   }
}
```

Figure 4. Example of a Model drawing in Java

2. View

The following is a display that is needed in the design of information systems for medicament sales at the Apotik Bubulak Bogor:

a. Figure 5 is a Login for the User to be able to enter the medicament sales information system, with the following display:

Figure 5. Login

Figure 5 Login above is used so that users can access the menus in the medicament sales

P-ISSN: 2656-1743 |E-ISSN: 2656-1735
DOI: https://doi.org/10.34288/jri.v2i3.138

information system. By first entering your Username, Password, and Access Rights. If the data entered is valid then the user will enter the medicament sales information system.

b. Figure 6 is the Medicament Data Form, with the following display :

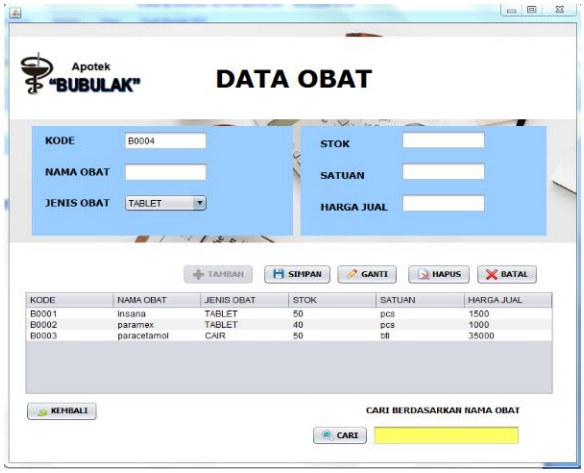

Figure 6. Medicament Data Form

Figure 6 Medicament Data Form is used by the user to be able to manage medicament data. Users can add medicament data, update medicament data, delete medicament data, search for medicament data, save and cancel the medication data management process.

c. Figure 7 is the User Data Form, with the following display:

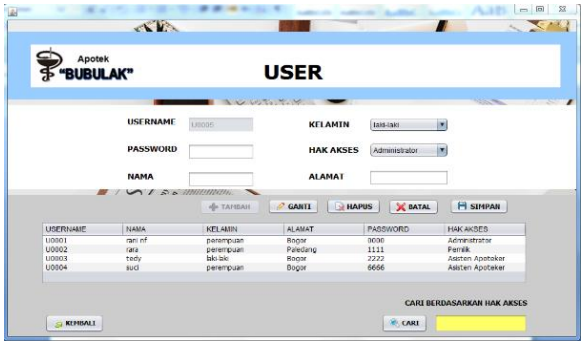

Figure 7. User Data Form

Figure 7 User Data Form above is used by Admin in managing User data. Admin can add user data, update user data, delete user data, search for user data, perform user data storage, and cancel the user data management process. This User Data can later be used to log in when the user will access the medicament sales information system.

d. Figure 8 is the Account Data Form, with the following display:

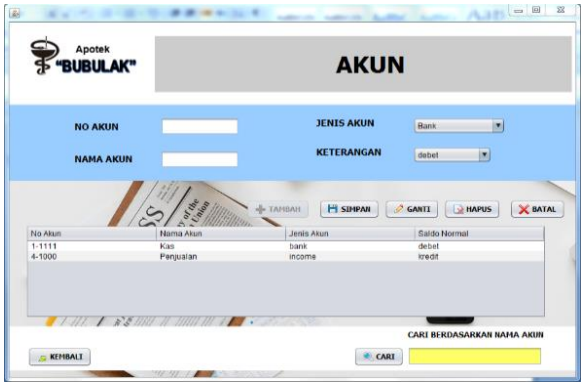

Figure 8 Account Data Form

Figure 8 This Account Data Form is used by users to be able to manage account data. Users can add account data, update account data, delete account data, search account data, save and cancel account data management processes. This account data, will be correlated when will make a journal of each sales transaction that occurs.

e. Figure 9 is the Sales Transaction Form, with the following display :

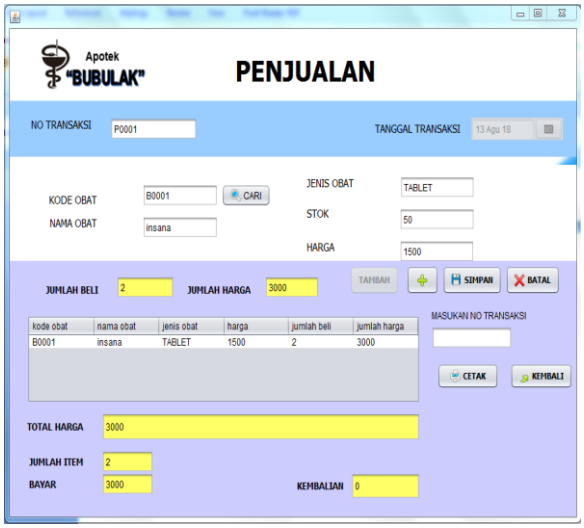

Figure 9 Sales Transaction Form

Figure 9 Sales Transaction Form above, used by the user when there are consumers conducting medicament sales transactions. Transaction data carried out by consumers will be inputted through this sales transaction Form, and after completing the transaction, the user will save the transaction, then continue to print proof of the transaction, which will later be given to the consumer.

f. Figure 10 is the Journal Data Form, with the following display :

Figure 10 Journal Data Form

Figure 10 Journal Data Form above, used to make a journal after the medicament sales transaction process is complete. In making this journal, requires accounts associated with the transaction.

g. Figure 11 is the Sales Report Form, with the following display :

Figure 11 Sales Report Form

Figure 11 Sales Report Form above, used to find out how the medicament sales information system runs. With the report on the sale of the medicament, it can be known information about the sale of medicaments in this Pharmacy, whether it has increased or not. So later it can be used by the Chairperson as material for making further decisions.

3. Controller

The following is an example controller, as a bridge between Model and View, using the Java programming language.

```
package login1;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.SQLException;
import java.sql.Statement;
import java.sql.ResultSet;
import javax.swing.JFrame;
import javax.swing.JOptionPane;
import koneksi.koneksi1;
public class form_login1 extends javax.swing.JFrame {
Connection con;
Statement ss;
ResultSet rs;
String sql;
public form_login1() {
initComponents();
JFrame form=new JFrame();
 form.setSize(400, 400);
koneksi1 DB = new koneksi1 ();
DB.config();
con = DB.con;
ss = DB.ss;}
private void
fkeluarActionPerformed(java.awt.event.ActionEvent evt) {
dispose();
this.setVisible(false);
this.setDefaultCloseOperation(EXIT_ON_CLOSE);
System.exit(0);}
private void
fmasukActionPerformed(java.awt.event.ActionEvent evt) {
aksi_login();
dispose();
}
private void aksi_login() {
String hak_akses=aksescb.getSelectedItem().toString();
try{ String sql="select * from user where
idUser='"+idUser.getText()+"' and
passUser='"+String.valueOf(passUser.getText())+"' and
hakAkses='"+hakAkses+"'";
ss=con.createStatement();
rs=ss.executeQuery(sql);
while(rs.next() {
 rs.getString("idUser");
 rs.getString("nmUser");
rs.getString("jnsKel");
rs.getString("almtUser");
rs.getString("passUser");
rs.getString("hakAkses"); }
rs.last();
if(rs.getRow()!=1)  {
JOptionPane.showMessageDialog(rootPane, "Maaf username,
password atau hak akses yang   anda masukkan
salah","Peringatan",JOptionPane.ERROR_MESSAGE);
idUser.setText(null);
passUser.setText(null)  }
else
{if(hakAkses=="Administrator")
{
userakses.set_hakAkses("Administrator");
JOptionPane.showMessageDialog(null,"Anda Berhasil ", "Status
Login",  JOptionPane.INFORMATION_MESSAGE);
new menu_utama2().setVisible(true);
this.dispose();
}
else if(hakAkses=="Pemilik")
{
userakses.set_hakAkses("Pemilik");
JOptionPane.showMessageDialog(null, "Anda Berhasil Login
","Status Login",JOptionPane.INFORMATION_MESSAGE);
```

```
new menu_utama2().show();
}
else if(hakAkses=="Asisten Apoteker")
{
userakses.set_hakAkses("Asisten Apoteker");
JOptionPane.showMessageDialog(null, "Anda Berhasil Login
","Status Login", JOptionPane.INFORMATION_MESSAGE);
new menu_utama2().show();
}
}
}catch(Exception e){
JOptionPane.showMessageDialog(null, "Anda Gagal
Login","Peringatan",JOptionPane.ERROR_MESSAGE);
System.err.print(e);
} } }
```

CONCLUSION AND SUGGESTION

Conclusion

Based on the above research, it can be concluded that an organization whose data processing is still carried out conventionally, requires the development of a system in it, to help solve various problems that arise. As is the case, which occurred at the Apotik Bubulak Bogor. At Apotik Bubulak Bogor, especially the medicament sales information system requires a new system, to help process the data and minimize problems. And the use of the MVC (model view controller) method, can help in designing the system. By using the MVC method, it can be seen as the needs of the new system. As can know the needs of the data structure and the display required and how to bridge between the data structure and the display. So that later medicament sales information system applications will be generated, which can help the performance of the system.

Suggestion

This research still has many shortcomings and weaknesses, so it is necessary to do further development by other researchers.

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