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Object Oriented Programming

Implementation of Oriented Programming Concepts Objects in The Parking System Application Using Java Programming Language

Indah Purnama Sari

Universitas Muhammadiyah Sumatera Utara, Jl. Kapten Muchtar Basri No. 3, Medan, 20238, Indonesia

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CORRESPONDENCE

Phone: +6282276837886

E-mail: indahpurnama@umsu.ac.id

A B S T R A C T

The development of Information Technology has become increasingly rapid. Many agencies or companies that have used information systems for operational processes that manually become an automated and integrated system. One of which is a parking system. In Indonesia there are still many vehicle day care stations that use a parking system manually. This makes the parking attendant unfamiliar with the price set and the lengths of time parked the vehicle and make it difficult in the process of calculating the report of parked vehicles. For this reason, an integrated parking system is needed so that it can be applied to manual vehicle storage. So in making the parking system uses the concept of programming. The concept of the program to be used is the concept of Object Oriented Programming with the Java programming language and the editor uses Netbeans 8.2 to run the program. The method in conducting this research is to use 2 methods, namely the method for collecting data with the description method and the method for developing a waterfall system. With the parking system will provide convenience for parking users and also make efficient parking attendant performance. So expect speed, and accuracy in collecting vehicle parking at a vehicle storage in Indonesia.

INTRODUCTION

The development of a technology is something that is greatly enjoyed by the wider community. Because technology has influenced humans in all aspects of their lives.

The development of Technology and Information or ICT (Information and Communication Technology) has advanced significantly and is always being developed to produce benefits with a positive impact on society.

One of the most common examples of application in everyday life is the application of computer programs in managing parking in malls, buildings, hotels, and many other places. Almost all places such as malls, buildings, hotels in big cities in Indonesia use the application of computer programs to manage the parking process. The computer program is called a parking application (Wahyudiantoro, 2013:21).

Parking is a state of a vehicle that is temporarily left by its driver. Parking in the middle of the highway is prohibited by law, but parking on the side of the road is generally permitted. Parking facilities are built together with most buildings to facilitate the vehicles of building users (Utomo, 2013:12).

The parking system application program is a software application used to manage parking transactions both at the entrance and exit. The number of transactions or the number of vehicles entering and leaving the parking area is not small, so that it is possible for transaction errors to occur which will harm the parking manager with a not insignificant amount of rupiah (Isnanto, 2013:13).

Many public places in Indonesia still use manual methods for parking payments. Such as in supermarkets or local markets in certain cities, for example Sardo Swalayan in Malang, Roxy Squere in Banyuwangi, and Persada Swalayan in Malang. The manual method used is only with a ticket system given to vehicle owners when entering the vehicle storage area. Not to mention if the parking lot is full of visitors, the security and effectiveness of this ticket system will certainly decrease and make employees or parking attendants unable to work properly and optimally.

Therefore, this automated parking system is very necessary to help employees in obtaining accurate data about parking.

The purpose of designing this parking system is to implement the concept of Object-Oriented Programming in a parking system with the Java programming language using the NetBeans 8.2 editor. To facilitate the work of employees or parking attendants in inputting parking data and calculating parking costs.

METHOD

Data Collection Method

This research method uses the description method. The purpose of this descriptive research is to collect actual facts that are currently occurring. According to Sugiyono (2005: 21) states that the descriptive method is a method used to describe or analyze research results but is not used to make broader conclusions.

The parking system contains many facts that exist in our environment. Currently, there are still many public places that provide parking or vehicle storage that are still manual, namely with tickets. With these facts, it can be concluded that the automated parking data system with this computer is still very minimally applied.

System Development Method

The system development methodology used is the System Development Life Cycle (SDLC) which is often called the waterfall development model. The waterfall method is a systematic and sequential information system development model (Sasmito, 2017).

The research method used for software development is using the waterfall model. The number of transactions or the number of vehicles entering and exiting the parking area is not small, making it possible for transaction errors to occur which will harm the parking manager in quite a large amount of rupiah (Isnanto, 2013: 13).

This model is a sequential software approach starting from analysis, design, coding, testing and supporting stages (Rosa and Shalahudin, 2013).

Needs Analysis is to analyze what needs will be needed when creating a program, such as hardware and software that will be used. In this case, using the Java programming language with Netbeans 8.2. For database and application design, namely mapping what columns and attributes are used in the application and analyzing the classes and methods in the application. The following is a brief description of the application design used.

The coding or application implementation stage uses the application of OOP or Objected Oriented Programming. The last stage is the application testing stage, where the application is used and checked whether it can run or not, whether there are errors or not. So that the output of the program can be useful. The testing model in this study uses a questionnaire on a Likert scale conducted on 10 students. The scores used range from 0 to 4.

RESULTS AND DISCUSSION

Running the Program and Implementing the GUI

In the first stage, the user will be faced with the main menu. In the main menu, there is an exit menu and a parking menu to enter the core of the parking application program.

Figure 1. . Main Application Display

Then next, from the main display, go to the main display after the Parking button is clicked. So a display like the following appears.

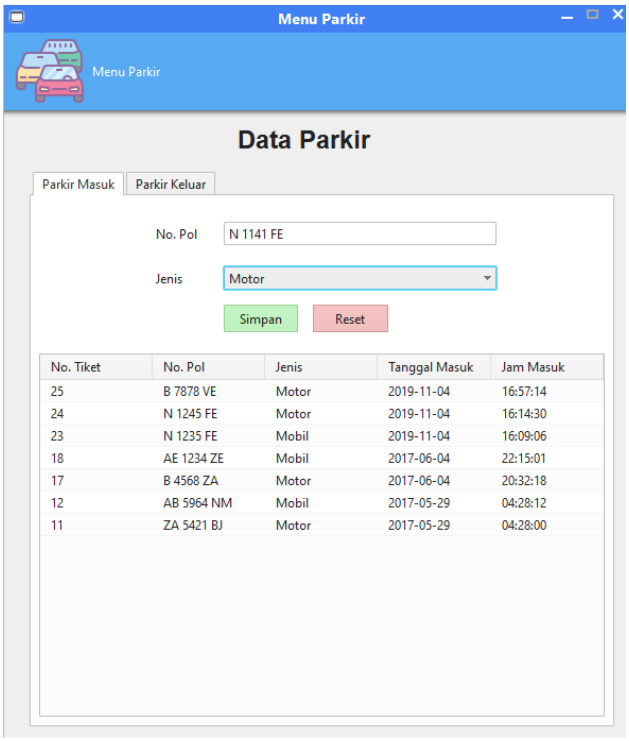

Figure 2. Parking Entry Menu Display

In this display, the user inputs data in the form of a license plate number and type of vehicle, motorbike or car. Then click save to save the data in the database. The reset button functions to eliminate data that is sometimes entered incorrectly. The user can immediately press reset and re-input the correct data. So in the table below, it automatically adds data along with its ticket number. So that the data is automatically saved.

Figure 3. Exit Parking Menu Display

When the vehicle wants to exit and make a payment. Then the officer as a user can directly input the vehicle's license plate number, then automatically by clicking the search button the required data will come out including the total parking fee. So that it can immediately calculate the total payment efficiently according to the correct and clear data. Then click exit when the payment process is complete, because it indicates that the vehicle has finished parking in that place. Data can be directly updated in the database. The Clear button is provided to make it easier for users to re-input their data when the next vehicle wants to carry out the transaction process and so on.

Application of OOP

1. Implementation of Data Types
   There are several data types used in this program, for example String which is used to enter characters such as police numbers and vehicle types and Integer to initialize parking fee objects, days, and times. The data types used in this program are shown in the source code:

```
new String [] {
    "No. Tiket", "No. Pol", "Jenis", "Tgl Keluar", "Jam Keluar", "Biaya"
}
int hari = Integer.parseInt(konek.rs.getString("durasi_hari"));
int jam = Integer.parseInt(konek.rs.getString("durasi_jam"));
int biaya, biaya_akhir;
```

Figure 4. Application of Data Types in Applications

2. Implementation of Classes and Objects
   OOP cannot be separated from the classes and objects used. Of course, this is a step to create an application-based system that can be integrated and connected between one feature and another. The following is the implementation of the Class in the source code.

```
public class koneksi {
public class TA_parkir {
```

Figure 5. Implementation of Classes in Applications

The implementation of the object is in the source code:

```
new Object [][] {

},
new String [] {
    "No. Tiket", "No. Pol", "Jenis", "Tgl Keluar", "Jam Keluar", "Biaya"
}
```

Figure 6. Implementation of Objects in Applications

3. Application of Inheritance
   A class that contains the same members from several other classes is called a superclass or parent class. The class that inherits is called a subclass or child class. Inheritance produces a class hierarchy that makes it easy to connect GUI display pages with feature classes that contain methods for each display in the application. In this program, the application of Inheritance is found in the source code:

```
public class fParkir extends javax.swing.JFrame {

public class awal extends javax.swing.JFrame {
```

Figure 7. Implementation of Inheritance in Applications

4. Implementation of Interface Class
   Programmer interface, to share constants or determine the form of methods that can be used by a number of classes. Interface is implemented into a class using the implements keyword. A class can implement more than one interface. Interface functions to declare in advance the methods to be created. If you want to use the method in another class, you only need to call and implement. In this program, the implementation of the Interface is in the source code:

```
package ta_parkir;

public interface tampil {
      public void tampil_masuk();
      public void keluar();
}

public class fParkir extends javax.swing.JFrame implements tampil  {
    DefaultTableModel masuk, keluar;
```

Figure 8. Implementation of the Interface in the Application

Application Testing Results In

In this study, a user trial was conducted on 10 respondents, namely students of the Informatics Engineering Department at the State University of Malang. The trial data were obtained by distributing a questionnaire in the form of a question form along with its assessment scale. The results of the User trial are presented in Table 1 and Table 2.

Table 1. User Test Results

Assessment Indicators	Respondent Results				
	1	2	3	4	5
Early Appearance	0	0	0	0	10
Parking Features	0	0	0	1	9
Ways of working	0	0	0	1	9
(Operational) Application					
Appearance	0	0	0	0	10
Overall/User					
Application Interface					

Table 2. Percentage of Application Trials

No	Evaluation	Presentation Score
1	System Operations Application	99%
2	Application User Interface	99%
	Average Percentage	99%

CONCLUSIONS

The concept of OOP or Objected Oriented Programming in Java has many uses to create a program from this daily life problem. It is not wrong that many things can be implemented from daily life with this Java OOP. Based on the results of user trials, the results of user satisfaction based on the operational assessment aspects of the system and the application user interface are 99% which means very good. So it can be concluded that this Java-based parking management application is worthy of use. This parking system program can be applied to the community, especially vehicle storage places in Indonesian cities. The existence of a parking system with the OOP concept can provide comfort for parking users and make the performance of parking officers more efficient.

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