



Implementation of the waterfall method to the car rental information system at UD Bintang Rimba

Maruloh¹, Siti Nur Khasanah², Sandra Jamu Kuryanti³, Agus Junaidi⁴

^{1,2}Sistem Informasi, Universitas Nusa Mandiri, Jl. Raya Jatiwaringin No 2, East Jakarta 13620

³Sistem Informasi, Universitas Bina Sarana Informatika, Jl. Kramat Raya No 98, Central Jakarta, 10420

⁴Teknologi Informasi, Universitas Bina Sarana Informatika University, Jl. Kramat Raya No 98, Central Jakarta, 10420

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ABSTRACT

With the development of information technology, we are required to be able to keep up with technological developments. At this time, there is still a conventional car rental information system. This causes the information that can be obtained by the public about this car rental is still minimal. So it is necessary to have information that can be accessed widely by the public so that people can easily get information about car rentals without having to come directly to the rental place. Apart from that, it provides benefits for car rental owners in the process of recording reports, no longer needing to use a conventional system that must record every transaction. So that there is an information system development for the car rental. The method of developing software using the waterfall model. With the design of this car rental information system, it is hoped that it can help speed up and simplify car rental so that the rental process becomes more effective and efficient and helps the admin in making reports. The web application can also be a means of assisting companies or agencies in improving the performance of car rental vehicles.

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Corresponding Author:

Siti Nur Khasanah,
Sistem Informasi,
Universitas Nusa Mandiri,
Jl. Raya Jatiwaringin No 2, East Jakarta 13620.
Email: siti.skx@nusamandiri.ac.id

1. INTRODUCTION

In this era of globalization, the need for four-wheeled transportation is now an important requirement in fulfilling people's mobility. Car rental companies have grown rapidly with various vehicle brands and facilities. Competition between companies is very tight, so a reliable marketing strategy is needed, such as the use of internet technology. (Hasan, 2019)

The need for transportation services is a reflection of the needs of the community, the higher the level of community activity, the higher the mobility of community activities and will further require a pattern of improvement in the field of transportation services. (Saryoko, Badrul, & Samudi, 2017). So that the vehicle rental service requires an

information system to facilitate car rental activities so that the process can be fast and easy in booking the car rental (Saubani, Nainggolan, & Khasanah, 2019).

Several other studies conducted are in 2021 Videl Rental is a car rental business that requires a computer-based information system so that the rental system becomes more practical and car data reports, tenant data, driver data and car return data reports can be stored properly. Therefore, in this study, a car rental information system was created on Videl Rental using the Grounded Research method (Haidar, Dhika, & Habibie, 2021)

The next research was conducted by a car rental in Sidoarjo, on the car rental still using books in recapturing customer transactions and customer daily reports. Manual management often occurs causing errors (human errors) so that a lot of data is lost or damaged. So that in this study a web-based car rental information system was created using PHP and MySQL as well as using the codeigniter framework (Naufal & Eviyanti, 2022).

The next research was conducted on lotus car rental car rental. Currently, the rental process in the rental still uses manual methods, so that if the availability of the car runs out, the borrower looking for a car to another rental place or Lotus car rental will contact one by one car rentals who work together to ask about the availability of the car. Therefore, a car rental information system was created using RAD (Rapid Application Development) (Hasan, 2019).

Penelitian selanjutnya dilakukan oleh Filda, dkk yang membuatkan suatu system informasi penyewaan mobil berbasis java dengan menggunakan metode SDLC. Sistem Informasi yang dibuat menggunakan Bahasa pemrograman java yang responsive dan (Angellia, Cahya, & Louis, 2020).

UD. Bintang Rimba is a company engaged in the glorious field of car rental which is located in Sрати Village, Ayah District, Kebumen Regency. The current system is still not computerized. The obstacles faced by UD.Bintang Rimba still use paper media in providing information to customers when they are going to register and documents in the form of car type data, customer data, car return and rental data, transaction data which can slow down the car rental process, data search and make rental reports every month, because they have to find and adjust archives where the data is not necessarily there or maybe it has been damaged

The purpose of this study is to find out customer registration procedures, car data, car type data, loan transaction processes, car returns and car rental reports and ongoing management at UD.Bintang Rimba. Based on these problems, the authors aim to create a car rental information system and provide web-based rental information using a consigner where the system will be made computerized to assist in data management, so that information data processing becomes easier and more accurate.

2. RESEARCH METHOD

The research method and data collection used in this study are:

2.1. Method of collecting data

Data collection methods used in this study include:

a. Observation

Observation is data collection that is done by observing behavior or events that are happening (Abidin, 2017). In this method the researcher made observations at the UD.Bintang Rimba car rental place and collected and examined all available data such as car rental recording data.

b. Interview

The interview is a direct communication technique between the researcher and the object by means of the researcher asking questions which are answered directly with the object (Abidin, 2017). In this method the researcher held a meeting with UD Car Rental. Bintang Rimba and conduct question and answer sessions or interviews with the administrators of UD.Bintang Rimba with several questions related to the topics discussed.

c. Literature review

This activity is carried out by collecting reference sources as references such as books, journals and articles or existing references related to research (Nurbayati & Budihartanti, 2020). This method is used as a support and support from existing data as well as comparison material. researchers also approach by using reference books and journals

2.2. Software Development Methods

The software development method in this study uses the Waterfall model. The Waterfall model describes a systematic and sequential approach to software development, starting with the specification of user requirements then going through the stages of planning, modeling, construction, and delivery of the system to users (deployment), ending with support. on the complete software produced (Sukamto & Shalahudin, 2018)

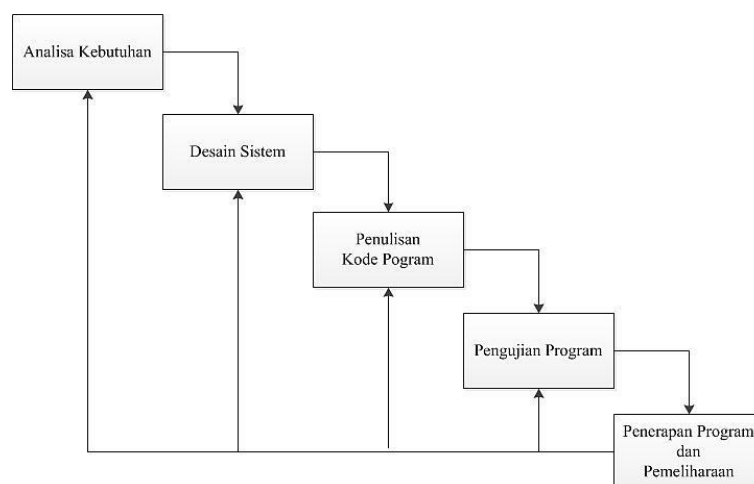


Figure 1. Waterfall Model

a. Requirement Analysis

At this stage the authors begin to identify system requirements, such as functional requirements and non-functional system requirements

b. System Design

At this design stage, it is an advanced stage of the analysis phase, designs for applications such as interface design and database design will be presented and will be used in the Academic Information System that will be created.

c. Writing Program Code

At this stage the author applies database design and interface design techniques to the PHP programming language for website creation purposes.

d. Program Testing

In the final testing phase of the waterfall method, blackbox testing is used

e. Program Implementation and Maintenance

At this stage, the software can be modified by the user if it has been delivered to them. Changes may occur because bugs were not found during testing. The Maintenance Support Session attempts to establish the software development process without creating new software features

3. RESULTS AND DISCUSSIONS

3.1. Requirement Analysis

Admin requirement Admin manages car data, Admin manages customer data, Admin manages transaction data, Admin manages reports. Customer needs, Customers can make transactions, Customers can change their profile, Customers can make payments

3.2. System Design

At the design stage using use case diagrams. usecase diagram displays the role of the user and how the role is when using the system. Use case diagrams can be used to represent user interactions with the system and describe user problem specifications (Destriana, Husain, & Siswanto, 2021). use case diagram is a collection of connected groups to build the system properly. Use case is the interaction between use cases and participants (Wijaya & Astuti, 2019)

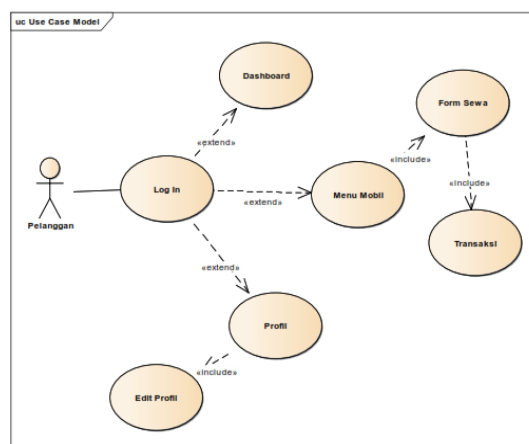


Figure 2. Customer Use Case Diagram

Activity diagram is a procedural logic technology that utilizes various activity flows to be designed (Habibi & Aprilian, 2020). Activity Diagram Describes a series of activity flows that are used to define activities that are formed in an operation so that they can

also be used for other activities (Mufida, Rahmawati, & Hertiana, 2019). The activity diagram in this study is as follows

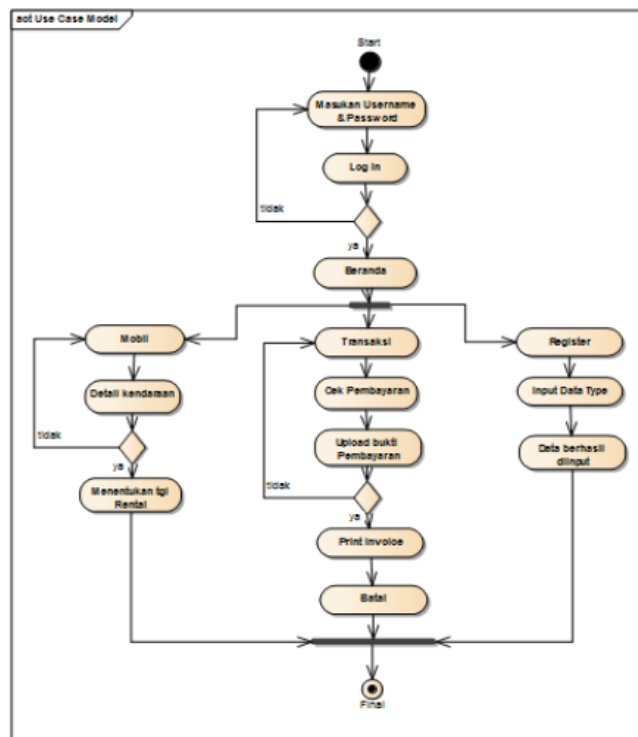


figure 3. Activity diagrams

Class diagrams or class diagrams are a type of structure diagram in UML which clearly illustrates the structure and class descriptions, attributes, methods, and relationships of each object (Prasetya, Sintia, & Putri, 2022). Class diagram is a diagram that describes the relationship (relationship) between classes contained in a system logically (Rohman & Savero, 2018). class diagram in this study is as follows

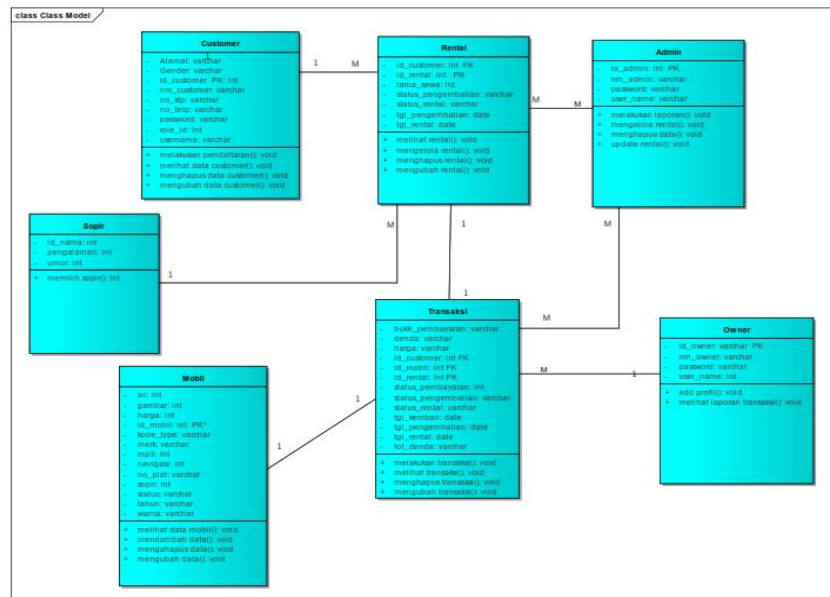


figure 4. class diagrams

3.3. Writing Program Code

After doing the design, the next step is writing the program code. in this study writing program code using the PHP programming language with the CodeIgniter framework. The codeigniter framework is a PHP framework that helps developers create web-based applications (Anggraini, Pasha, & Setiawan, 2020). Inside Codeigniter is equipped with various ready-to-use libraries for various needs, such as database connections, sessions, cookies, email, security, image manipulation and many more to make work easier (Ramadhan & Rusmawan, 2018). besides that, bootstrap and java script are also used to beautify the appearance of the program. Bootstrap provides a neat and uniform solution to common, interface tasks that every developer faces (Jantce TJ Sitinjak, Maman, & Suwita, 2020)

3.4. Program Testing

Black box testing is a software testing technique that focuses on the specifications of the functions contained in the software being developed (Rahadi & Vikasari, 2020). At the program testing stage, it is carried out using the black box testing method. The Blackbox Testing method is a procedure used to test an application without having to pay attention to the details of the application. This test only checks the output value based on the respective input value. There is no attempt to identify what program code the output uses (Nugroho, Sari, Permana, & Negara, 2021). The following is the result of one of the program tests

Table 1. Black Box Testing Results Admin Login Form

No.	Test Scenario	Test Case	Suggested Results	Test Result	Conclusion
1	Clear all fields of all login data fields in the login form, then click "Login"	Username : (empty) Password : (empty)	The system will deny login access and will redirect to the username form	According to expectations	Valid
2	Just fill in the Username data and	Username : (111)	The system will deny login access and will	According to expectations	Valid

	leave the Password blank then click "Login"	Password : (empty)	redirect to the password form		
3	Just fill in the Password data and empty the Username data then click "Login"	Username : (empty) Password : (***)	The system will deny login access and will redirect to the username form	According to expectations	Valid
4.	Fill in both data with the wrong conditions, then click "Login"	Username : (wrong) Password : (wrong)	The system will deny login access and will display the message "Incorrect Username and Password"	According to expectations	Valid
5.	Fill in the Username data with the correct conditions and the Password is wrong then click "Login"	Username : (correct) Password : (wrong)	The system will deny login access and will display the message "Incorrect Username and Password"	According to expectations	Valid
6	Fill in the data with the condition that the Username is wrong and the Password is correct then click "Login"	Username : (wrong) Password : (correct)	The system will deny login access and will display the message "Username and Password are incorrect"	According to expectations	Valid
7	Fill in the data with the conditions that the Username is correct and the Password is correct then click "Login"	Username : (correct) Password : (correct)	The system will receive login access and display the dashboard page	According to expectations	Valid

3.5. Program Implementation and Maintenance

The following is the implementation of the car loan information system from the research that has been made:

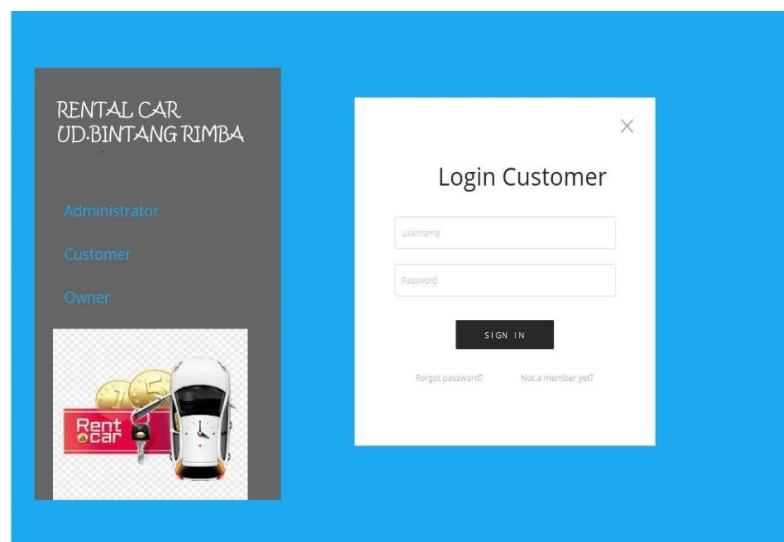


Figure 5. Customer Login Page

Figure 5 is a display of the login form. used by consumers to enter into the system. later consumers can rent a car on the menu provided by the system.

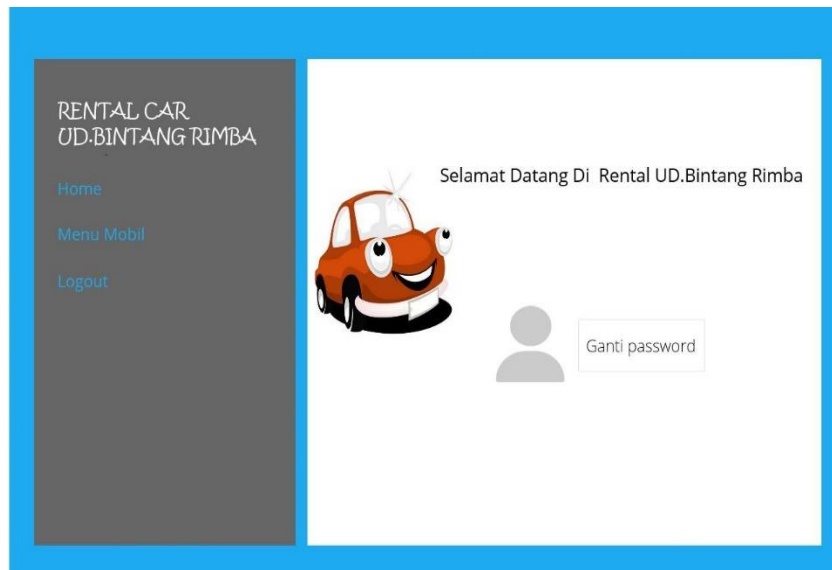


Figure 6. Customer Menu page

Figure 6 is a page from the car rental system. This page appears if the username and password input on the login page is correct. On this page consumers can order a car through the car menu.

4. CONCLUSION

Making the design of a Condegniter web-based car rental information system is expected to make it easier for web access, both prospective customers who want to rent in advance, as well as provide convenience provided to customers in making online orders, as a promotional medium and also customers can see availability the car needed and make it easier to make transactions.

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