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Design of a Web-Based Car Rental Self-Management Information System at PT Len Railways System (LRS) Bandung

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Abstract : Swakelola Car Rental is a snapshot of car rental data carried out by a company to find out the financial data that comes out during the project that is being released. In inputting this data, PT Len Railways System (LRS) is still doing it in a sheet-by-sheet way, namely with Microsoft Excel; this will slow down the management of car rental self-management data. Therefore, a Web-based Car Rental Self-Management System Design will be built that uses PHP programming language and My SQL as a database using qualitative methods. News and data are generated through observation and interviews. Documentation and literature studies related to research. The software development method utilized is the waterfall sample method, which follows a sequential process that begins with system analysis and progresses through design, coding, and testing phases. This method cannot be implemented arbitrarily. And with this design system, the company's performance in terms of managing leases must be more effective.

IndexTerms **- Information Systems; Car Rental; Data Processing; Website.**

INTRODUCTION

PT Len Railway Systems was established in 2012, is a company engaged in EPC (Engineering, Procurement, Construction) for railway signaling. PT Len Railway Systems is a subsidiary of PT Len Industri (Persero), one of the State-Owned Enterprises (BUMN) domiciled in Bandung. PT Len Industri (Persero) has spread businesses and products in the field of electronics for industry and infrastructure, one of which is in the field of railway transportation. Making railway system development activities the company's primary business, PT Len Railway Systems has produced and manufactured the frequency and transaction system for railways as our own nation's engineering work among the world's challenges and the invasion of imported products. Currently, PT Len Railway Systems is involved in projects with new technology and is being used for the first time in Indonesia, including LRT (Light Rail Transit) in Palembang and APMS (Automated People Mover System) at Soekarno Hatta airport.

In carrying out these projects in various places, of course, transportation is required to crosscheck the activities being carried out and to help the needs involved in the project. Transportation is a means used by humans (employees) to move goods or people and connect several regions, cities or countries. However, not only one transportation is used in each city or each project, so PT Len Railway Systems rents or rents cars in various places that are carrying out projects by involving the person in charge of the project to be a means of protection for the rental or rental of the vehicle. The vehicles needed are motorcycles and cars. However, PT Len Railway is more focused on car rental or rental because it is affordable. Every project that does car rental will be responsible to PT Len Railway Systems. PT Len Railway System will input all the rental or rental car data, but PT Len Railway Systems does not have a special system that can handle self-storage data from various projects every month with fast integration. Data input is still carried out sheet by sheet. This will of course slow down the management of data on car rental self-management. And in searching for project code data, it

is still manual, so that when the data is needed for input, it takes a long time because of the code checking that must be integrated.
Therefore, to deal with these problems, it is necessary to build a Project Car Rental Management system, and it is hoped that the system created can be useful in achieving the performance of PT Len Railway Systems.

RESEARCH METHODOLOGY

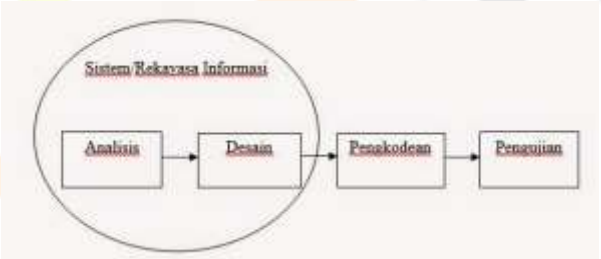
The research method used is qualitative. Based on (Sugiyono: 2005) Qualitative research is research used to research on the condition of natural objects, where the researcher is a key instrument

Data and Sources of Data

In obtaining data and supporting theories, the author conducts various kinds of research including:
Observation is a systematic observation and recording of the symptoms that appear in the object of research (Zuriah, 2009).1 The author conducted observation for 2 months at PT Len Railways System (LRS) which was shown to obtain the complete factual data needed.
Interviews are a tool for gathering information by asking a number of questions to be asked and answered orally. (Zuriah, 2009). In the interview stage, the author conducts direct questions and answers to supervisors and employees related to the object of writing, especially the accounting section.
collecting data through written relics such as archives, including books on theories, opinions, postulates and laws and others related to research problems (Zuriah, 2009). The author obtained data based on documents related to the subject matter researched by the author.
That is, data collection through books using references related to titles. The author collects data through articles and books related to what the author researches.

3.3 Theoretical framework

The method used in this design work is the waterfall method. based on Sukamto and Shalahuddin (2014:28) "the waterfall system development method or waterfall method is often also called the sequential linear model or classic life cycle.2 The waterfall method provides a sequential or sequential application lifeflow approach starting from analysis, design, coding, and testing"



Here is a picture of a model of the waterfall:

Figure 1. Waterfall Models

The stages in the waterfall method are briefly as follows:
System analysis is carried out to identify problems, obstacles that occur and expected needs so that improvements can be proposed. At this stage, system analysis is carried out, including: Problem identification is the first step of system analysis. Identifying problems into Efforts to define problems to be more measurable. In this analysis, problem identification is carried out by first revealing what problems are found and how the problems will be measured and related to a research procedure. The problem found at PT LRS is that the input of self-managed data for car rental is still carried out sheet-by-sheet, which will take time to input the data; Analyzing the needs of system software users (users) and developing user needs, it will strive for all needs by collecting data and information that will be used as a means of supporting the research mechanism. The solution to this problem is to build an automatic system design where the company will quickly input the data needed. To analyze software needs in the design of information systems and workflows on those systems. Data needs for the system are; User/Admin Data, Car Rental Data, Expense Data; A feasibility study is used to determine the likelihood of success of the proposed solution. This stage is useful to ensure that the proposed solution is actually achievable. To realize this stage, the formation of a website-based system is carried out, namely the design of a four-wheeled vehicle rental self-management information system, where this system will input data and will make it easier for employees to cross-check project car rental data.

Software design is a multi-step process that focuses on the design of software program creation including data structures, software architecture, interface representations, and coding mechanisms. This stage translates the software requirements from the requirements analysis stage to the design representation so that it can be implemented into a program at the next stage.

For this stage, a workflow is needed on the system. The following is the system workflow that will be needed:

1. Login Page
   User/Admin input NIP and Username to login;
2. Dashboard
   The main page or interface that gives an overview of the design;
3. Driver Data Page
   Users can input driver data according to the vehicle used;
4. Vehicle Data Page
   Users can input vehicle data used during the project;
5. Rental Data Page
   Users can input rental data according to vehicle data and driver data;
6. Report
   Users can check the Report from all data and can print the Report as needed;

The design must be transacted into the software program. The result of this stage is that the computer program is in accordance with the design that has been created in the design stage. In the coding stage, it will create coding using sublime and adjust the previously analyzed data.

The testing stage is carried out when the information system has been operated, the testing focuses on the software in terms of logic and functionality and makes sure that all parts have been tested. This is done to animalize errors and ensure that the output produced is as desired. The testing stage is the last stage in this method and the author implements the code that has been created by operating or running through software as researched by the researcher.

RESULTS AND DISCUSSION

Based on the description above, we can know that the management of project car rentals at PT Len Railways Sytem is still using a manual method using Miscrosoft Excel, to deal with these problems, it is necessary to build a Project Car Rental Management system so that it becomes more effective.

To continue the design process and make it easier to design, Flowmap, Context Diagram, Data Flow Diagram (DFD) and Entity Relationship Diagram (ERD) are created.

Flowmaps are charts that have a flow to illustrate the steps to solve a problem or system.

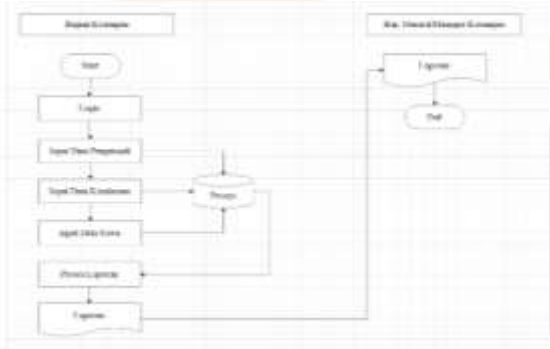
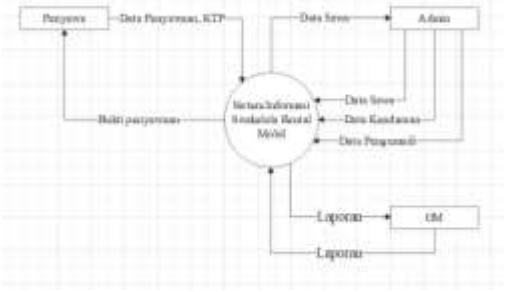


Figure 2 : Flowmap

According to Jogiyanto (2005:59) a context diagram is a data flow diagram that functions to illustrate what an object is designed for, this context diagram describes globally or comprehensively an information system



that relates data flows between the outside world.

Figure 3: Context Diagram

The designed system context diagram is shown in Figure 3.Context Diagram. In the debut image there are three entities, namely tenants, admins and finance departments. The process starts from the tenant claiming rental data using an ID card to the system, then the admin will input rental data, vehicle data and driver data to the system to be managed by the database so as to generate rental reports. after that the report will be given to the financial General Manager for ACC.

According to Hartono (2005:700) in his book Information System Analysis and Design, Data Flow Diagram (DFD) is a tool used in the methodology of structured system development (Structured Analysis and Design). The Data Flow Diagram on the designed system is shown in Figure 4. Data Flow Diagram Level 0. Some of the processes are as follows:

a) Login
b) Manage Driver Data
c) Manage Vehicle Data
d) Manage Rental Data
e) Report

Figure 4: Level 0 Data Flow Diagram (DFD Level 0)

According to Sutanta (2011), in his book entitled "Database in Conceptual Review" explains that Entity Relationship Diagram (ERD) is a data model developed based on objects.

According to Mata Taledo and Cushman (2007:139) define "Entity Relationship Diagram (ERD) is a graphical and logical representation by including detailed descriptions of all entities, relationships, and constraints. 5

Based on the explanation above, it can be concluded that ERD is a data model and a graphical representation that includes it based on objects.

Figure 5. Entity Relationship Diagram (ERD)

The Entity Relationship Diagram (ERD) in this design is shown in Figure 5. Entity Realtionship Diagram (ERD). In this ERD there are 4 entities, namely tenants, renters, cars and admins where in the 4 entities each have their own relationships needed by the system.

At this stage, the design that has been designed will be poured in the form of coding with PHP programming language and MY SQL as a database. The following is the system interface that has been designed:

a) Listing Page

This page is a Registration page, where admins or operators who do not have or who have never logged into the system must register first.

Figure 6. Listing Page

b) Login Page

On the login page, the admin enters NIP and Password to enter the main page of the system that has been created.

Figure 7. Login Page

c) Administrator Menu Page

On the main page, this is a page that contains all menus that can be used by operators in managing vehicle data, drivers, rentals, and reports on the system.

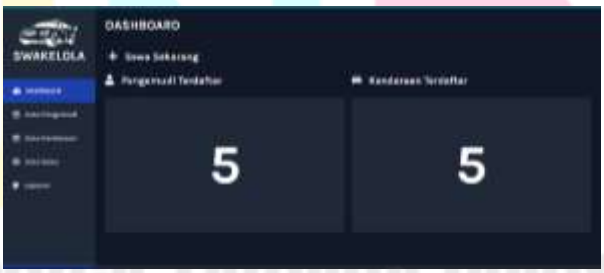


Figure 8. Administrator Menu Page

d) Driver's Page

On the driver page, the admin inputs the driver data registered in the self-management data.

Figure 9. Driver's Page

e) Vehicle Page

On the vehicle page, the admin inputs vehicle data that has been used by the company's project.

Figure 10. Vehicle Page

f) Rental Page

This page is a page where the admin inputs rental data with data that is already in the self-management process.

Figure 11. Rental Page

g) Transaction Report Page

This page is a page that contains transaction data results that can be printed by operators on the system.

Figure 12. Transaction Report Page

Figure 13. Transaction Report Page

The system testing stage is carried out after the design is completed, this test is carried out using the blackbox method with the aim of finding errors contained in the system.

Table 1. Blackbox Login Page

Testing	Result	Status
NIP and Password Input	If the NIP and password are incorrect, then you cannot log in.	Succeed

Figure 14. Blackbox Login Page

Table 2. Blackbox Home

Testing	Result	Status
NIP and Password Input	If the NIP and Password are correct, they will enter the main page	Succeed

Figure 15. Blackbox Home

Table 3. Blackblox Driver Page

Testing	Result	Status
Enter the driver's data and click save	If the data has been input and saved, the Data Added Successfully caption appears.	Succeed
Edit driver data	If the data has been edited and saved, a description of Data Edited	Succeed

	Successfully will appear	
Clear driver data	If the data has been deleted, a message will appear that the Data Has Been Successfully Deleted	Succeed

Figure 16. Blackbox Driver Data Input

Figure 17. Blackbox Edit Driver Data

Figure 18. Blackbox Clear Driver Data

Table 4. Blackbox Vehicle Page

Testing	Result	Status
Enter the vehicle data and click save	If the data has been input and saved, the Data Successfully Added caption appears.	Succeed
Edit vehicle data	If the data has been edited and saved, a description	Succeed

	of Data Edited Successfully will appear	
Clear vehicle data	If the data has been deleted, a message will appear that the Data Has Been Successfully Deleted	Succeed

Figure 19. Vehicle Data Input Blackbox

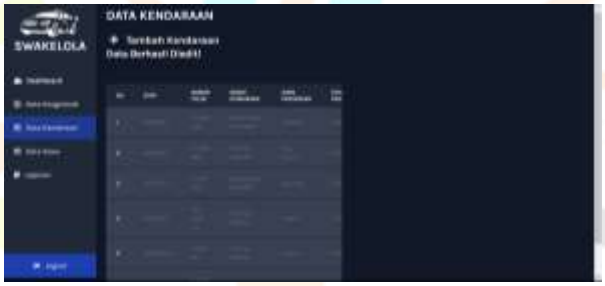


Figure 20. Blackbox Edit Vehicle Data

Figure 21. Blackbox Deletes Vehicle Data

Table 5. Blackbox Rental Page

Testing	Result	Status
Enter rental data, check rental price and click save	If the data has been inputted, the price has been listed and saved, it will be automatically inputted.	Succeed
Delete rental data	If the data has been deleted, a message will appear that the Data Has Been Successfully Deleted.	Succeed

Figure 22. Blackbox Input Data Rental

Figure 23. Blackbox Clear Rental Data

II. ACKNOWLEDGMENT

Based on the series of system design carried out related to the car rental self-management information system starting from system analysis, system design to the implementation of the results of the research that has been carried out at PT Len Railways System, it can be concluded that, The results of this research analysis produce a design in the form of information on the analysis of the ongoing system, the proposed system and the needs of users. Through the design obtained, the system was successfully built with the function of self-management data management of car rental and can make it easier for companies to input car rental data.

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