Hours Meter Report System Application for Heavy Equipment at PT. Belawan Indah

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ABSTRACT

Crane (heavy equipment) is one of the tools to unload and load containers from ships / depots. Because of its very important uses, each component of the crane must be checked every day before and after use. To improve the efficiency of the reporting process, an information system or additional feature is created which can be used by technicians in reporting cranes. The technology used in the form of Android-based applications so that it can be accessed mobile by anyone, anywhere, and anytime. This system uses the Waterfall method, the Waterfall Method is used aims to develop a system of crane usage reports, which is carried out sequentially or linearly. The system is made as easy and simple as possible so that the operator does not have trouble inputting reports. This system will provide information reports to Bosses / Pic who can monitor the condition of the crane only through logins to the system or sent emails. With this system all information will be captured clearly and neatly in accordance with the SOP in the company.

Keyword : Heavy Equipment Crane, Android, Waterfall, Information System

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1. INTRODUCTION

Information is very important for every level of society in the modern era like today(Syahputra & Oktavianasembiring, 2019). This also applies in a corporate environment(Forcadell et al., 2020). The importance of accurate company information will affect many things. One of them is information about the report(Gulledge et al., 2020). Companies involved in Shipping and Containers require heavy equipment as a means of loading and unloading containers from trado (trucks). This heavy equipment process is carried out by the operator (heavy equipment user) to carry out the loading and unloading routine(Handayani, 2015).

Several previous studies have discussed the problem of reporting the use of heavy equipment, including research conducted (Irawan, 2016) This research discussesthe construction work process using heavy equipment that is scattered in the project area. The difficulty of procuring routine inspections due to the lack of supervision of the distribution of heavy equipment, as well as the late reporting of accidents that resulted in material losses.This study makes an android application to make it easier for the SHE team to carry out maintenance, supervision, and reporting of accidents that can cause losses. The results of designing an android application make the SHE team can easily inspect, supervise and report heavy equipment in the company.

The presence of an Android-based smartphone application as a technology product is expected to assist in accessing information or data in companies(Mardian et al., 2018). The portability of the Android smartphone makes it easier (Putra et al., 2017) for branch/representative personnel to access applications anywhere.

In developing applications, a method is needed, the waterfall method is a method that has been widely used in developing applications(Signe et al., 2019), including research conducted by (Wella & Fauzan, 2016) and (Tabrani & Pudjiarti, 2017), in this study they developed a reporting application regarding reporting of aircraft departure schedules and inventory of goods. Both studies use android-based applications and the waterfall method.

Based on this explanation, an idea emerged, how to build a Hours Meter (HRM) report application for heavy equipment use, where this application can later help solve the problem of reporting heavy equipment usage. For this research case study at PT. Belawan Indah.

2. RESEARCH METHOD

A. Systems Development Method

In system development, a method is needed that functions as a reference or procedure in developing a system. The system development method used by the author is the Waterfall method.

The stages carried out in the waterfall model include stages such as analysis, design, implementation, evaluation, improvement, and development. The stages of the waterfall model are used as a reference or research procedure that the author does.

1. Analysis of system requirements includes requirements such as machine data, what features are required, how the system processes run, and others.
2. Design aims to describe how a system is built. System Design describes the form or design of the system being designed and helps in explaining the hardware specifications and architecture of the system.
3. Implementation is the process of making a system and later integrating with the next stage. The implementation process is based on the results of the analysis and design stages
4. Testing/ Integration is the stage that is carried out to test the implementation phase that has been carried out. Testing / Integration aims to determine the quality of the system and find out whether the system is ready or not for use
5. Deploymentis the stage that is carried out after the testing / integration process. After the functional and non-functional testing has been completed, the deployment or preparation of the system is prepared for use by container shipping companies.
6. Maintenance is a system maintenance process after the system is released

B. System Planning

In designing this system the author uses the Unified Modeling Language (UML) for system design. UML is a standard specification language for documenting, describing, and building software systems (El-Attar, 2019).

1. Use Case Diagram

Below is a use case diagram that is currently running on the Heavy Equipment HRM (Hours Meter) Reporting System.

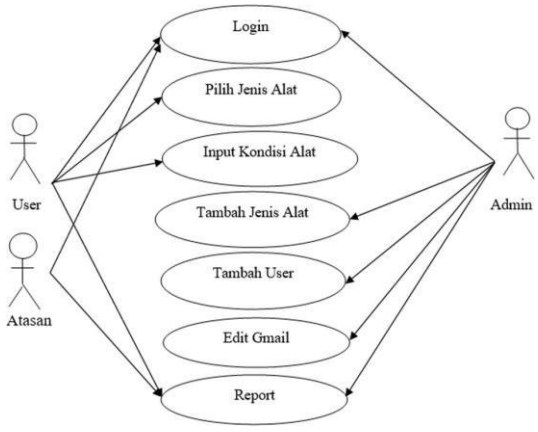

Fig 1. Use Case Diagram System

Use Case Diagram above describes all the functions that must be had in system design. The relationship between the user, the Operations Manager and the admin, among others, is to see the reports that have been input by the user and the registration of the account carried out by the admin, where the admin has the right to create an account and after that he can log in according to the data registered by the admin.

2. Activity Diagram

Activity Diagram used to describe more complex business activities, where the relationship between one use case and another is described(Ahmad et al., 2019). The following is an activity diagram that is designed.

- Activity Diagram Machine Condition Input

Input activities of heavy equipment conditions are activities that occur when the user enters detailed machine conditions. The following is a design for the input activity diagram for heavy equipment conditions, can be seen in Figure 2 below.

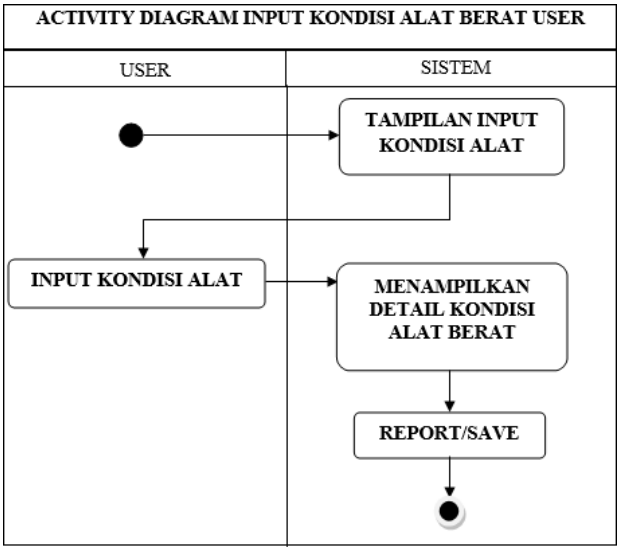

Fig 2. Activity Diagram of Heavy Equipment Condition Input

- Activity Diagram Heavy Equipment Type Input

Heavy equipment type input activity is an activity that occurs when Admin enters a new type of machine. The following is a design for the type of heavy equipment input activity diagram, it can be seen in Figure 3 below.

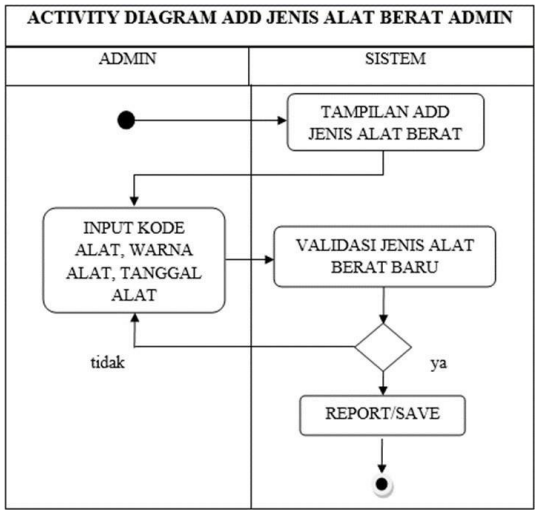

Fig 3. Activity Diagram of Admin Heavy Equipment Type Input

3. Class Diagram

The following shows the form of the system class diagram that was built.

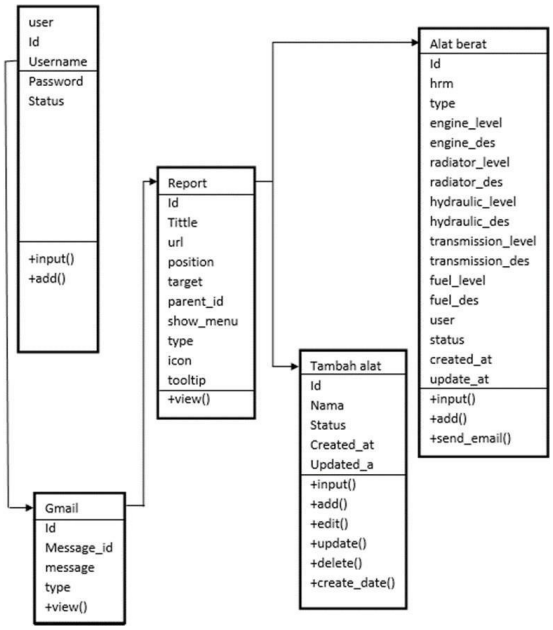

Fig 4. Class Diagram System

3. RESULTS AND DISCUSSION

After the analysis and design stage is carried out, the next stage is the implementation and system testing phase. The following describes these stages.

A. Main Menu Admin Level

The main view of the admin will appear after the admin has logged in first, where on the main page of the admin menu there are several menus that can be managed by the admin including the reports menu, heavy equipment menu, email and managing users.

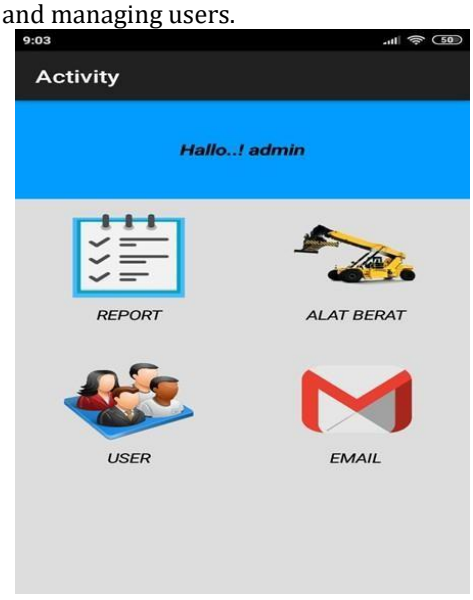

Fig 5. Main Menu Admin Level

B. Add Type of Heavy Equipment

The Add Type Heavy Equipment view at the Admin level is a view used to create new types of heavy equipment. Here is how it looks.

Fig 6. Display Add Type Heavy Equipment Admin

C. Admin Report

The Admin Report display is a display used by the admin to view reports on heavy equipment information that has been inputted by the user.

Fig 7. Report Menu Admin

D. Heavy Equipment Data Search Information

Machine data information user is a display that is used by the User to input the Hours Meter information for the machine being used. It aims to provide information and conditions for the type of heavy equipment used.

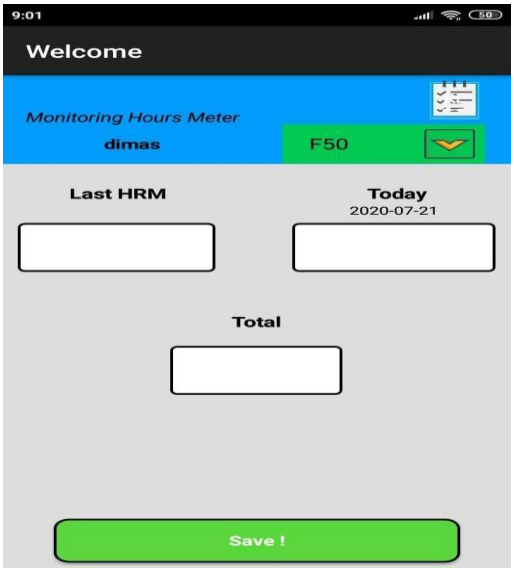

Fig 8. Monitoring Hours Meter

E. Report User

The Report User display is a display that is used by users to view the results of inputting information for the Hours Meter of the machine being used. In this view the user cannot edit or delete data that has been created. Users can only view and search / filter access only.

Fig 9. User Report Display

F. Main Menu Leader Level

The main view of the superior is the display that appears when the boss has successfully logged into the system, namely entering the main menu of the leader.

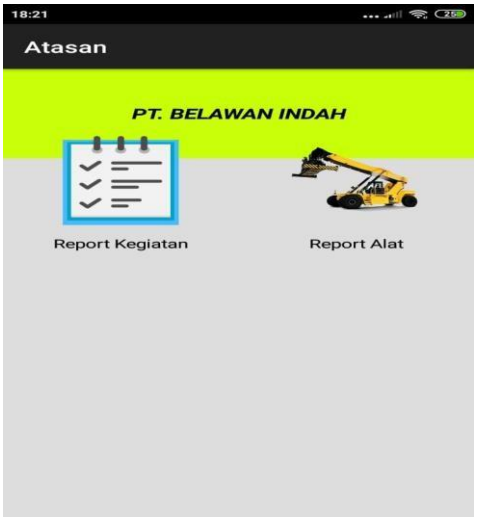

Fig 10. Main Menu Top Level

G. Result

This stage is the process of executing the system to determine whether the system can run properly as desired. System testing is often associated with finding bugs, program imperfections, errors in the program that cause system execution failures.

The results of application testing that are carried out on the features in the application can be seen in the following table.

Table 1. Application Testing Results at the Admin Level

NO	FUNCTION TESTED	HOW TO TEST	EXPECTED LOOKS	TEST RESULT
1	*Login*	*Admin* enter username & password	*Admin* go to the main Admin view	It works
2	*Add Email*	Select Add Email	Admin can change Email	It works
3	*Report*	Select report	Admin can see the results of inputting machine reports	It works
4	*Add Type* Heavy equipment	Select Add Type of Heavy Equipment	Admin can add new types of machines	It works
5	*Add Account*	Select Account	Admin can see user / admin data and can also create new user / admin	It works

Table 2. Application Testing Results at the User Level

NO	FUNCTION TESTED	HOW TO TEST	EXPECTED LOOKS	TEST RESULT
1	*Login*	Enter username & password	*User* made it into the main view	It works
2	Heavy Equipment Data	Select Machine Data	*User* can input Heavy Equipment HRM reports	It works
3	*Report*	Select report	The user can view the machine information that was just inputted	It works

Table 3. Application Testing Results at the Leadership Level

NO	FUNCTION TESTED	HOW TO TEST	EXPECTED LOOKS	TEST RESULT
1	*Login*	Enter username & password	The boss made it into the main view	It works
2	*Report* Activities	Select Activity report	Bosses can view user activity reports	It works
3	*Report* Heavy equipment	Select machine report	Bosses can see the new machines that the admin input	It works

4. CONCLUSION

From the discussion that has been described, the conclusions in this study can be drawn as follows:

1. The design and implementation of an android application-based heavy equipment usage report information system can be used as a medium to make it easier for heavy equipment users (technicians) to convey the condition of the equipment they are using.
2. With this system all information can be collected and made into reports according to user needs.
3. The black box test results on the system show that the system can run as it should.

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