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Warehouse Management Information System On Maklon Services With Economic Order Quantity Method

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ABSTRACT
CV. XYZ is a maklon services provider that partners with other businesses to manufacture snacks. Currently, incoming and outgoing goods data is still managed manually and there is no technology-based warehouse management information system. This study aims to design a website-based warehouse management information system that can be used to manage goods in the warehouse. The system in this study was designed using the waterfall method. This warehouse management information system is website-based and created using the CodeIgniter 3 framework with PHP and MySQL programming languages as its database and its editor tools using Visual Studio Code. The result of this research is the creation of a warehouse management information system that is able to manage goods in the warehouse, so that it can facilitate the work of managing incoming goods, outgoing goods, and stock of goods in the warehouse. With the existence of a website-based warehouse management information system, the system used can be changed to a computerized system, so that it is expected to help in managing goods in the warehouse to be more effective and efficient, as well as the presentation of stock reports to be more accurate and the information can be used to help in the decision-making process to accelerate the company's performance, especially in warehousing.

***Keywords**: Codeigniter; Jasa Maklon; Manajemen Gudang; Waterfall.*

INTRODUCTION
CV. XYZ is a maklon services provider that partners with other businesses to manufacture snacks. This company still uses manual methods to manage warehouse data, such as using stock cards, Microsoft Excel connected to a database, Google Drive, and there is no technology-based warehouse management information system. When goods come in and go out, they are recorded manually using stock cards, which takes longer, is less efficient, and can cause errors due to human error, such as differences in stock of goods in the warehouse. After recording using a stock card, the data is then entered into Microsoft Excel, which takes more time and makes the stock report less accurate. The process of searching for goods also takes longer and finding differences in goods takes even longer.

According to (Ishlakhuddin et al., 2021) The need for information is a priority for decision-makers in company management. The warehouse has a lot of data and information, Therefore, it requires a well-planned system for its management. To make work easier, it is necessary to apply information technology in company management, one of which is a technology-based warehouse management information system.

The implementation of a technology-based warehouse management information system is essential to control incoming and outgoing goods as well as production capacity. The information generated from the information system can be used by all parties who require information related to warehouse management data. With this information system, the decision-making process can be carried out more timely and efficiently.

Based on these problems, this study aims to design a website-based warehouse management information system as a solution to the problems that arise due to manual warehouse management. So that

it can change the system use to be computerized and is expected to help in managing goods in the warehouse to be more effective and efficient, as well as presenting stock reports to be more accurate.

METHOD

The type of research used in this study is development research which produces a product in the form of a warehouse management information system in the field of technology. In his journal (Okpatrioka, 2023) the research and development method is a research method used to create or produce a particular product and to test how effective the product is. Therefore, this study employs research and development methods.

According to (Wahid, 2020), the waterfall model is a model that uses a systematic and sequential approach in developing information systems. This model starts from the planning stage and continues gradually to the management (maintenance) stage. The waterfall model is very suitable for use in this research and development to create and develop a website-based warehouse management information system framework. There are five stages carried out in developing a website-based warehouse management information system as follows:

- Requirement

  This stage begins with collecting data through various methods, such as observations, interviews, and literature reviews, which will be used in designing the application to be developed. The observation conducted by the researcher was to conduct direct observation at CV. XYZ related to the process of managing goods in the warehouse. The researchers also conducted interviews with warehouse staff and employees to gather information about the company and the process of managing goods in the warehouse.
- Design

  In this stage, the researcher designs the display design that will be displayed on the website-based warehouse management information system application. This includes the process design stage, the database design stage, and the design of the system interface that will be used by users on the website.
- Implementation

  This stage begins with the coding process to create the application. Researchers use Visual Studio Code for the coding process in creating the application. Researchers use the PHP programming language with the CodeIgniter 3 framework, SB Admin 2 template, and MySQL as the database.
- Verification

  At this stage, verification and testing are carried out to determine whether the system in the application that has been created is functioning properly and can run as expected. Researchers used the black box method to test the system in the website-based warehouse management information system application.
- Maintenance

  At this final stage, researchers perform system maintenance and correct errors that were not detected in the previous stage.

RESULT AND DISCUSSION

This warehouse management information system has a dashboard menu, warehouse data menu, partner data menu, user data menu, goods data menu, incoming goods menu, outgoing goods menu, damaged goods menu, goods stock report menu, incoming goods report menu, outgoing goods report menu, and damaged goods report menu. To ensure that all the features function properly, the researcher conducted system testing using the black box method.

Result

- Goods Data Page

  The goods data page is a page used to manage, display goods data information, and print goods data PDFs. This page can be accessed by the warehouse head as a super administrator, the material warehouse admin as a user, and the finished goods warehouse admin as a user. On this page there are safety stock and EOQ features. When the value of the stock of goods is equal to or less than the amount of safety stock, a safety stock and EOQ notification will appear. When the value of the stock of goods is more than the safety stock amount, the safety stock and EOQ notifications will automatically disappear. As for the display goods data page as follows:

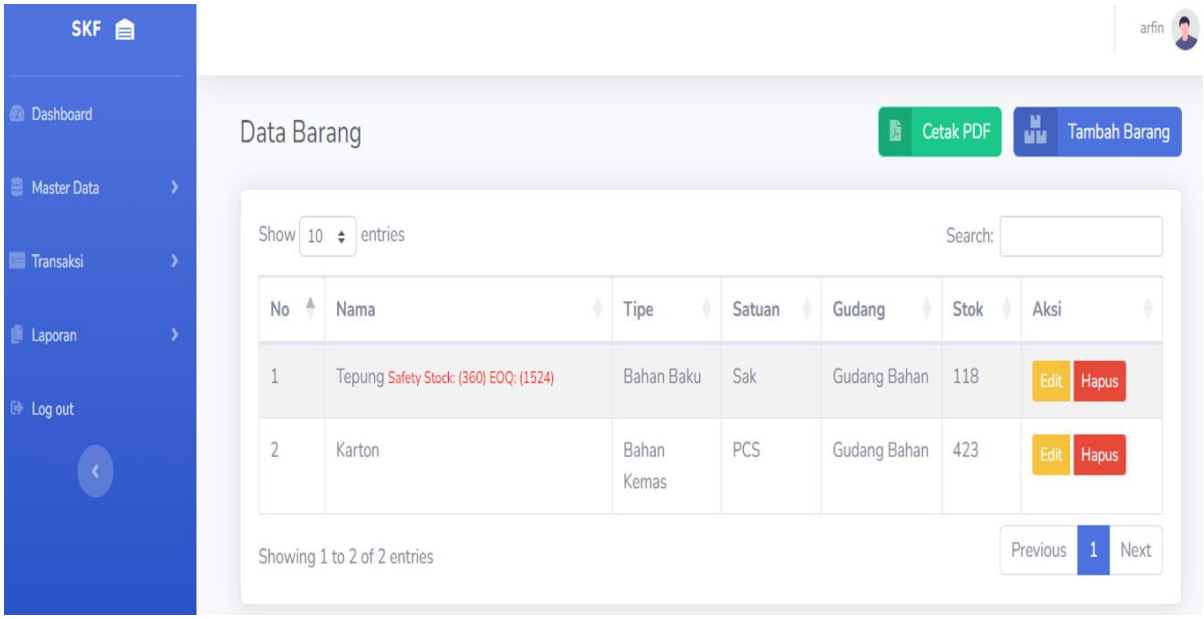

Figure 1. Goods Data Page

- Incoming Goods Page
  The incoming goods page is a page used to manage and display incoming goods information. This page can be accessed by the warehouse head as a super administrator, the material warehouse admin as a user, and the finished goods warehouse admin as a user. As for the display incoming goods page as follows:

Figure 2. Incoming Goods Page

- Outgoing Goods Page
  The outgoing goods page is a page used to manage and display outgoing goods information. This page can be accessed by the warehouse head as a super administrator, the material warehouse admin as a user, and the finished goods warehouse admin as a user. As for the display outgoing goods page as follows:

Figure 3. Outgoing Goods Page

- Damaged Goods Page
  The damaged goods page is a page used to manage and display information about damaged goods. This page can be accessed by the warehouse head as a super administrator, the material warehouse admin as a user, and the finished goods warehouse admin as a user. As for the display damaged goods page as follows:

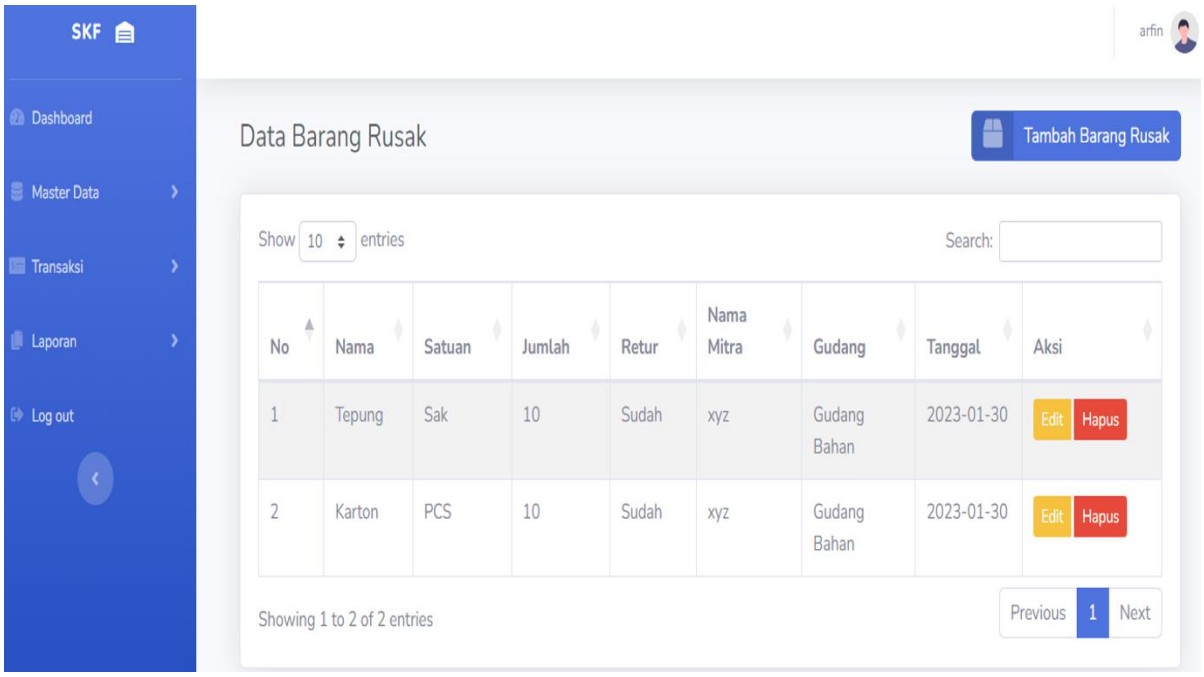

Figure 4. Damaged Goods Page

- Goods Stock Report Page
  The goods stock report page is a page used to display monthly goods stock report information and print a PDF of the goods stock report. This page can be accessed by the warehouse head as a super administrator, the material warehouse admin as a user, and the finished goods warehouse admin as a user. As for the display goods stock report page as follows:

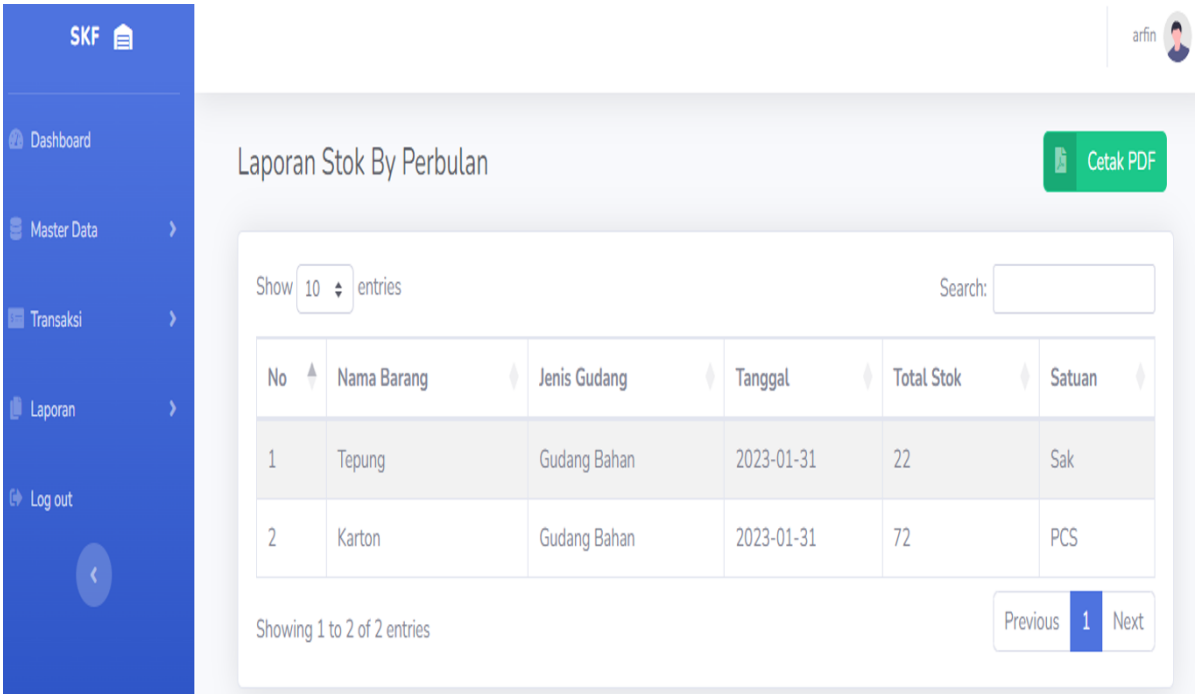

Figure 5. Goods Stock Report Page

- Incoming Goods Report Page
  The incoming goods report page is a page used to display monthly incoming goods report information and print a PDF of the incoming goods report. This page can be accessed by the warehouse head as a super administrator, the material warehouse admin as a user, and the finished goods warehouse admin as a user. As for the display incoming goods report page as follows:

Figure 6. Incoming Goods Report Page

- Outgoing Goods Report Page
  The outgoing goods report page is a page used to display monthly outgoing goods report information and print a PDF of the outgoing goods report. This page can be accessed by the warehouse head as a super administrator, the material warehouse admin as a user, and the finished goods warehouse admin as a user. As for the display outgoing goods report page as follows:

Figure 7. Outgoing Goods Report Page

- Damaged Goods Report Page
  The damaged goods report page is a page used to display monthly damaged goods report information and print a PDF of the damaged goods report. This page can be accessed by the warehouse head as a super administrator, the material warehouse admin as a user, and the finished goods warehouse admin as a user. As for the display damaged goods report page as follows:

Figure 8. Damaged Goods Report Page

Discussion

The researchers tested the web-based warehouse management information system application. In conducting system testing, researchers use the black box method. According to (Religia & Heriyanto, 2019) black box testing is a software quality testing method that focuses on software functionality and aims to find incorrect functions, interface errors, errors in the structure of the software functionality testing process. Here are some tests carried out by researchers as follows:

Table 1 Pengujian Sistem

No	Tested Function	How to Test	Interface	Results
1	Login	Super administrator and user enter username and password	Super administrator and user enter into the main page according to access rights	Accepted
2	Data user	Click the user data menu,	Super administrators can	Accepted

		click the add user, edit, delete, and search buttons	access the user data menu according to the actions carried out	
3	Warehouse data	Click the warehouse data menu, click the add warehouse, edit, delete, and search buttons	Super administrators can access the warehouse data menu according to the actions carried out	Accepted
4	Partner data	Click the partner data menu, click the add partner, edit, delete, and search buttons	Super administrators can access the partner data menu according to the actions carried out	Accepted
5	Goods data	Click the goods data menu, click the add goods button, edit, delete, search, print pdf, and test the safety stock and EOQ notification features	Super administrators and users can access the goods data menu according to the actions taken and the safety stock and EOQ notification feature testing was successful	Accepted
6	Incoming goods	Click on the incoming goods menu, click on the add incoming goods button, edit, delete, and search	Super administrators and users can access the incoming goods menu according to the actions carried out	Accepted
7	Outgoing goods	Click on the outgoing goods menu, click on the add outgoing goods button, edit, delete, and search	Super administrators and users can access the outgoing goods menu according to the actions carried out	Accepted
8	Damaged goods	Click on the damaged goods menu, click on the add damaged goods button, edit, delete, and search	Super administrators and users can access the damaged goods menu according to the actions carried out	Accepted
9	Goods stock report	Click on the goods stock report menu, click on the print PDF button, and search	Super administrators and users can access the goods stock report menu according to the actions carried out	Accepted
10	Incoming goods report	Click on the incoming goods report menu, click on the print PDF button, and search	Super administrators and users can access the incoming goods report menu according to the actions carried out	Accepted
11	Outgoing goods report	Click on the outgoing goods report menu, click on the print PDF button, and search	Super administrators and users can access the outgoing goods report menu according to the action carried out	Accepted
12	Damaged goods report	Click on the damaged goods report menu, click on the print PDF button, and search	Super administrators and users can access the damaged goods report menu according to the action carried out	Accepted
13	Change password	Click the change password menu and change the password then click the save button	Users can access the change password menu according to the action carried out	Accepted
14	Log out	Click log out, click the yes button, and cancel	Super administrators and users can access log out according to the actions carried out	Accepted

CONCLUSIONS

Based on the results of research and design conducted by the researcher, the researcher can conclude the following:

- This research produces a web-based warehouse management information system that can help manage goods in the CV. XYZ warehouse.
- This website-based warehouse management information system can manage incoming goods, outgoing goods, damaged goods, and goods stock reports in the warehouse.
- This website-based warehouse management information system can help manage goods in the warehouse more effectively and efficiently, as well as presenting stock reports more accurately.

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