

Proposed Web-Based Goods Recording Information System in the Warehouse of PT Bahana Unindo Teknik Plant Plastics Injection



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ABSTRACT: PT Bahana Unindo Teknik Plant Plastics Injection is a company engaged in manufacturing. In the company's warehouse there is a problem, namely the absence of an integrated goods recording system, this is an obstacle because the recording is still done using stock cards and Microsoft Excel. Recording with this method affects the level of speed in the activity of recording goods in the warehouse, recording time takes an average of 10 minutes depending on the variation in the number of items. The proposal given is an information system for recording goods to support activities in the warehouse. System development is carried out using Unified Modeling Language (UML) modeling and creating an information system interface design. The use of an information system for recording goods is expected to shorten the time for recording and provide flexibility in data sharing capabilities in the warehouse of PT Bahana Unindo Teknik Plant Plastics Injection.

KEYWORDS: Recording, Unified Modelling Language, Information System

1. INTRODUCTION

Industry 4.0 transformation supports warehousing activities, one of which is the administrative process. The use of information systems can simplify the flow of work and it has an impact on worker productivity in carrying out inbound and outbound records. With a warehouse information system, companies can monitor warehouse activities and get information on goods quickly. Furthermore, by using an information system, companies can maintain stability and monitor stock availability, thereby minimizing stock shortages in warehouses.

Warehouse is an important component of the supply chain, including sourcing, production and distribution of goods. A warehouse is a place for temporary storage and retrieval of inventory used for further process activities or for distribution to consumers. The warehouse is described as a part of the logistics system in the company with the function of storing products and providing information including the status and condition of supplies/materials stored in the warehouse, so that the information is in accordance with updated actuals and can be accessed by people with the interests in the course of warehouse activities. The absence of a warehousing information system in a company may cause goods to be damaged in storage, damaged during the handling process, incorrect storage of goods, stock discrepancies and so on that can impact the company's losses both physically and financially.

An information system is an arrangement of people, data, processes and information technology that interact with each other to provide, store, process and collect as output information that users need to support an organization. An information system is a framework that coordinates both human and computer resources, to convert input (input) into output (information) that is useful for achieving company targets.

The administration process at the PT Bahana Unindo Teknik warehouse still uses two methods, namely manual recording and using Excel. The use of manual methods in recording goods with an impact on the time of the goods recording process, where warehouse staff need quite long time to write and calculate data on incoming and outgoing goods on stock cards manually.

Based on the description of the problems that occur repeatedly, PT Bahana Unindo Teknik Plant Plastic Injection requires an appropriate goods recording information system, so as to provide efficiency in carrying out administrative activities and make it easier to control the inbound and outbound processes. The solution that can be provided is implementing an information system

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with the features according to the needs of goods recording activities in the company's warehouse. Based on this background, the research focuses on the proposed use of an information system for recording goods that can later be implemented at PT Bahana Unindo Teknik Plant Plastic Injection.

There are limitations used to limit the scope of the research as follows:

The research location was carried out at PT Bahana Unindo Teknik Plant Plastics Injection; The research period started in November 2022 – May 2023; The research topic was a proposed web-based goods recording information system.

It is expected that the proposed research carried out may provide benefits to: PT Bahana Unindo Teknik, and can serve as a reference and evaluation for the Company to implement the proposed goods recording information system in warehousing activities, especially in increasing the stability and speed of goods recording so it can continue to maintain optimal business activities.

2. RESEARCH METHODOLOGY

The availability and accuracy of stock of goods was determined by the goods recording system in the warehouse. Apart from that, the speed and ease of obtaining goods information was one of the factors determining the performance of warehousing activities. The research was conducted with the purpose of increasing the company efficiency and making it easier to retrieve information in recording incoming and outgoing goods at the company's warehouse. Proposed improvements that can be made in the form of a web-based goods recording information system were expected to help companies increase efficiency in recording activities for both incoming and outgoing goods.

The research was conducted using qualitative data. The data used comes from primary data. Primary data were obtained from interviews with related parties. Not only primary data, the secondary data were also used in this research. The secondary data used were SOP documents and work instructions in the warehouse. SOP and IK were used as a reference for receiving and sending goods.

The preparation of improvement proposals in this research was carried out in three stages, it started from the needs analysis stage and proposed system flow, framework design and system programming, and system interface design. The stages of the proposed information system for recording goods at the PT Bahana Unindo Teknik Plant Plastics Injection warehouse are as follows.

1. Need analysis

Based on the production flow, there are 4 main inventories at PT Bahana Unindo Teknik Plant Plastics Injection, including supplies of raw materials, child parts & components, work in process (WIP) goods and finished goods. These goods are stored first in the warehouse before entering the next process, so they require fast and accurate recording. During the recording goods process in the warehouse, companies need an integrated system so that it provides flexibility in its use and can make it easier for users when using the system.

2. Proposed information system flow

At this stage, figure out the flow of the proposed information system to meet the Company' need and provide user flexibility and be able to overcome the problems experienced. The following is a needs analysis of the proposed information system:

- a. Login
- b. System start page
- c. Warehouse Information
- d. Transactions
- e. Goods Master Data
- F. Inbound/Outbound Report

System design started with creating a system development framework. In making this framework through a design process using Unified Modeling Language (UML). Unified Modeling Language is a modeling language for systems or software with an "object-oriented" paradigm. Modeling was actually used to simplify complex problems so that they were easier to study and understand. There are types of UML that can be used, including use case diagrams, activity diagrams, and class diagrams. There are several UML models that can be used, including using Use Case Diagrams, Activity Diagrams, and Class Diagrams.

1. Use Case Diagram

Use case diagram is used to visualize or describe interactions between systems and external systems or users. A use case can represent a single goal for the system and describe a series of activities and user interactions to achieve the goal. At the analysis

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stage, use case diagram play very important role in finding system requirements and understanding how the system should work. In a model it is possible to have one or several use case diagrams.

2. Activity Diagram

Activity diagrams illustrate the flow of activities in a system that is in the development process, each flow begins, the decisions that may occur and how they end. Activity diagrams can visualize parallel processes that may occur in several executions.

3. Class Diagram

Class diagram is modeling in UML that describe the system structure in terms of defining the classes that will be created to build the system. Class diagram has attributes and methods or operations

The warehouse information system interface is created using the Laravel framework to make it easier for users to use or access the system. There are six main displays in the system, including the login menu display, dashboard, account management, master data, transactions and reports.

3. RESULTS AND DISCUSSION

The information system used was a web platform. System user analysis was to find out the actors or users that were involved in running the information system. Models used in designing information systems consisted of Use Case Diagrams, Activity Diagrams, and Class Diagrams. An explanation of the modeling used was as follows.

1. Use Case Diagram

Use Case Diagram is modeling in UML that function to explain requirements from the user perspective. Use case diagrams represent the relationship or behavior between users and the system through a simple scheme with the purpose of make ease for users to read information on the functional requirements of the system. The warehouse information system use case diagram was created based on an analysis of the company's system requirements and the information system proposal flow that was created above. The following is a use case diagram along with an explanation.

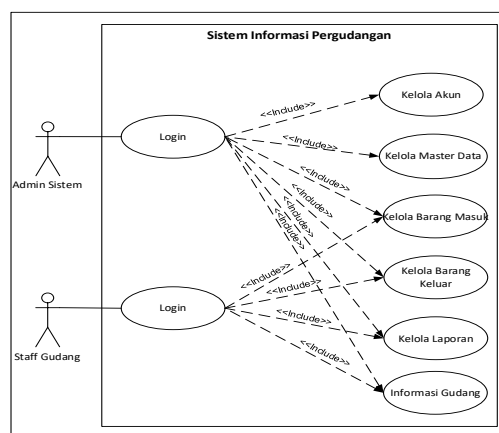


Figure 1. Use Diagram

In Figure 1 , it is explained that there were two types of actors in the warehouse information system use case diagram, namely system admin and warehouse staff, each actor had their own use case needs. There were six use cases in the warehouse information system, including the login use cases, manage accounts, manage master data, view warehouse information, manage incoming goods, manage outgoing goods, and manage reports. System Admin actors can access all use cases in the warehouse information system through use case login using email and password first, while warehouse staff log in using email and password that have been registered first to be able to access warehouse information, manage incoming goods, manage goods log out, and manage reports. Each actor is required to log in to the initial web display first in order to access each use case.

2. Activity Diagram

Activity diagram is modeling in UML that have the function of illustrating the flow of activities in the system. This diagram represents the development of a use case diagram that has a flow of activities. The activity flow can be in the form of a series of menus or business processes that describe the actions that need to be carried out by the actor. The following is an activity diagram for each use case development in a warehouse information system.

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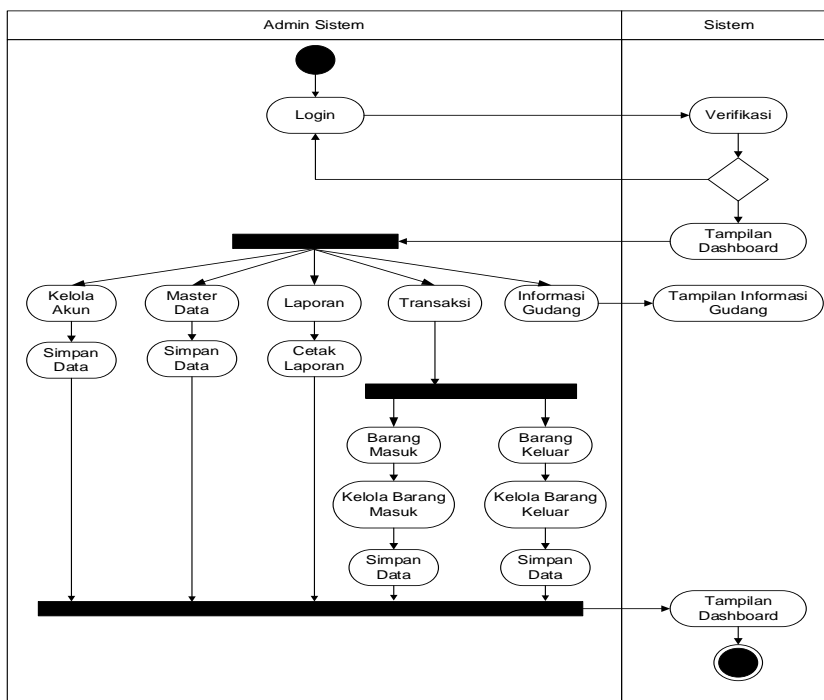


Figure 2. Activity Diagram

3. Class Diagram

Class Diagram is modeling in UML (Unified Modeling Language) that is used to describe the structure of objects in the system. Class Diagrams describe the relationship between one class and another and the attributes and operations that exist in each class in a system. In a warehouse information system there are interconnected classes as well as attributes and operations that are the basis for system development. The following is the class diagram used.

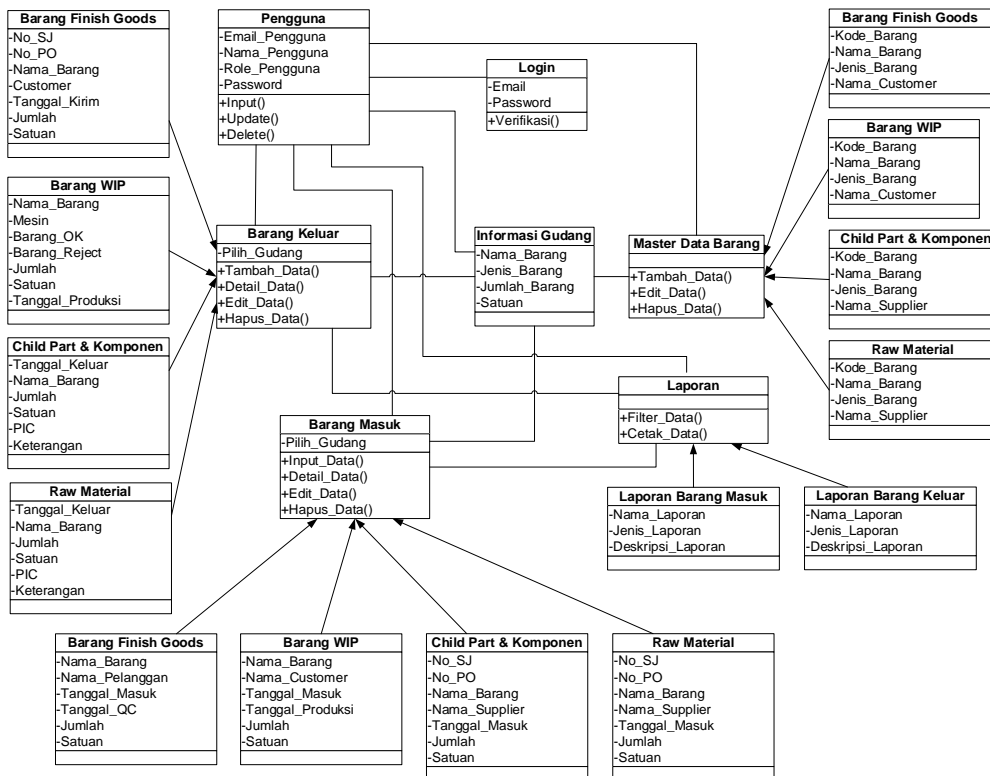


Figure 3. Class Diagram

In Figure 3 above, it can be explained that the activity diagram contains the User class that was a class used to represent users of the system. Then the Login class was a class that was related to users being able to access the features contained in the system.

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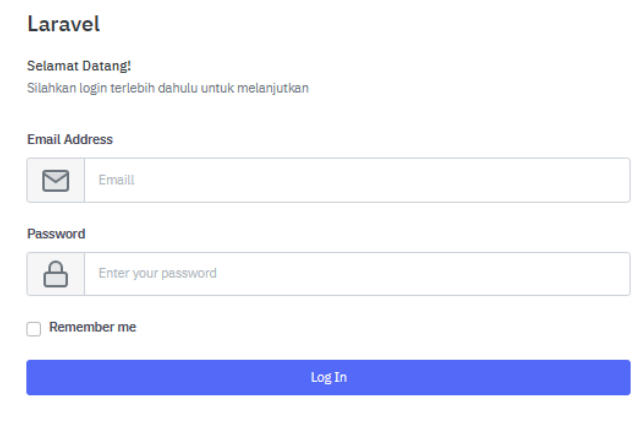
Then the Master Data class was a class that represents a list of items contained in the system. Then the Warehouse Information class functions to display information on the stock of goods in the warehouse. Then the Incoming Goods class had the function of representing incoming goods in the warehouse information system. Then the Outgoing Goods class had a function to represent outgoing goods in the warehouse information system. The Report class was a class that describes the Incoming Goods and Outgoing Goods class reports.

DEVELOPMENT OF WAREHOUSE INFORMATION SYSTEM

An information system that can be developed to manage data on incoming and outgoing goods at PT Bahana Unindo Teknik Plant Plastic Injection. The following is a display of the interface for information system development. An information system that can be developed to manage data on incoming and outgoing good at PT Bahana Unindo Teknik Plant Plastic Injection. The following is a display of the interface for information system development

1. Login Display

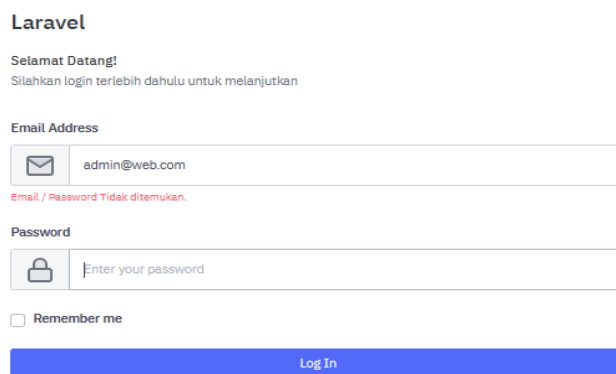
Login is the initial process to enter a system. The login display on the system is a user interface that allows the user to input access information such as username and password.



The screenshot shows a Laravel login page. At the top, it says "Laravel" and "Selamat Datang!" followed by the instruction "Silahkan login terlebih dahulu untuk melanjutkan". Below this are two input fields: "Email Address" with a placeholder "Email" and "Password" with a placeholder "Enter your password". There is a "Remember me" checkbox and a blue "Log In" button.

Figure 4. Login Menu Display

In Figure 4 above is the login display on the system. In the login menu, users are required to enter their email and password. Apart from that, there are login and remember me buttons that are used to store user access data. If the email and password are correct, a dashboard display will appear. If the email and password entered are incorrect, a notification will appear as shown in the figure below.



This screenshot shows the same Laravel login page as Figure 4, but with an error message. The "Email Address" field now contains "admin@web.com". Below the field, a red error message reads "Email / Password Tidak ditemukan.". The "Password" field and "Remember me" checkbox remain the same, along with the "Log In" button.

Figure 5. Wrong Password Display

2. Dashboard Display

The dashboard display on the system is a user interface used to view information quickly and effectively. Generally, dashboards display information in the form of graphs, tables or diagrams that can help users understand the data more easily

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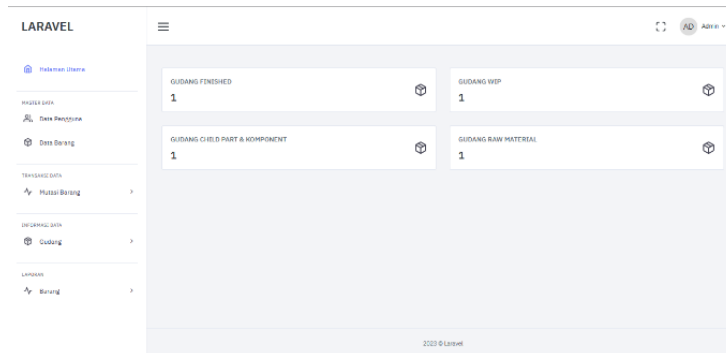


Figure 6. Dashboard Menu Display

In Figure 6 above is a dashboard display in the information system, displaying information on the number of goods in the warehouse. Apart from that, it displays the menu functions found in the system that are located on the left. At the top right there is a full screen function and a menu to log out of the system.

3. Manage Accounts Display

The account management view on the system is a user interface that allows users to manage accounts on the system. This display generally consists of several options for changing information such as passwords and privacy preferences.

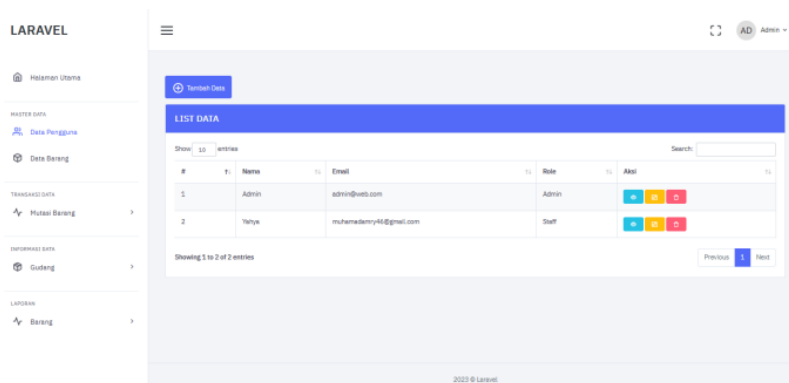


Figure 7. Manage Accounts Display

In Figure 7 above is the account management display, there is a list of accounts registered in the system along with their roles. There are functions to add account data, view detailed information, edit account information, and delete account data. If the user chooses to add account data, the system will display an add account form.

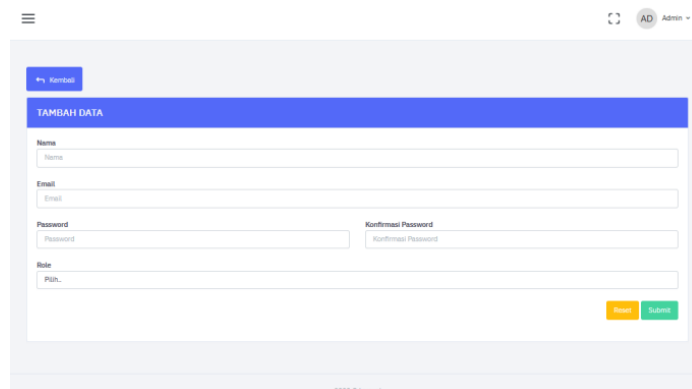


Figure 8. Add Account Form Display

In Figure 8, there is the display of the add account form, there is data that must be filled in by the user, including name, email, password, password confirmation, and role. There is a button that functions as a back button, reset data, and save data

4. Master Data Display

The master data display functions to provide control over item data in the system and to organize the required information easily.

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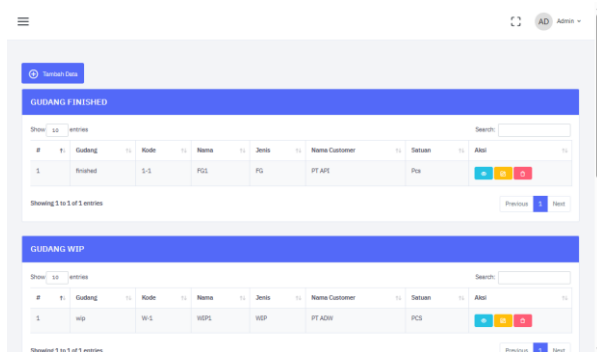


Figure 9. Master Data Menu Display

In Figure 9 above is the master data menu display, in this display there are 4 warehouse lists displayed. In each warehouse list there are buttons to view detailed information, edit data, and delete data. Apart from that, there is a button that is used to add new item data. If the user selects the add data button, the add item data form will appear.

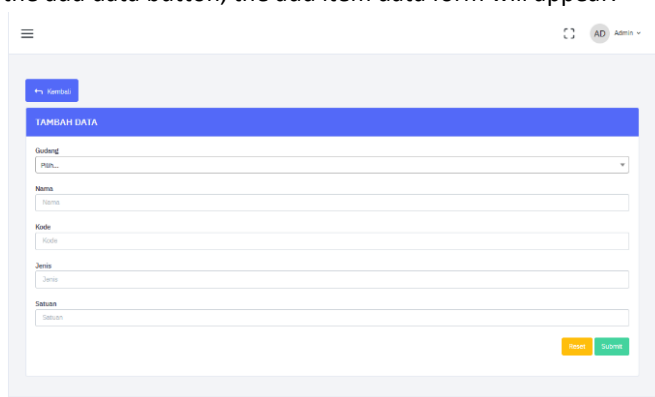


Figure 10. The Add Item Data Form

Figure 10 describes form for adding item data, this display contains data that must be filled in by the user, apart from that there are buttons that are used to return, reset data and save data.

5. Display of Incoming Goods Transactions

The display of incoming goods transactions in the system functions to make it easier for users to record goods entering the warehouse. The display generally makes it easier to record and manage stock of goods, apart from that, the incoming goods display is usually used to view the history of incoming goods transactions carried out previously.

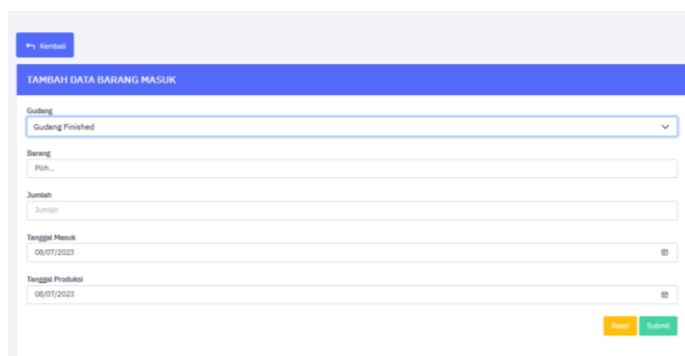


Figure 11. Incoming Goods Report Menu Display

Figure 11 is a display of incoming goods transactions. In this display there is a historical list of incoming goods, there are buttons to view detailed data information, edit data and delete data. To change the list page, there is a previous button that is used to change the previous page and a next button is used to change the next page. To add data there is an add data button, if the user selects this button a form to add data for incoming goods will appear.

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Figure 12. Incoming Goods Form Display

Figure 12 above is a display of the incoming goods form, in this form there are data that needs to be input by the user. Apart from that, there are buttons that are used to go back, reset data, and save data.

6. Outgoing Goods Transaction Display

The display of outgoing goods transactions in the system functions to make it easier for users to record goods entering the warehouse. This display generally makes it easier to record and manage stock of goods. Apart from that, usually the incoming goods display is used to view the history of incoming goods transactions that have been carried out previously.

Figure 13. Outgoing Goods Menu Display

Figure 13 above is a display of the outgoing goods menu, the same as the incoming goods menu display. This menu displays a list of outgoing items. There is a button that is used to add data to display data, if the user selects this menu the add data form will appear. Apart from that, there are buttons to view detailed data information, edit data, and delete data.

Figure 14. Display the Add Out Data Form

Figure 14 is a display of the add out data form. In this form there are data that must be filled in by the user, apart from that there are buttons to return, reset data and save data.

7. Display of Good Report

The item report display in the system functions to determine the location of the warehouse, goods and the amount of stock available as well as customers.

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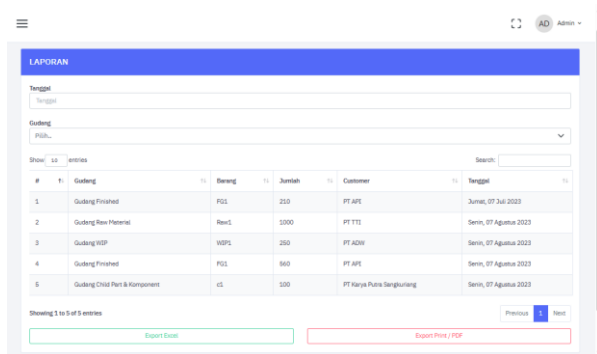


Figure 15. Incoming Goods Report Menu Display

Figure 15 displays the incoming goods report menu. This display displays a list of periodic reports and there is a feature to select the report date range. Apart from that, there is a button that is used to print reports into Excel or PDF files.

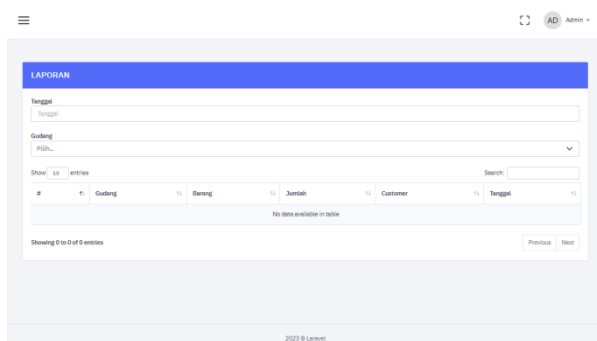


Figure 16. Outgoing Goods Report Menu Display

Figure 16 is a display of the outgoing goods report. Just like the incoming goods report, this display displays a list of periodic reports and there is a feature to select the report date range. Apart from that, there is a button that is used to print reports into Excel or PDF files.

8. Warehouse Information Display

The warehouse information display functions to find out the list of stock items available in the warehouse. Apart from that, there are previous and next buttons that functions to display the previous and next pages.

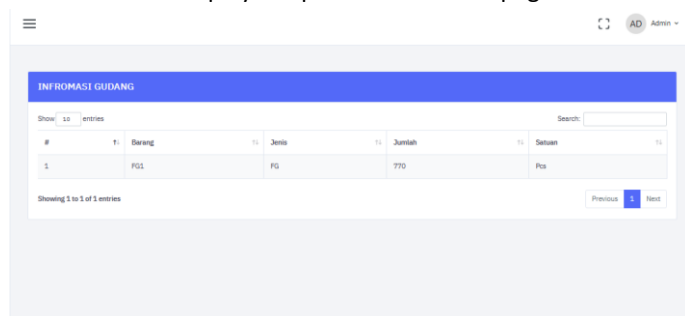


Figure 17. Warehouse Information Menu Display

Figure 17 shows the display of the warehouse information menu. In this display there is a list of stock items available in the warehouse, apart from that there are previous and next buttons that function to display the previous and next pages.

COMPARISON OF OLD SYSTEM WITH INFORMATION SYSTEMS

Based on the results, there was a comparison between the warehouse information system and the old system that had been used by the company. The comparison used 5 parameters, including system media, recording of goods transactions, recording time, flexibility, and ability to view information or data. The following are the results of the comparison of the information system with the old system.

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Table 1. Comparison of old systems with information systems

Parameter	Sistem Lama	Sistem Informasi
Media Sistem	Kartu stok dan Microsoft Excel	Situs Website
Pencatatan Transaksi Barang	Dilakukan secara manual dengan menggunakan kartu stok dan memindahkan ke Excel	Pencatatan langsung menggunakan sistem dan perhitungan otomatis secara real time
Waktu Pencatatan	8 menit untuk melakukan pencatatan barang masuk	2 menit untuk melakukan pencatatan barang masuk
Fleksibilitas	Kartu stok hanya dapat digunakan satu orang dan tidak dapat berbagi pada waktu yang sama	Dapat diakses pada waktu yang sama oleh pihak yang memiliki hak akses
Kemampuan Melihat Data	Harus melihat kartu stok dan mencari data informasi yang diinginkan terlebih dahulu secara manual	Dapat melihat langsung secara real time dengan mengakses fitur informasi gudang pada sistem

4. CONCLUSION

Based on analysis and observation of the problems experienced by PT Bahana Unindo Teknik Plan Plastic Injection in the activity of recording, incoming and outgoing goods that was carried out using manual methods, namely with stock cards and Microsoft Excel. This results in decreased efficiency in goods recording activities. So the proposal given was a web-based goods recording information system. It considers efficiency and flexibility of use according to user requests. The features contained in the warehouse information system include account management, master data, goods transactions, warehouse information, and reports. This information system can be used by companies to support recording and reporting activities.

The proposals given are expected to support warehousing activities in the recording of incoming and outgoing goods with the purpose of increasing the efficiency and performance of warehousing activities. So warehouse staff can more easily record incoming and outgoing goods.

REFERENCES

- Zaroni. (2017). Panduan Eksekusi Strategi Logistics & Supply Chain. Jakarta: Prasetiya Mulya Publishing.
- Prasetyo, H. A., Priyambadha, B., & Arwan, A. (2018). Pembangunan Aplikasi Sistem Informasi Pergudangan pada Rumah Sakit Umum Daerah Dr. Murjani Sampit Kabupaten Kotawaringin. *Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer*, 2789-2800.
- Martono, R. V. (2018). Manajemen Logistik. Jakarta: PT Gramedia Pustaka Utama.
- Pandiangan, S. (2017). Operasional Manajemen Pergudangan. Jakarta: Mitra Wacana Media.
- Alfarizi, S., Mulyawan, A. R., & Basri, H. (2018). Rancang Bangun Sistem Informasi Penjualan Berbasis Web Dengan Pemanfaatan UML (Unified Modelling Language) Pada CV Harum Catering Karawang. *Indonesian Journal on Networking and Security*.
- Heriyanto, Y. (2018). Perancangan Sistem Informasi Rental Mobil Berbasis Web Pada PT.Apm Rent Car. *Jurnal Intra-Tech*, 64-77.
- Kurniawan, T. (2020). Perancangan sistem aplikasi pemesanan makanan dan minuman pada cafetaria no caffe di Tanjung Balai Karimun menggunakan bahasa pemograman PHP Dan MySQL. *Jurnal Tikar*, 192-206.
- Whitten, J., Bentley, L., & Ditman, K. (2004). Metode Desain dan Analisis Sistem. Yogyakarta: CV. Andi Offset.
- Mcleod, R. (2006). Sistem Informasi Manajemen Edisi Revisi. Jakarta: PT Prenhallindo.
- Kadir, A. (2014). Pengenalan Sistem Informasi Edisi Revisi. Yogyakarta: Andi Yogyakarta.



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