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Product Ordering and Inventory Information System at Pt. Putra Mandiri Emas

Tempahan Produk dan Sistem Maklumat Inventori di Pt. Putra Mandiri Emas

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ABSTRACT

Information systems play a crucial role in improving the quality of company decisions through the presentation of fast, precise, and accurate information. PT Golden Putra Mandiri, which is engaged in ordering uniforms in Cimahi, faces challenges in the ordering process and managing inventory of goods. This research aims to develop a computerized ordering information and inventory management system, so that the ordering process can be more efficient and accurate. The method used is research and development (R&D), which includes the analysis of needs to identify important features of the system. Furthermore, the design and implementation of the system is carried out, followed by testing using black boxes to ensure the effectiveness of the product in the context of the company's operations. This (R&D) approach is longitudinal, allowing for phased evaluations that focus on improving the system based on user feedback. This research develops an information system for ordering and managing inventory of goods, improving efficiency, minimizing errors, and ensuring a smooth production process.

Keywords: Information system; ordering; research and development (R&D); black box

INTRODUCTION

PT Golden Putra Mandiri is one of the companies that moves in the field of ordering clothing uniforms in Cimahi which provides comfort for employees with the clothes they wear. PT. Golden Putra Mandiri provides knowledge, expertise and experience and is committed to serving and establishing good relationships with customers (Rendi, n.d.).

To improve work efficiency in the face of increasingly high business demands, PT Golden Putra Mandiri faces challenges in inventory management and product orders, which often result in shortages or excess stocks. Mistakes in booking planning have a direct impact on company performance and customer satisfaction. Therefore, it is important to develop an effective information system in planning product orders and calculating the need for raw materials, so that companies can make the right purchases and avoid stock spikes. With the implementation of an integrated information system, it is hoped that the company's operational performance can improve, service to customers can be improved, and errors in inventory management can be minimized.

PT Golden Putra Mandiri needs to develop a website-based information system that integrates product ordering and inventory management to improve operational efficiency and service quality. This research aims to create an ordering system using the Research and Development approach, including the creation of a monitoring form that is connected to the inventory of materials and accessories. This form will allow tracking of the status of the order as well as ensure the availability of materials. In addition, the system will be equipped with a material order form that regulates the process based on the status of product approval by customers. With this development, it is hoped that the company can reduce inventory management errors and improve service to customers.

Research and Development (R&D) is a systematic process carried out by companies to create and develop new products, services, or technologies. R&D encompasses a wide range of activities, from basic research aimed at understanding a particular phenomenon or concept, to the development of practical applications that can be implemented in a product or service. Through R&D, companies can identify market needs, innovate, and improve product efficiency and quality. This process is crucial in maintaining a company's competitiveness in the market, as it allows the company to adapt to changing customer needs and rapid technological developments (Haryati, 2012).

Based on the first research conducted by (Jarot Dian, Fujiama Diapoldo Silalahi, 2021) with the title "Web-Based Inventory Monitoring Application at Dolog Semarang Logistics Employee Cooperative Using Barcode Reader". The results of this study are the development of a computer-based stock monitoring application to improve the efficiency of recording and reporting purchase and sales transactions. The app is designed to address the drawbacks of conventional logging, such as data corruption and difficulties in generating reports. Using the Research and Development (R&D) model, this application is implemented with PHP web programming and MySQL database, allowing faster and more accurate access to stock data for management decision-making (Dian & Silalahi, 2021). from the results of this research can be different from my research, namely this system covers the monitoring of goods from the results of sales and purchase of products, while in my research I monitor the stock of accessories for the needs of products that have been ordered by customer.

Based on the second research conducted by Rio Pratomo with the title "Designing Inventory and Sales Application Systems in Java-Based Sixteen Merch Distro". Analysis of inventory and sales systems in Distro Sixteen Merch to improve the effectiveness and efficiency of product data management. The research uses Research and Development (R&D) methods as well as interviews and literature studies to collect data. The results show that the application of inventory and sales systems can help companies in managing products and decision-making, thereby improving the structure and quality of system management (Pratomo, 2020). From the results of this research, it can be different from my research, namely that this system requires customers to register their identity first, then customers can order products and confirm their orders, while in my research, customer identity and product orders until order confirmation are carried out by the marketing company PT Golden Putra Mandiri.

With the existing problems, an information system is needed that can help in product ordering planning, so that it can help PT Golden Putra Mandiri in planning product orders and goods inventory in order to meet the needs of the company. Therefore, the author made a research entitled Product Order Information System & Goods Inventory at PT Golden Putra Mandiri.

PROBLEM STATEMENTS

From the background that has been described above, the formulation of the problem is obtained, namely:

1. How can an information system be designed and developed to assist in the effective and efficient planning of product orders?
2. How can the system calculate the quantity of materials or components required for each ordered product, in order to help PT Golden Putra Mandiri accurately estimate the amount of raw material purchases?
3. How to avoid material stock spikes?

LITERATURE REVIEW

Information Systems

Information System is a set of elements or components in the form of people, procedures, databases and interrelated tools to process, store and produce information to achieve a goal. According to Information Systems are systems that are generally created based on a set of computers and manual components that can be collected, stored and processed to provide output to users. Thus, it can be concluded that an information system is a combination of organized modules that come from components related to hardware, software, people and networks based on a set of computers and generate information to achieve goals.

Flowchart

Flowchart is a graphical representation of the steps and sequence of procedures of a program. Flowchart helps analysts and programmers to break problems into smaller segments and helps in analyzing other alternatives in operations.

Use Case Diagram

Use Case diagrams illustrate the interaction relationships between systems and actors. Use cases can describe the type of interaction between the system user and the system. The first step to Modelling is the need for a diagram that is able to describe the actions of the actors with the actions of the system itself, as contained in the use case diagram. The components of the Use Case Diagram consist of several items, namely:

1. About Us

A system is drawn into a square shape. Its function is to limit the use case with interaction from outside the system. Systems are generally labelled according. However, generally this system is not given a picture because it does not give much meaning to a diagram.

2. Actor

Actually, actors are not part of the system, but have a great influence on the system. Actors have a very important role in describing who interacts with the system Actors give and receive information from the system even if it is not as control.

3. Use Case

A use case is a component that describes the functionality in a system. So that consumers and makers know each other and understand the flow of the system to be created.

Activity Diagram

Activity diagrams illustrate the main activities and relationships among the activities in a process.

Class Diagram

A class diagram or class diagram is a type of structure diagram in UML that clearly describes the structure and description of the class, attributes, methods, and relationships of each object. It is static, in the sense that a class diagram does not explain what happens if the classes are related, but rather explains

what the relationship is. This class diagram is appropriate if implemented to projects that use object-oriented concepts because the diagram class diagram is quite easy to use.

The model design of this class diagram itself is divided into two parts. The first part is an elaboration of the database. The second part is part of the MVC (Model, View, Controller) module, which has a class interface, class control, and class entity.

User Interface

User Interface or often called UI, is a communication mechanism between the user and the system in a software, whether website-based, mobile, operating system or hardware interface software. The mechanism is adjusted to the user's needs for the program that is built or developed. The scope of UI includes physical appearance, colour use, animation display, and communication patterns of a program with its users.

In general, a UI designer will make a design that makes it easier for users. The design will be tailored to the level of the user's basic needs for the software. The result of UI design is software with all the features that suit the needs of users in using the software.

User Interface

A database is a collection of data that is related to one another, stored on computer hardware and can be used by software to manipulate it. From this definition, there are three things related to databases, which are as follows:

1. The data contained in the computer itself is organized in the form of a database.
2. Permanent storage is used to store the database. This storage is one part of the hardware technology used in information systems.
3. Software for manipulating data. This software can be created by yourself using a computer programming language or purchased as a package. Many software packages are provided to manipulate databases. This software package is called a database management system.

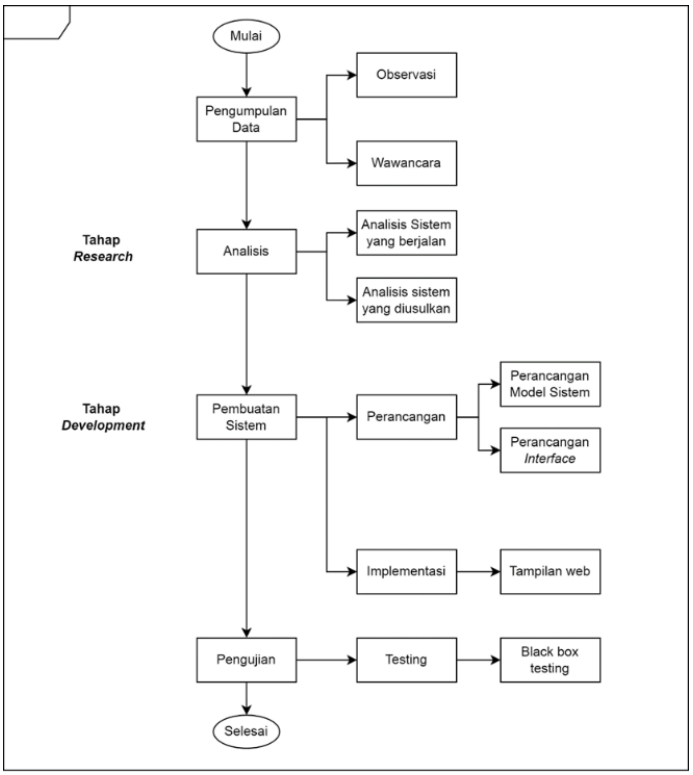
Research and Development R&D

Research and development methods are research methods used to produce a particular product, and test the effectiveness of that product. To be able to produce a certain product, research is used that is a needs analysis and to test the effectiveness of the product so that it can function in the wider community, research is needed to test the effectiveness of the product research and development is a longitudinal process, which may take place gradually and span multiple years

METHODOLOGY

The time and place of the research will take place from September 2023 to May 2024 at PT. Golden Putra Mandiri which is located on Jl. Pesantren Raya, North Cimahi District, Cimahi City and Ibn Khaldun University Bogor. The activities carried out are data collection, problem analysis, proposed system analysis, literature study, modelling, application design and data testing. The method used includes three main parts, namely the preliminary stage, the development stage and the testing stage. The research method applied with the research stages shown in Figure 1.

Figure 1: Research method



A. Introductory Stages

The preliminary study stage was carried out by conducting a needs analysis. The analysis of the needs is carried out by observation and interviews. Data collection by observation method is carried out by looking at the process of activities that run on the object being studied, from these activities the author obtains primary data (available on the attachment page).

B. Development Stages

At the stage of system development, analyze, design and implement information systems for ordering products and goods inventory. This method has three phases, namely Analysis, Design and Implementation.

C. Stages of Testing

At this stage, the process of testing all functions is carried out using the black box method to test the functionality of each feature created and determine the system's shortcomings and weaknesses.

FINDING AND DISCUSSIONS

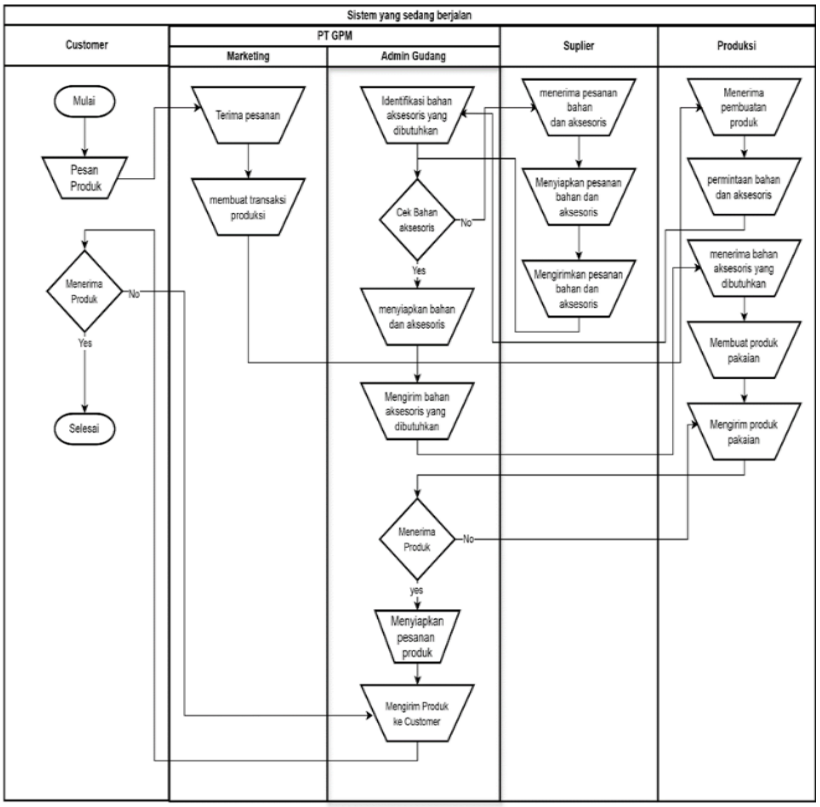
Analysis

In analyzing and designing the system, the right data and information are needed and in accordance with the needs of the system. This can be obtained by analyzing the system that is already in place or that is running.

Problem Analysis

Based on the problems that occurred at PT Golden Putra Mandiri when ordering materials and accessories were still manual, so the time needed was inefficient and in determining the number of orders for materials and accessories needed. The following system is currently running shown in Figure 2.

Figure 2: Running systems



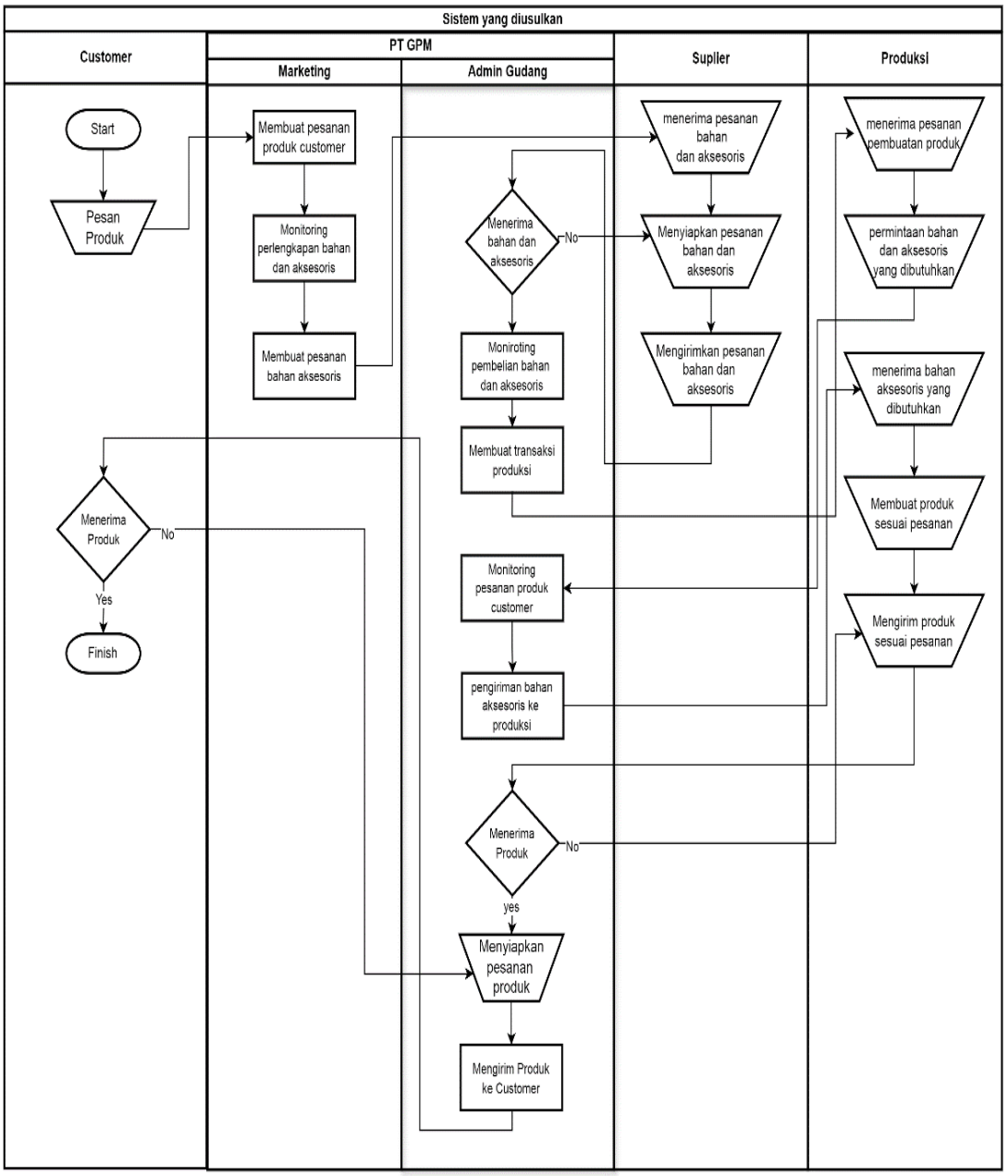
Data Collection

Data collection is carried out by dividing it into two types: primary and secondary data. Primary data was obtained through direct observation by visiting PT Golden Putra Mandiri, which served as the case study for this research. Examples of data collected from these observations include product data and material data. Secondary data refers to information obtained from existing sources relevant to the research, such as literature and related journals. All collected data is then inputted into the database to be used in the development and testing of the system.

Problem Solving

Designing and building an information system for ordering products and supplies at PT Golden Putra Mandiri to help plan orders for materials and accessories at PT Golden Putra Mandiri. The following is a flowchart of the proposed system for the solution of the problem shown in Figure 3.

Figure 3: Proposed system



Planning

In the discussion of this sub-chapter, it will be explained about designing using the Unified Modelling Language (UML) which consists of Use Case Diagram, Activity Diagram, Sequence Diagram and Class Diagram.

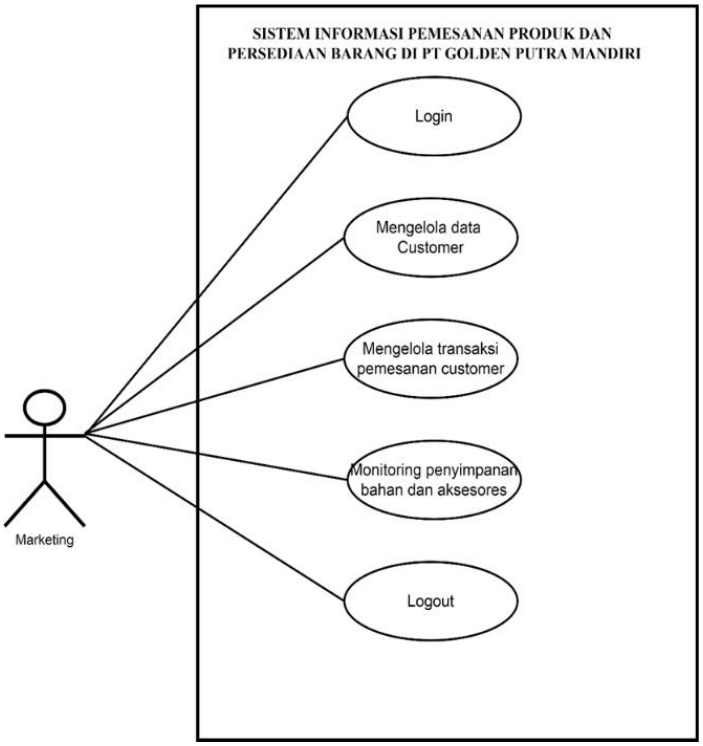
Use Case Diagram

A use case diagram is a description or representation of the interaction of activities carried out by actors on the system. The actors consist of two of them, marketing and warehouse admin.

1. Use Case Diagram Marketing

Use case marketing diagram is a brief overview of the relationship between marker employees and the system and its functions. The use case marketing diagram is shown in Figure 4.

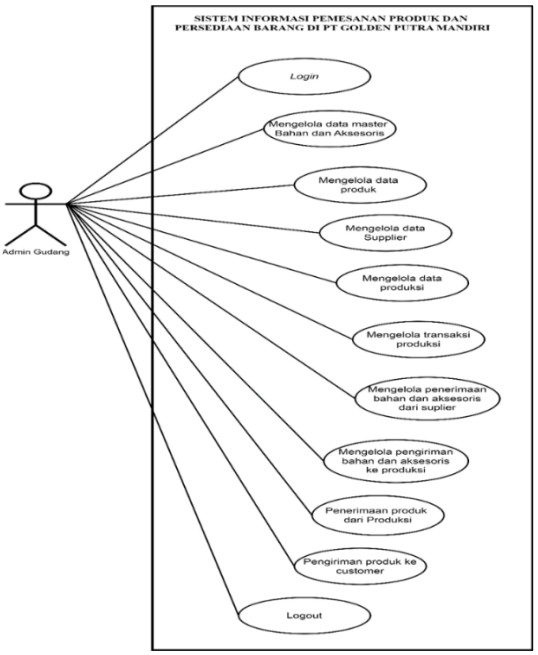
Figure 4: Use Case Diagram Marketing



2. Use Case Diagram Gudang

The warehouse admin use case diagram is a brief overview of the relationship between warehouse admin employees and the system and its functions. The use case diagram of the warehouse admin is shown in Figure 5.

Figure 5: Use Case Diagram Warehouse



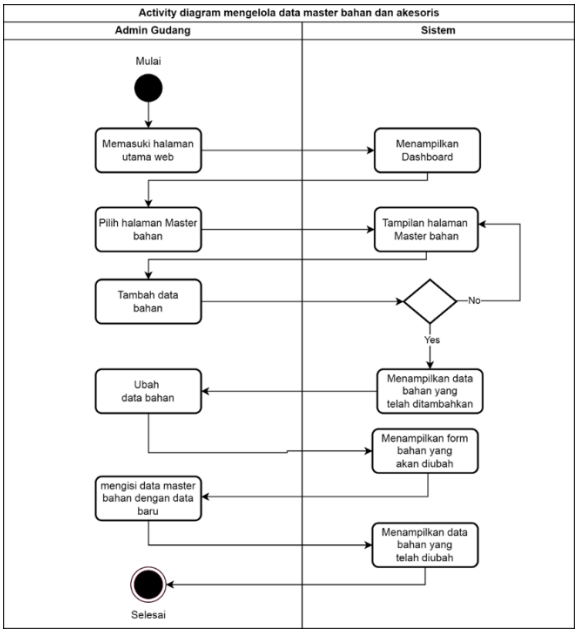
Activity Diagram

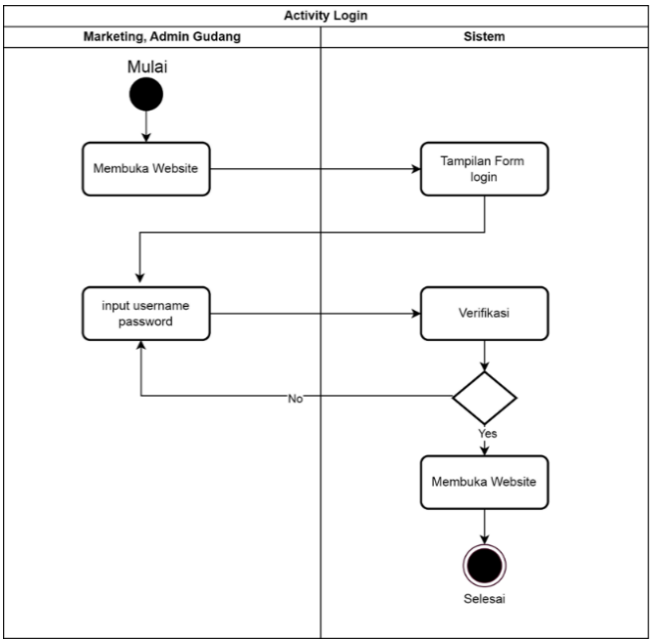
Activity diagrams describe the flow of activities available in the system being created.

1. Activity Diagram Login

Activity is a flow of marketing activities and warehouse admin at PT Golden Putra Mandiri to enter the information system for ordering products and inventory of goods at PT Golden Putra Mandiri. The warehouse admin login activity diagram is shown in Figure 6.

Figure 6: Activity Diagram Login

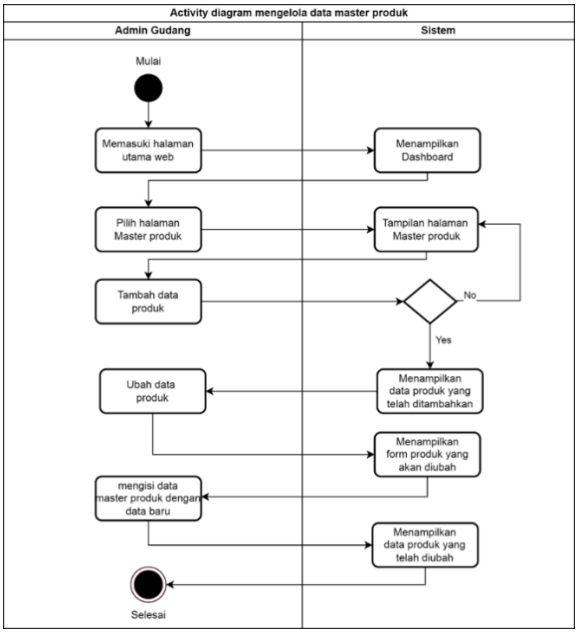




P**roduct Master Data Activity Diagram**

This activity diagram shows how the flow of activity from the warehouse admin is in managing the material master data. The activity diagram managing the master material data is in figure 7.

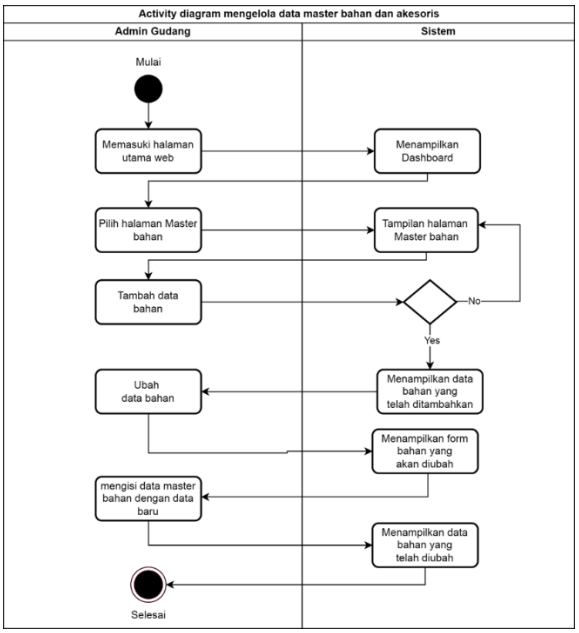
Figure 7: Product master activity diagram



2. Activity Diagram Data Master Bahan

This activity diagram shows how the flow of activity from the warehouse admin is in managing the material master data. An activity diagram managing the material master data can be seen in Figure 8.

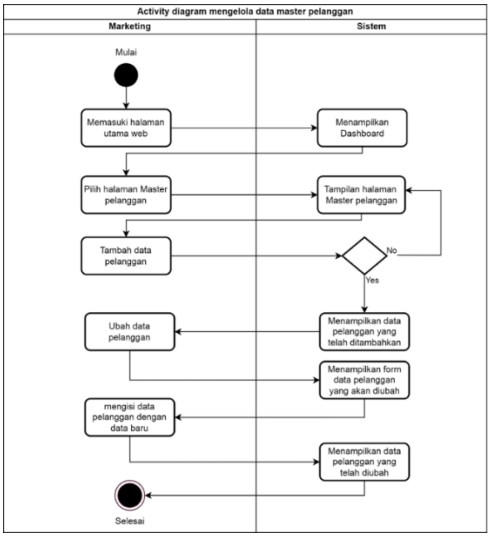
Figure 8: Activity diagram master materials



3. Activity Diagram Managing Customer Master data

This activity diagram shows how the flow of activity from warehouse admins manages customer master data. An activity diagram of managing customer master data can be seen in Figure 9.

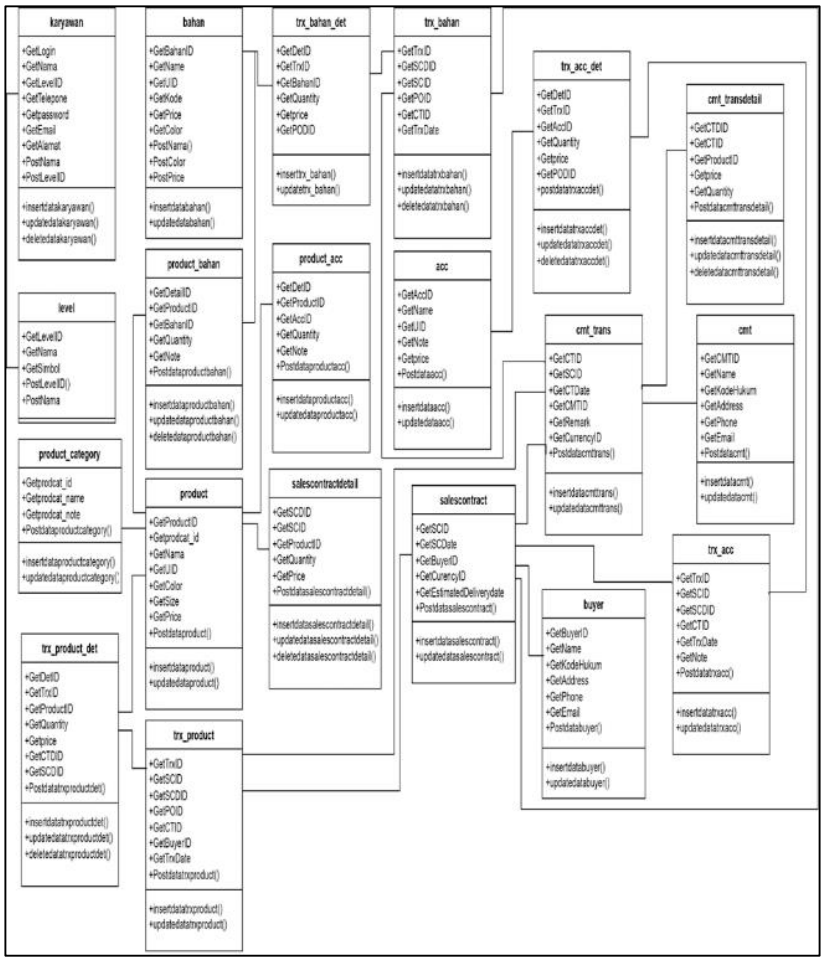
Figure 9: Customer master activity diagram



4.2.3 Class Diagram

Class diagrams illustrate class sets, collaborations and relationships between classes. The class of diagrams is constructed as shown in Figure 10.

Figure 10: Class Diagram



Implementation

Implementation of the information system for ordering products and supplies of goods at pt. Golden Putra Mandiri uses research and development (R&D) by writing lines of program code using the PHP programming language. The display of the information system for ordering products and goods inventory at pt. Golden Putra Mandiri uses research and development (R&D) as follows:

Login Page Implementation

In the implementation of the login page where there are two users, namely warehouse admin and marketing who can enter the system, they must first log in by entering their username and password.

1. Implementation of Warehouse Admin Login Page and Marketing

The following is the view of the warehouse admin login page and marketing shown in Figure 11 and 12.

Figure 11: Warehouse admin login page

Figure 12: Marketing login page

Dashboard Page Implementation

The implementation of the dashboard page contains the main view after the marketing and warehouse admin successfully log in to the system.

1. Implementation of Warehouse and Marketing Admin Dashboard Page

The design of the Warehouse Admin and marketing dashboard page can be seen in Figure 13 and 14.

Figure 13: Warehouse admin dashboard page

Figure 14: Marketing dashboard page

Implementation of the Material Master Data Page

The interface design of the material master page contains the display of material data inputted by the warehouse admin. The design of the material master page can be seen in Figure 15.

Figure 15: Material master page

Product Master Data Page Implementation

The product master page interface design contains the display of product data that is input by the warehouse admin. The design of the product master page can be seen in Figure 16.

Figure 16: Product master page

Customer Master Data Page Implementation

The customer master page interface design contains a display of customer data that wants to order the product. The design of the customer's master page can be seen in Figure 17.

Figure 17: Customer master page

Testing

The test was carried out using the black box method. Black box testing is done by validating the results that are issued by the system when an order is given to the system and testing is done by the admin and principal. The black box test can be seen in Table 1.

Table 1: Black box testing

Yes	Yard	Function Test	Result
1	Marketing and Warehouse Admin Login Page	- Verify login with the correct username and password. - Verify login with the wrong username and password.	Succeed
2	Dashboard Page	- Displays a welcome message according to the user level.	Succeed
3	Material Master Page	- Displays a list of material data. - Add material data. - Change material data.	Succeed
4	Product Master Page	- Displays a list of product data. - Add product data. - Changing product data.	Succeed

Yes	Yard	Function Test	Result
5	Customer Master Page	- Displays a list of customer data. - Add customer data. - Changing customer data.	Succeed

CONCLUSION

This research successfully developed a product ordering information system and inventory management using the Research and Development (R&D) method. This system is designed to improve the efficiency of order management and reduce errors and delays in the procurement process. This system is equipped with a monitoring form that allows for direct tracking of customer order status. This feature helps ensure the smoothness of the production process from order to the availability of materials in the warehouse. Additionally, this system ensures that material orders can only be placed after customer orders are approved. If there are no incoming orders, the material ordering is automatically prevented, avoiding waste and maintaining the efficiency of the production process according to customer needs.

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