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Implementation Web-Based Qr-Code Information System Design in Warehouse Inventory Management System Using Rapid Application Development (RAD) Method at PT Dharma Precision Parts

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A B S T R A C T

This research aims to implement a web-based information system using QR-codes in warehouse inventory management using the Rapid Application Development (RAD) method. The implementation of QR-code technology is expected to increase efficiency and accuracy in the process of tracking and managing goods in warehouses. The RAD method was chosen because of its ability to speed up the system development process through rapid iteration and prototyping. The results of this implementation show significant improvements in warehouse operational efficiency as well as reduced human error in inventory recording and tracking. With a web-based information system, users can easily access and manage inventory data in real-time, increasing transparency and accuracy of information

INTRODUCTION

Information technology is developing more quickly these days. Society requires an ever-increasing amount of fast, accurate, and precise information. Information is simply data that has been arranged such that the recipient may make sense of it and find value in it. In the meantime, an information system is any system within an organization that combines people, resources, technology, means, processes, and controls in order to accomplish crucial communication channels, manage specific kinds of regular transactions, provide signals to management, and more. for significant internal and external events and offer a foundation for knowledge to enable informed decision-making (Syam, 2022).

As the business world becomes more dynamic, it cannot be denied that a company's quality plays a central role in maintaining the stability of its warehouse system and achieving effective control over the flow of goods. goods, both in terms of physical management and data management. This success also directly impacts the performance of employees who can optimize their tasks and responsibilities with high efficiency (Bagiana and Nasam, 2023). Warehousing is very important and inseparable from the business world, especially companies selling industrial products. Therefore, there must be a system to regulate the warehousing process according to the enterprise, thereby helping the business process run better. Warehousing or warehouse is one of the main keys to its operation. A company's supply chain can be managed efficiently and costs can be minimized if the warehouse management system is implemented in the right manner (Loekman, 2023).

THEORETICAL REVIEW

Information System

An information system is a system within an organization that meets the needs of processing day-to-day transactions, supporting the organization's management functions and strategic activities to be able to provide certain parties beyond the scope of required reporting (Suryadharma & Budyastuti, 2019).

Qr - Code

QR code is a type of matrix code or two-dimensional barcode developed by Denso Wave, a division of Denso Corporation, a Japanese company, and released in 1994 with this feature. The important thing is that it is easy to read by the scanner. QR stands for quick response, because the goal is to convey information quickly and receive a quick response (Gunawan, 2018).

Website

A website or web page can be understood as a collection of pages used to display information, text, still or moving images, animations, sounds and/or a combination of all of these, both static and dynamic, forming a series of interconnected buildings, each linked by a network of pages (hyperlinks) (Utama, 2011).

Inventory

An inventory system will provide an organizational structure and viable manufacturing operating policies for maintaining and monitoring inventory. With this inventory system, it is hoped that management can be held

accountable for ordering and receiving the ordered goods. This can be done by tracking when orders are placed and maintaining or monitoring the process of what is ordered, as well as how many items are ordered and who the suppliers are (Hasanudin, 2018).

Rapid Applicafion Devlopment

Rapid application development commonly known as RAD methodology, is commonly used by application developers to develop information systems. This method aims to develop applications quickly through several iterations and feedback. Rapid application development (RAD) is a software process model that emphasizes a short development life cycle. Rapid application development (RAD) is a rapidly adapted version of the waterfall model, using a component development approach. (Kelvin & Amalia, 2022).

Figure 1. Rapid Application Development Method

Database

A database is a collection of information stored systematically on a computer so that it can be checked by a computer program to retrieve information from the database. The basic concept of a database is a collection of records or knowledge. A database can be created and processed using a computer program, which we usually call software. Software used to manage and call queries. DBMS is software designed to manage databases and perform data operations required by many users (Hidayah & Yani, 2019).

MySQL

MySQL is a relational database management system (RDBMS) model like SQL Server. MySQL as an open source system can be used freely and developed as needed. MySQL is the top choice for web and web-based application development because MySQL can handle millions of queries and thousands of transactions at the same time (Prayoga, 2018).

PHP

PHP is a programming language intended to run on websites, often used to process information on the Internet. Meanwhile, in another sense, PHP is the abbreviation for Hypertext Preprocessor, which is a free or open source server-side web programming language. PHP is a script embedded in HTML and located on the server (Hidayah & Yani, 2019).

HTML

HTML stands for Hypertext Markup Language, a web standard language maintained by the World Wide Web Consortium (W3C) in the form of tags that organize each element of a web page. HTML acts as a structure for web pages, placing each element of the website in the desired layout (Hidayah & Yani, 2019).

UML (Unified Modeling Language)

UML (Unified Modeling Language) is a graphical/visual language for visualizing, specifying, constructing, and documenting OO (Object Oriented) based software development systems. UML is not only a visual programming language, but can also be directly connected to many different programming languages, such as JAVA, C++, Visual Basic, or even directly connected to object-oriented databases (MaharanI & Aman, 2018).

METHODOLOGY

The research method used is the descriptive analytical method with a quantitative approach, which means that the research is carried out with an emphasis on the analysis of numerical data (numbers), aiming to obtain a clear picture of the situation based on the data obtained by presenting, collecting and analyzing the data. thus becoming new information that can be used to analyze the problem being studied. "Descriptive method" is a method used to describe the analysis of research results, but not to draw broader conclusions. The method used to develop the web-based inventory information system using QR codes is Rapid Application Development (RAD) or commonly known as the RAD method, which is often used by application developers to develop information systems. This method aims to develop applications quickly through repeated iteration and feedback.

RAD is a software process model that emphasizes short development life cycles. RAD is a rapidly adapted version of the waterfall model, using a component construction approach. From this definition of the RAD concept, it can be seen that application development using the RAD method can be done in a relatively faster time. In accordance with the RAD methodology, the following are the application development stages of each application development phase.

a. Requirement Planning Stage

In this stage, users and researchers meet to identify goals regarding the system to be created. At this stage, it really requires an active role from both parties and the focus remains on achieving company goals.

b. Workshop Design Stage

This stage is the stage for designing and improving which can be described as a workshop. During the system design stage the user responds to existing prototype work and the analyzer improves the designed modules based on user responses. The design workshop stages include, among others, process design, database design, and interface design.

c. Implementation

At this point, the built design will be implemented by programming to match the existing design. At this point, the programs needed to access the built system are also installed.

d. Testing

At this point, the researcher tested the built system using black box testing. These tests are aimed at checking the functionality of the application rather than its internal structure or workings. This testing is aimed at

determining whether the system is working properly or not and if not, the system can be improved.

RESULTS

Use Case Diagram

Use case diagrams are used to explain what activities can be performed by a user or users of a running system. Use case diagrams describe the interactions between one or more actors and the information system being created. Use cases let you know who has access to the system.

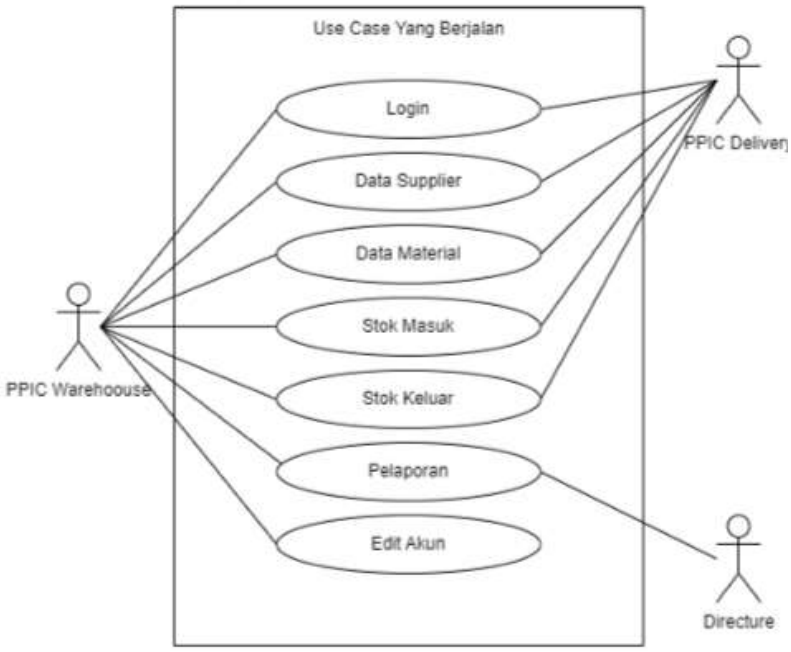

Figure 1. Use Case Diagram

Class Diagram

A class diagram is a class that describes the structure and explains the classes, packages, objects and their relationships with each other like containment, inheritance, association etc. The class diagram also explains the relationship between the classes in the system being created and how they work together to achieve a goal. Based on the results of the requirement analysis performed, the class diagram is formed from the system being created as follows:

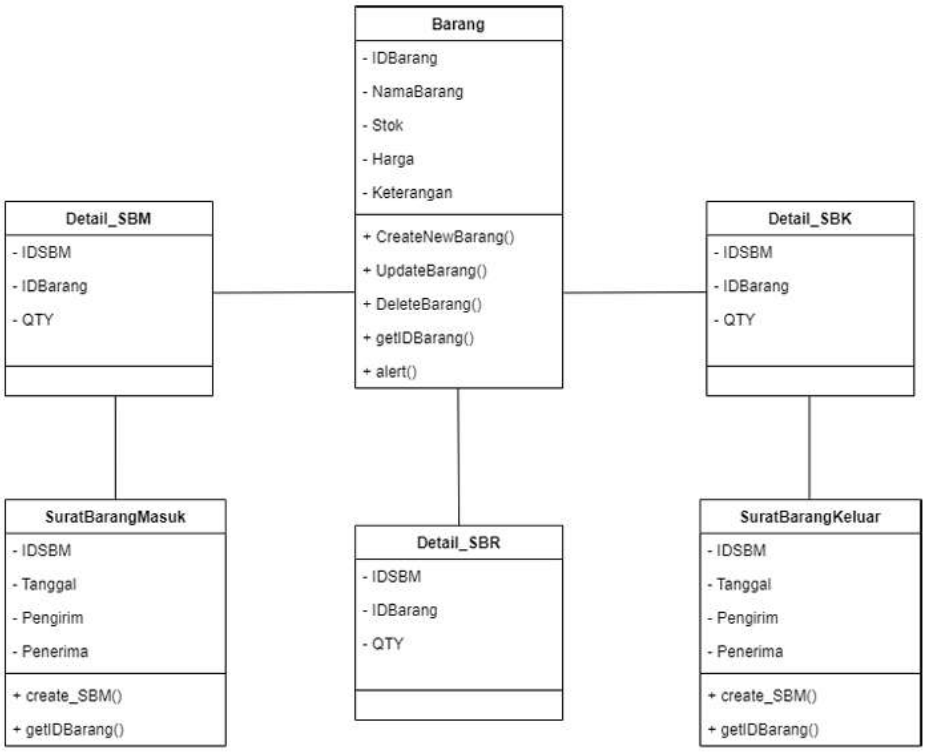

Figure 3. Class Diagram

System Implementation

After the design phase is complete, the next step is to implement the design results. To implement the inventory information system, the author uses the PHP programming language. The interface or final form of a web-based information system, at this point the program can be used and display the interface design. This is the final interface result for the web-based inventory system.

1. Login Page

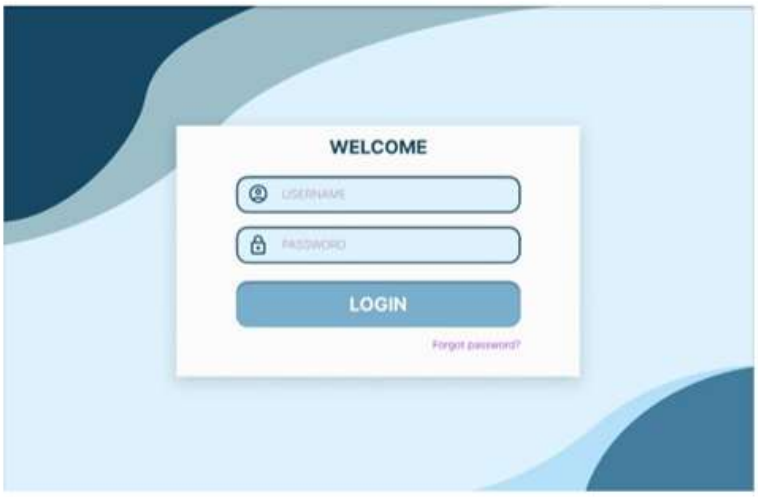

Figure 4. Login

2. Home Page

Figure 5. Home Page

3. Input Item Page

Figure 6. Input Item Page

4. Raw Data Material Page

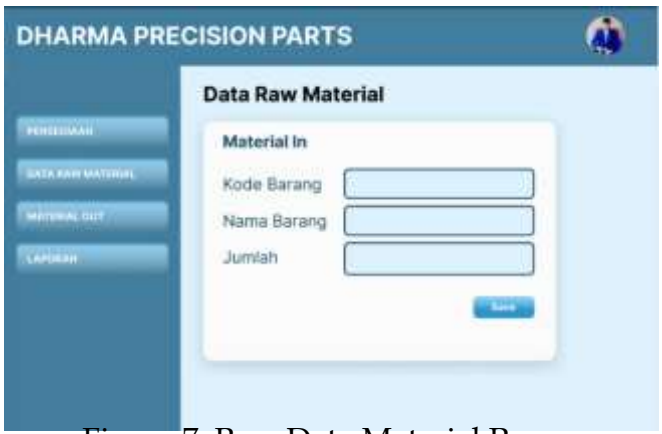

Figure 7. Raw Data Material Page

5. Material Out Page

Figure 8. Material Out Page

6. Report Page

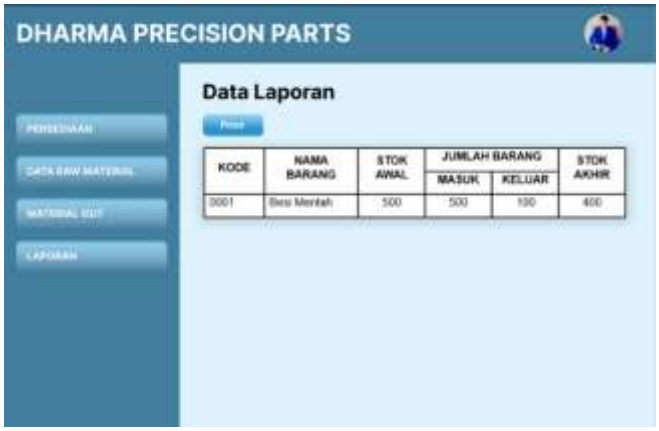

Figure 9. Report Page

7. QR-Code Page

Figure 10. QR-Code

DISCUSSION

Following this research, a process of collecting data on goods in circulation at PT was implemented. Dharma's precision parts were computerized to prevent data loss and damage. This system also helps to avoid delays in delivering goods to consumers because inventory is well controlled. The implementation of QR-code technology is expected to increase the efficiency and accuracy of the process of tracking and managing goods in the warehouse. The RAD method was chosen due to its ability to accelerate the system development process through rapid iteration and prototyping. The results of this implementation show significant improvements in warehouse operational efficiency as well as reduced human error in inventory recording and tracking. With a web-based information system, users can easily access and manage inventory data in real-time, increasing transparency and accuracy of information.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of designing a web-based inventory application at PT. Dharma Precision Parts, then the following conclusions are made:

1. One of the problems above is the design of a web-based QR Code inventory information system. This program was chosen because it makes it easier to process data and can guide users to minimize errors in warehouse management.
2. This information system's design enables PT. Dharma Precision Parts' warehouse management process to be well-organized during report recording and printing, which is anticipated to improve user convenience and enable more effective and efficient raw material management in the warehouse.

Based on the analysis results described by the author previously, the author makes some suggestions so that the system can be used more effectively in the future, specifically:

1. Individual staff training is required to use this information application program to its maximum effectiveness.
2. Maintain built applications and improve systems according to company policy.
3. Data backup is required to ensure data security.

FURTHER STUDY

The author used MySQL as the database and used HTML and PHP programming languages to create this application. Managing data about raw materials, suppliers, import and export transactions, reporting on raw data and raw material consumption are the only tasks that this system can perform. After that, to keep the system working properly according to the company policy, regular checks are necessary.

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