An Analysis and Survey of Polishing Dents Warehouse Inventory Development

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Abstract

PT Setia Kiji Reed (SKR) was established in 1991, with its Jl address. Rancaekek Km. 24.5, Linggar, Kec. Rancaekek, Bandung Regency, West Java 40394 is a company that already uses computer technology in carrying out its business processes. This company is a joint venture between Japan (KIJI Reed Co. Ltd) and Indonesia, with business activities in the textile industry such as manufacturing and sales of reeds for weaving looms and material suppliers for air-jet reeds. The company has three divisions: Wirecut, Polishing Dents, and Reed Production. However, recording incoming and outgoing goods transactions at the Polishing Dents warehouse is not fully recorded in one application but is stored in various databases. Each punch-out or raw material from the supplier is stored in the warehouse as a raw material., These goods are processed through the production process into finished goods, held in the warehouse as finished goods for export. The data obtained in this study were collected by interview, observation, and literature study. Software development uses the Rapid Application Development (RAD) methodology and a system design approach through the Object-Oriented Approach with the Unified Modeling Language (UML). The results of this study are an inventory management information system that can support and manage inventory processes in the warehouse, such as controlling and monitoring goods, maintaining goods returns, assigning suppliers, and reporting.

Keywords: *Warehouse, Inventory, Unified Modeling Language, Rapid Application Development.*

1. Introduction

Today's advances in technological development bring many benefits to human work and companies whereby utilizing technology can facilitate human work and company business efforts. One technology widely used by society today is information technology (computers and telecommunications) [1]. Information technology that is increasing can be used to facilitate a job, the exchange of information becomes more accessible and faster, and the work done is more effective and efficient. Of course, information technology can improve a company's performance. One example of information technology in the business world is that information technology is used to process inventory data, especially in online and offline sales. The use of information systems by utilizing computer technology will save more time, not take up a lot of energy, and produce accurate data presentation [2] [3] [4].

PT Setia Kiji Reed (SKR) was established in 1991 with a location on Jl. Rancaekek Km. 24.5, Linggar, Kec. Rancaekek, Bandung Regency, West Java 40394 is a joint venture company between Japan (Kiji Reed Co. Ltd) and a local Indonesian partner, with business activities in the textile industry such as manufacturer and sales of reeds for weaving looms and material supplier for air-jet reeds. The company has three divisions: Wirecut, Polishing Dents, and Reed Production. As a textile manufacturing company, PT Setia Kiji Reed (SKR) needs to utilize information technology in warehouse inventory management. Lack of inventory control and not being recorded in inventory information are often experienced in the sales business, both online and offline sales, and the industrial world [5]. Managing inventory cannot be taken lightly because if the list is excessive, the risk of damage to goods increases, and the costs incurred increase, such as operational costs, storage costs, and others [6] [1]. On the other hand, if the inventory of goods is too little, the risk of shortage of stock will be significant. It can delay profits for the company and customer disappointment because the desired goods do not yet exist [7]. However, recording incoming and outgoing goods transactions at the Polishing Dents warehouse is not fully recorded in one application but is stored in various databases in separate places. The following process occurs at the Polishing Dents Warehouse:
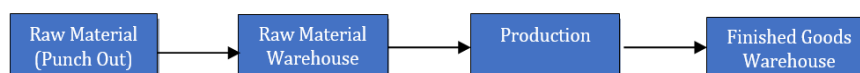

Fig 1. Warehouse workflow

Each punch-out or raw material from the supplier is stored in the warehouse as a raw material. These goods are processed through the production process into finished goods, held in the warehouse as finished goods for export.

Based on the recording of incoming and outgoing goods transactions in the Polishing Dents warehouse, it is not fully recorded in one application; the author makes inventory software to assist business activities in the company. The problems that occur, namely:

1. PT Setia Kiji Reed (SKR) has difficulty knowing all transactions for recording incoming and outgoing goods in the polishing dents warehouse.
2. PT Setia Kiji Reed (SKR) has difficulty in making stock reports

In designing this software program, it is necessary to limit problems in making requirements, namely as follows:

1. Only discusses incoming goods transactions, outgoing goods, and reports that occur at the Polishing Dents warehouse
2. Software created using Netbeans 8.0.2

With the design and manufacture of this software aims as follows:

1. Eliminate errors in data processing so that the data results in and out of goods are by existing ones
2. Make it easy to print reports of incoming and outgoing goods transactions that occur in the Polishing Dents warehouse

2. Literature Review

Mansell and Sichona define inventory as storing idle goods in warehouses waiting to be used [8]. Inventory management involves systems and processes in identifying inventory needs, determining the number of goods that must be stored, ways to procure goods through suppliers, reporting the warehouse's actual status, and managing stored goods. Today's company managers need reliable and effective inventory control to reduce costs and be competitive [9]. Inventories alone account for as much as 30% of the company's invested capital [10]. Inventory control can increase profitability by reducing costs associated with storage and handling and goods management [11].

Inventory maintenance is a problem that is often experienced by the business sector, especially in selling goods, especially those who have exported. Inventory management is essential for the sustainability of the business organization because if the need for inventory in a business organization is neglected, it can cause business congestion, especially for goods that are sold for export where the demand is high, so it is necessary to maintain its availability to meet customer needs. Inventory problems include the availability of sufficient goods when needed, and these goods must also be in good condition. So it means that the inventory of goods must be adequate; it should not be too much or too little [12]. Inventory management is tasked with managing a list of goods and reducing company costs. The goods inventory does not need to be too much because it will increase capital requirements requiring storage space and additional costs related to stored goods [1] [4].

3. Methods

3.1. Research Method

The research method used in this research method is the Research and Development (R&D) method. R&D is a research method used to produce these products [13] [14]. This software development methodology is SDLC with the waterfall method, consisting of requirements, design, implementation, integration & testing, operation & maintenance stages [15]. The steps of the waterfall method are:
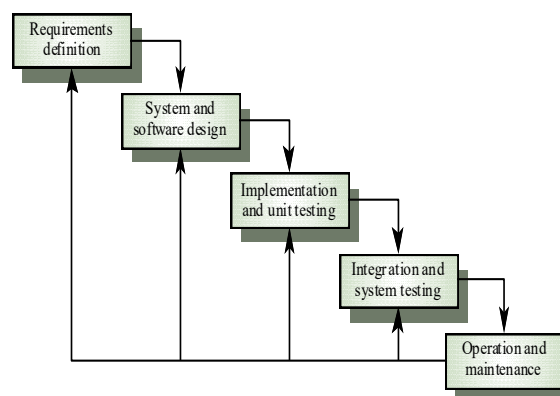

Fig 2. The classic waterfall model

1. Requirements. At this stage, the developer collects complete needs from users and stakeholders.
2. System design. The design or software design is carried out in this second stage before entering the coding stage. The method of this system and software can be done using structural analysis such as Flowcharts, Entity Relationship Diagrams (ERD), Data Context Diagrams (DFD), and Data Flow Diagrams (DFD). Or also, with an object-oriented approach, UML diagrams such as use case diagrams, activity diagrams, class diagrams, sequence diagrams, state machine diagrams, communications diagrams, component diagrams, and deployment diagrams.
3. Implementation and testing of modules. At the implementation stage, the design that has been compiled is implemented into a programming language (coding) that is understood by the machine. The resulting program codes must be tested, both black-box and internal code testing, namely white box testing. This test is for verification and validation that the input given to the application can provide the appropriate output desired by the user.
4. Integration and system testing. At this stage, integration or merging of existing modules is carried out, and system testing (module integration) is carried out to verify and validate that the software is by the design and its function is indeed running correctly or not.

For example, it is seen about usability, functionality, operability, observability, stability, and correctness. The user or client is directly involved in testing the system at this stage.
5.   Operation and maintenance. The last stage of the classic waterfall model is where the system is installed and maintained, which can be error correction, adaptation to needs in the field (adaptive), performance improvement (perfective), and preventive.

The author collects data by direct observation of the system running and conducting interviews so that it is easier to get information and the system's needs to be built.

3.2. Procedural Design

Module Name: add stock

Purpose	: increase the number of punch out items in stock
Input	: supplier code
	supplier name
	item code
	name of goods
	unit
	amount
	description
Output	: incoming item data
Algorithm	: 1. Button (+)

```
1. Button (+)
         if jmlBrgMasuk < 0 then
                      "The number of items must be filled"
         else
                      sisaStock = stockBrgPunchOut + jml
2. Button (-)
         if dataBrg==null then
                      "No items selected"
         else
                      sisaStock = stockBrgPunchOut - jml
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4. Results and Discussion

The following is a system design with several diagrams: a use case diagram and a class diagram.

4.1. Use Case Diagram
Use case diagrams to define which actors are directly involved in the designed information system and determine what each actor can carry out activities.
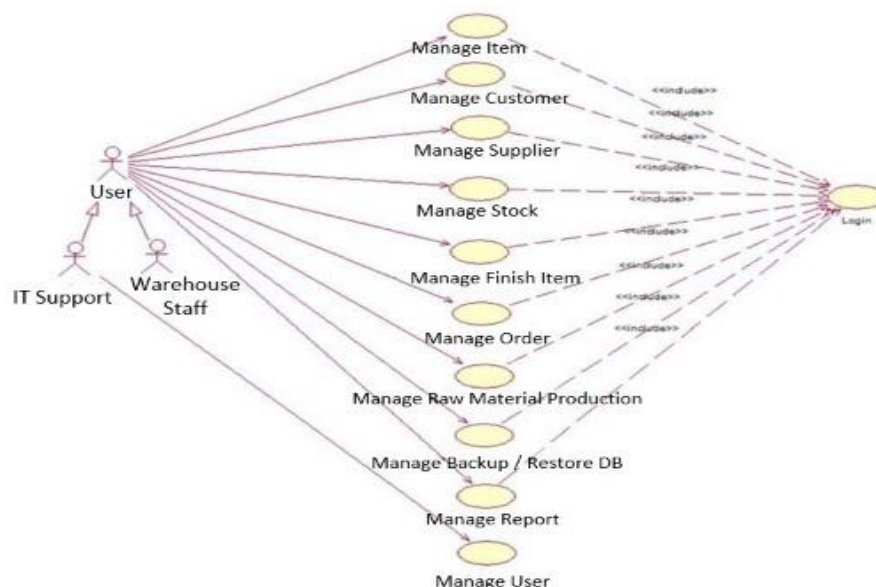

Fig 3. Use Case Diagram

Actor identification:
1. IT Support, as the primary administrator who can access Manage Item, Manage Customer, Manage Supplier, Manage Stock, Manage Finish Item, Manage Order, Manage Raw Material Production, Manage Backup/Restore Database, Manage Report and Manage Users, registered with the system
2. Warehouse staff is an administrator who can access Manage Item, Manage Customer, Manage Supplier, Manage Stock, Manage Finish Item, Manage Order, Manage Raw Material Production, Manage Backup/Restore Database and Manage Report.

4.2. Class Diagram

Describes the structure of a programming system from each class and shows the static structure of classifiers in a system.
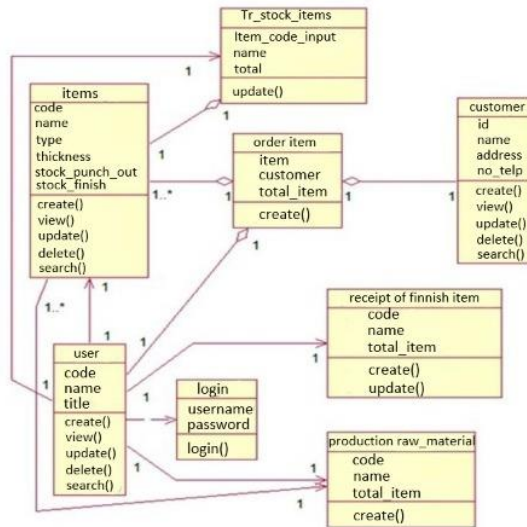

Fig 4. Class Diagram

Description :
1. Class Manage Stock Item can not stand alone without the Class Items. One transaction to add stock can choose many items, so it's one too many.
2. Many users can manage Stock of Item, Manage Receipt of Finish Item, Manage Production of Raw materials, Order Item.
3. Class Manage Receipt of Finish Item cannot stand alone without the Class Manage Raw Material Production.
4. Class Order Item cannot stand alone without an Item Class.

4.3. System View

The display or interface of this information system is as follows:
a. Dialog Screen: Log in
   Function: Used to enter the software
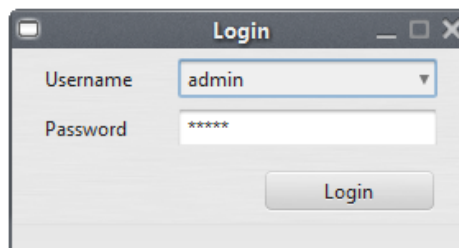
Fig 5. Display Login

b. Dialog Screen: Dashboard
   Function: The main menu is displayed after the login process is successful.

Fig 6. Dashboard

c. Dialog Screen: Item Data
   Function: To save the name of the existing item data.
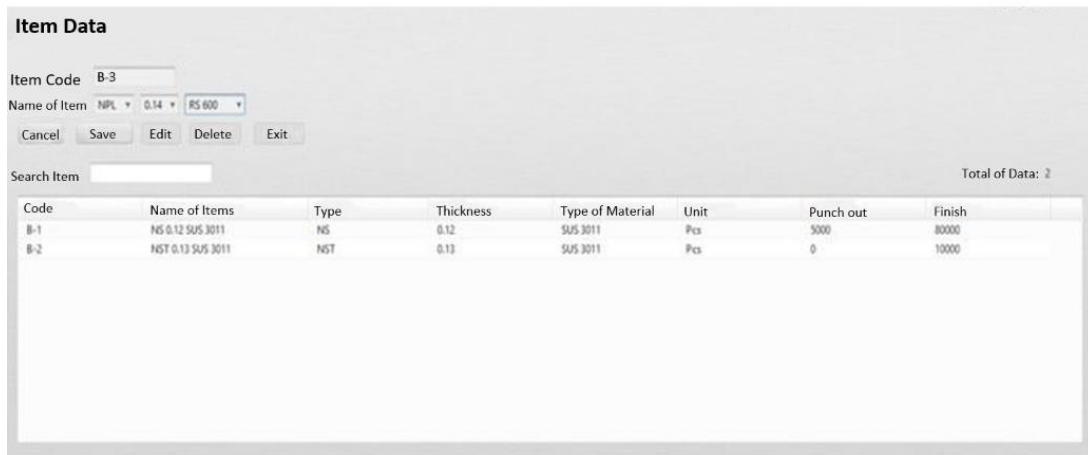
Fig 7. Item Data

d. Dialog Screen: Search Item Data
   Function: To search item data by the name of goods, type, thickness, material type.
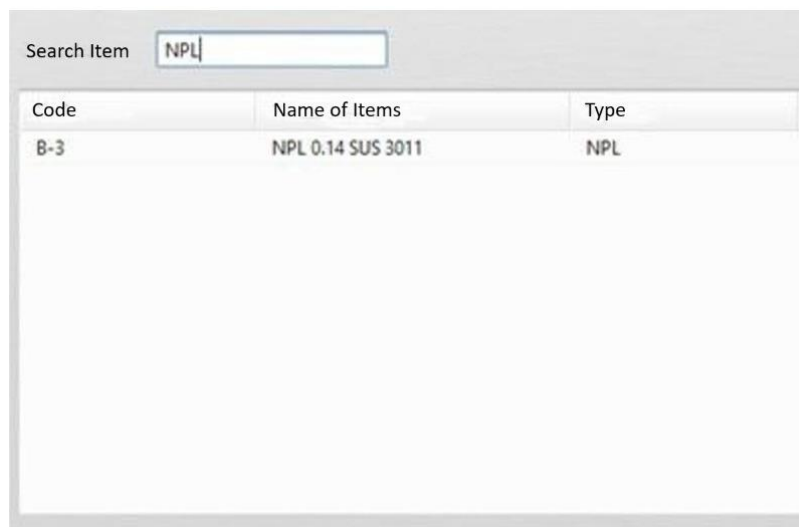

Fig 8. Search Item Data

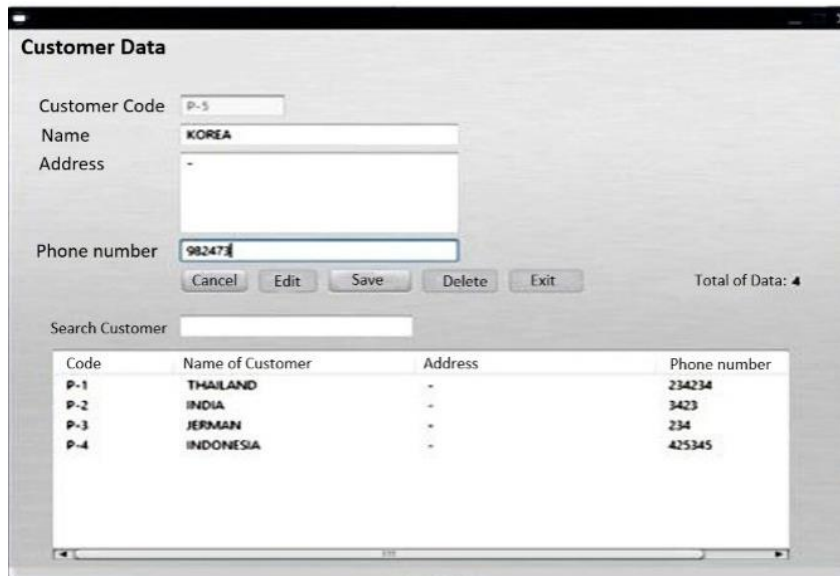e. Dialog Screen: Customer Data Input
   Function: To save customer data.

Fig 9. Customer Data Input

f.   Dialog Screen: Search Customer Data
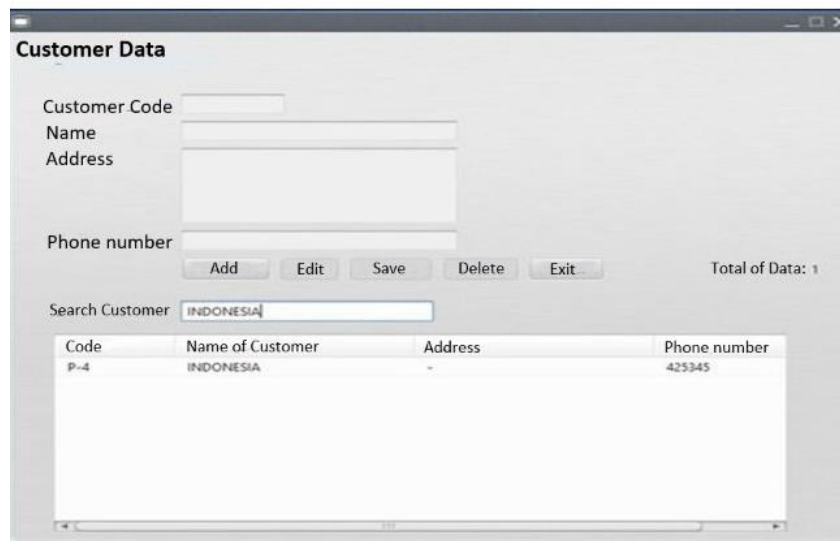   Function: To search data by Customer Name.

Fig 10. Search Customer Data

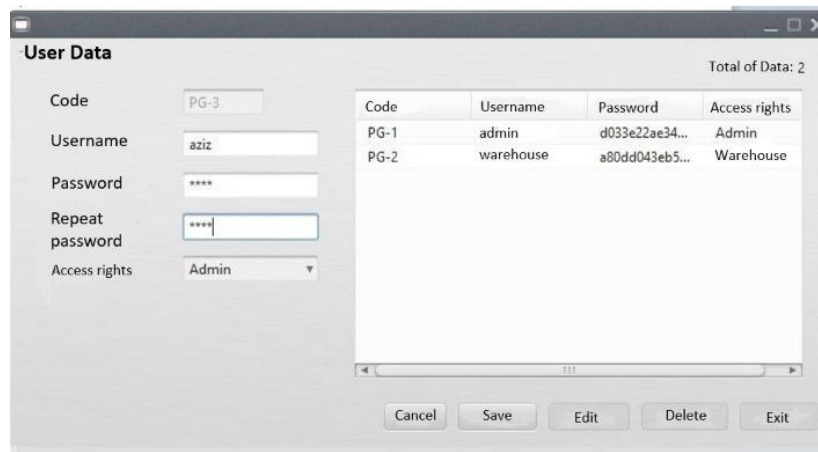g.   Dialog Screen: User Data Input
    Function: To save username data.

Fig 11. User Data Input

h.   Dialog Screen: Search User Data
      Function: To search data by username.

Fig 12. Search User Data

i.   Dialog Screen: Add Stock
     Function: To increase the stock of Punch-Out items.

Fig 13. Add Stock

j.   Dialog Screen: Raw Material Production
     Function: To process Punch-Out stock of items into Finished Item through the production process.

Fig 14. Raw Material Production

k. Dialog Screen: Receipt of Finished Item
    Function: To record data from finished raw material production and process to change raw materials that have entered production into a finished item.

Fig 15. Receipt of Finished Item

l. Dialog Screen: Order Items
Function: To record the disbursement of finished items to customers.

Figure 16. Order Items

5. Conclusion

After implementing and testing problems into an application, the authors conclude several conclusions: Inventory software at PT Setia Kiji Reed's Polishing Dents warehouse can facilitate operators in managing inventory, especially recording incoming and outgoing goods transactions in the warehouse, managing finished goods production, supplier assignment and reporting. In addition, report generation can be more easily done through this application.

After doing research, the author wants to suggest this software. The language in the application is now changed to a language that is familiar in the polishing dents warehouse area. In addition, to complete the data filter categories that exist in each form.

Acknowledgment

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