

Warehouse Management System

¹Genta Sahuri, ²Fakhrul Aziz Putro Utomo

^{1,2}President University, Jl. Ki Hajar Dewantara, Cikarang Baru, Bekasi

^{1,2}Fakultas Komputer

e-mail: ¹ghent_wow@yahoo.com

Abstract

Many multinational companies still use “paperwork” or not the computerized way to organize data to control the movement and storage of materials within a warehouse and process the associated transactions, including shipping, receiving, put away and picking. Companies are supposed to concern in Risk Management also, in case disaster happens paperwork will too vulnerable from the disaster.

This research is aimed to help the small sized manufacturing company to improve their business and warehouse management by providing a web service and send the information about the number of current stock in warehouse to mobile phone through SMS which will become a solution to overcome those problems mentioned before. This system will record every company incoming material until data warehouse processing and creates reports that provides helpful information for the decision making process in the troupe.

Keywords—computerized, inventory management, sms gateway

1. INTRODUCTION

In several manufacturing companies, one of the parts or divisions which important is supplies. Supplies it needs to be controlled regularly and periodic, because the supplies can affect the financial unit. In addition, there is still the calculation of the quantity of goods that is defective, Reject item, in return or restored by the quality of being neither good nor broken. The supply of raw materials must be able to meet the needs of the plan of production because if the supply of raw materials cannot be met, then will obstruct the production process. The lateness of the schedule the fulfillment of the product ordered consumers can be detrimental to the company. Whereas if the supply of raw materials to improve storage charges, excessive damage, and loss of raw material.

The term of “Warning system” is any system of biological or technical nature deployed by an individual or group to inform of a future danger. Its purpose is to enable the developer of the warning system to prepare for the danger and act accordingly to mitigate or avoid it. In Organization, a warning system can make the organization faster to know where the problem is. By knowing that the organization can easier to solve that problem and even avoid it.

Many advantages of the computerized system over the manual system. The manual system is tedious and it is more error prone. Some Organization can handle work much efficiently with the computerized system and it helps in effectiveness and efficiency by save more time and money. The popularity of the computerized system is increasing day by day and most of systems are being computerized nowadays.

Since in this era all company or organization want to make a system that can make the business process faster and all the user want the system help them in their job became faster and easier. By developing the warning system that can make the company or the user easier and faster to avoid the problem. So that it can produce information that is used as the basis of decision making for both management to solve problems and to improvements in weakness of the system that is currently running, through “online” system that can make the manager faster to get that information and faster when creating the decision to solve the problem. And this research will develop the web application and using Short

Message Service (SMS) gateway to give notification to user. That can provide the manager to easily reach the information of inventory stock which item stock that in critical zone and which one is not.

2. METHODOLOGY

Rapid Application Development is used as the methodology to develop the application. According to James Martin in the year of 1991, Rapid Application Development (RAD) is a development life cycle designed to give much faster development and higher-quality results than those achieved with the traditional life cycle. It is designed to take the maximum advantage of powerful development software that has evolved recently.

In addition, due to the iterative approach and prototyping, testing and integration of end user feedback happens at each stage of product development. Hence, the end product has lesser number of changes and defects, thereby minimizing the risks involved in the project. There is little or no testing effort involved:

1. Requirements Planning Phase

This phase combines elements of the system planning and systems analysis phases of the Systems Development Life Cycle (SDLC). Users, managers, and IT staff members discuss and agree on business needs, project scope, constraints, and system requirements. It ends when the team agrees on the key issues and obtains management authorization to continue.

2. User Design Phase

During this phase, users interact with systems analysts and develop models and prototypes that represent all system processes, inputs, and outputs. The RAD groups or subgroups typically use a combination of Joint Application Development (JAD) techniques and CASE tools to translate user needs into working models. User Design is a continuous interactive process that allows users to understand, modify, and eventually approve a working model of the system that meets their needs.

3. Construction Phase

Focuses on program and application development task similar to the SDLC. In RAD, however, users continue to participate and can still suggest changes or improvements as actual screens or reports are developed. Its tasks are programming and application development, coding, unit-integration and system testing.

4. Cutover Phase

Resembles the final tasks in the SDLC implementation phase, including data conversion, testing, changeover to the new system, and user training. Compared with traditional methods, the entire process is compressed. As a result, the new system is built, delivered, and placed in operation much sooner.

3. RESULT AND DISCUSSION

Inventory warning system is a system which is able to give warning when the inventory in the warehouse department is running out of stock. This research helps the manufacturing company to avoid a shortage of supplies (out of stock) or excess (overs of stock) raw materials when do the production process. The method that is used in this research is minimum stock level. This method is aim to reduce costs by cutting stock to a minimum number.

The problem that usually occurred is when the warehouse out of stock and the manager just know the condition when it is already happen. In this case the process of production will stopped and the production process could not be completed on time in accordance with the schedule determined beforehand that cause the product late for sent to the customer. To solved that problem this research create a system that is able to send an information from web application that can be called as a web server to the user through Short Message Service (SMS) to the alert the manager.

The Use Case diagram of the system is as seen in Figure 3.1. Use Case diagram are made to give the information of the core elements and processes of the system and it explains about the whole system from user point of view. The key elements are termed as actors and the processes are called use cases. Its goal

is to present a graphical overview of the functionality provided by the system in terms of actor, their goals and any dependencies between those use cases [19].

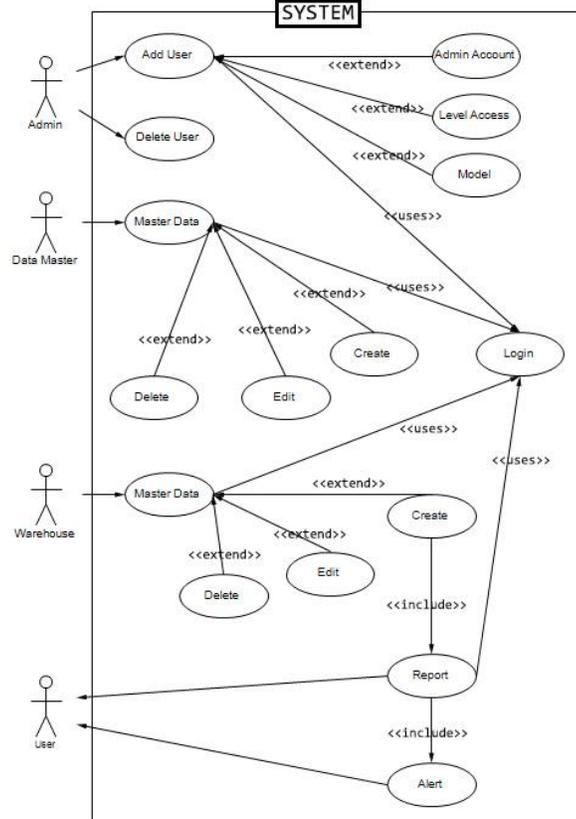


Figure 3. 1 Use Case Diagram

Figure 3.2 illustrates the relations between entities in Master data menu used to store all name of stock in warehouse in this inventory warning system. There are 7 entities in Figure 3.2, which are masterinventory, invcategory, supplier, manufacturer, model, location, and satuan. Masterinventory is table that store information all items name. Invcategory, this table used to store data that have information all category of item, such as this item is a raw item or not. Supplier, this table have the information of data supplier.

Manufacturer, is table used to store information of manufacturer of the item. Model, table that is used to store the information of model of item. Location, table that store the information that tell which warehouse that this item being stored. Satuan, is to store the information the name of its measurement for the item in the warehouse. Masterinventory table need the information of the rest table to add some information to this table.

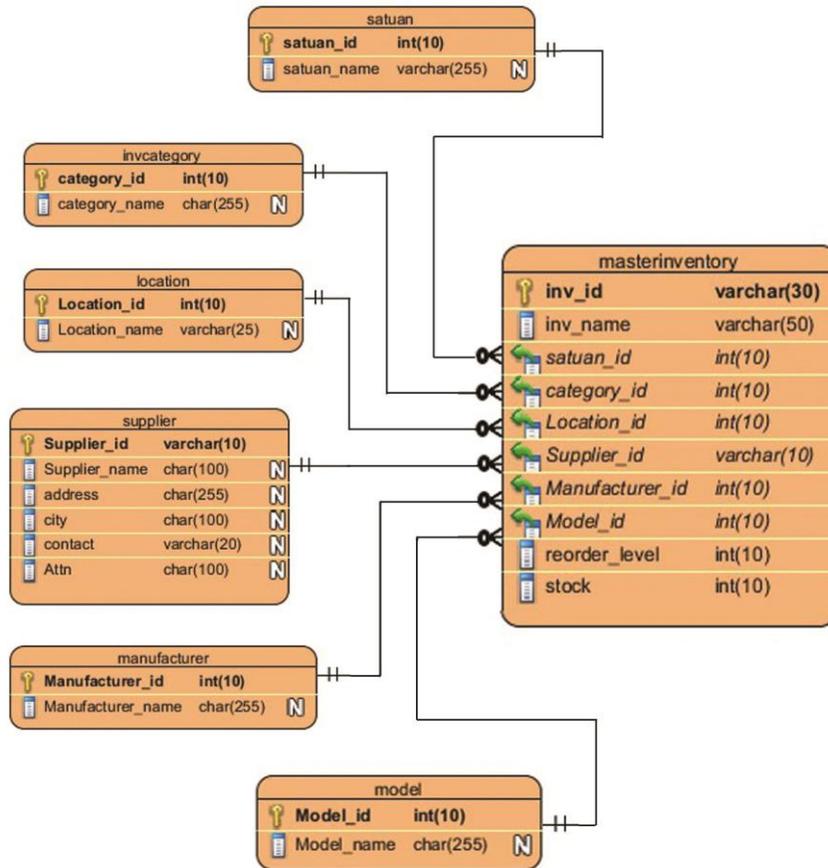


Figure 3. 2 Table Relation for Master Data

Figure 3.3 illustrates the relations between entities in Account menu used to create or delete user in this inventory warning system. There are 4 entities used for account menu. There are adminlevel, module, adminlogin, and levelaccess. Adminlevel is a table that store the information of the admin level of the user.

Module, table that store information of all module in this inventory warning system. Adminlogin, this table to add or delete user that can be used to login in this inventory warning system and levelaccess is to store the information of level access of some admin level which module that they can use.

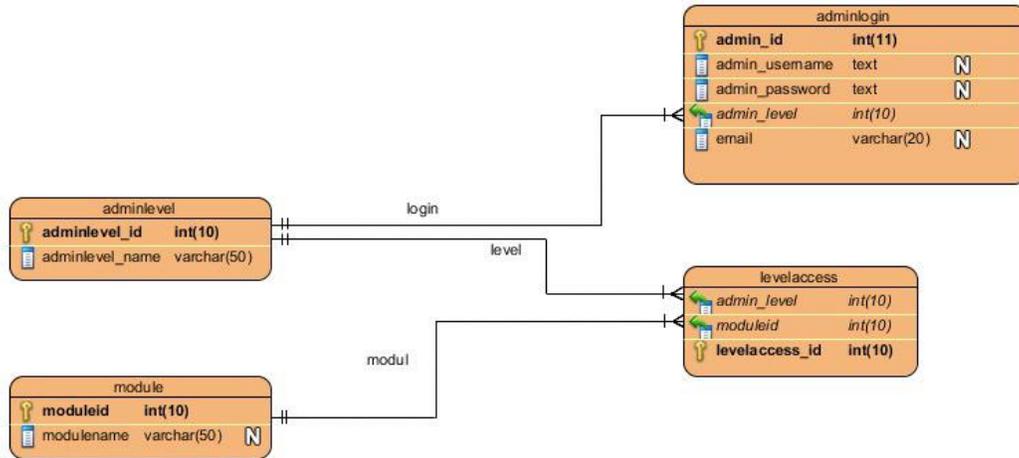


Figure 3. 3 ERD for User Account

Figure 3.4 illustrates the relations between entities in Transaction menu used to keep track all transaction in warehouse in this inventory warning system. There are 5 entities used for transaction menu. There are masterinventory, receiving, delivery, production, and supply. Masterinventory, in this menu used to give the information of some item name to use in the other table. Receiving, table that store the all information of receiving in warehouse that tell the item that have been receive in warehouse department.

Delivery, table that store all information of delivery in warehouse, table that store the information of delivery in warehouse that tell the item that have been going out from warehouse department however it deliver for to sell to costumer. Production, table that store all information of some item that just came in from production department. Supply, table that store all information of some item that have been going out from warehouse department to be use in production department.

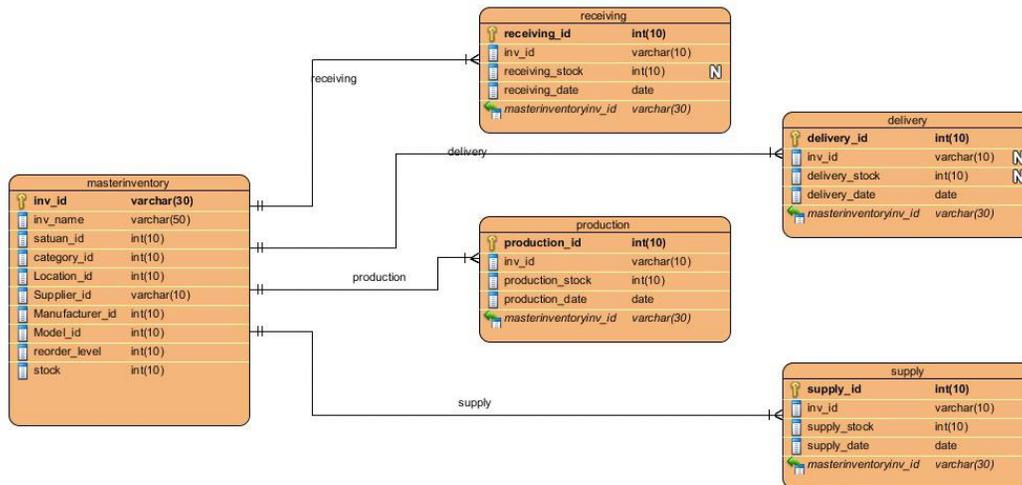


Figure 3. 4 ERD for Transaction

Figure 3.5 show the page of main page. After the user go through the login system. The application will bring the user to this page. In the main page there are sub menu account, master, transaction and report.

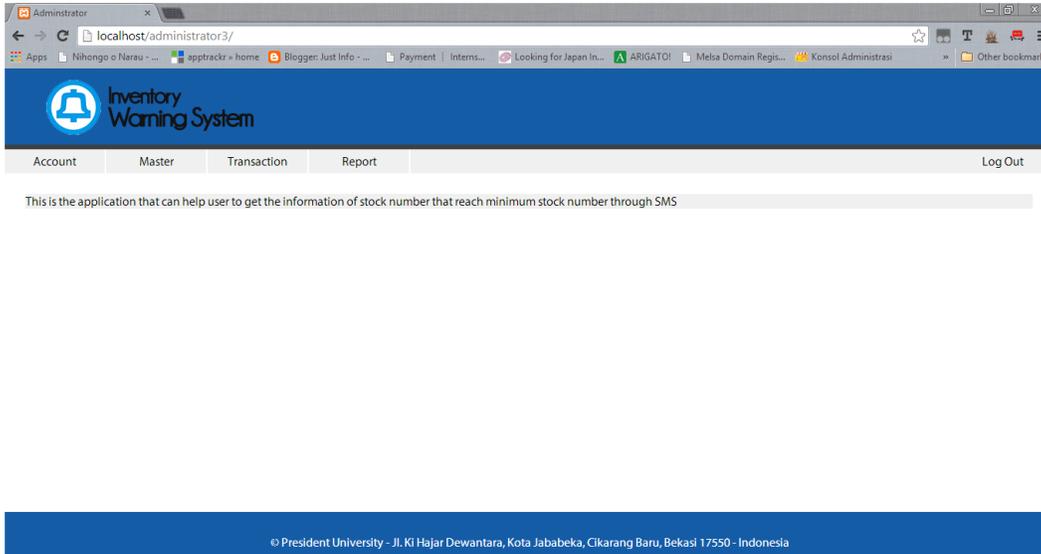


Figure 3. 5 Main Page

Figure 3.6 shows the transaction page of the system. In the transaction page there is receiving sub menu, supply production sub menu, production sub menu and delivery sub menu.

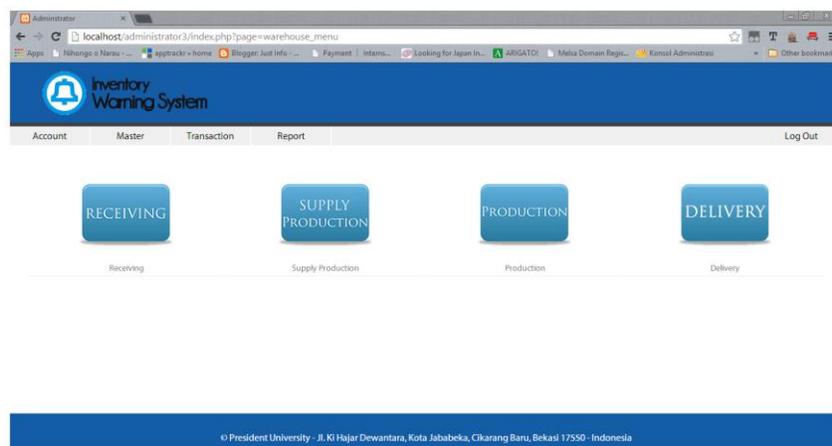


Figure 3. 6 Transaction Page

Figure 3.7 shows the page of report page that only can be opened by manager admin level. The system will check and send the SMS from here.

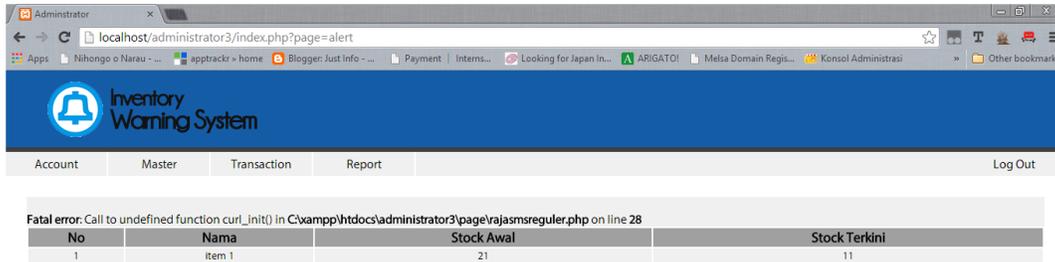


Figure 3. 7 Reporting Page

While the formula to check the status of current stock is as below:

$$\text{Current stock} = \text{Receiving} - \text{Supply} + \text{production} - \text{Delivery}$$

Where the receiving is come from the latest input from receiving menu, supply from supply production menu, production from production menu, and delivery from delivery menu.

4. CONCLUSIONS

Warning system for inventory stock control that is based on web application and give notification through SMS. This system has help the decision maker or manager faster when creating a decision to solve some problem in inventory stock control unit. Creating web application for the user to input the number of the stock in warehouse it is really help the system to prevent invalid data. In the manual system, the user record all item by hand writing in paper, this system make an invalid data and make data inaccurately. And by using web application so the record system easier, faster and the data is more accurately.

This research implemented in the companies in low budget and effort which is suitable for small enterprise in Indonesia. Small enterprises are playing important roles in our current economic production. By increasing the small enterprises condition the writer hopes to see the major change in the economic condition in Indonesia especially in manufacturing company. And using the alert system through Short-Message Service (SMS) if some of item reach the critical section that mean the item is nearly out of the manager can tell purchasing department to supply the item reached the minimum stock number, this system is helpful for the decision maker to do to that possible threats that appears in warehouse department .

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