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Lampung, Indonesia

The First International Conference on Engineering and Technology Development (ICETD 2012)
Faculty of Engineering and Faculty of Computer Science, Universitas Bandar Lampung

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PREFACE

The activities of the International Conference is in line and very appropriate with the vision and mission of the UBL to promote training and education as well as research in these areas.

On behave of the First International Conference of Engineering and Technology Development (ICETD 2012) organizing committee; we are very pleased with the very good responses especially from the keynote speakers and from the participants. It is noteworthy to point out that about 45 technical papers were received for this conference

The participants of conference come from many well known universities, among others: Universitas Bandar Lampung, International Islamic University Malaysia, University Malaysia Trengganu, Nanyang Technological University, Curtin University of Technology Australia, University Putra Malaysia, Jamal Mohamed College India, ITB, Mercu Buana University, National University Malaysia, Surya Institute Jakarta, Diponogoro University, Unila, Universitas Malahayati, University Pelita Harapan, STIMIK Kristen Newmann, BPPT Lampung, Nurtanio University Bandung, STIMIK Tarakanita, University Sultan Ageng Tirtayasa, and Pelita Bangsa.

I would like to express my deepest gratitude to the International Advisory Board members, sponsors and also welcome to all keynote speakers and all participants. I am also grateful to all organizing committee and all of the reviewers which contribute to the high standard of the conference. Also I would like to express my deepest gratitude to the Rector which give us endless support to these activities, such that the conference can be administrated on time.

Bandar Lampung, 20 Juni 2012

Mustofa Usman, Ph.D
ICETD Chairman

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Design of Warehouse Management Application Tool for Controlling the Supply Chain

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Abstract—**Warehouse has a broad meaning and is more than just storage, but has more function than that such as receipt of goods, placement of goods, arrangement of stock, the movement of goods, the release of goods, delivery of goods which are all required software to assist in the process of the above. Warehouse management System is a key element in the supply chain, where the main goal is to control all the process that occure in it such as shipping, receiving, storage, movement and retrieval. With Warehouse Management System we can control the process of moving and storage with better use of warehouse space to be optimize, improving the effectiveness of the process of acceptance and delivery as well as knowing the amount of stock with greater accuracy at any time.**

Keywords— **Warehouse Management, Warehouse, Supply Chain**

1. INTRODUCTION

Development of rapidly growing companies in Indonesia either company engaged in production or any company engaged in the service. Company engaged in the service one of which is a warehousing Company refer to as warehouse or Warehouse. Competition in the field of warehousing services company, especially now is very tight, especially with globalization era that everything was free.

In this condition certainly not independent service company with warehouse service and manage it well and proportioned, with intense competition is not shed settings can only be done manually because it will affect the stock of goods, movement of goods, delivery of reports and data security. Major media in this case is the storehouse.

Warehouse not only as a temporary storage of goods, for this we need a tool or a tool to organize all this. In this case the system or application. In summary contains the understanding of warehouse management systems: the management of inter-related activities in the activities of temporary storage of goods. In this thesis will discuss warehousing information system in this case is referred to as WMS (Warehouse Management System).

Currently the warehouse has a broad meaning and is more than just storage,but more than that, for example for receiving goods, the placement of goods, arrangement of stock, the movement of goods, expenditure, delivery of goods which are all activities that require software) to assist in the process above.

To solve the above problems, the tools necessary to assist the above process, and tools recommended by the authors is to apply the concept of WMS (Warehouse Management System), which is expected by applying the concept and making the application is then the problem can be implemented quickly warehousing , accurate, precise and efficient.

2. BASIS OF THEORY

A. Basic System Concepts

In general, the system is a collection of objects or elements interacting to achieve a particular goal. System as a network of procedures linked together, gather together to perform an activity or to accomplish a specific goal (Jerry Fitz Gerald 5).

B. Basic Concepts Of Information

In general, information is data that is processed into a form more useful and more meaningful for those who receive it. Information is data that is processed into a form more useful and more meaningful for those who receive it (Jogiyanto 8). A source of information is data. Data is the plural of the singular form datum or data item. Data is processed through a model for the resulting information will then be forwarded to the recipient the end result of a decision and take action, which means producing another action that will result in some data back. The data will be captured as input and processed back to a model and so that eventually form a cycle called the cycle of data processing .

C. System Analysis

System analysis is the decomposition of a complete information system into its component parts in order to identify and evaluate the issues, opportunities, barriers and needs that occur the need expected, and it can be concluded that repair-repairs (129 Jogiyanto). System analysis is done after the planning phase system and before the design phase of the system. System analysis phase is a critical stage and it is very important because of an error in this phase will also lead to errors in the next stage.

The steps in the analysis phase system similar to the steps undertaken in defining the projects that the system will be developed in the planning system. The difference lies in the scope of their duties. In the analysis of the system, the scope of its work is in more detail .In the analysis phase of the system are the basic steps that must be performed by systems analysts.

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Here are the basic steps are:
1. Identify, is identify the problem.
2. Understand, that is to understand the working of the existing system.
3. Analyze, is analyze the system.
4. Report, which is making the report analyzes the results.

D. Waterfall Method

Waterfall method is a form of system development usedto describe the major stages and steps on the stage indevelopment process (Jogiyanto 411).

The method is also called the classic waterfall life cycle. This method takes the approach in software development starting from the system level and progress of systems engineering, software requirements analysis, design (design), programming (coding), testing (testing) and maintenance (maintenance). Activities contained in the waterfall method shown in Figure 2.2.
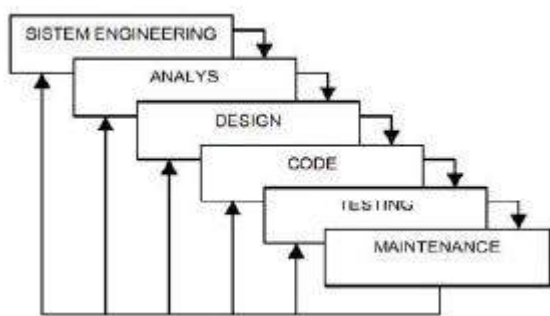

Figure 2.1. Waterfall scheme

E. Unified Modeling Language (UML)

Unified Modeling Language (UML) is a language that has become the industry standard for visualizing, designing and documenting software systems. UML offers a standard for the design model of a system. By using UML can create a model for all types of software applications, where applications can run on any hardware, operating system and any network as well be written in any programming language. But because the UML class and operation also uses the basic concept, then he is more suited to writing software in object-oriented languages like C + +, Java, C # or VB.NET. However, UML can still be used for procedural modeling applications in VB or C.

As with other languages, UML defines the notation and syntax or semantics. UML notation is a set of special forms to describe the various diagram software. Any special form to describe the various diagram software. Each form has a specific meaning and UML syntax defines how these forms can be combined. UML notation is mainly derived from three notations that have been there before: Grady Booch OOD (Object Oriented Design), Jim Rumbaugh OMT (Object Modelling Techniques) and Ivar Jacobson OOSE (Object Oriented Software Engineering).

F. Related theory of WMS (Warehouse Management System)

Warehouse Management System or Warehouse Management System is a key element in the suppply chain, where the main goal is to control all the processes that occur in it such as shipping, receiving, storage, movement and retrieval.

With WMS, we can control the process of moving and storage with better use of warehouse space with optimately, improve the effectiveness of the process of acceptance and delivery as well as knowing the amount of stock with greater accuracy at anytime.

Here are some advantages to implement WMS (Warehouse Management System) that is:
1. Handling Speed Up Process.
   WMS Implementation in a warehouse lead time can accelerate the process with a process performed by a computerized or automated that would otherwise be done manually and a lot of people.
2. Ensure Accurate Inventory Data.
   With WMS we know all the inventory and the number of stock transactions more quickly and accurately at any time (real time).
3. Optimize Your Warehouse Layout and Space Utilization.
   With WMS, you can set the optimal location for storing goods. The number and type of goods that will go into storage warehouse will be governed by existing tools in the system.
4. FIFO Implementation.
   The flow distribution of goods can be carried out properly and in accordance with the principle of FIFO (First In First Out), and some recent information that the WMS software can now be applied FEFO (first expired first out).
5. Automated Data Collection.
   Data collection can be done automatically by using radio-frequency portable data terminal (PDT) and barcode scanner.
6. Cycle Counting.
   Application of WMS also provides an advantage in calculating the time / cycle every process or lead time. The data needed to calculate the productivity of warehouse and facilitate the improvement efforts.

If the optimal application of WMS has the above advantages can be achieved and can ultimately benefit the company because, in principle, WMS will optimize labor, reduce processing time, reduce unnecessary inventory process and ultimately will improve our service to the next customer. On the other hand, the application of WMSjuga not easy and requires formulation of a fairly mature. From design to technical Bussiness Process should be fixed so that the results are as expected.

Not every warehouse can or should apply because sometimes a WMS warehouse system fairly simple to implement. For example in a warehouse with a small scale or type of unit that is easy handling.

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In addition, the desire to invest any of the companies contributing to the implementation of WMS. WMS investment fund that counted large enough, certainly do not want to end up in vain without success.

3. SYSTEMS ANALYSIS AND DESIGN

A. Warehouse Management System (Wms)

Warehouse Management System or Warehouse Management System is a key element in the suppply chain, where the main goal is to control all the processes that occur in it such as shipping, reception, storage, movement and retrieval.

With WMS, we can control the process of moving and storage with better use of warehouse space to be optimized, improving the effectiveness of the process of acceptance and delivery as well as knowing the amount of stock with greater accuracy at anytime.In the design of the writer will create a design system implement the concept of WMS (Warehouse Management System) so hopefully this application can be used in a service company engaged in logistics or warehousing.

B. Organizational Structure
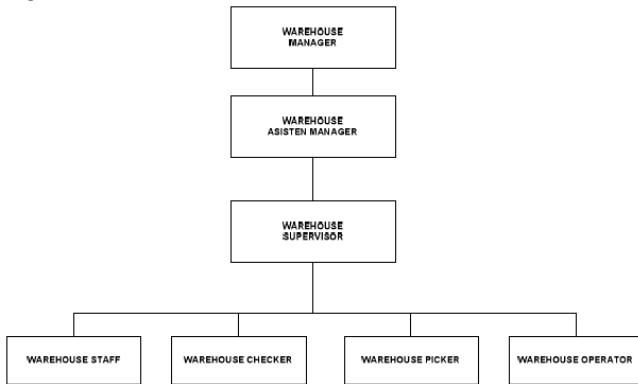
Figure 3.1 Organizational Structure

C. System Analysis

After analysis of several logistic companies to provide input to the authors apply the concept of WMS (Warehouse Management System). This proposal is to develop systems and concepts that are already there so hopefully if this concept has been executed then the item accuracy, and the exercise of warehousing can work well. As for the details are:

Figure 3.2 Use Case

D. DatabaseDesign
ERD(EntityRelationshipDiagram)

Figure 3.3: EntityRelationship diagram

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E. DESIGNSCREEN

Figure 3.4: Design Screen WMS

F. Access Level

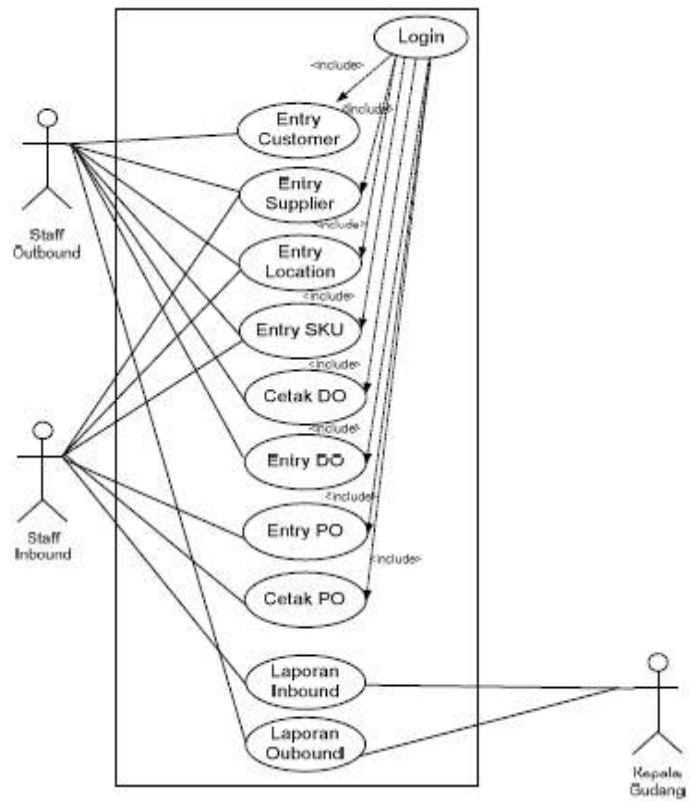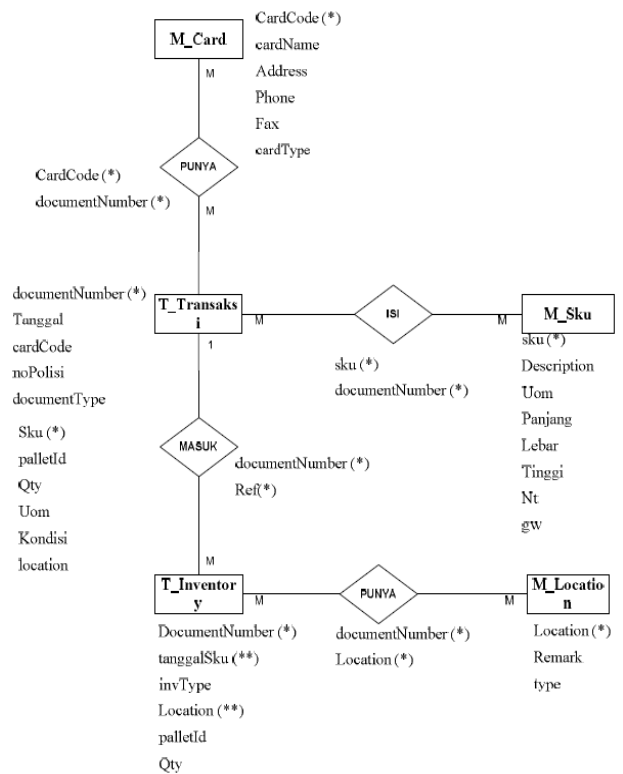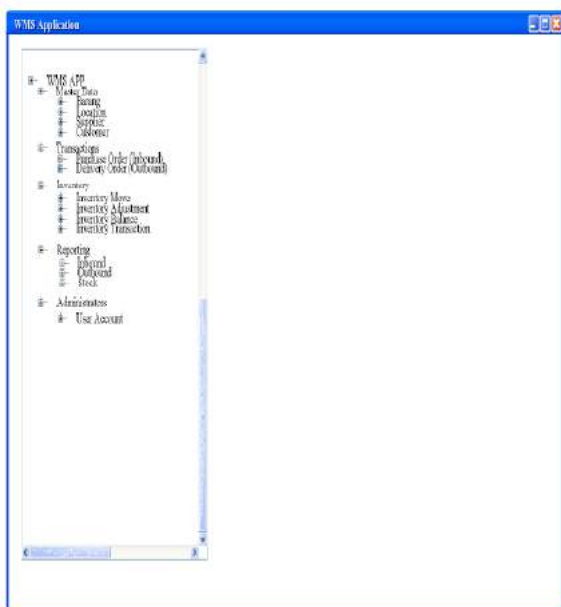| No	Modul	Type	Group			
			Admin	Staff Inbound	Staff Outbound	Kepala Gudang
1	Maintain Customer	M	Yes	Yes	Yes	Yes
2	Maintain Location	M	Yes	Yes	Yes	Yes
3	Maintain SKU	M	Yes	Yes	Yes	Yes
4	Maintain Supplier	M	Yes	Yes	Yes	Yes
5	Maintain User Account	M	Yes	No	No	No
6	Inventory Move	T	Yes	Yes	Yes	Yes
7	Purchase Order	T	Yes	Yes	No	Yes
8	Delivery Order	T	Yes	No	Yes	Yes
9	Adjustment	T	Yes	No	No	Yes
10	View Inventory Balance	V	Yes	Yes	Yes	Yes
11	View Inventory Transaksi	V	Yes	No	No	Yes
12	Report Stock	R	Yes	Yes	Yes	Yes
13	Report Inbound	R	Yes	Yes	No	Yes
14	Report Outbound	R	Yes	No	Yes	Yes
15	Backup/Restore	T	Yes	Yes	Yes	Yes
16	Change Password	T	Yes	Yes	Yes	Yes

Tabel 3.1: Access Level

4. IMPLEMENTATION ANDTESTING

Implementationis done afterChapter3, namelythe design and manufactureprogramhas beencompleted.This implementationwillbe doneas a conditiontorun theprogramor applicationthat has been made.

a. TestingDevice
This applicationis createdusing acomputerwith thespecificationsindetailare:
1) Hardware(Hardware).
   - ComputerType: PC(PersonalComputer)
   - Processor: IntelPentium4
   - Hard Drive: 40GB
   - Monitor: 14Inch
2) Software(Software)
   - OperatingSystem: WindowsXPSP2
   - Database: SQLServer 2005
   - Program: MicrosoftVisualstudio2005 9(. NET2005).

b. TestingProcedures
Testing is doneby focusingonthe functionalpurposesofthis application. Here are theresults ofthe testingsystem isWarehouse ManagementSystem (WMS).

c. Analysis Of Test Results
Interface applications can run well. The entire interface between the form can be done. Function application has been tested according to test scenarios that have been made previously. Throughout the testing goes well, the interface and functionality of each form can be done with the output expected by the user.
The report produced in accordance with the filter / selection is entered into the form and produced a good report and easily understood. Grouping on the menu is very good. Ability to process applications in the analysis relies heavily on the ability of the database server processes the query is performed by the application.

5. CONCLUSIONS AND RECOMMENDATIONS

Based on the results of research conducted it can be concluded as follows:
a. Application of WMS (Warehouse Management System) using the programming language C # (C Sharp) was created.
b. Applications are made to produce / make statements goods quickly, precisely and accurately.
c. WMS application is contained in the transaction module Inbound, Outbound transactions and goods will be faster searching.
d. Security of transaction data is better, because the backup and restore database module is available in this application.

From the above conclusions the authors have some suggestions for the implementation of WMS applications(Warehouse Management System) can be run well, namely:
a. The user must use this application the user should have to do training / practice in using this application.

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b. For data security admin user should be able to use the backup module that has been available in this system.

c. Hardware should be frequently used in the update / upgrade

d. The design of this system design is not always permanent, and therefore this system can be designed in accordance with the time and needs.

e. For data security and protect data, users should have access to this system can maintain the confidentiality of their password.

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