

# Design and Implement E-Warehouses Management System for Universities in Developing Countries

Wasnaa Kadhim Jawad

University of Information Technology and Communications

wsnaakash@yahoo.com

## Abstract:

Recently, the universities are strived to find out a new approach in their warehouses for meeting their requirements efficiently and rapidly. This is the main reasons behind adopting the electronic applications to increase the accuracy of dealing with the important data and information which relates to add and remove of materials from and into warehouses located within universities.

Keywords: Warehouses, Universities, Electronic Applications.

## 1. INTRODUCTION

Nowadays the use of Information Technology (IT) is increasing, because people need faster communication, also storage information and fast data processing. ITs are an important way to achieve these goals. Warehousing defines the act or a process of storing the commodities in a storage place specifically known as a warehouse. Benefits of warehousing can be summarized as follows:

- It ensures the protection of the quality and quantity of the commodities.
- Safety requirements like temperature, humidity, insulation are taken care of.
- Provides a maximum storage space.
- It provides the facilities for processing, packing, blending, grading, etc. of the goods for the purpose of sale.

- Warehouses provide a receipt to the owner of goods for the goods kept in the warehouse.

Warehouse Management System (WMS) is a good option for improving the control of warehouse operations. The development of warehouse management system (WMS) is the process of automating any conversion from work depends on the human effort in everything to work depends on information technology. (WMS) is software and processes to control and administer warehouse operations from the time goods or materials enter a warehouse until they move out. Operations in a warehouse include inventory management, picking processes and auditing.

Warehouse management system (WMS) is the solution to decreasing inventory cost and improving degree of customer contentment. Challenges that facing WMS and how to solve it can be described as follows:

- Shortage of communication is a great challenge. This can be solved through using the right applications and software.
- Time Management is a great challenge. This issue can be solved through elimination the supposition in the location of commodities.
- Inventory Accuracy/Tracking is a great challenge. This issue can be solved through the properly trained of the warehouse staff in order to handle errors from other departments.

In [1], authors affirmed implement a WMS and the decreasing of operation time. In [2], authors affirmed the importance of real time information in WMS. In [3], authors asserted the importance of warehouse planning in IT. They propose a bottom-up approach for collaborative warehouse order fulfillment based on a multi-agent system and IoT infrastructure. Advances in ambient intelligence and RFID technology have enabled development to new approach in the logistics and production domain called “Bottom-up”. It is based on information recovered from products and resources at the bottom of the chain which is then transmitted to the upper levels and impacts decision making across all supply chain areas.

## 2. THE SUGGESTED SYSTEM FRAMEWORK

Figure (1) shows the outline of the suggested system framework. It displays master portions and the desired relations among them. E-warehouse

system consist of three main processes (Products, Dispatch, Reports) each process has its own specific function. This system consists of its own database and table, and its contents are related to the main data center for management the whole system.

## 3. ALGORITHM OF WAREHOUSING SYSTEM

The algorithm of each process in E-warehouse system is explained in the following below:

- ❖ Products: this process is used to insert new material in E-warehouse system as shown in Figure (2) , at the beginning we always insert code for a new item and allocate place for a new item in the warehouse depending on its categories, eventually save it in the database.

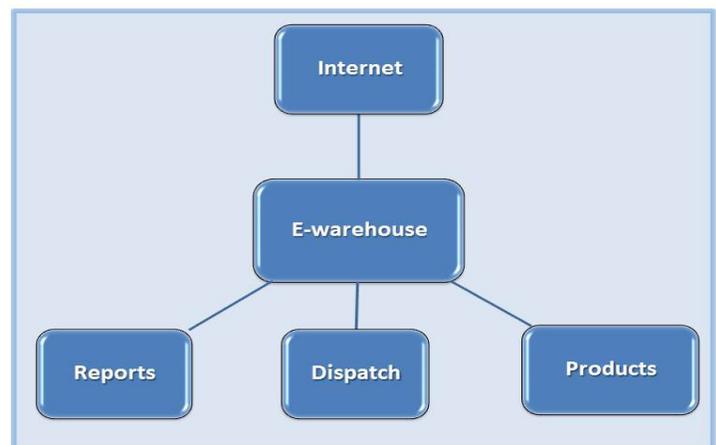


Figure (1): The suggested system framework

- ❖ Dispatch: this process is used to remove material from warehousing system as shown in Figure (3), firstly we select the material and its quantity that we want to bring out from the warehouse, and in all cases we must calculate the new balance of the materials that remaining in the warehouse lastly save it in the database.
- ❖ Reports: this process is used to view a list of materials in the warehousing system and their quantities as shown in Figure (4).

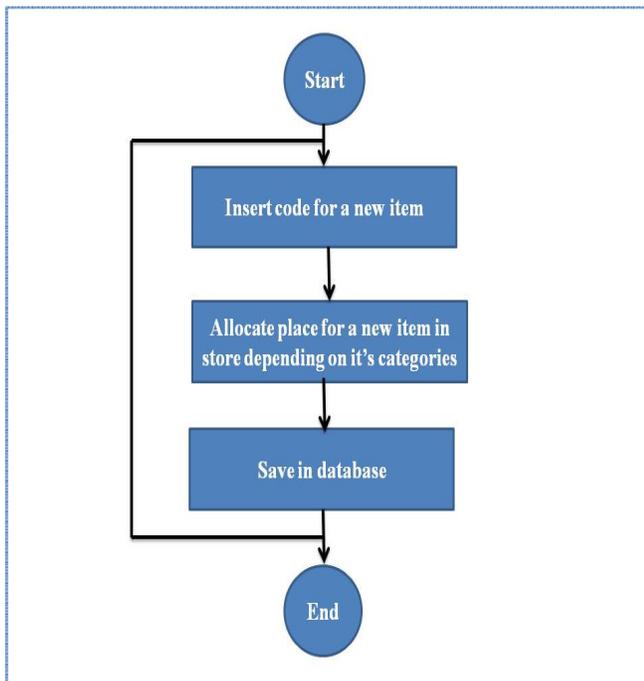


Figure (2) Inserting Material in Warehousing System

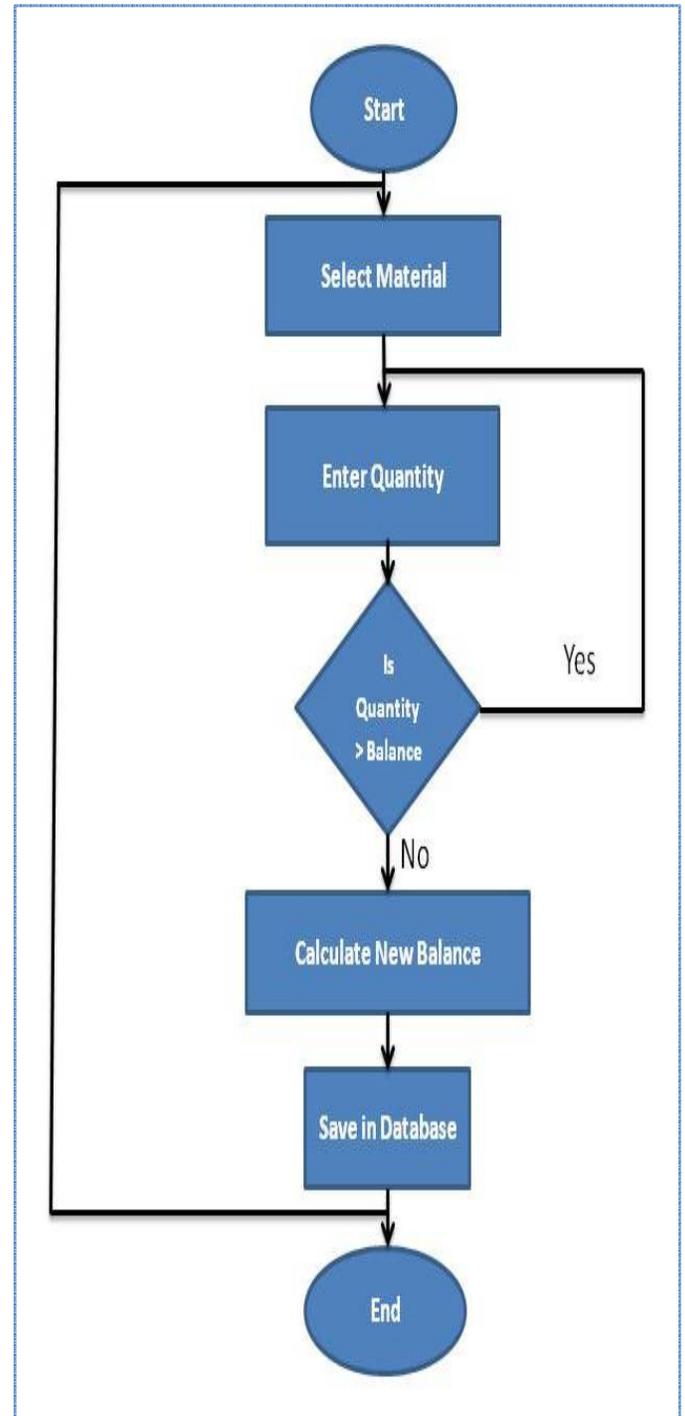


Figure (3) Removing Material from Warehousing System

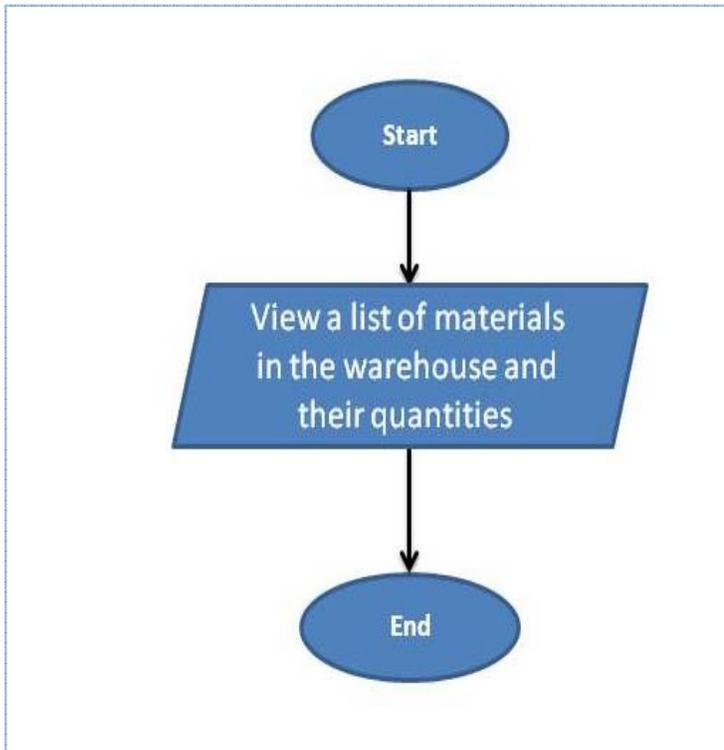


Figure (4) View a list of Materials in Warehousing System

#### 4. RESULTS

1 - The speed of making the appropriate decision which helps in the planning and control of the institution because of the existence of a unified database.

2. The system helps reduce errors and reduce costs by integrating enterprise data into a database as a major source of information.

3 - Business automation process is the inevitable result of the system life cycle. The system life cycle means that any system has a period of time after which it becomes

invalid to be replaced by a new system (smart system) in the management of enterprises using information technology.

4 - reduce the time to achieve the highest rate of profit for the institution that wants to automate its business.

5 - Inventory of data within the warehouse is done in a simple and easy to the user.

#### 5. CONCLUSIONS

During our study in this paper we found that there are different activities in WMS as shown in the following below:

- Warehouse design, which enables organizations to customize workflow and picking logic to make sure that the warehouse is designed for optimized inventory allocation. The WMS establishes bin slotting that maximizes storage space and accounts for variances in seasonal inventory.
- Inventory tracking, which enables the use of advanced tracking systems, including radio-frequency identification (RFID), automatic identification and data capture (AIDC) and barcode scanners to make sure that goods can be found easily when they need to move.
- Receiving and putaway, which allows inventory putaway and retrieval, often with pick-to-light or pick-to-voice

technology to help warehouse workers locate goods.

- Picking and packing goods, including zone picking, wave picking and batch picking. Warehouse workers can also use lot zoning and task interleaving functions to guide the pick-and-pack tasks in the most efficient way.
- Labor management, which helps warehouse managers monitor workers' performance by using key performance indicators (KPIs) that indicate workers who perform above or below standards.
- Reporting, which helps managers analyze the performance of warehouse operations and find areas to improve.

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