UNIVERSITI TEKNIKAL MALAYSIA MELAKA

INVENTORY MANAGEMENT SYSTEM FOR MULTI LEVEL GOODS

This report submitted in accordance with requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor Degree of Manufacturing Engineering Technology (Process and Technology) with Honours

by

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I hereby, declared this report entitled Inventory Management System for Multi Level Goods is the results of my own research except as cited in references.

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APPROVAL

This report is submitted to the Faculty of Engineering Technology of UTeM as a partial fulfillment of the requirements for the degree of Bachelor Degree of Engineering Technology Manufacturing Engineering Technology (Process and Technology) with Honours The member of the supervisory is as follow:

EN. HANIZAM BIN HASHIM
(Project Supervisor)

ABSTRAK

Pada dasarnya, inventori boleh digambarkan sebagai sebilangan item, barangan dan bahan-bahan yang disimpan sebagai stok dengan kategori dan kegunaan yang berbeza. Sistem Inventori adalah proses mengesan stok yang boleh didapati di stor itu. Stor 2 JTKP Fakulti Teknologi Kejuruteraan, dipilih sebagai kajian kes, yang mana sistem kawalan inventori di stor berkenaan dapat dibaiki dengan adanya sistem yang lebih sistematik. Objektif kajian ini adalah untuk mereka bentuk sistem rekod inventori di Factory 2, untuk mengubah sistem inventori manual dengan mempraktikkan kaedah mengesan kekurangan stok di Factory 2. Di samping itu, XAMPP telah digunakan sebagai perisian utama dalam membangunkan dan menguruskan sistem inventori. Projek ini juga akan memberi tumpuan kepada dua jenis kategori inventori, iaitu bahan mentah dan bekalan. Sistem Inventori Factory 2 telah mengurangkan masa pengendalian permintaan bahan mentah secara manual, yang dilakukan melalui borang manual sebelum ini. Selain itu sistem mempunyai sistem mengesan kekurangan stok. Sebagai contoh, apabila produk kurang daripada lima belas, tanda amaran daripada had akan dipaparkan pada halaman web. Oleh itu, ia memudahkan pelanggan untuk membuat pesanan mereka dan untuk mengetahui stok yang. Berdasarkan pencapaian sistem ini , beberapa amalan seperti menghantar pemberitahuan melalui e-mel, sistem boleh dilihat di web sebenar dan menambah pangkalan data pembekal pada sistem adalah disyorkan pada masa depan

ABSTRACT

Basically, inventory can be described as a number of items, goods and materials that kept in as a stock by a group of people with a different intentions and categories. Whereby, an Inventory System can be described as a process of tracking a stock that is available at the stor. Concerning about this project, JTKP store of Faculty of Engineering Technology, is selected as a case study, by which the best practice inventory control system for variety storage of goods can be improvise by implement a programmed system. The objective of this study is to design an inventory record system at Factory 2 store, to programmed the manual inventory system with setup triggering stock out limit and to implement the system in Factory 2 store. In addition, XAMPP server was used as a main software in developing and managing the inventory system. This project also will focus on two types of inventory category, which is Purchased Raw Material and Supplies. Factory 2 Inventory System has reduced the handling time in terms of requesting the stock manually, which is done through manual forms previously. Moreover this system comes with triggering system concerning on the stock out limit. For instance, when the product is less than fifteen, a warning sign or a notification stock out limit will appear on the web page. Hence, by this kind of announcement, it ease the customer to place their order and to review on the current stock. Based on the outcome, several practices such as sending notification through email, viewable system in real web and adding the supplier database on the system are recommended in future.

DEDICATION

I would like to express my gratitude towards my loving family, who have been my pillar throughout process in carrying out this task. This project report is adoringly dedicated to my beloved parents and family members who have been my persistent foundation of inspiration. They have given me the drive and discipline to embark upon any task with enthusiasm and determination. Without their love and rigid support, this project would not have been made possible.

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First and above all, I praise God, the almighty for giving me this chance and granting me the ability to proceed successfully.

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I warmly thank to academics staffs for their numerous involvement and assistance, directly or indirectly, in the progress of this project especially to Factory 2 inventory in-charge technician. Deepest gratitude to the Faculty of Engineering Technology, UTeM, for granting me the opportunity, facilities and time to conduct on this project.

I would like to take this opportunity to show appreciation to my adored family for the incessant prayer and precious support throughout this process.

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LIST OF ABBREVIATIONS, SYMBOLS AND NOMENCLATURE

UTEM	-	Universiti Teknikal Malaysia Melaka
JTKP	-	Jabatan Teknologi Kejuteraan Pembuatan
MySQL	-	My Structured Query Language
XAMPP	-	Cross Platform Apache PHP Perl
C#	-	Visual C Sharp

CHAPTER 1
INTRODUCTION

1.0 Background

Basically, inventory can be described as a number of items, goods and materials that kept in as a stock by a group of people with a different intentions and categories. For instance, inventory applicable at home based stock, such as groceries stock, to a huge institutions of a warehouse, company and a factory. Whereby, an Inventory System can be described as a process of tracking a stock that is available at the stor.

By referencing to a book of ' Essential Of Inventory Management' Inventory is basically divided into raw materials, finished goods and work-in-process. Other categories of inventory should be considered from functional standpoints. In a just-in-time manufacturing environment, inventory is considered as a waste. However, in a environments where an organizations suffers from poor cash flow or lacks strong control over a electronic information transfer among all departments and all significant suppliers, lead times, and quality of material received, inventory plays important roles (Muller, 2011).

Whereby, based on article under 'Inventory Management System' (Hayden, 2014)Inventory Management is a system that serve to provide uninterrupted production, sales and/or customer service at a minimum cost. It is an essentials part of any successful business. Whereas, an inventory management system will tracks the sale, purchase and payments related to these elements of inventory. As for that, ineffective inventory management can lead to business failures and losses.

Concerning about this project, JTKP store of Faculty of Engineering Technology, is selected as a case study, by which the best practice inventory control system for variety storage of goods can be improvise by implement an computerized system. In addition, Microsoft Access 2007 will be use as a main software in developing and managing the inventory system. This project also will focus on two types of inventory category, which is Purchased Raw Material and Supplies.

1.1 Problem Statement

Inventory control is a crucial system where certain criteria's must be met to determine the efficiency of the organization or a warehouse. A good criteria of inventory control system is a system that able to predict, tracking and organize the stock systematically.

Current inventory system at Utem JTKP Store is depending on manually record where it consumed time to record and trigger the stock. Moreover, most of the stock or inventory tracking and triggering is done manually, whereas the current process requires more human power and can caused mistake by human error. Therefore the current inventory control can be improvised by implement using a automated software of Microsoft Access. Moreover, based on the current situation, there is some difficulties in trigger the stock. By implement this concept and organized the stock based on their inventory categories, it will less time consumed.

1.2 Objective

The objectives to be achieved in this project are:

i. To design an inventory records system at Factory 2 store.

ii. To computerize the manual inventory system with setup triggering stock out limits .

iii. To implement the system to factory 2 store.

1.3 Project Scope

This study was carried out at JTKP Store of Faculty of Engineering Technology, whereby this study is to purpose an establish best practice inventory control system in a variety storage of goods.

Regarding this project, there are several limitation on this project. For instance, this project will focusing on only two types of inventory categories, which is Purchased Raw Material where it consist of aluminium plate, aluminium block, mild steel and etc. Second category is Consumables/ Supplies which consist of lubricant oil , soap and etc. Therefore, Microsoft Access 2007 is suggest as software to construct an inventory control system and Visual C# software suggest as integrated software to conduct triggering method.

CHAPTER 2
LITERATURE REVIEW

2.0 Introduction

This chapter explain on literature review of general overview on Inventory, Types of Stock, Inventory Management System and current existing Inventory Software . In addition, current existing Microsoft Office Software (Microsoft Access) and Visual C# also being discussed.

2.1 Inventory

Based on Max Muller, the author of ‘ Essential Of Inventory Management’ (Muller, 2011), all organization keep inventory, whereas the inventory includes a company’s raw material, work in process, supplies used in operations and finished goods

2.1.1 Purpose of Inventory

According to Max Muller, (Max Muller 2011) in a just-in-time manufacturing environment, inventory is considered as a waste. However, in a environments where an organizations suffers from poor cash flow or lacks strong control over (1) electronic information transfer among all departments and all significant suppliers, (2) lead times, and (3) quality of material received, inventory plays important roles. Some of the important reasons for obtaining and holding inventory are :

a. Predictability
    - In order to involve in capacity planning and production scheduling, it is necessary to control amount of parts and subassemblies that have process in given time. Inventory prevent process from any harm.

b. Lower Ordering Cost
    - By purchasing large quantity of an item rarely, the ordering cost are less than buying smaller quantities frequently.

c. Quantity Discounts
    - Purchasing large amount of parts often get bulk discounts rather than purchase in small quantities.

d. Unreliability of Supply
    - Inventory as a safety precaution from unreliable supplier, or when an item that scarce (restricted quantity) and steady supply difficult to ensure.

2.1.2 Types Of Stock

Inventory is basically divided into raw materials, finished goods and work-in-process. Other categories of inventory should be considered from functional standpoints (Muller, 2011).

The relationship between three categories of inventory which are raw materials, finished goods and work-in-process can be seen in figure below, Figure 2.1.

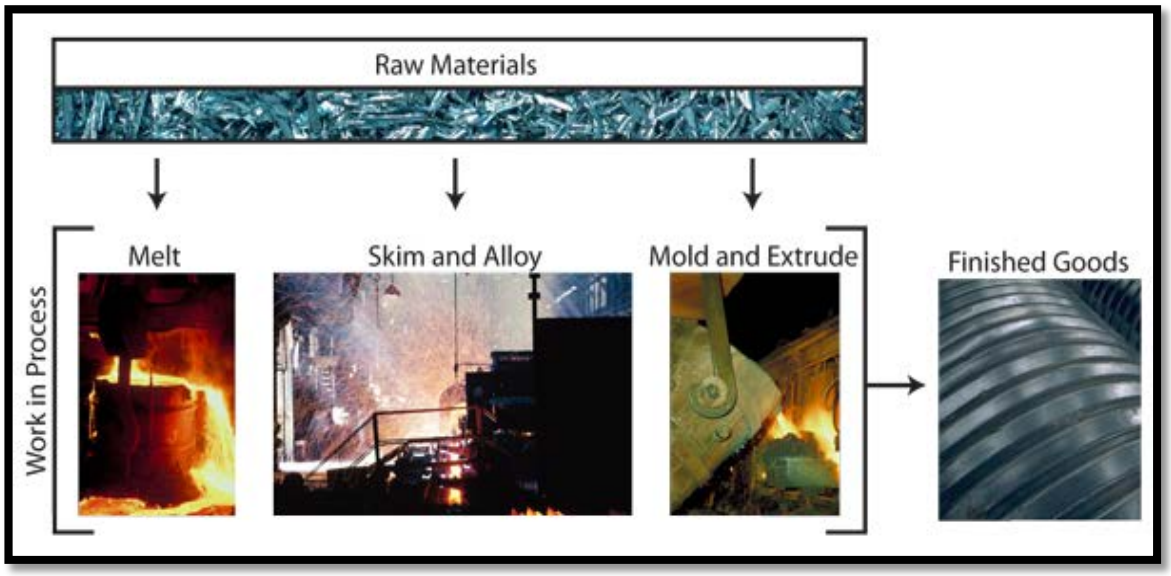

Figure 2.1 : Relationship between Inventory's Category

a. Raw Material
    - Materials to produce partial products and completed goods.
    - Example of raw material are shown in Figure 2.2 below such as aluminium block, mild steel plate, aluminium rod etc.

Figure 2.2 : Raw Material

b. Finished Product

- Product that ready for customer sales. It also beneficial to buffer manufacturing from predictable and unpredictable market demand.

c. Work-In-Process (WIP)

- An items during the raw material is being changed into partial product, finished product and subassemblies.
- WIP exist from work delays and long movement times between operation.

d. Consumables

- Consumables inventory are used in many operation and often treated like a raw material.
- For instance, cleaning materials, lubricants, tapes, hand towels, shown in Figure 2.3 below.

Figure 2.3 : Consumable

2.2 Inventory Management

Based on article under 'Inventory Management System' Inventory Management is a system that serve to provide uninterrupted production, sales and/or customer service at a minimum cost. It is an essentials part of any successful business. Whereas, an inventory management system will tracks the sale, purchase and payments related to these elements of inventory. As for that, ineffective inventory management can lead to business failures and losses (Hayden, 2014).

2.3 Inventory Management System

An inventory management system will tracks the sale, purchase and payments related to these elements of inventory. As for that, ineffective inventory management can lead to business failures and losses (Hayden, 2014) .