

**ONLINE INVENTORY MANAGEMENT SYSTEM
FOR A MUSIC SHOP**

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FACULTY OF COMPUTING AND INFORMATICS

UNIVERSITY MALAYSIA SABAH

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**THESIS SUBMITTED IN PARTIAL FULFILMENT
OF THE REQUIREMENT FOR THE DEGREE OF
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**FACULTY OF COMPUTING AND INFORMATICS
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DECLARATION

I hereby declare that this thesis submitted to Universiti Malaysia Sabah as partial fulfilment of the requirements for the degree of Bachelor of Computer Science, has not been submitted to any other university for any degree. I also certify that the work described herein is entirely my own, except for quotations and summaries sources of which have been duly acknowledged.

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7th July 2015

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ABSTRACT

Online inventory management system is a web-based application system that connects the system into a web server and a database server such as MySQL. This system is very important for companies or stores in managing the inventory for many different kinds of business in the industries these past few years. The aim of this project is to develop an online inventory management system that can manage the inventory of a music shop to help the staff managing the inventory and can improve the service for the customers. One music shop was selected and surveyed to obtain all the client requirements needed for the system that will be developed in this project. One of the features of the system is it will have a notification features that can notify automatically to alert the staff about the current level stock if it reached the minimum level of stock in the inventory. This feature proposed to prevent from the out-of-stock issues occur. Other features are automated set of reorder point and generate sales report. The methodology used to develop the system is the waterfall development method. This web-based application system will be developed using the Adobe Dreamweaver CS6, Adobe Photoshop CS6 (64-bit), Hypertext Preprocessor language (PHP 5.5.11), MySQL 5.6.16 as the database server, Apache 2.4.9 as the web server and XAMPP 1.8.3 to connect the system to the database. Some of the idea of the system was found after doing the comparison between some of the existing systems stated in the literature review part. Overall, the system was able to be fully developed with all the modules needed to achieve all the objectives of this project.

ABSTRAK

Sistem pengurusan inventori atas talian merupakan satu system aplikasi berasaskan web yang menghubungkan sistem kepada pelayan web dan pelayan pangkalan data seperti MySQL. Sistem ini sangat penting bagi syarikat-syarikat atau kedai-kedai dalam menguruskan inventori untuk pelbagai jenis perniagaan dalam industri ini sejak beberapa tahun lepas. Tujuan projek ini adalah untuk membangunkan satu sistem pengurusan inventori atas talian yang boleh menguruskan inventori kedai muzik untuk membantu kakitangan yang menguruskan inventori dan dapat meningkatkan perkhidmatan kepada pelanggan. Satu kedai muzik telah dipilih dan dikaji untuk mendapatkan semua keperluan pelanggan yang diperlukan untuk sistem yang akan dibangunkan dalam projek ini. Salah satu ciri sistem ini adalah ia akan mempunyai ciri-ciri pemberitahuan notifikasi yang boleh memberi notis secara automatik untuk memberi amaran kepada kakitangan mengenai tahap minimum stok inventori. Ciri ini dicadangkan untuk mengelakkan dari isu kehabisan stok berlaku. Ciri-ciri lain adalah set titik pesanan semula automatik dan menjana laporan jualan. Kaedah yang digunakan untuk membangunkan sistem ini adalah kaedah pembangunan air terjun. Sistem aplikasi berasaskan web akan dibangunkan dengan menggunakan Adobe Dreamweaver CS6, Adobe Photoshop CS6 (64-bit), Hypertext Preprocessor bahasa (PHP 5.5.11), MySQL 5.6.16 sebagai pelayan pangkalan data, Apache 2.4.9 sebagai web pelayan dan Xampp 1.8.3 untuk menyambung sistem ke pangkalan data. Beberapa idea sistem ditemui selepas melakukan perbandingan di antara beberapa sistem yang sedia ada yang dinyatakan di dalam bahagian kajian literatur. Secara kesimpulannya, system ini dapat dibangunkan sepenuhnya selaras dengan modul-modul yg diperlukan untuk mencapai kesemua objektif-objektif dalam projek ini.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter is about the overview of this project starting from the problem background, problem statement, objectives, scope and organizational of report is written in this chapter. The focus of this project is to develop an online inventory management system for a music shop to manage the shop inventory. The inventory stock consist of music instruments like guitars, drums and keyboards and other music items like guitar picks, capo, drum sticks, amplifiers and more.

1.2 Problem Background

Generally, the staffs in a surveyed music shop keep track of the inventory by hand. They must count their sales each day, what they have sold and record it into a piece of form. The same method used in calculating current stock for inventory level alert. The forms will be compiled in a file for the shop records. The same method also applied when they want to reorder stock, record cash bills and invoices.

It is common for every business to have a record and report of sales every day. For the selected music shop surveyed, they need a system that can generate a report to show the overview of the sales. It is better than record it into forms. They will need to compile the forms into a file for the shop records this will waste valuable staffs hours and papers.

There are some situations might happen where the staff may suddenly want to take leaves for days or working outside of the shop. Due to these issues, some of the task assigned to the staff might be delayed such as checking up stock level to prevent from running-out-of stock problem. By getting a notification about the inventory current level from the system may be more efficient for the owner and the staffs.

There are some unfortunate situations might happen to the customer where they may walk out from the shop empty-handed due to out-of-stock issue. This will not only wasting the customer's time and energy but also will increase the number of unsatisfied customers leaving the shop. With the system providing a list of products available on the shop for sale, they can simply browse the product catalogue list in the system before they go to shopping.

1.3 Problem Statement

The main problem in this project is the selected surveyed music shop doesn't have an inventory system that can help them manage their inventory. With the system, they may get all the advantages of the inventory management system which will improve the service and management of the shop.

Besides, they record their sales manually using a form by hand which means this will waste time and cost. By using the system, they can generate a report for the owner to view their sales easily.

The music shop is a large music instruments shop that sells many different kinds of brands and models of music instruments and other smaller items. Mostly customers don't like to waste their time get into a shop empty-handed due to out-of-stock issues. Moreover, the customer might find it hard to pick their best instruments or items while shopping. With the product catalogue provided by the system, they can view the product descriptions with details available on current sale of the shops before shopping. This can gain the customer's satisfaction as well as increase the shop sales every day.

1.4 Objectives

The three main objectives of this project are:

1. To develop an inventory management system for a music shop.
2. To record the sales of the shop.

3. To create a product catalogue for the customers.

1.5 Scope

Generally, the system will have three types of users which are the admin user, the staff user and the customer user. The owner will have the access of the admin while the staff user is for the staffs and the customer user is for the customers.

For accessibility in the inventory system, the admin will be able to access the whole full system features. For the staffs, they will be able access the inventory only after the admin create an account for the staff. Besides this, staffs cannot delete user or add new user. Moreover, staff user will only able to edit own profile and cannot edit user type level in the system. For the customer user, this user will only able to view a catalogue of music instruments and items with the product details. For registered customers, they can do online purchasing for all the available products in the shop.

The modules of system are:

- User login and registration
 - The user will able to log in into the system according to the user type. New users need to register to be able to access the system. Admin user will have the full authority of system access while staff user only able to update the inventory and the staff own profile. For the customer user, this user only able to view the product catalogue details available on sale as well as do online purchasing after registered.
- Inventory management
 - To view and manage the inventory products by add new product, edit product information and delete product. The

products are guitars, pianos, drums, keyboards, violins and more. Other items are like PAs system, amplifiers, drum sticks, capo, guitar strings, guitar picks, guitar tuner and more. All the products will be categorized into its own category.

- Sales and report
 - The daily sales history will be recorded daily automatically for the owner to view. The date of purchased will be recorded after the payment attachment of customers were verified. The sales report view can be selected according to selected dates. The sales report also can be printed.

- Notification on stock level
 - A notification function will be added into the system which can alert the inventory users about the current products quantity available and showing it remarks from the dashboard that can tell the users which products reached the reorder level and needed to be reordered.

- Product catalogue
 - The registered customers can view product catalogue and buy the products directly from the system by using the add-to-cart features. The online purchase is important for customer satisfactory where it can save time and cost. This not only benefits the customer but also the shop since this feature may increase the sales of the product due to service reached the customers satisfactory.

1.6 Organization of the Report

This report is divided into three chapters. The three chapters included in this report are the Introduction for chapter one, Literature Review for chapter 2 and Methodology for chapter 3.

Chapter 1 contains the introduction about the project which includes the description of project and explanation about the problem background, problem statement, objectives of project and the project scope.

Chapter 2 contains the literature review which includes the introduction on literature review and the research done on some existing systems. A summary of comparison was done about its concepts and methods used.

Chapter 3 contains the methodology of the project which includes the introduction on methodology and the explanations on methodology used such as the design of the system and what are the techniques approaches applied in this project. The chapter also includes the explanation on software and hardware requirements used for the project.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter reviews about the different types of existing inventory management system developed by various developers in a way to improve the business inventory management and services for their customer. Exploration was made in the existing systems to find out the features and functions have in the system to have a view on how an inventory system look like and works. This also will help in gaining ideas to develop the system in this project. All the literature review was referred from some websites, articles, journals and books.

2.2 History of Inventory Management System

Computers become more convenient and play an important role in human daily life activities over the past few years until today. The increases of technologies nowadays have improved many work sectors such as business, education and so forth. In the middle of 1990s, many companies have started to do a testing on the inventory management software that can record data as the products were brought in and out of the shops (Lockard, 2012). The inventory management solutions technology has already evolved early of the year 2000s from a small scale of business to a larger scale of business (Lockard, 2012). Before the revolution in the industrial field, many businesses basically had to write down all their products sold every day in a piece of paper or form and compiled it into a file for company's record. They had to make order

by using note that was done by hand-written which are very inefficient ways of doing business.

An inventory management system is a structured and better for all kinds of business where they were concerned with the identification and tracking down of the inventory items (Bronack, 2012). An inventory management system can track down and maintain the inventory levels by keeping all the records of the items sale and also keeping all the records of the sales statistic recorded by dates. Besides this, it can also create a work order, bill of items and other production-related documents. Companies or shops usually use the inventory management system to prevent from outages, overstock and out-of-stock issue. It organizes the data in the inventory that was before usually stored in forms.

The basic functions of an inventory management system are:

- Reorder Point – A reorder point is a signal from a system that informs when is the time to reorder the stock when it has reached at the point of minimum inventory level. It is commonly set when the inventory level reached almost zero around the time when the next order expected to come (Mercado, 2007).

The reorder point can be compute by using the formula shown below.

$$\text{Reorder Point} = \frac{\text{Lead time demands (days)}}{\text{Days}}$$

Source: (Mercado, 2007)

Figure 2.1 Formula of Reorder Point

Example of computational:

Lead demands (days):	14 days
Demands per day:	100/day
Reorder Point =	12 days x 100/day
=	1200 units

Part No. JKL		Unit: EACH			
Date	Reference	Details	Quantity In	Quantity Out	Running Balance
12-Jan		Carryover Balance			20,000
12-Jan	PO 390856	Received Shipment	10,000		30,000
15-Jan	Sales Order 79860	Issued Out		2,000	27,500
15-Jan	Sales Order 55466	Issued Out		12,000	15,500
22-Jan	PO 390856	Received Shipment	50,000		65,500
22-Jan	Cycle Count	Adjustment		(2,500)	68,000
25-Jan	Sales Order 79863	Issued Out		25,000	43,000

Source: (Mercado, 2007)

Figure 2.2 Inventory concepts

- Economic Order Quantity – An economic order quantity is the most economical cost to order an item such as in the ordering cost and the holding inventory cost (Mercado, 2007). There are two main costs need to be considered which are:
 - Holding inventory cost – The holding cost is defined as the total of order quantity divided by two multiplied with the cost of item and multiplied again with the annual holding cost.

$$\text{Holding cost} = \frac{\text{Order quantity}}{2} \times \text{Cost of item} \times \text{Annual holding cost}$$

Source: (Mercado, 2007)

Figure 2.3 Formula to find the holding cost

- Incurred in reordering the item cost – The reordering cost is defined as the total of sum of annual usage divided by order of quantity multiplied with unit ordering cost.

$$\text{Ordering cost} = \frac{\text{Annual usage}}{\text{Order quantity}} \times \text{Unit ordering cost}$$

Source: (Mercado, 2007)

Figure 2.4 Formula to find the Ordering cost

The total cost will be the sums of holding cost and ordering cost.

$$\text{Total cost} = \text{Holding cost} + \text{Ordering cost}$$

Source: (Mercado, 2007)

Figure 2.5 Formula of total cost

Hence, the economic order quantity can be derived using the following formula:

$$\text{Economic Order Quantity} = \frac{\sqrt{(2 \times \text{Annual usage}) \times \text{Unit ordering cost}}}{\text{Unit holding cost}}$$

Source: (Mercado, 2007)

Figure 2.6 Formula of Economic order quantity

2.3 Importance of Inventory Management System

An Inventory Management System is a very important system and it plays an important role in investment on financial in a business (Peavler, 2012). An inventory management system is very good because it not only gives many advantages for business performances but also for the customer satisfaction. Studies have shown that averagely, four percent of the customers will not feel satisfied about the products or the services given. Many other studies also has shown that a customer that was not satisfied will most likely to tell nine other people they know, while a customer that was satisfied will tell five other people they know,

about how good the services they have received or offered by the company or shop (Cacioppo, 2000).

A good service means that good treatment given or offered by the shop to the customers. Shop that using modern inventory management system was applying new and better techniques. These techniques will help to optimize the inventories, which this will decrease the inventory and also lowering the cost, thus maximize the customer service. With all these improvements made in the inventory management, the shops will have higher competition in giving better services to the customers (R. Michael Donovan and Co., n.d).

By using the inventory management system, the shop management and the customer service can be improved. Besides, the data integrity also can be increase and this will produce measurements with detailed performances. In order to have a successful management for the inventory, all business must understand their customer needs, the vendors partnerships, the technology used, the data integrity and also the performance measures (Lee & Kleiner, 2001).

There are some critical variables need to be considered in a business during measuring the customers satisfaction (Eckert, 2007). The critical variables are the factors that will affect the customer's satisfaction in every kinds of business.

The critical variables were listed and defined as shown in the table below.

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