Application Development for Stock Maintenance and Billing System

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Abstract – **This paper presents an Inventory Management System designed in Python language. Managing stock is very difficult in supply chain management, that's why companies should have inventories to maintain the stock. It helps to avoid overstocks, counts the quantity of inventories, finds out the demand. As it becomes really difficult to search the products manually from warehouses because for detailed searching it requires a lot of efforts. To avoid all these problems inventory management is very important because it maintains the stocks and goods and finds out which product is available.Meanwhile, it makes the billing system easier as well. Inventory management system is playing a very significant key role in the supply chain management.**

Keywords –**Supply chain management, Inventory, Inventory Management System, Overstocks.**

I. INTRODUCTION

Inventory is consider to be important part of company as inventory represents the financial statements, the sales of goods ,helps to control the wastage of those products which are not in use anymore and maintains the future demand of goods. Inventory can be of raw materials, partially finished products or finished products. That's why it is important to have an application for fulfilling all these demands mentioned above. This application is particularly for the electronic goods. These kind of applications are used by large companies. So, we came up with this idea to built an application for small organizations as well. This will reduce human efforts and work will done quickly. Inventory Management system have the ability to track sales and available goods, tells the admin when it's time to reorder and how much to purchase. Inventory management uses different kinds of data to keep the track of goods because they move through a process including costs of goods, arrival of stock, reordering of the stock. So, Inventory management is a process I which an organization is provided by products and it needs to fulfill the targets or goals of purchasing and development of goods. Stock management plays a key role to find out how an organization track and control it's products and inventories. It is a basic for a company to get able to track the goods and other necessities and quantify it in exact way specifically for the continuous and healthy business activities.

Inventory management system is a software which is very helpful for those businesses who operates hardware stores, where the owner keeps the records of sales and purchase. Stock management is required at various places where it is difficult to track the records of goods, sales and purchase because of the huge amount and variety of stock. And mismanaged stock lead to disappointed customers, degradation in sales and purchase and loss in business. This is a software which focused in the area of inventory.

1. Motivation

The motivation of this paper is to make a better understanding for a shopkeeper to analyze the requirements of the inventory according to customer's demand. In future there may be some more modifications in order to make things more easier and handy.Hopefully there may be some new idea in the development process.

2. problem statment

Inventory management is a challenging problem, companies need to have inventories in warehouses to avoid overstocks. There are huge amount of data and it gets very difficult to keep the backup of data. This software will help admin to manage and handle stocks, data easily. Inventory system can be used by any firm either product selling company or manufacturing company. Processing any critical data need high accuracy and time consuming if done manually, whereas accuracy can be enhanced, time consuming can be decreased if processing is done using automation or software.

3. Objectives

The main purpose of the Inventory Management System is to manage the details of Supplier, Customer, Payment, Purchasing and Inventory. The software helps to reduce the manual paper work which are hard to access and manage the details when in need. And also the development of this system helped to introduce us with new programming language i.e. Python. This application used to show how much the stock is remaining and sales, purchase details.

II. PROJECT METHODOLOGY

The Inventory Management System desktop application is developed on the "Anaconda - Spyder". Spyder stands for Scientific Python Development Environment is a free integrated development environment (IDE) that is included with Anaconda Navigator. It is designed by and for scientists,engineers and data analysts. Spyder consist of many popular packages like NumPy, SciPy etc. In the Spyder,

Python programming language is used for both front end and back end work. For Graphics User Interface, tkinter package is used. Tkinter is a Python binding to the Tk GUI toolkit. For back end, SQLite3 is used and can be imported easily in Spyder IDE. SQLite3 is a very easy to use database engine. It is self-contained, server-less. The Python standard Library consist of a module called "sqlite3" which works with the database.

Inventory Management System is divided into following modules:

* Login and Validation Page
* Registration Page
* Dashboard
* Billing Page

1. Login and Validation Page

Login and Validation Page is the first page of a software where the user will log in with its credentials. The GUI of this page consist of two text fields for Username and Password which will be entered by user. On clicking the login button, combination of username and password will be checked in the database and if they are incorrect the message will appear displaying "Invalid username or password". If one of the field or both fields are left empty, message will appear displaying "Please complete the required field".

For GUI, TKinter package is used. For implementing Tkinter it need to be import into the source code by using "From tkinter import *". Following are the in-built of tkinter are used:

* Geometry method is used for providing dimesnion to the page.
* Title method is used to define the title or name to be displayed on the title bar of the page.
* Frame method is used to give height,width and colour to the page.
* Label method is used for creating label(displaying text) on the page .
* Place method of label is used for providing position of label in the frame.
* Entry method is used for creating text field in the frame.
* Bind method is used for binding the text with link i.e. hyperlink.
* Toggle methods are created to toggle between two pages of the software.

* For implementing SQLite3 database, it need to be import in the source code by "import sqlite3". On first execution of user-defined database method, folder will be generated in the given destination of desktop in which .db file will be created. To check the database online sqlite3 database browser is present and thus connection is made between database and software.

2. Registration Page

Login and Validation page consist of hyperlink which will toggle Login Page to Registration Page if the user is new to software. In Registration Page, new user will insert details like username, password, email id, address, Shop Name and click on Register button. On clicking Register Button, first database connection will be initiated using database() method which will create table (if there exist no table) of all the fields present in the GUI of page and User id which will be auto incremented.

3. Dashboard

Dashboard consist of various options for admin to modify the stock present in inventory. Insert button will insert new stock, update button will modify already present stock, add button will add up the product that customer need and simultaneously reduces the number of product present in database.

4. Billing Page

On clicking the check out button after adding the products required by customers, the total amount to be paid by user will be displayed on the screen with number of products purchased. This will be added to the table of bill present in the database with user id.

* It gives dashboard with interactive graphs to visualize sales reports.
* It supplies management to add and manage existing products.
* Categories management to add new and edit existing product categories.
* Warehouse management includes add, edit warehouse for stocks.
* Reports management like manage sales profit, loss ledger, sales ledger and expenses ledger.
* Configuration management for setting up the system according to business needs and requirements.
* It tracks all the information of inventory and sales.
* It utilizes resources in an efficient manner by increasing their productivity.
* It generates the report on sales, and it also helps to analyze what product is in demand.

III. CONCLUSION

Our project is a descent venture to fulfill the needs of the shopkeeper. This software shall prove to be a powerful software in satisfying all the requirements of the

shopkeeper and demands of the customer. The main objective of this project on test based online desktop platform is to keep the track of the inventories, modification and access of the system by the owner. This software allows admin to view and manage various inventory and stock. This project is totally built at administrative perspective and thus only the administrator is guaranteed to access. The purpose of this project is to build a software to reduce the manual work for managing the inventory of a shop without any difficulty.

It can lead to error free, secure and fast management system. It can help the owner to concentrate on their other activities instead of concentrating on the record keeping. Thus it will help the organization for the better utilization of resources. The organization can manage computerized records without any redundancies.

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