Web App Store for Inventory Management and Stock Report in Android App Using Centralized Database

[1]Prof. Vishal Shinde, [2]Ashutosh Singh, [3]Kajal Wayal, [4]Vishakha Vadhavinde

[1]Asst. Professor, [2, 3, 4]UG Student, [1, 2, 3, 4]Computer Engg. Dept. Shivajirao S. Jondhle College of Engineering & Technology, Asangaon, Maharashtra, India.

[1]mailme.vishalshinde@redfimail.com, [2]ashutoshsingh2040@.gmail.com, [3]kajalwayal123@gmail.com, [4]vishakharvadhavinde@gmail.com

Abstract - Inventory management and stock report is the system which is widely used in the industry. Therefore, only by establishing a shared inventory management system for the various departments of the enterprise enabled enterprises to timely and effective control of its own inventory of resources, management and rational use. The System will be fully generalized and have control on Inventory, Stock Management, Expenditure, Reports, Sales, Purchase with a centralized connectivity to the database. The System is also accessible on the mobile hence it make the usage of the system more easily to the inventory manager.

Keywords - *Inventory, Stocks & Bill Management, Inventory, stocks & bills in Android with centralized Database, Invoice and Bills with GST, Stock Management, GST.*

I. INTRODUCTION

Inventory Management is the very important aspect of big business & private owned organizations, especially where there is a lot of orders are being placed every day & there are a lot of materials & the maintenance is really important which the system will do & also will record the time taken to process an order. The software or web app is designed with all the features of the GST pattern. It is the process of overseeing, managing, understanding & controlling the flow of inventory goods & units that a business uses in the production of a manufacturer of goods & units for sale or distribution.

AIM

The project aims at providing an efficient interface and system to the big and small industries for managing their stock inventory and report based on each item purchased from distributors and sold to the customers. Reports, Customer Alerts". This feature keeps track of any upcoming occasions (i.e. function to send the offers and messages to the customer and their clients, and special events that may influence inventory needs for the upcoming day, balance reports (i.e. outstanding bills).

OBJECTIVE

1. The accuracy in predicting the requirements maintaining of good quantity level and to give reminder (alert) for the next order.
2. The accuracy in relating outstanding of sales and purchased orders.
3. Real time data fetching from database resource to all the system.
4. The accuracy in generating the reports of sales, purchased, expenditure, outstanding bill orders and updating of that.
5. The accuracy in the proper sync of the stock and database.

II. LIETRATURE SURVEY

1] Inventory control with a convex ordering cost function: [1] In a stochastic and dynamic setting, Karlin (1958) considers basic inventory control models featuring three types of ordering cost functions, associating each type of function with an optimal decision rule having a particular structure:

a) A linear ordering cost function is associated with what is now widely known as base stock rules, which have the form: order up to meet a target inventory level s∗ when the current period's inventory level is below s∗; i.e., order the quantity (s∗ −I) if the current inventory level is I < s∗, and otherwise order 3 nothing.

b) An ordering cost function involving a fixed set-up cost incurred for all positive order quantities, in addition to a linear cost component, is associated with (s, S) rules: order up to a target level S∗ when we see inventory below a critical level s∗, where s∗ ≤ S∗; i.e., order the quantity (S∗−I) if the current inventory level is I < s∗, and otherwise order nothing.

2] Inventory control under average cost criteria: [7] As observed in the general treatments of Markov Puterman (1994, p. 331), an average cost criterion may be appropriate for modeling systems in which decisions are made frequently.

a)   Order management: This helps the company to maintain the record of the goods, items company products which are outgoing, purchasing or selling.

The order management also stores the pervious order details in the database of the software that can be used further for analyzing the total profit, losses and turnover of the company. Except this it also gives the brief details about to company's estimation.

b) Updated data: provides up to date and real-time data on inventory levels is an advantage of inventory management system.

Company members or employees or the granted users can easily access the software through their mobile devices, laptop and desktops for checking current inventory numbers stock levels reports and the automatic updating of inventory allows the business to make informed decisions.

These authors also note the complexity of technical analysis under average cost criteria; problematic characteristics of inventory models, in particular, include the possibility of state spaces and feasible action sets that are unbounded (and perhaps continuous), as well as unbounded cost functions.

3] Components of Inventory management systems: [5] The Inventory Software is the base with components like Barcode or RFID scanner, Barcode or RFID label printer. There is Retail Inventory System, stockroom inventory, warehouse Inventory System, and fixed asset inventory.

a)   A barcode reader /Scanner is an electronic device for reading printed barcodes. Like a flatbed scanner, it consists of a light source, a lens and a light sensor translating optical impulses into electrical ones.

The barcode readers also contain decoder code/ program within it for analyzing and accessing the data from the barcode's image data which is provided by the sensor and then sending the barcode's content data to the scanner's output screen.

Sr. No	System	Features	Technology	Advantages	Disadvantages
01	Vendor management systems	This method significantly reduces the load of paper work /the cost and the labor	PHP,SQL	1. The distributors can control inventory management for customers.	To keep up with demand of the product that is popular and is demanded by the customers from all around the world.
02	Traker systems	You can track and control purchasing, invoicing, product.	DOT NET, C, C#, SQL	1. The software allowing you to have the status of your inventory available at your fingertips.	1. Do not have a centralized Database.
03	ERP (enterprise resource planning) systems	ERP provides an integrated real-time view of core business using common databases.	DOT NET, C, C#, SQL, PHP, JAVA	1. Product planning, cost and development. 2. Manufacturing. 3. Marketing and sales.	1. The Cost of ERP is too high. 2. Development is highly costly.
05	BS1 Enterprise Accounting Free Edition	BS1 Enterprise Accounting Free Edition is a freeware program for inventory control and management	DOT NET, C, C#, SQL, JAVA	1. Sales orders, purchase orders, accounts payable, accounts receivable general ledger, inventory and much more.	1. No Centralized Database.

Table .1 - Comparative Analysis

III. EXISTING SYSTEM

The current system at the company is being operated manually using Excel Spreadsheets as a database for collecting information, which has many drawbacks and limitations such as lack of centralized information and updating of data takes time. At this time the company does not have an independent system that satisfies their requirements and can better deliver the process from the shipment order is placed until the time the order is received. When we receive the Purchase Order we prepare a bunch of document: Starting with filling a Work Order Form which contains all the information regarding the Customer and Project attached with the material list to be delivered, Copy of Purchase Order, and Copy of Quotation. Take the signature of procurement Manager and Finance Manager to process the delivery. Submit it to Stock & Doc. Controller, who enter all these information in Oracle System which allows our Yard team to see booked Work Order in the system.

IV. PROBLEM STATEMENT

The process of manually looking for the inventory available in stock is really time consuming and cumbersome that includes the person responsible to see how many materials are in the inventory, how many

materials have been ordered and received and keep the record of the time that will take for the suppliers to process orders and other various tasks included in inventory. [6]

At current the inventory is managed an update on an excel spreadsheet which has been an outdated form of recording and | maintains the inventory of materials as it is really difficult to enter the data and then update the data on daily basis .the inventory management system will solve the problems as everything about the inventory will be stored in a database which will be much easier to marinating and update and this will also save time and cost-effective for the organization and will automate many inventory-related tasks.

V. PROPOSED SYSTEM

The project will be including the order of sales and purchase form customer and vendor. It also includes the report generation of sales, purchase and profit or loss of company based on inventory. The project also includes the Expenditure and Balance report as well as. The software or web app also allows the user to make it customized and grant multiple users or admins for the access of the software. Overall the system will be effective in generating reports, purchase Invoice, Sales bill, and Expenditure details with some of the additional features which makes the web app more efficient.

WORKING MODEL
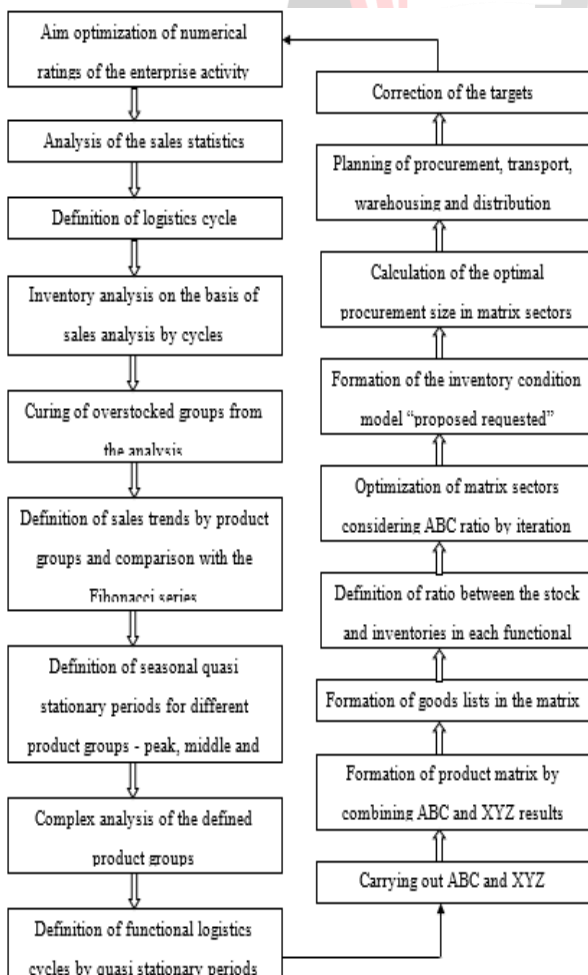
VII. MATHEMATICAL MODEL

There are two risks involved when choosing a value of y, the amount of inventory to order or produce. There is the risk of being short and thus incurring shortage costs, and there is a risk of having too much inventory and thus incurring wasted costs of ordering and holding excess inventory. [4]

 In order to minimize these costs, we minimize the expected value of the sum of the shortage cost and the holding cost.

$$\frac{dl_1(t)}{dt} + \theta l_1(t) = P - D; 0 \le t \le t_1 \qquad (1)$$

$$\frac{dl_2(t)}{dt} = -D; t_1 \le t \le T \qquad (2)$$

with boundary conditions are $l_1(t_1) = 0$ and $l_2(T) = 0$. The solutions of the equation (1) & (2) are

$$l_1(t) = \frac{(P - D)}{\theta} \left(1 - e^{\theta(t_1 - t)}\right); 0 \le t \le t_1 \qquad (3)$$

$$l_2(t) = D(T - t); \; t_1 \le t \le T \qquad (4)$$

The components of the Total Cost of the system are as follows

(i)   Average setup cost $= \frac{A}{T}$

(ii) Average holding cost $= \frac{h}{T}\left\{\int_0^{t_1} l_1(t)dt + \int_{t_1}^{T} l_2(t)dt\right\}$

$$= \frac{h}{T}\left\{\frac{(P-D)}{\theta^2}[1 - e^{\theta(t_1)}] + \frac{(P-D)}{\theta} t_1 + \frac{D}{2}[T - t_1]^2\right\} \qquad (5)$$

(iii) Average production cost $= \frac{C_1}{T} Q_0$

$$= \frac{C_1}{T}\left\{\frac{(P-D)}{\theta} \left(1 - e^{\theta(t_1)}\right) + DT\right\} \qquad (6)$$

(iv) Average shortage cost $= \frac{C_2}{T} \int_{t_1}^{T} l_2(t)dt = \frac{DC_2}{2T}[T - t_1]^2 \qquad (7)$

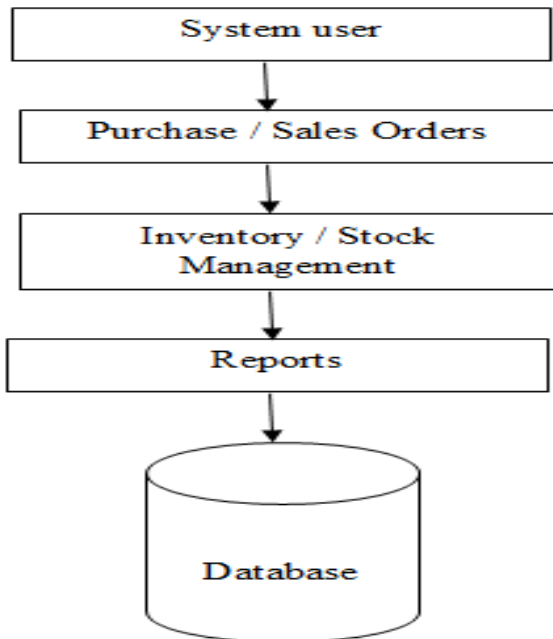## VIII. SYSTEM ARCHITECTURE

Fig: 2.-System Architecture

SETTING UP AND MONITORING STOCK LEVELS [2]

Perhaps, the first approach is to establish a system for monitoring various levels of inventory so as to ensure optimality, utmost effectiveness, and efficiency. Having high levels of inventory adds to expenses and increases overhead costs, hence, inventory levels and stock-outs are critical metrics for development of proactive inventory management policy in any organization.

ESTABLISHING PURCHASE PROCEDURE [8]

A proper purchase procedure is imperative to ensure the appropriate inventory control. The procedure will vary from organization to organization. Beyond setting up proper purchase system, the inventory manager needs to monitor the usage or demand for he items in terms of conducting regular inventory turnover and ABC analyses, and these two approaches are explained briefly below.

ABC-INVENTORY CLASSIFICATION TECHNIQUE [3]

The ABC (Always Better Control) is a well-known IMT that large firms adopt to have an efficient control on a huge amount of inventory. The technique aims at engendering effective control of materials by classifying the inventory into three groups, A, B, and Q, according to their respective values.

As the name implies, JIT is a model that attempts to replenish inventory for organizations just when the inventory is required. It will be the preferred method for very expensive inventory items, that is, items with relatively higher purchase price, holding costs or ordering cost, but low levels of demand.

IX. ADVANTAGES

1. Reorder point: the number of units that should trigger a replenishment order.
2. Order quantity: the number of units that should be reordered based on the reorder point, stock on hand and stock on order.
3. Lead demand: the number of units that will be sold during the lead time.
4. Stock cover: the number of days left before a stock out if no reorder is made.
5. Accuracy: the expected accuracy of the forecasts.
6. Maintaining a balance between too much and too little inventory.
7. Tracking inventory as it is transported between locations.
8. Receiving items into a warehouse or other location.
9. Picking, packing and shipping items from a warehouse.
10. Keeping track of product sales and inventory levels.
11. Cutting down on product obsolescence and spoilage.
12. Avoiding missing out on sales due to out-of-stock situations.
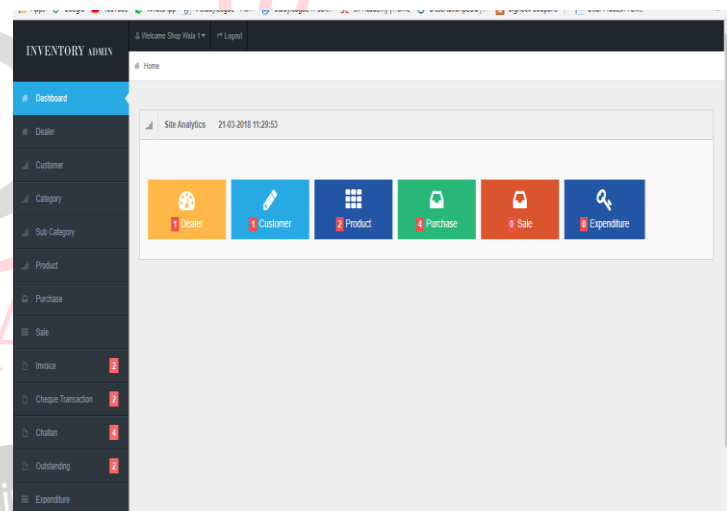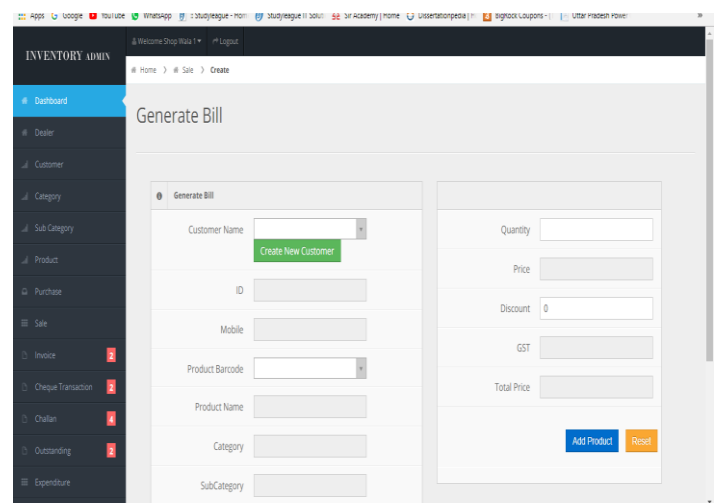
X. DESIGN & DETAILS

Fig: 3.-Admin Panel

Fig:4.-Generate Purchase Bill

Fig:5.-Generate Sales Bill

Fig:6.-Invoice Details

Fig:7 Bill Details

XI. CONCLUSION

We have tried to implement the R.S. Chadda for guideline to selective control (Chadda R.S.: Inventory Management in India) mentioned in the reference and after implementation we got the conclusion as: This paper is developed a stock management and billing web app and which also used in the android platform as well without using any different database. Hence the process involves all the work using a centralized database on the server which is used by web app as well as android app. And it is also connected with all the updated GST pattern and flexible to the requirements of customer according to their business model.

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[10] Sahin, Evren and Yves Dallery. "Assessing the impact of inventory inaccuracies within a Newsvendor framework." European Journal 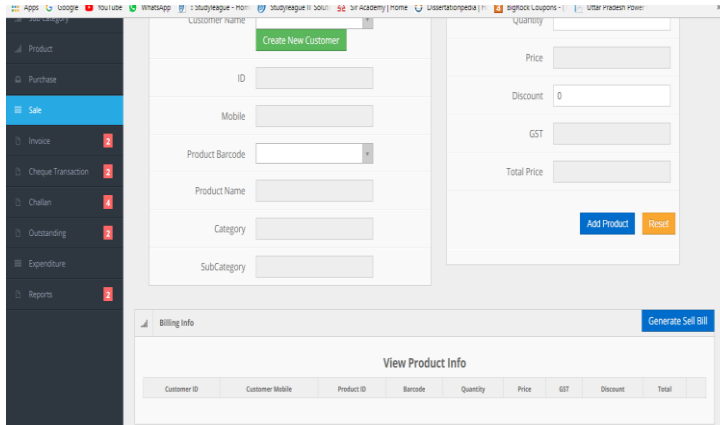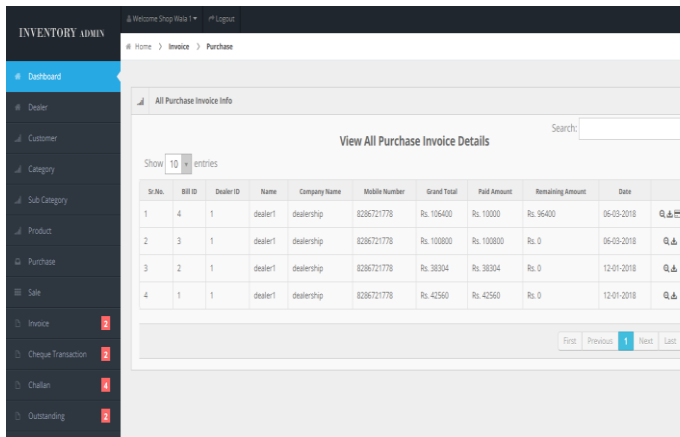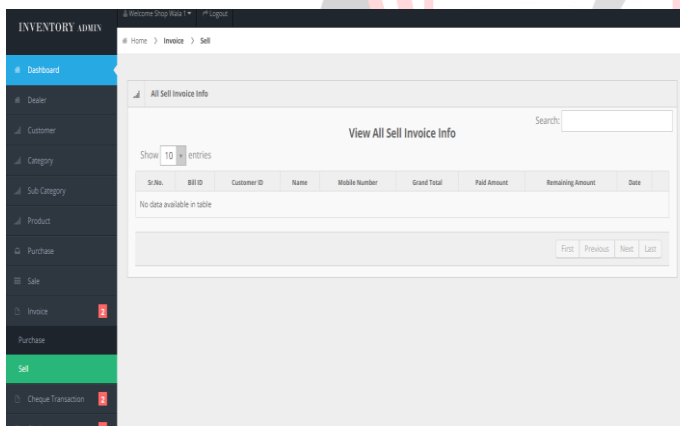of Operational Research 197 (2009): 1108-1118.