INVENTORY CONTROL SYSTEM

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Abstract- *This paper is aimed at developing a desktop based application named Inventory Control System for managing the inventory system of any organization. The Inventory Control System (ICS) refers to the system and processes to manage the stock of organization with the involvement of Technology system. This system can be used to store the details of the inventory, stock maintenance, update the inventory based on the sales details, generate sales and inventory report daily or weekly based. This paper categorizes individual aspects for the sales and inventory management system. Inventory Control System is important to ensure quality control in businesses that handle transactions resolving around consumer goods. Without proper inventory control, a large retail store may run out of stock on an important item. Inventory Control System helps to minimize the errors while recording the stock.*

Keywords: **Inventory Control System (ICS), Stock, Inventory, Sales**

1. INTRODUCTION

An inventory control system is a system that encompasses all aspects of managing a company's inventories; purchasing, shipping, receiving, tracking, warehousing and storage, turnover, and reordering. In different firms the activities associated with each of these areas may not be strictly contained within separate subsystems, but these functions must be performed in sequence in order to have a well-run inventory control system. Computerized inventory control systems make it possible to integrate the various functional subsystems that are a part of the inventory management into a single cohesive system.

In today's business environment, even small and mid-sized businesses have come to rely on computerized inventory management systems. Certainly, there are plenty of small retail outlets, manufacturers, and other businesses that continue to rely on manual means of inventory tracking. Indeed, for some small businesses, like convenience stores, shoe stores, or nurseries, purchase of an electronic inventory tracking system might constitute a wasteful use of financial resources. But for other firms operating in industries that feature high volume turnover of raw materials and/or finished products, computerized tracking systems have emerged as a key component of business strategies aimed at increasing productivity and maintaining competitiveness. Moreover, the recent development of powerful computer programs capable of addressing a wide variety of record keeping needs—including inventory management—in one integrated system have also contributed to the growing popularity of electronic inventory control options.

In this paper we have developed Inventory Control System Model software in which all the information regarding the stock of the organization will be presented. It is an intranet based desktop application which has admin component to manage the inventory and maintenance of the inventory system. This desktop application is based on the management of stock of an organization. The application contains general organization profile, sales details, Purchase details and the remaining stock that are presented in the organization. There is a provision of updating the inventory also. This application also provides the remaining balance of the stock as well as the details of the balance of transaction. Each new stock is created and entitled with the named and the entry date of that stock and it can also be update any time when required as per the transaction or the sales is returned in case. Here the login page is created in order to protect the management of the stock of organization in order to prevent it from the threads and misuse of the inventory.

2. LITERATURE REVIEW

[1] Alfaro, José A., and Luis A. Rábade "Traceability as a strategic tool to improve inventory management: a case study in the food industry" aim to show that traceability can become much more than just a way to guarantee food safety. It provided them with many qualitative and quantitative advantages along the different stages of their supply chain, their manufacturing operations and their inventory and logistics activities.

[2] Ashayeri, J., Heuts, R., Jansen, A., & Szczerba, B "Inventory management of repairable service parts for personal computers" explains that the computer

industry is a highly competitive industry; products have to be repaired as quickly as possible, since slow repair can lead to loss of future business to competitors with better service reputations. It maintains that a good reputation is therefore closely linked to the availability of spare parts on the market.

[3] Matsebatlela, Molebogeng G., and Khumbulani Mpofu. "Inventory Management Framework to minimize supply and demand mismatch on a manufacturing organization". There is a problem of excessive inventory in a Manufacturing Company, situated in South Africa. In this study an Inventory Management Framework (IMF) was developed. Quantitative content analysis was used to collect data. Statistical tools were used to select the fiscal year with the vast data variation for data analysis for this study.

3. METHODOLOGY

3.1 Architectural Review

This desktop based application is based on 3-tier architecture of Java Application. The 3-tier includes the three hierarchy of the flow of programming logic from user interface to database and again database to user interface with the desired information requested by the clients. In between there involves the logic layer for effectively and correctly manipulating the request. The 3-tier includes the following:

3.1.1 Client tier

The visual part is implemented using all kinds of swing components, which does not make database calls. The main function of this tier is to display information to the user upon user's request generated by user's inputs such as firing button events. For example, inventory list will display when user click "display" button if he or she wants to know the list of stock remaining in the organization.

3.1.2 Business tier

The middle tier, business logic, is called by the client to make database queries. It provides core function of the system as well as connectivity to the data tier, which simplify tasks that were done by the clients tier.

3.1.3 Data tier

Data layer is also the class which gets the data from the business tier and sends it to the database or gets the data from the database and sends it to business tier. This is the actual DBMS access layer or object layer also called the business object. The database backend stores information which can be retrieved by using the mysql database Connectivity. Mysql database connectivity is used to manage the communication between the middle tier and the backend database by issuing complex database queries.

3.2 Database Theory

A database is a collection of information that is organizes so that it can easily be accessed, managed and updated. In one view, database can be classified according to types of content: bibliography, full-text, numeric, and image. In computing, databases are sometime classified according to their organizational approach. A distributed database is one that can be dispersed or replicated among different points in a network.

3.2.1 Relational Database

ICS has the relational database model. A relational database is a digital database whose organization is based on the relational model of data. This model organizes data into one or more tables of rows and columns. These tables here have the relation. The relation is maintained by the unique key defined in each row. The key can be primary and foreign depending on their nature of connection. The standard user and application program interface to a relational database is the structured query language (SQL). SQL statement are used both for interactive queries for information from relational database and for gathering data for reports.

Primary Key

The primary key of a relational table uniquely identifies each record in the table. It can either be a normal attribute that is guaranteed to be unique or it can be generated by the DBMS. A primary key's main features are:

- It must contain a unique value for each row of data.
- It cannot contain null value.

Foreign Key

A foreign key is a column or group of column in a relational database table that provides a link between data in two tables. In foreign key reference, a link is created between two tables when the column or columns that hold the primary key value for one table are referenced by the column or column in another table thereby establishing a link between them. Creating a foreign key manually includes the following advantages:

- Changes to primary key constraints are checked with foreign key constraints in relation table.
- An index enables the Database Engine to quickly find related data in the foreign key tables.

3.2.2 Structured Query Language (SQL)

The structured Query language (SQL) is the set of instructions used to interact with a relational database. In fact, SQL is the only language the most databases actually

understand. Whenever you interact with such a database, the software translates your commands into SQL statement that the database knows how to interpret. SQL has three major Components:

- Data Manipulation Language (DML)
- Data Definition Language(DDL)
- Data Control Language (DCL)

3.3 ACID Property

Every database transaction obeys the following rules:

Atomicity – Either the effects of all or none of its operation remain when a transaction is completed. In other words, to the outside world a committee transactions appears to be indivisible, atomic, and an aborted transaction does not leave effects on the database at all, as if never existed.

Consistency – Every transaction must leave the database in a consistent state, i.e., maintain the predetermined integrity rules of the database. A transaction must transform a database from one consistent state to another consistent state. Thus since a database can be normally changed only by transactions, all the database's states are consistent. An aborted transaction does not change the database state it has started from, as if it never existed.

Isolation – Transactions cannot interfere with each other. Moreover, usually the effects of an incomplete transaction are not even visible to another transaction. Providing isolation is the main goal of concurrency control.

Durability – Effects of successful transactions must persist through crashes by recording the transaction's effects and its commit event in a non-volatile memory.

4. ANALYSIS AND DESIGN

4.1 ICS Requirement

The goal for the application is to manage the inventory management function of the organization. Once it is automated all the functions can be effectively managed and the organization can achieve the competitive advantage. Business requirement are discussed in the Scope section, with the following additional details:

- Helps to search the specific product and remaining stock.
- Details information about the product sales and purchase.
- Brief Information of the organization today's status in terms of news, number of present inventory as per the date entered.
- It helps to identify the total presented inventory in the company.
- To know the balance and details of sales distributed in specific date.
- There is proper transaction management of inventory.
- All transactions have specific entry date along with quantity and rate.
- Only admin can login in the page.

4.2 Users Requirement

User requirement are categorized by the user type

4.2.1 Admin:

- Able to create new godown along with date.
- Able to edit the entry as per entry.
- Able to add, modify and delete the stock entry.

4.2.2 Inventory management:

- Able to check the stock available.
- Able to check the balance payment.
- Able to view the remaining sales stock.

4.3 Feasibility Analysis

This software has been tested for various feasibility criterions from various points of views.

4.3.1 Economic Feasibility

The system is estimated to be economically affordable. The system is medium scale desktop application and has affordable price. The benefits include increased efficiency, effectiveness, and the better performance. Comparing the cost and benefits the system is found to be economically feasible.

4.3.2 Technical Feasibility

Development of the system requires tools like:

- IDE (Eclipse / NetBeans IDE 8.2 or above)
- Mysql / Oracle 11g Express Edition or above
- Java Development Kit (jdk), etc.

which are easily available within the estimated cost and schedule.

4.3.3 Operational Feasibility

The system provides better solution to the libraries by adding the typical requirement and necessities. The solution provided by this system will be acceptable to ultimate solution for the stock management.

5. OUTPUT

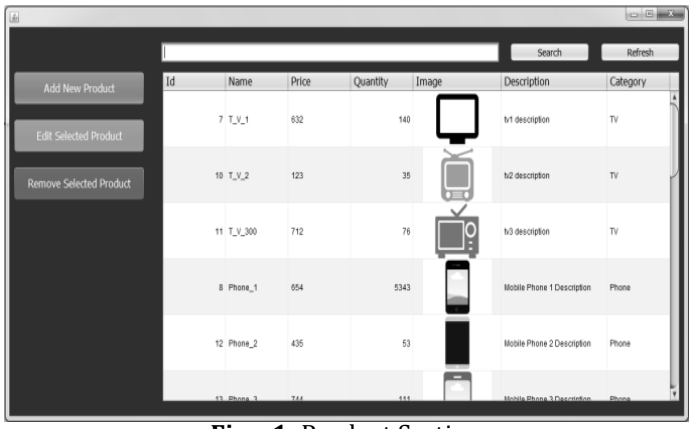

Fig – 1: Product Section

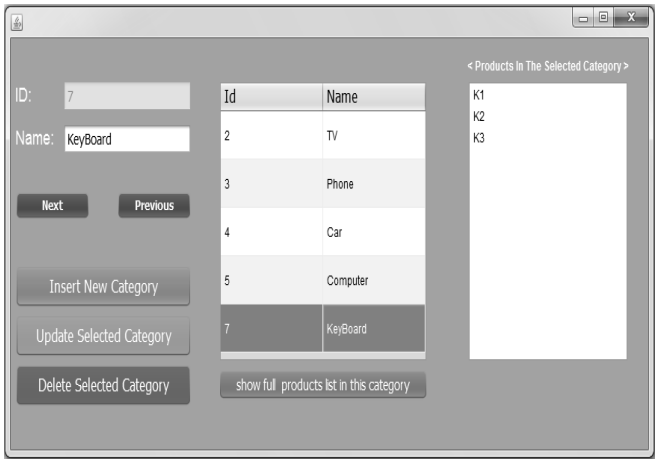

Fig – 2: Category Section

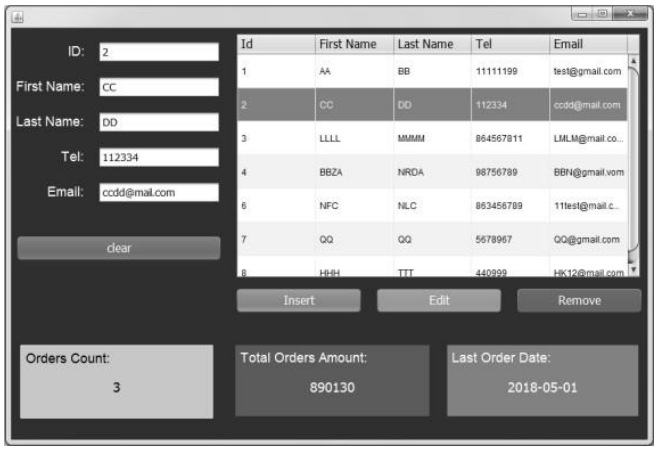

Fig – 3: Customer Section

6. CONCLUSION

Inventory Control System is a simple desktop based application basically suitable for small organization. It has every basic item which is used for the small organization. We are successful in making the application where we can update, insert and delete the item as per the requirement. This application also provides a simple report on daily basis to know the daily sales and purchase details. This application matches for small organization where there small limited if godowns. Through it has some limitations; our team strongly believes that the implementation of this system will surely benefit the organization.

REFERENCES

[1] Alfaro, José A., and Luis A. Rábade. "Traceability as a strategic tool to improve inventory management: a case study in the food industry." International Journal of Production Economics 118.1 (2009): 104-110.

[2] Ashayeri, J., Heuts, R., Jansen, A., & Szczerba, B. (1996). Inventory management of repairable service parts for personal computers. International Journal of Operations & Production Management.

[3] Matsebatlela, Molebogeng G., and Khumbulani Mpofu. "Inventory Management Framework to minimize supply and demand mismatch on a manufacturing organization." IFAC- PapersOnLie 48.3 (2015): 260-265.