Inventorix - A web based inventory application

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Abstract

Usually, inventory cost represents 45-90% of all expenses for business. A computer based system is needed not only to provide up-to-the minute information about stock levels but also to implement the in-house business logic, integrate data and transaction from different sources and, provide tools to readily monitor, administer, configure and maintain the inventory control system. A web based inventory application, Inventorix, using cold fusion 7MX (with .cfm extension) server model on SQL-SERVER 2000 test platform was developed to monitor and control inventory, ensure proper accounting and accurate budgeting and avoid stock-outs. It has 3-user level: 1. Decision making from product category, customer, and employee lists, 2. Information gathering on order and purchases and 3. Operation/Administration level with absolute control (add, view, edit, copy, search, delete) of records on the database. Inventorix optimizes stock resource use and enhances availability, generate revenue through effective operations, prevent obsolete stocks and, minimize ordering and carrying costs while maximizing profit through efficient stock monitoring and budgeting.

Introduction

The cost of materials varies from one industry to the other. However, material cost accounts for about 50% of the total value of the finished goods in many industries. Hence, the efficiency and effectiveness with which a firm does its purchases may well determine its overall margin (sales less variable cost) (Omolehinwa, 1998).

Inventory has the same meaning as materials or stock. It is a current asset represented by goods owned by the business at a particular point in time and held for the purpose of future sales or for the manufacturing of goods for sales. In other words, equipment, for instance, constitute a stock item for sale for a manufacturing company but a fixed asset manufacturing goods for a utility company (Omolehinwa, 1998).

Inventory control, therefore, is an admixture of all the tasks involved in the monitoring, organizing and managing of an organization's inventory in order to minimize cost, maximize profit thereby optimizing resources.

Thus, inventory control involves the procurement, care and disposition of materials. Control of inventory which typically represents 45-90% of all expenses for business, is necessary to ensure that the business has the right goods on hand to avoid stock-outs, prevent shrinkage (spoilage/theft), and provide proper accounting. Many businesses have too much of their limited resources and capital tied up in their major assets inventory. Worse still, they may have their capital tied up in the wrong kind of inventory. Inventory may be old, worn out, shopworn, obsolete, the wrong sizes or colours, or there may be an imbalance among different product lines that reduces the customer appeal of the total operation. Inventory control systems range from eyeball systems, reserve stock systems to perpetual computer-run systems. Valuation of inventory is normally stated at original cost, market value, or current replacement costs, whichever is lowest. This practice is used because it minimizes the possibility of overstat-

ing assets. The ideal inventory and proper merchandise turnover will vary from one market to another. Average industry figures serve as a guide for comparison. Too large an inventory may not be justified because the turnover does not warrant investment. On the other hand, where demand outstrips product supply, too small an inventory may minimize sales and compel customers to look elsewhere. Minimum inventories based on reordering time need to become an important aspect of buying activity. Carrying costs, material purchases, and storage costs are as expensive as stock-outs. All of these costs can be minimized by efficient inventory policies (Score 471, 2002).

Managers are concerned with three kinds of inventories: raw materials, in-process or semi-finished goods and finished goods. Effective control of these inventories releases otherwise tied up capital in unnecessary inventory, improve production control and protect against obsolescence, deterioration and/ or theft.

Inventory control (IC) thus help to balance the stock's value, size, color, style, and price line in proportion to demand or sales trends, plan the winners as well as move slow sellers, secure the best rate of stock turnover for each item, reduce expenses and markdowns, and maintain a business reputation by providing new, fresh merchandise in required sizes and colour. Several approaches can be used for IC in any type and size of operation. The actual system selected will depend upon the type of operation and the amount of goods.

A system is an integration of independent parts that work together in unison to achieve a predefined goal that is understood by all the sub-units. An IC system is, therefore, a functional collection or network of modules that can monitor, manage, administer and control such entities like stocks, stores, suppliers, customers and the whole set of interactions within and between these entities.

Inventory Management (IM) is concerned basically with planning and controlling of material. In this context, control is a process by which events are made to conform to a plan. Therefore, in order to control materials, there must be a plan of actions. Planning focuses on such issues as what to store, where to buy, when to buy and how much to buy. The items to be stored will be dictated by the basic funct-ions of the firm and the customers it serves. The supplier will be selected based on factors such as the ability to supply the quantity, of the right quality, at the right time and at the right price from the purchaser's perspective (Omolehinwa, 1998).

Successful IM involves simultaneous attempt to balance the costs of inventory with the benefits of in-

ventory. Many small-scale businesses under-estimate the true cost of carrying inventory which includes not only the direct costs of storage, insurance, taxes, etc. but also the cost of money tied up in inventory. The total annual cost may amount to 15-25% (Omolehinwa, 1998). Inventory may also tie up capital sometimes leading to business strain and severe crisis. Good IM improves customer service, increases sales, profit and working capital making loan facilities unnecessary. Managerial performance can be measured from inventory turnover. The value gives a rough guideline by which managers can set goals and measure their performance. However, the turnover rate varies with the function of inventory, type of business and how the rate was determined e.g. based on the cost of goods sold on predetermined values evaluated by trade and professional organizat-ions for various industries (OSBDC, 2005).

The objectives of this study are to meet requirements of audit and control, which centres around accountability and optimisation, improve material usage through control and identification of materials/items that are surplus or underutilized, create database for physical and fiscal requirements, minimize pilferage especially of vulnerable material/item, form basis for projecting and budgeting future capital replacement and make inventory control more flexible and easier.

Materials & Method

The server model of the application is Coldfusion 7 MX (with .cfm extension). The backbone of the application is the database which is SQL-SERVER 2000. Information stored on the database is made available for access to users through the Web Application Interface. The pages of the web application contain server side codes that are executed on the server only and cannot be viewed by users. This beefs up the security and integrity of the application and the information around which it revolves.

Results & Discussion
Inventorix: An Inventory Control Tool

Inventorix is a web application that functions essentially as an IC tool. It has an efficient navi-gational system that provides users with links to their most-often-carried-out routine task. One special feature of Inventorix is the charting capability that gives users a pictorial view of information, like sales by categories. Inventorix is built on SQL-SERVER 2000 that supports robust database and has handy tools for performing special tasks like data mining (which is useful for trend study), database ba- ckup (which avoids the pitfall of system failure),

replication (copying databases) and jobbing (scheduling of task to be done).

Users can access the application from any location in real time through the Internet. Since only one database is used, the problem of database integration sometimes embedded in stand-alone applications does not occur.

Inventorix users and Security issues

Security is of paramount interest in virtually all companies because it is cheaper than loss of materials. To further perpetuate this culture, Inventorix has three-user level. The scope of the change which a user level can effect varies and increases along the level ladder:

User Level 1: Decision-making - the information received is used to make far-reaching decisions that could even form basis of policies, for example, management.

User Level 2: Information generation - data is fed into the system from which appropriate information is generated that is needed for decision making, for example, the storekeeper.

User Level 3: Operation/Administration - necessary controls such as security measures, priority measures and other significant parameters are enforced.

The system is constantly monitored to ensure compliance and continuous operation.

The Web Application User Interface

Users 1: A User Level 1 after proper validation (Fig. 1) is directed to the Inventorix core page (Fig. 2) where links are provided for all the functionality of the application. The application has an easy-to-use interface. The Core Quick Links by the bottom left-hand side of the page (Fig. 2) provides quick links to viable information like category, customers, product, employees' lists etc. Depending on the application be-
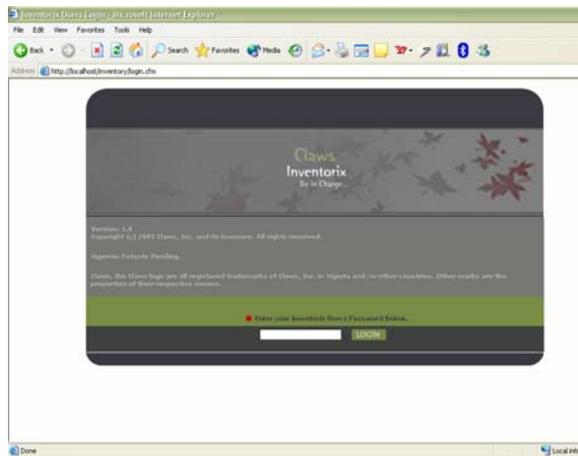
Fig. 1: Inventorix login page
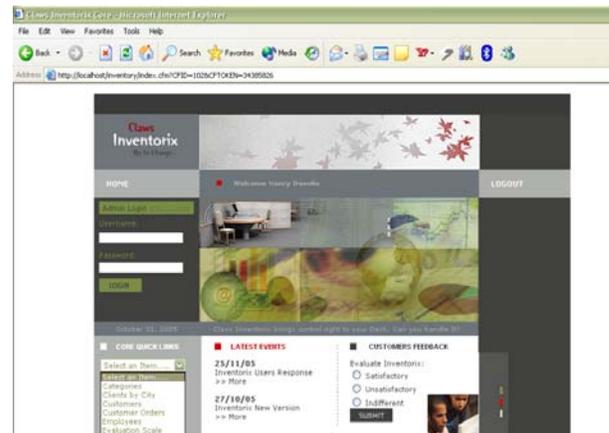
Fig. 2: Inventorix core page

ing viewed, the application presents data and graphical analysis (Fig. 3). It allows users to view information and make decisions on it.

Fig. 3: Sample graphical analysis of sales by categories
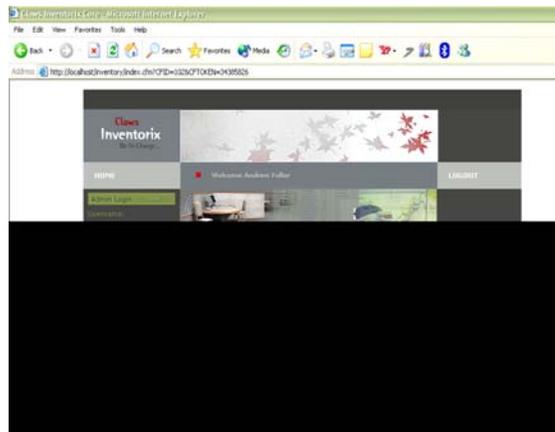
Fig. 4: User level 2 interface with additional tasks

User Level 2: A User Level 2 has an added capability to enter information into the system (Fig. 4). He has additional Jump Menu on his interface from which he can choose to perform certain tasks such as fill Order Form, order Detail Form and purchase Orders (Fig. 5)

Fig. 5: Additional tasks for user 2

Fig. 6: User level 3 login page

Users can always logout on any page after completing their necessary transactions.

User Level 3: The user level 3 interface (Fig. 6) is different and usually known by the administrator only for obvious reasons of security. The administrator's web page (Fig. 7) contains a list of tables and views on the left-hand side of the page. He has full control of the tables and views in the database. He can add, view, edit, copy, search and delete records on the tables. He may also choose to create new account, edit employees' records, enter new products, add new events or archive old ones. Thus, he has absolute control.

The benefits of Inventorix include, optimizing the use of scarce resources that has been invested in stocks, generating revenue for organizations which covers capital by providing efficient and effective op-

erations, avoiding stock out cost, preventing obsolete

Fig. 7: Web administrator's tasks page

stocks, minimizing ordering and carrying costs, making stock readily available, maximizing profit by helping users to monitor stock levels and maintain a database of inventory which facilitates study and future decision making.

Limitations of Inventorix
Wrong data input yields wrong information output (GIGO – Garbage In Garbage Out). Information does not necessarily connote the present state or quality of decision variables within the organization such as undetected theft, pilferage or obsolete stock. Thus, continuous auditing is inevitable.

Not all issues are reflected in the nominal information presented by Inventorix. For instance, storekeepers inefficiency or non-chalance (immeasurable in quantitative terms). Therefore, effective supervision and monitoring of staff is imperative.

Conclusion
A computer based inventory control system, like Inventorix, makes inventory control task to be flexible and easy. Inventorix provides users with real-time information about stocks and other inventory sub-entities needed to make management decision.

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