

Sales and Production Management System and Reporting using Centralized Database System

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ABSTRACT

In the industry, one of the most extensively utilized systems is the Sales and Production management system. Since there were numerous departments inside the company, building up a shared sales and production management system enabled timely and effective control of the company's stocks, order management, and efficient use. If you do the accounting using manual methods for the administration, as mentioned above, chores will also take a lot of paperwork and workforce. This study suggests a system with total generality, control, and access to sales, orders, suppliers, personnel, and reports to address the challenges encountered.

The system will provide features to handle inventory data properly and overcome the insufficiency of the current systems. Trending technologies that are quicker and more user-friendly than those suggested in the literature will be used, including React JS, Node JS, Express JS, and MongoDB as the database. Users of the system have been grouped into many parties, including the admin, salesperson, production manager, material & product manager, and stock manager. The proposed method, which solves the drawbacks of the comparable systems put out in the literature, should, according to the paper's conclusion, be further enhanced through research in the area.

It is necessary to conduct more research to provide more capabilities for managing sales data and to create a responsive design that can use on mobile devices.

Keywords— Product and Sales Management, Web based Application, Centralized Database

being placed every day & there are a lot of materials & the maintenance is important which the system do & will record the time taken to process an order. The software or web app is designed with all the features including 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.

Inventory management system brings in multiple benefits for businesses, which aren't just limited to the inventory control processes but the entire company. For instance, with a robust automated inventory control system, the sales team is updated about the available inventory stock, whereas the marketing team is also considerate of the items that need to be marketed on priority and items which are depleted. These systems also give real-time insights into inventory data to the company's C-suite. Access to real-time inventory count data, can be known as the biggest and most apparent benefit of an automated inventory management system.

With a robust automated inventory management system implemented, managers can keep up with the available stocks and make timely decisions. The automated inventory control software can update the inventory count in its system consistently; thereby, it always has a definite and accurate count of inventory available. Also, the higher accuracy of stock count through an automated system means there is a low requirement of performing manual stock counts, which may only be performed occasionally to check for potential losses. Furthermore, implementing an automated inventory control system makes it easier to track and update inventory stocks spread across multiple warehouse locations, which otherwise can be cumbersome. In the same way reduces human error is also another benefit of an automated inventory system. Manual operations are always prone to human errors.

Contrarily, with the automated inventory

I. INTRODUCTION

Sales and Production management is the very important aspect of big business & private owned organizations, especially where there is a lot of orders are

management system, businesses can rely on the accuracy of the data they receive. The system consistently updates inventory data “as and when” an inventory item is dispatched or restocked, thereby reducing any error chances in data entry. An automated inventory management system doesn’t only help reduce the data entry errors but also significantly improve the efficiency of the inventory management process. The system minimizes the need for human resources required to manage spreadsheets.

Also, with the automated system being placed, the available human resources can free themselves up from redundant tasks and contribute more value to the business by streamlining other inventory systems or purchasing methods. Below the term company C-suite is referred to as a company's top management positions (e.g., CEO, CIO, CFO, etc.)

II. RELATED WORK / LITERATURE REVIEW

Implementing a web-based solution makes the activities run automatically. SnackHack 365 is a proposed system which is suitable for any kind of a company who need future predictions upon their business, automate their works and centralize the business data. The proposed system is a web application for an inventory for a biscuit company. This is not a simple solution but also contains methods where to get and collect information from the beginning of the collection of raw materials. Each stakeholder can interact with the system and get the necessary information. Currently there is not any other platform with those requirements such as predicting the future demands, automated system for each actor. Inventory forecasting and reporting is yet another standard feature that helps businesses get real-time insights into their inventory stocks. The reporting tools give an accurate picture of what items are being sold, which are not getting sold, and other performance parameters. If not for the automated system, such analysis would take hours on excel sheets to understand the patterns.

All this data can be used by C-Suite managers to understand the performance of the business, forecast future performance, and adjust where required to optimize sales. Not only the stock data but also the revenue of each period, orders that has made during a sales quarter, user contribution and the user management progress of the system can also be analyzed using the forecasting and reporting. By referring the revenue C-Suite can make plans for the next quarter. At the same time SanckHack365 offer an order fulfillment system. The order fulfillment system assists businesses with printing shipping labels, assigning

tasks, tracking orders, and performing other tasks related to order fulfillment. The system was broken down into several functions to understand the sales patterns, make inventory forecasts, and perform inventory check for depleting stocks. This subsequently delivers the marketing team crucial insights into the underselling and overselling items and the profit margins of each item. The report also highlights the performance of promotional campaigns, thereby helping them to create more effective and targeted campaigns to maximize sales.

III. METHODOLOGY

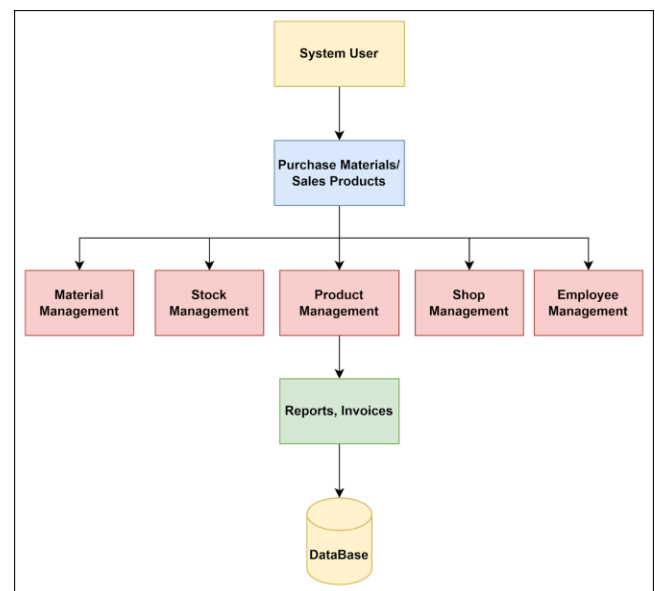


Figure 1: System Architecture Diagram

Several implementations for automated inventory systems have been released during the past period. The lacking part of them was using scattered databases. When developing this proposed system, the focus was a centralized database. For the development process usage of modern programming languages were important. Achieved the goal by using the modern coding stack called MERN stack. The target audience of the previous deployed versions was users, stockholders, and stocks in the inventory. In this proposed system the target audience is also categorized which was helpful to cover-up almost every aspect of the system. Processing customer order deliveries, inventory demand fulfillment, managing real-time data, which is essential for warehouse operations, comprising all the warehouse management systems already applied, performing tracking tasks plays a major role in this process. Raw materials as components to produce the finished goods, finished goods as the products ready for selling, MRO (maintenance, repair, operating supplies)

stands for everything supporting the manufacturing process. What’s interesting is that the screws, for example, used for machinery assembling are classified as raw materials, but when they are the spare parts for machinery repairing, they are grouped like MRO, work-in progress inventory items, which are the goods waiting for the next stage of processing having been produced (e.g. goods placed in the stock for quality control) are the types and how they are automated by this inventory control system.

A. Relevant Technology

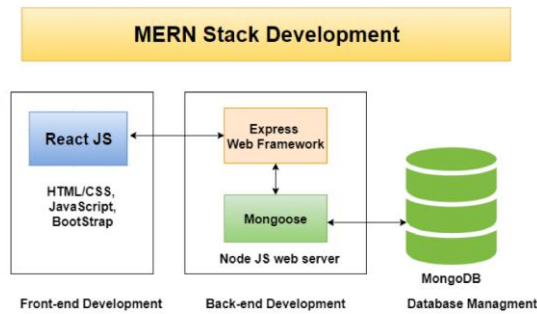


Figure 2: Relevant Technology

MERN Stack is used for this system since it offers an end to-end framework to developers, with all the components playing a significant role in developing web apps. The MERN allows the creation of a 3-tier architecture that includes frontend, backend, and database using JavaScript and JSON. The first component is ReactJS, a JavaScript library for developing UIs based on UI components. The second component is ExpressJS which is a backend web application framework for NodeJS and this perfectly complements the ReactJS framework, a front-end JS framework for developing interactive UIs in HTML while communicating with the server. The third component which is NodeJS, a JS runtime environment that allows users to run code on the server and comes with the node package manager or npm, enabling users to select from a wide selection of node modules or packages. MongoDB, which is the base of the MERN stack, is designed to store JSON data natively. Everything in it, including CLI and query language, is built using JSON and JS. The NoSQL database management system works well with NodeJS and thus, allows manipulating, representing, and storing JSON data at every tier of the application.

B. Centralized Database

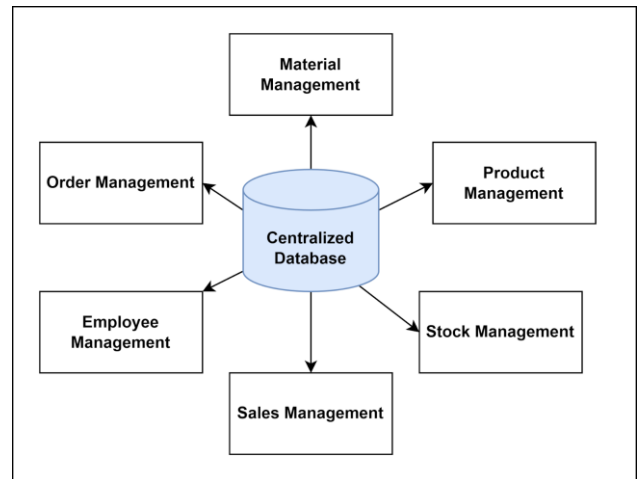


Figure 3: Centralized Database

This centralized database is stored at a single location such as a mainframe computer. It is maintained and modified from that location only and usually accessed using an internet connection such as a LAN or WAN.

C. Hardware Requirements

This centralized database is stored at a single location such as a mainframe computer. It is maintained and modified from that location only and usually accessed using an internet connection such as a LAN or WAN. The proposed system requires:

- CPU: Minimum Core i3
- Memory: Minimum 4GB
- Processor: Minimum 1 GHz; Recommended 2GHz or more
- Ethernet connection (LAN) OR a wireless adapter (Wi-Fi)
- Hard Drive: Minimum 32 GB; Recommended 64 GB or more.

IV. PROPOSED SYSTEM

The process of manually looking for the inventory available in stock is really time consuming and cumbersome that includes the person in charge of counting the number of materials that are currently in the inventory, counting the number of materials that have been ordered and received and keeping track of how long it takes suppliers to process orders and performing other various inventory-related tasks. 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 difficult to enter the data and then update the data on daily basis. This Sales and Production management system will solve the problems as everything about the inventory will be stored in a database which will

be much easier to maintain and update and this will also save time and cost-effective for the organization and will automate many inventory-related tasks. There were several reasons of choosing the target audience as a biscuit manufacturing company. The company's present system, which relies on Excel Spreadsheets as a database for information collection and manual operation, has several drawbacks and limitations, including a lack of centralized data and a lengthy update process. At this time the company does not have an independent system that satisfies their requirements and can better deliver the process from the material order is placed until the time the products are added to the shop and purchase order by the customers. When Material manager purchase Materials they must prepare a bunch of documents.

As the solution SnackHack365 was proposed. This Sales and Product management application is used as a centralized database for stock, production, and sales information and allow managers to manage inventory information, track inventory data, search items, manage user access, and alert low-stock and over stock. It also includes the report generation of sales, purchase and profit or loss of company based on inventory. The project also includes the employee management, creates user onboarding via email invitation as well. This web application also allows the admin to make it customized and grant multiple users or admins for the access of the software. This application correctly validates each element to identify it to minimize human error and increase efficiency and accuracy. The application uses a cloud-based database system that supports First In - First Out methodology as a display for application's inventory and multi-user access. Overall, the system will be effective in generating reports, purchase Invoice, Sales bill, and Product details with some of the additional features which makes the web app more efficient.

V. DISCUSSION

Web-based online Sales and Production management system is an innovation in making it easier for humans to control and manage information. The system is needed to get accurate information clearly, fast, and concrete [1]. The use of information technology has a significant effect. [2] In this case, accurate software can help to speed up company performance in generating desired information and managing them. Some companies define inventory as goods or resources [3]. The inventory is an activity consisting of goods data entry, data return, and inventory data that reports all transactions. Inventory function is to store in a place [4]. Web services allow centralized database that improve sales management. Therefore, central product managers can communicate with managers

to obtain information [5]. The use of web-based online sales and product management system will save a lot of time, energy, or large costs. This system can be applied on the internet. The inventory system is developed following the business process flow. Inventory management is a vital function to help ensure the success of manufacturing and distribution shops. The effectiveness of inventory management systems is measured directly by how successful a company is in providing high-level customer service, low inventory investment, maximum throughput, and low costs [6]. The function of the inventory system is to be able to meet the anticipated customer demand. Besides, inventory is expected to maintain customer satisfaction, the second is to separate various parts or production components. Therefore, problems can be avoided from fluctuations because there has been additional inventory to separate the production operations process from suppliers [7]. The benefit of the web-based online inventory system is many, namely make it easier for companies to monitor current stock positions, makes it easier for companies to make reports or information about the product, and makes it easy for companies to make more goods to be stocked [8]. Information technology helps people to do anything through the internet [9]. In this case, the company needs information technology systems to have a significant influence on the effectiveness of the company in developing its business. This study aims to show the use of this web-based online sales and product management system to how this system effects to predict the requirements and maintaining of good quantity level of orders.

A. Setting up and monitoring Material Levels

Perhaps, the first approach is to establish a system for monitoring various levels of materials to ensure optimality, utmost effectiveness, and efficiency. Having high levels of material management adds to expenses and increases overhead costs.

B. Setting up and monitoring Product Levels

The aspect of monitoring various categories of products is to ensure optimality, utmost effectiveness, and efficiency. Having high levels of production handling also 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.

C. Establishing Distribution Procedure

A proper distribution procedure is imperative to ensure the appropriate sales control. The procedure will vary from organization to organization. Beyond setting up proper distribution system, the production manager needs to monitor the usage or demand for he items in terms of conducting regular inventory turnover and analyses.

D. Summary of reporting

A proper summary reporting of purchased materials, stocks, and sales is essential to ensure the accuracy in outstanding of sales and purchased orders, predicting the requirements, and maintaining of good quantity level of orders.

E. Equation

In the proposed system there are several equations used by different users specially production manager, and the sales representative. Production managers calculate all the summary details to gather the information into one dashboard. For the total number of sales made the calculation used is

$$\sum Z = \sum X - \sum Y$$

Where z demonstrates the total number of sales made, X shows the total number of stocks and Y is for the total number of orders made for each stock.

On the other hand, sale's representative calculates the total revenue. The calculation used to get the total revenue is,

$$\sum A = x_n * y_n$$

Where A demonstrate total revenue, x is for each product which is multiplies by its amount which is shown as y. n is the parameters used here to demonstrate each product and the relevant amount.

VI. CONCLUSION

The proposed system offers a web-based application that is exceptionally helpful for handling stock, products, and sales. With the aim to develop an inventory management application, the project was well implemented. Hence the process involves all the work using a centralized database on the server which is used by web application. The system also ready to maintain reports like stock, product requirements, etc. It's easy to keep up the records through a database of each subunit. This system is an innovation from humans as an effort to build an application that will help companies. It can be used in the fields of industry, business, or company. Web-based online sales and product management system is still the company's best partner in carrying out the company's mission.

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