International Academic Institute for Science and Technology

International Academic Journal of Innovative Research
Vol.10, No.2, 2023, pp.10-17.

ISSN 2454-390X

International Academic Journal of Innovative Research

www.iaiest.com

Analyzing Grocery Items Inventory and Managing Stock

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Abstract

Analyzing Grocery items inventory and managing stock is a software application designed to help grocery stores manage their sales processes and inventory. The system typically includes features such as inventory management, point of sale (POS) functionality, and reporting. With a Grocery Items, grocery stores can keep track of their inventory levels, manage their sales transactions, and generate reports on sales and inventory data. This can help grocery stores improve their operations, reduce waste, and provide better customer service. The system works by integrating with the store's POS system, allowing sales data to be automatically recorded and tracked. The system can also be used to manage inventory levels, track product expiration dates, and generate reports on sales and inventory data. Overall, a Grocery items inventory and managing stock can be a valuable tool for grocery stores looking to optimize their operations and improve their bottom line. The goal of the database design for the grocery management system is to facilitate the automated processing of products purchased, billing, and purchases made, as well as to maintain and safeguard sales records. Both the owner and the employee find it easier to control and manage the company's transactions with its support. You won't have to spend as much time manually entering every detail of the customer's and company's transaction. All of the company's data and information is processed and stored by my system. Java and its link to PHP/My Admin are the building blocks of this system. Everything from customers and employees to products and sales figures as well as payment details will be saved in the system's database. The user can keep track of the sale or item that the customer is reserving with my basic silver cross grocery management system. Only authorised users with the staff administrator role can access the Cashier system.

Keywords: Inventory Management, Point of Sale (POS), Products Purchased, Billing.

DOI:10.71086/IAJIR/V10I2/IAJIR1005
Received: 22 March 2023/Revised: 07 April 2023/Accepted: 17 May 2023/Published: 30 June 2023

Introduction

Regardless of the status of the economy, groceries remain popular. Consumers might cease visiting restaurants and movie theaters, but you simply cannot survive without soap, toothpaste, and, well, veggies. Due to the hectic lifestyle of the city, tiresome commutes, and extended workdays, a lot of consumers find it difficult or choose not to undertake the task of buying food [1]. With a sizable clientele, rising Internet usage (mostly via smartphones), and the growing appeal of online shopping, some businesspeople have seen the opportunity to open grocery e-stores. Although grocery e-tailing presents challenges, it also offers a high percentage of repeat orders as a benefit. All you have to do is make an initial impression on a customer. Only when inventory is correctly handled and there are no stock outs will that occur.

Every facet of your company is impacted by management, including your capacity to accurately and timely execute orders as well as your storage expenses. Similar to the stock market, inventory carries some risk [2]. Monitoring the quantity of units, you've sold and projecting how many more you'll sell in the future are both parts of forecasting [3]. For the inventory controller, whose job it is to ensure that the warehouse is rotating supplies and that client orders are being filled, managing inventory using various methods is a crucial responsibility.

Any product, whether it be FMCG or F&V, has a shelf life. If the supplies are not being rotated, they will be left on a designated shelf where they will eventually decay [4]. However, if customers' orders are not filled, their expectations will not be met because they placed their orders with specific expectations [5]. If orders are not filled because products are out of stock or are shipped to customers in poor condition, this will negatively impact the customers' shopping experience.

Literature Review

Kmiecik [6] In this paper, the results of 29 selected distribution networks' demand forecasting tools are displayed. Conventional forecasting techniques, such as time series exponential smoothing, ARIMA, machine learning, and neural network-based approaches developed in the R programming environment, were employed. The forecasting findings were then contrasted under the circumstances of inventory management and transportation planning (within the framework of "future" dynamic ABC analysis). The forecasting function is a crucial component of logistics coordination in distribution networks, supporting 3PL's inventory management and transportation planning activities. Nowadays, a centralized network with a third-party logistics provider (third-party logistics provider) in charge of organizing and carrying out logistical procedures while adding value is one of the most effective models for logistics coordination. Because of this, 3PL can produce a forecast that is comparable for various DN kinds and aggregations (per recipient or per SKU). From the perspective of transportation planning and inventory management, it might facilitate coordination in DN.

Shen et al [7] the study builds an integrated inventory model for "farmers' professional cooperatives + distribution centers + supermarkets" that sell fresh agricultural products. A model that maximizes the supply chain's total profit is suggested, taking into account several participants at each tier. The distribution center is in charge of not only storage, processing, and distribution, but also of coordinating the production and supply information of farmers' professional cooperatives and the order sales information of supermarkets. The model assumes that freshness and sales prices have an impact on the market demand for fresh agricultural products. A more sophisticated evolutionary algorithm is created to address the nonlinear optimization issue. The case study's findings demonstrate that, given the supply chain distribution method, the best supply and replenishment strategy is achieved.

Baylen [8] The study's objectives were to ascertain the efficacy of the inventory management system that contributed to the decline in earnings of the small eateries in the four districts of Quezon province that were chosen at random, as well as to offer recommendations and fixes for the issues that these establishments face on a daily basis. Both quantitative and qualitative methods were included in the data collection for this descriptive study. While restaurant owners were being interviewed, a survey was given to the staff members. The collected data was analyzed and interpreted using the weighted mean, frequency, and percentage.

Low and Rejab [9] The object-oriented design methodology was used to create this system. The waterfall methodology is the one that is applied. Indicate who is using the system. The system consists of the following five modules: report generation, supplier, cashier, inventory, and login. Owners of retail stores can replenish inventory when it runs out by using the system's reports to identify which products are selling well. Users can methodically document and store all product moves in the system by using the system. It is anticipated that the system will offer a variety of modules to make it easier for retail store staff to handle merchandise.

HR and Aithal [10] In brick-and-mortar retailing, the concept of minimum display quantity (MDQ) is unavoidable. As a result, retailers must guarantee a certain level of inventory shown at each location, regardless of the income or inventory turns made by a specific store. It has been noted that most physical retailers in India make the following assumptions: (a) the current inventory management system is best for their store; (b) software solutions record accurate inventory movement; (c) it is risky or biased to involve the store management team in decisions related to inventory; and, most importantly, (d) stockouts will inevitably result in lost sales. Store managers now have a predisposition and mindset that stems from these assumptions and widely accepted practices. They believe that their store maximizes revenue and profit by using the inventory that is made available to them through the current inventory management system, and that there are always going to be instances where customers are dissatisfied because of stockout situations.

Proposed Methodology

JavaScript (JS) is the world's most popular lightweight, interpreted compiled programming language. It is also known as a scripting language for web pages. It can be used for Client-side as well as Server-side developments. JavaScript is the popular programming language that is widely used for building web applications. Node.js is the JavaScript runtime built on the V8 JavaScript on the server side. Java Script can be added to your HTML file in two ways:

Internal JavaScript: We can add JS code directly to our HTML file by writing the code inside the <script> tag. The <script> tag can either be placed inside the <head> or the <body>tag according to the requirement.

External JavaScript File: We can create a file with .js extension and paste the JS code inside it. After creating the file, add this file in <script src=" file_name.js"> tag inside <head> tag of the HTML file.

Features of Java Script

- All popular web browsers support JavaScript as they provide built-in execution environments.
- JavaScript follows the syntax and structure of the C programming language. Thus, itis a structured programming language.
- JavaScript is a weakly typed language, where certain types are implicitly cast (depending on the operation).
- JavaScript is an object-oriented programming language that uses prototypes rather than using classes for inheritance.
- JavaScript is an object-oriented language, which means that it uses objects to represent dataand functionality. This makes it easy to organize and structure your code, and allows youto reuse code across different parts of your application.
- JavaScript is often used to add interactivity to web pages, such as animations, form validation, and dynamic content. With JavaScript, you can create web pages that respond to user input in real-time, without requiring a page refresh.
- It is a light-weighted and interpreted language.
- It is a case-sensitive.

Front End Development

The process of creating a website or web application using markup languages like HTML, CSS, and JavaScript in order to allow users to directly view and interact with it is called front-end web development or client-side development. As a developer working in front end development, you need to keep on top of all the latest trends and developments in the area because the tools and techniques used to build websites' front ends are always evolving. While web designers create the visual aspects of a website, front end developers work on the technical aspects of making that design a reality on the web. Designing a site with the user's experience in mind means prioritising legibility and relevance in content presentation. However, modern users access the internet through a wide range of devices, each with its own unique combination of screen size and resolution, necessitating careful consideration of these factors by the designer. This calls for meticulous preparation on the part of the developer to guarantee that their site displays appropriately across a wide range of devices, operating systems, and browsers.

Pros

- **Improved user experience-** Front-end development can improve the user experience of a website or application by making it more visually appealing and easier to navigate.
- **Faster load times-** By optimizing the front-end code, developers can reduce page load timesand improve the overall performance of the website or application.

- **Greater accessibility-** Front-end development can make websites and applications more accessible to users with disabilities by incorporating features such as screen readers and keyboard navigation.
- **Better search engine optimization (SEO)-** By optimizing the front-end code and content, developers can improve the website's search engine ranking and increase its visibility to users.

Cons

- **Limited functionality-** Front-end development is focused on the user interface and user experience, which means that it may not have the same level of functionality as back-end development.
- **Security vulnerabilities-** Front-end development can introduce security vulnerabilities, suchas cross-site scripting (XSS) attacks, if not properly secured.
- **Browser compatibility issues-** Front-end development can be challenging due to the wide variety of browsers and devices that users may be using, which can result in compatibility issues.

Sequence Diagram

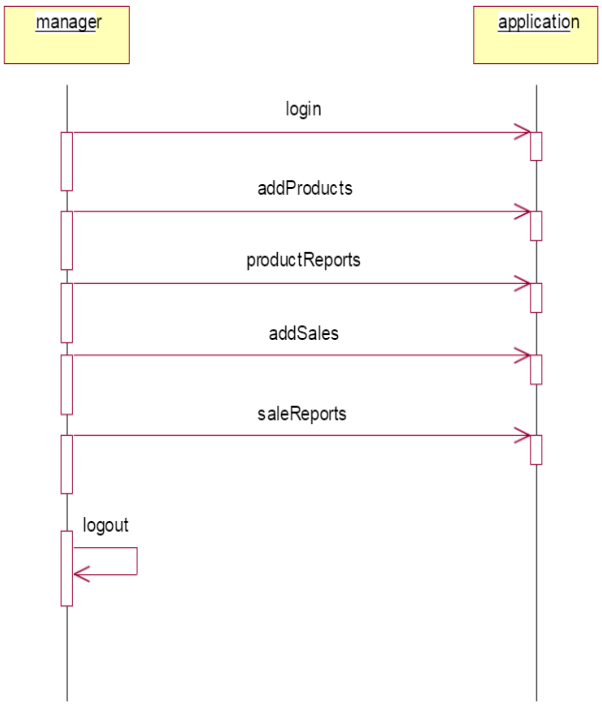

Fig. 1: Sequence Diagram

System Module

- **Login:** Passwords and usernames are customisable for the administrator. They can then provide other people the login information after they've logged into the system.
- **Order:** An employee takes the dealer's order over the phone and enters the products' quality. A crystal account will then be created for billing purposes, and the data will be recorded in the database.
- **Stock:** The goods will be sent to the warehouse after the trade. The complete number of products offered can be found in the stock unit.
- **Payment:** Adaptable to either authorise only or upon invoice conception, or to both authorise and charge. Payment upon delivery is an option.
- **Customer:** Verify all products and place product orders. Discover the current status of your order and view the products you have added to your cart recently.

Software Configuration (Windows 10)

System Configuration is a well-designed utility in Windows that could do wonders when changing several settings on the PC. It helps users change boot settings or configure theservices, drivers, and apps to run. Though most of the operations here could be done separately,it takes a lot longer, making System Configuration in Windows 10 the first

choice of many. The utility especially comes in handy when performing a clean boot during a troubleshooting sequence.

Here are few of its features

- **Configure boot settings**: The utility provides users with a handful of preconfigured boot options to choose from, namely, *Normal startup*, Diagnostic *startup*, and *Selective startup*.
- **Enable/disable services**: The Services tab in System Configuration lists all the available ones, and users can manually enable even a bunch of them, at once.
- **Quickly launches Windows tools**: Often unnoticed, the *Tools* tab in the System Configuration allows users to open a bunch of other built-in utilities in Windows quickly.

Table 1: Software Requirements

Operating systems	Windows 10
Coding language	HTML, PHP, CSS, Javascript Text
Editor	Sublime Text3
Database	MySql Version 7
Package	XAMPP.CONTROL

Table 2: Hardware Requirements

Processor	Intel core i3
Memory	8GB
RAM Hard Disk	1 TB
Package	XAMPP

Results and Discussion

Output Screens

1. Home Page

Fig. 2: Home Page

2. To Add Page

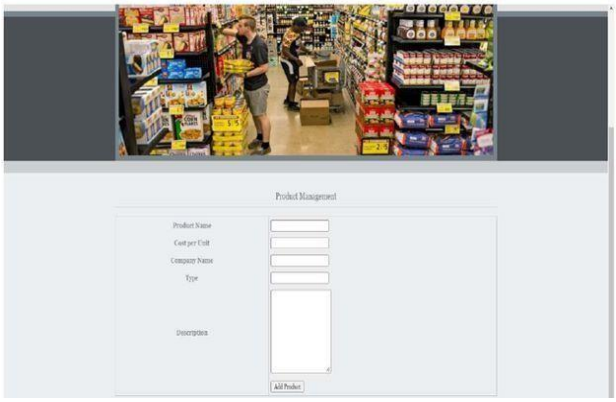

Fig. 3: Add Pages

3. Product Report

Fig. 4: Product Report

4. To Add All Sales

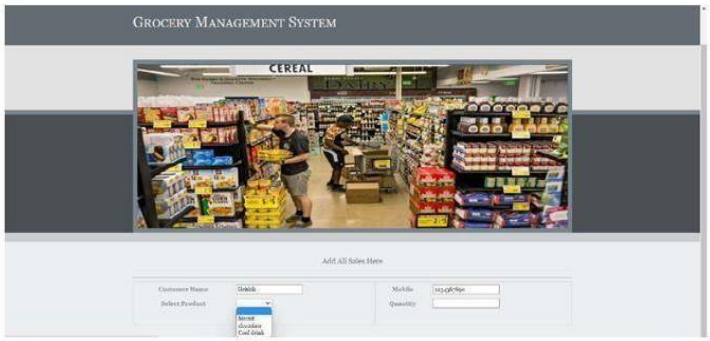

Fig. 5: Add All Sales

5. Sales Report

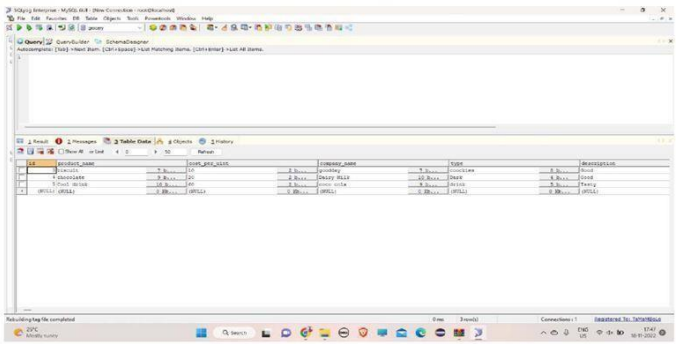

Fig. 6: Sales Report

6. Admin Database

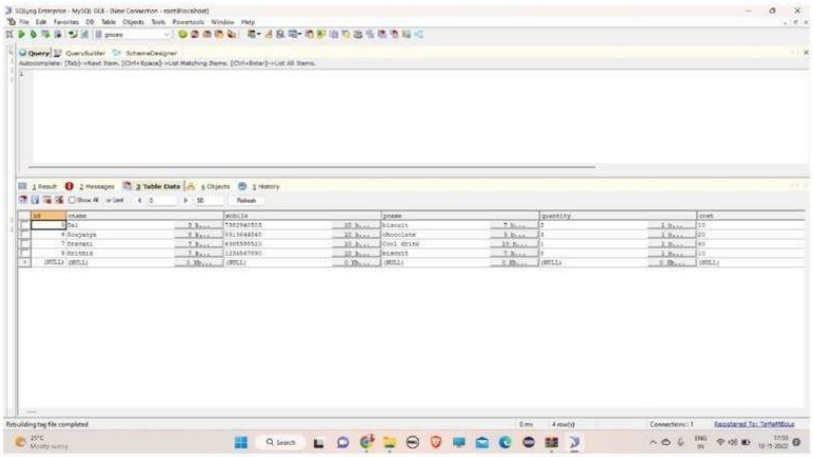

Fig. 7: Admin Database

7. Product Database

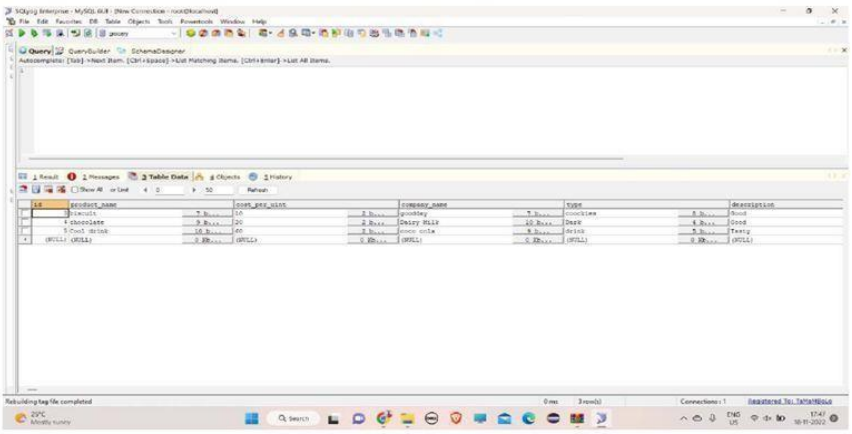

Fig. 8: Product Data Base

Conclusion

Overall, I would have to say that my internship was rather beneficial. Computer companies will find the project titled "Analysing grocery items inventory and managing stock" to be very useful. If you sell computer products online, this solution is ideal for you. You can see that the data is easily and correctly retrievable. The software for online grocery shopping has been made more user-friendly so that anyone may use it. When a user enters their login credentials, this software grants them access to the system. Computer product information are handled by this project.

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