

STOCKMASTER - An ERP Software

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Abstract—StockMaster is a web-based inventory and order management system developed to simplify business operations for small and medium enterprises. Many businesses still depend on manual methods such as registers or spreadsheets, which often lead to errors and poor data management. This system provides a digital solution to manage products, vendors, purchases, and sales in one place. It offers features like real-time stock tracking, low stock alerts, and secure user authentication. By using modern web technologies, the system improves accuracy, saves time, and helps businesses make better decisions. Overall, StockMaster enhances efficiency and reduces the challenges of traditional inventory management.

Index Terms—Inventory Management, Stock Tracking, Vendor Management, MERN Stack Web Application, Authentication, Business Automation, Low Stock Alerts

I. INTRODUCTION

In today's fast-growing business environment, managing inventory and daily operations efficiently is very important. Many small and medium businesses still use manual methods like notebooks or spreadsheets to manage their stock and sales. These methods are time-consuming and often lead to mistakes such as wrong stock levels, duplicate data, and difficulty in tracking records.

To solve these problems, a digital system is needed that can handle all business operations in one place. StockMaster is designed as a full-stack web application that helps in managing inventory, vendors, purchases, and sales effectively. It provides a simple and user-friendly interface where users can easily track stock, manage suppliers, and monitor transactions.

The system also includes features like secure login, role-based access, and real-time alerts for low stock, which help prevent product shortages. By using modern technologies, StockMaster improves data accuracy, saves time, and supports better decision-making for businesses.

II. ANALOGY

StockMaster works like a digital store manager for a business.

In a traditional shop, a manager keeps track of products using notebooks, remembers which supplier provides which items, and checks manually when stock is low. This process takes time and can lead to mistakes.

Similarly, StockMaster acts like that manager but in a smarter and automated way. It keeps all product details, vendor information, sales, and purchases in one system. Just like a manager warns when items are running out, StockMaster gives low stock alerts. It also securely controls who can access the system, like a manager allowing only authorized staff.

So, instead of depending on manual work, businesses can rely on StockMaster as a smart digital assistant that handles everything faster, more accurately, and efficiently.

III. PROBLEM STATEMENT

Many small and medium businesses still rely on manual methods like registers or spreadsheets to manage inventory, which often results in errors and inaccurate stock records. Tracking vendor details and purchase history becomes difficult and time-consuming. There is no proper system to provide real-time low stock alerts, leading to possible product shortages. Additionally, data is not centralized, making reporting and decision-making inefficient. Lack of secure authentication also increases the risk of unauthorized access to business data.

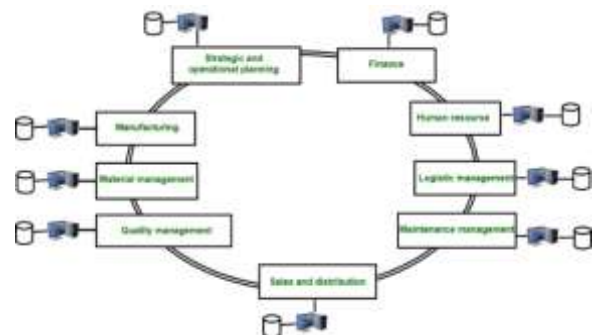


FIG: BEFORE ERP

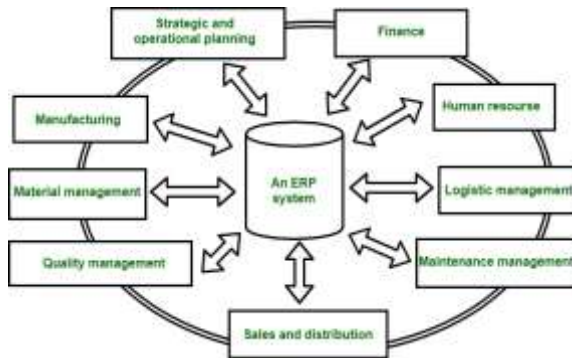
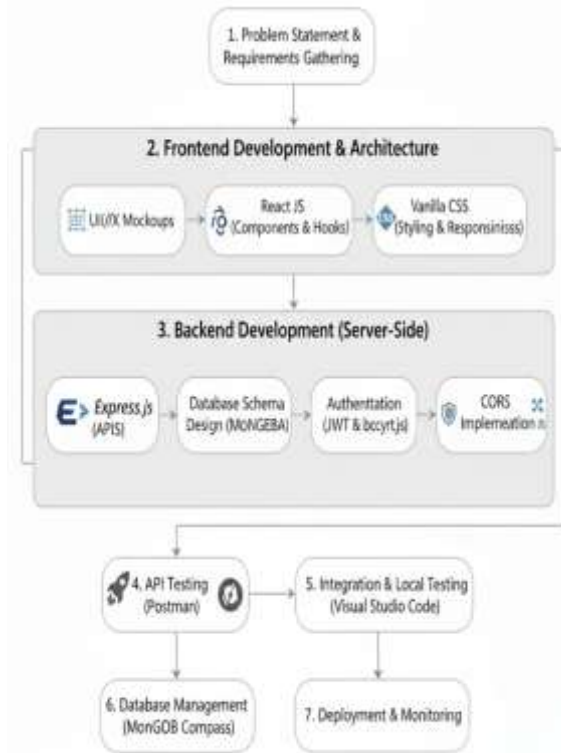


FIG: AFTER ERP

IV. DESIGN AND METHODOLOGY

The project followed a structured, full-stack development methodology to ensure clarity, modularity, and efficient implementation. The process began with a detailed problem statement and requirements gathering phase to establish system objectives and user needs. Based on these requirements, the frontend architecture was designed using UI/UX mockups, followed by development in React JS with component-based structuring and hooks, along with Vanilla CSS for styling and responsive layouts. The backend development employed Express.js for API creation, supported by a well-defined MongoDB schema, secure authentication using JWT and bcrypt.js, and proper CORS implementation for safe client-server communication. After development, API testing was conducted using Postman, and integration testing was performed within Visual Studio Code to validate end-to-end functionality. The workflow also included database management through MongoDB Compass to monitor and validate stored data. Finally, the system was prepared for deployment and monitoring, ensuring that all components operated reliably in a production environment. This systematic methodology enabled a robust, scalable, and maintainable application design.



V. TECHNOLOGY USED

Following are the technology stack we have use for designing the stockmaster :

1. React JS

React JS is a JavaScript library used to build the frontend (user interface) of the application. It helps in creating reusable components like buttons, forms, and dashboards. This makes the application faster and easier to manage. React updates only the required parts of the page, which improves performance and gives a smooth user experience.

2. Vanilla CSS

Vanilla CSS is used for designing and styling the application. It controls the layout, colors, fonts, and responsiveness of the website. With CSS, the application becomes visually attractive and works properly on different screen sizes like mobile, tablet, and desktop.

3. Node.js

Node.js is used to run JavaScript on the server side. It handles backend operations like processing user requests, connecting with the database, and sending responses back to the frontend. It is fast and efficient, especially for real-time applications.

4. Express JS

Express JS is a backend framework built on Node.js. It simplifies the process of creating APIs (Application Programming Interfaces). It helps in handling routes, requests, and responses easily. In this project, it is used to manage operations like login, signup, and data handling.

5. MongoDB

MongoDB is a NoSQL database used to store application data. It stores data in the form of JSON-like documents, which makes it flexible and easy to use. It is suitable for handling large amounts of data and allows quick data retrieval.

6. JWT (JSON Web Token)

JWT is used for authentication and security. When a user logs in, a token is generated and sent to the user. This token is used to verify the user for future requests without asking for login details again. It ensures secure access to the system.

VI. PLATFORM USE

1. Visual Studio Code

Visual Studio Code is a code editor used for writing and managing the project code. It supports multiple programming languages and provides features like debugging, extensions, and code suggestions, which make development faster and easier.

2. MongoDB Compass

MongoDB Compass is a graphical tool used to manage the MongoDB database. It allows users to view, edit, and analyze data visually without writing complex queries. It helps developers understand and manage data more efficiently.

VII. CONCLUSION

The StockMaster system is a complete and efficient solution for managing inventory and business operations digitally. It helps small and medium businesses move from manual methods like registers and spreadsheets to a more organized and automated system. By managing products, vendors, sales, and purchases in one place, the system reduces errors, avoids data duplication, and saves time.

The use of modern technologies ensures that the application is fast, secure, and easy to use. Features like real-time stock tracking, low stock alerts, and secure login improve the overall reliability of the system. It also helps business owners

to monitor their operations clearly and make better decisions based on accurate data.

In addition, the centralized system improves data management and provides better control over business activities. Overall, StockMaster increases productivity, improves efficiency, and provides a strong foundation for future improvements and expansion.

VIII. FUTURE SCOPE

The StockMaster system can be further improved by adding multi-user roles with advanced permissions, so different employees can access only the features they need. It can also include real-time notifications through email or SMS for low stock and important updates.

Integration with payment systems can help in automatic billing and smoother transactions. The system can also support multi-store management, allowing businesses with multiple branches to manage all data in one place.

Adding data backup and recovery features will improve safety and prevent data loss. The application can also include voice search or voice commands to make it easier to use.

In the future, the system can be integrated with third-party platforms like accounting software or e-commerce websites for better business management. Advanced AI features can help in predicting sales, suggesting stock levels, and reducing wastage.

Overall, StockMaster can be expanded into a complete ERP system that handles all business operations in a smart and automated way.

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