

Inventory Management System

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Abstract—This project presents an Inventory Management System tailored for small businesses. The system allows basic efficient tracking and management of inventory data, including fields such as product ID, name, price per item, quantity, total price, and customer information. By providing an organized structure and monitored updates, this system improves the management of stock levels, aids in data-driven decisions, and enhances the store's operational efficiency.

Index Terms—Inventory Management, Data Organization, Small businesses, Database, Consistent data entry

I. INTRODUCTION

Inventory management is crucial for small businesses to operate efficiently and meet customer demand. Without a robust system, managing inventory can become challenging, leading to issues like stockouts or overstocking, which directly impact profitability. This project aims to develop an Inventory Management System that supports small businesses by providing real-time updates, efficient data handling, and an intuitive interface. By organizing and tracking essential inventory data such as product ID, name, price, quantity, and customer details, the system empowers small businesses to make data-driven decisions, optimize stock levels, and enhance overall operational efficiency.

II. SYSTEM OVERVIEW

The Inventory Management System is built as a standalone application using Java Swing, GUI and MySQL database. The system allows users to add, update, delete, and view inventory data efficiently. The architecture includes a simple GUI for user interaction, a backend that manages data processing, and a database to store inventory records.

III. SYSTEM ARCHITECTURE

The system architecture comprises the following layers and components, designed to support comprehensive inventory management:

- **User Interface (UI):** Provides an intuitive interface using Java Swing for easy interaction. The UI allows users to manage inventory, suppliers, and pending orders efficiently.
- **Backend Logic:** Handles core functionality, including:
 - **Inventory Manager:** Manages CRUD (Create, Read, Update, Delete) operations for inventory items.
 - **Supplier Manager:** Tracks supplier details, enabling businesses to manage, view contact information, and ensure a steady supply chain.
 - **Order Manager:** Handles pending orders, allowing users to track incoming stock and manage outstanding orders, ensuring inventory levels are accurately maintained.
- **Database Layer:** A structured database that stores data for inventory, suppliers, and pending orders. This layer ensures data consistency and facilitates real-time tracking.

IV. DESIGN AND IMPLEMENTATION

The system is designed to be modular, ensuring easy maintenance and future upgrades. The core modules include:

- **Inventory Manager:** Handles CRUD (Create, Read, Update, Delete) operations for inventory data.

- **Data Persistence:** Stores inventory data in a local database to maintain consistency and accuracy.

V. KEY FEATURES

- **Data Management:** Allows efficient entry and management of inventory data.
- **Real-Time Tracking:** Provides up-to-date information on stock levels.
- **User-Friendly Interface:** Facilitates ease of use and quick access to inventory records.

VI. CHALLENGES

Implementing efficient data handling mechanisms and ensuring system stability were some of the challenges faced during development. Managing data consistency across various components was critical to ensure data integrity.

VII. TESTING AND RESULTS

The application was rigorously tested for:

- **Functionality:** Ensured smooth operation of CRUD functions.
- **Data Persistence:** Verified accurate data storage and retrieval.
- **Error Handling:** Tested application response to incorrect or missing data entries.

The test results indicate that the system meets its objectives, providing a robust solution for inventory management.

VIII. CONCLUSION

The Inventory Management System effectively meets the unique requirements of small businesses, particularly those in retail, by offering a streamlined approach to data management and inventory tracking. Its user-friendly interface and modular architecture allow small business owners to easily manage their stock, ensuring accurate records and timely order fulfillment.

By leveraging this system, small businesses can improve operational efficiency, reduce the risk of overstock situations, and enhance customer satisfaction through reliable inventory management.

Future enhancements could focus on incorporating features such as cloud-based data storage for increased accessibility and security, as well as integration with e-commerce platforms to facilitate online

sales and expand market reach. These improvements would further empower small businesses to adapt to the evolving retail landscape and drive growth in an increasingly competitive environment.

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