IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Electromobile Inventory Management System For Electronic Retail Stores

A Digital Solution for Real-Time Inventory and Sales Management

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Abstract: Efficient handling of inventory plays a vital role in the smooth functioning of electronic retail businesses. Conventional inventory practices are largely manual and often lead to problems such as inaccurate stock information, delayed transaction records, and difficulty in monitoring product movement. This paper proposes an ElectroMobile Inventory Management System, a software-based solution developed to organize and manage electronic products including mobile phones, televisions, air conditioners, refrigerators, and laptops. The system integrates inventory control, sales processing, and report generation into a unified platform that automatically updates stock quantities after each transaction and securely stores all data in a centralized database. A layered system architecture is adopted to enhance reliability, data security, and system scalability. Experimental observations indicate that the system delivers fast response time, precise data handling, and dependable report generation. By minimizing manual intervention and reducing operational errors, the proposed system offers an effective and user-friendly approach for improving inventory accuracy and business performance in electronic retail environments.

Index Terms **-** ElectroMobile Inventory Management System, Inventory Automation, Electronic Retail Management, Stock Monitoring, Sales Processing, Database Management, Report Generation, Real-Time Inventory.

1. INTRODUCTION

Modern retail businesses increasingly rely on computerized solutions to manage their daily operations with accuracy and speed. Electronic stores deal with a wide range of products such as mobile phones, televisions, air conditioners, refrigerators, and laptops, which makes inventory handling a complex task when performed using manual registers or paper files. Such traditional methods often lead to stock mismatches, delayed updates, and difficulty in identifying product availability at the right time. To address these challenges, this study proposes the ElectroMobile Inventory Management System, a software-based platform developed to organize and control electronic product information in a structured and efficient manner. The system enables users to store, modify, and monitor essential product details including brand, model, price, and quantity through a centralized database. Inventory operations are automated so that stock levels are updated instantly after each transaction, ensuring consistency between sales and inventory records. By integrating authentication, product management, sales processing, and reporting within a single platform, the proposed system minimizes human errors and enhances overall operational efficiency for small and medium-scale electronic retail businesses.

2. LITERATURE SURVEY

Many researchers have worked on inventory management systems using digital and mobile technologies. Zheng (2010) studied inventory control methods for mobile commerce and emphasized concepts such as reorder levels, safety stock, and optimized order quantity. The study mainly focused on theoretical modelling and did not provide a complete software solution for small retail shops.

Kumar (2022) presented an automated inventory system with secure authentication features to simplify stock handling and reduce human effort. Although the system improved accuracy, it did not concentrate specifically on real-time inventory control for electronic retail businesses.

Pido (2020) developed a mobile application for small enterprises to overcome difficulties caused by manual inventory tracking and spreadsheet-based record keeping. The solution improved monitoring of stock levels but was designed for a limited business environment.

Michaelle's (2009) proposed a Mobile Sales Assistant system using NFC technology to provide product information at the point of sale. While the approach enhanced customer service, it required specialized hardware and increased implementation cost.

From the above studies, it is observed that most existing solutions either emphasize theoretical inventory models or depend on mobile and hardware-based technologies. There is a need for a simple, low-cost, and software-oriented inventory management system specifically designed for electronic retail stores with integrated sales processing and reporting features. The proposed ElectroMobile Inventory Management System aims to fulfil this requirement by offering an efficient and practical solution.

3. PROBLEM STATEMENT

Electronic retail stores generally rely on manual or partially computerized methods to manage their inventory, which makes stock handling slow and unreliable. Such practices often result in mismatched stock records, difficulty in locating products, excessive storage of certain items, and frequent shortages of popular products. The absence of real-time inventory information creates challenges in monitoring daily sales and preparing accurate business reports. Due to these limitations, store owners face problems in making timely and informed operational decisions, which may lead to reduced profitability and lower customer satisfaction. Hence, there is a strong need for a computerized inventory management system that combines product handling and sales processing within a unified platform. The proposed ElectroMobile Inventory Management System is designed to provide an efficient, secure, and accurate solution for managing electronic store inventory.

4. OBJECTIVES OF THE STUDY

The primary aim of this research is to design and implement an automated system for managing inventory operations in electronic retail stores. The specific objectives of the proposed system are as follows:

1. To create a software-based ElectroMobile Inventory Management System for effective handling of electronic shop inventory.
2. To ensure systematic storage and management of product details including mobile phones, televisions, air conditioners, refrigerators, and laptops.
3. To implement a secure authentication mechanism to allow access only to authorized users.
4. To automate sales transactions with instant updating of stock quantities.
5. To generate digital sales receipts and safely record transaction information in the database.
6. To classify and display product availability status such as available, low stock, and out of stock.
7. To provide structured reports for stock monitoring and sales history analysis.
8. To minimize manual effort and reduce the possibility of human errors in inventory handling.
9. To design a simple and user-friendly dashboard suitable for non-technical users.
10. To enhance overall operational performance and support better managerial decision-making.

5. PROPOSED SYSTEM DESIGN AND ARCHITECTURE

5.1 System Design Overview

The proposed ElectroMobile Inventory Management System is developed to handle electronic product inventory using an automated and organized software framework. The system combines essential functions such as product handling, sales management, stock tracking, and report preparation into a single integrated platform. It is designed to minimize manual inventory activities and to maintain accurate product information by updating stock quantities immediately after each transaction. To achieve better system organization and reliability, the architecture is structured into multiple functional layers, allowing each part of the system to perform its role independently while maintaining coordinated interaction with other components. This approach improves system stability, simplifies future modifications, and supports scalability as business requirements grow. The inclusion of an easy-to-use interface further enhances system usability, making inventory operations efficient and convenient for electronic retail store administrators.

5.2 System Architecture Design

The ElectroMobile Inventory Management System is structured using a layered software architecture to achieve reliable processing and secure handling of information. Interaction with the system takes place through the interface layer, which offers features such as login access, dashboard navigation, product data entry, sales operations, and report viewing facilities. This layer is designed in a simple manner so that users without technical knowledge can easily perform inventory-related tasks.

User requests generated from the interface are managed by the control layer of the system, which governs the execution of core functions including authentication, product operations, sales management, and report creation. These requests are then evaluated by the processing layer where important rules such as data validation, stock updates, and transaction control are applied before final execution.

The storage layer maintains all system data such as user information, product records, and sales transactions in a secure database. It supports fast access and modification of data while ensuring correctness and reliability. The cooperation among these layers forms a well-organized system structure that enhances operational efficiency, security, and long-term maintainability of the proposed inventory management system.

5.3 Working of the Proposed System

The operation of the ElectroMobile Inventory Management System begins with secure user verification through the login module. Once access is granted, the system presents a dashboard that allows the user to navigate different functional components including product handling, sales management, inventory tracking, and report preparation. Any selected task is first interpreted by the control layer and then examined by the processing layer based on predefined operational rules. During a sales activity, the system automatically adjusts the corresponding product quantity and stores complete transaction details in the database. All inventory and sales records are maintained securely and can be accessed whenever required to generate current stock information and sales reports. The final outcomes of each operation are then presented through the interface, ensuring smooth and accurate execution of inventory activities.

5.4 System Block Diagram:

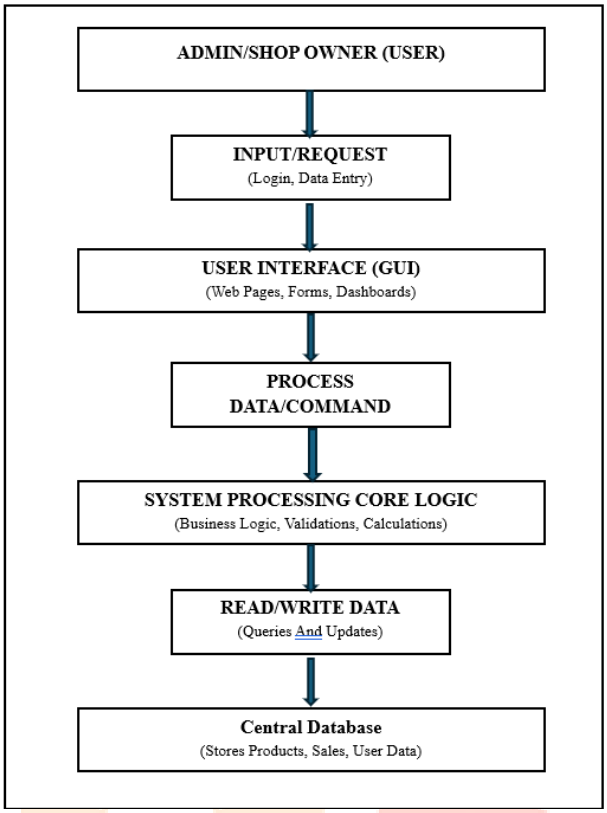

fig. electroMobile inventory management system

Description: The block diagram represents the sequential functioning of the ElectroMobile Inventory Management System. The operation begins when the Admin or Shop Owner enters required inputs such as login credentials and product or sales information. These inputs are handled through the user interface, which includes web pages, data entry forms, and dashboards for smooth interaction. The entered commands are then transferred to the processing unit of the system, where core operations such as business rule execution, data validation, and necessary calculations are performed. After successful processing, the system carries out database operations for storing and updating information. All essential data, including product details, sales transactions, and user records, are maintained in the central database. This organized flow of operations ensures accurate processing, secure data management, and efficient inventory control within the system.

5.5 Process Flow of the System

The operational flow of the ElectroMobile Inventory Management System starts with secure user authentication. Once the login is successful, the system displays a dashboard that provides access to different functional modules. The user chooses the desired operation, and the request is passed through the system's processing layers for execution. These layers evaluate the request according to predefined rules and system conditions. After processing, the system updates the relevant data and produces appropriate outputs such as confirmations, reports, or transaction summaries. Finally, the results are presented to the user through the graphical interface, ensuring, smooth and reliable system operation.

5.6 Advantages of the Proposed System

The proposed ElectroMobile Inventory Management System offers several benefits for electronic retail operations. It minimizes the dependency on manual inventory handling by automating routine tasks. The system maintains continuous updates of stock information, which helps in avoiding mismatches between sales and inventory records. It supports reliable storage of product and transaction data, ensuring correctness and data security. The interface is designed in a simple manner so that users can perform operations without technical difficulty. Automated generation of reports and sales receipts further reduces workload and saves time. In addition, the system architecture is flexible.

6. RESULTS AND DISCUSSION

6.1 Results

The developed ElectroMobile Inventory Management System was tested for its core functionalities including user authentication, product data handling, sales transaction processing, and report generation. The system performed all assigned tasks accurately and without errors. Stock levels were automatically updated after each sales transaction, ensuring real-time inventory tracking. The reports generated provided correct and structured information about product availability and sales history, which confirms the reliability of the implemented system.

6.2 Performance Evaluation

Performance evaluation of the system shows that it operates with quick response time and consistent stability during different operations. Database access for storing and retrieving product and sales information was executed efficiently. The layered system architecture helped in reducing system complexity and improving overall reliability. Report generation and transaction processing required minimal computation time, making the system suitable for continuous daily usage in retail environments.

6.3 Applications of the System

- Supports continuous monitoring of stock levels in real time.
- Helps in recording sales transactions and generating digital receipts automatically.
- It is useful for electronic retail shops and product showrooms for managing daily inventory operations.
- Assists business owners in decision-making by providing accurate sales and stock information.
- Suitable for maintaining organized records of electronic products such as mobiles, televisions, and laptops.

6.4 Advantages of the System

- Increases accuracy in inventory records by minimizing human errors.
- Improves overall operational efficiency through automation of inventory and sales processes.
- Provides a secure and easy-to-use interface for authorized users.
- Generate reports automatically, reducing the need for manual documentation.
- Saves time and effort by reducing dependence on manual inventory management methods.

7. CONCLUSION AND FUTURE SCOPE

7.1 Conclusion

This study has presented the development of the ElectroMobile Inventory Management System as a modern approach for handling electronic product inventory in retail stores. The system brings together product management, sales processing, and report generation within a single integrated platform while maintaining real-time stock updates. By replacing manual inventory procedures with automated operations, the system reduces dependency on paper-based records and minimizes the possibility of human errors. Practical testing of the system indicates reliable performance with accurate data handling, quick response time, and secure storage of information. The results also show improvement in tracking product availability and supporting informed business decisions for shop owners. Hence, the proposed system offers a simple, efficient, and scalable solution for small and medium-scale electronic retail businesses.

7.2 Future Scope

While the present system fulfills basic requirements of inventory and sales management, there is significant scope for future enhancements. The system can be extended to support multiple user roles with controlled access levels for administrators, employees, and managers. Barcode or QR code scanning functionality may be integrated to simplify product identification and accelerate billing operations. Digital payment modules can be incorporated to allow online transactions and automatic invoice generation. In addition, advanced reporting features with graphical analysis can be introduced for sales trend evaluation and business forecasting. Cloud-based deployment may also be implemented to enable remote access and secure data backup. Further improvements such as supplier management, customer relationship handling, and mobile application support can increase the usability and flexibility of the system for large-scale retail environments.

8. ACKNOWLEDGEMENT

It is with profound sense of gratitude that I acknowledge the constant help and encouragement from our Project guide & Mentor Prof. Guide name, Head of Computer Technology department Prof. Mr.Ghalame.S.S., hon. Principal Dr.Kanase.A.B. and wholehearted thanks to my family. This is to acknowledge and thanks to all individuals who played defining role in creating this work

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