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Ecommerce Website for Electronic Components - Electromart

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Abstract: ***ElectroMart is a web-based e-commerce platform developed to facilitate the online purchase of electronic components such as microcontrollers, sensors, ICs, and accessories. Traditional procurement of electronic components often involves fragmented vendor platforms and limited inventory transparency. This project provides a centralized digital marketplace with secure authentication, cart management, order processing, and administrative inventory control.The system is developed using Django (Python) for backend processing, HTML, CSS, and JavaScript for frontend development, and SQLite as the relational database. The platform supports role-based access control, enabling users to browse products, manage wishlists, place orders, track order status, and manage account settings. Administrators can manage products, monitor orders, update order status, and analyze revenue data through a dedicated admin dashboard. The proposed system improves inventory transparency, enhances user experience, and automates the order lifecycle process within an electronic component marketplace.***

Keywords: E-Commerce Platform, Django Framework, Role-Based Access Control, Inventory Management, Order Processing System, SQLite Database, Web Application Architecture, Electronic Components Marketplace.

I. INTRODUCTION

To address these limitations, ElectroMart is developed as a web-based e-commerce platform specifically designed for electronic components. The system provides a centralized digital marketplace where users can browse categorized products, view technical details, manage wishlists, add items to cart, and place orders securely. The platform enhances user convenience by offering structured product organization, transparent pricing, and real-time order tracking. The application is implemented using the Django framework in Python for backend processing, with HTML, CSS, and JavaScript for frontend development. SQLite is used as the relational database for managing structured data such as users, products, orders, and inventory records. The system follows a three-tier architecture consisting of presentation, application, and database layers, ensuring modularity and scalability. ElectroMart incorporates role-based access control to differentiate between users and administrators. While users can manage their accounts, addresses, and purchase history, administrators can monitor revenue, manage inventory, update order statuses, handle customer support tickets, and oversee overall system operations through a dedicated admin dashboard.By automating product management, inventory tracking, and order lifecycle processes, the proposed system improves operational efficiency, reduces manual errors, and enhances transparency in electronic component procurement. The rapid growth of digital commerce has transformed the way products are purchased and distributed across industries. In the electronics domain, students, hobbyists, researchers, and professionals frequently require components such as microcontrollers, sensors, integrated circuits, and accessories. However, traditional procurement methods often involve visiting multiple physical stores, checking inconsistent inventories, or relying on fragmented online vendors. These approaches lack centralized management, real-time stock visibility, and efficient order tracking mechanisms.

A. Problem Statement

Traditional electronic component purchasing systems suffer from several limitations:

1) Lack of centralized availability of electronic components across categories
2) Manual inventory management leading to stock in consistencies and overselling
3) Limitedtransparency in order tracking and delivery status
4) Poor integration between customer activity and inventory updates

These limitations highlight the need for an automated, web-based e-commerce solution that integrates user authentication, product management, cart operations, order processing, inventory control, and administrative monitoring into a unified platform

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II. RELATEDWORK

Several web-based systems have been developed to improve online product purchasing and service management. Early e-commerce platforms mainly focused on displaying product information and manually processing orders. These systems lacked proper database integration and real-time inventory updates, which often resulted in stock inconsistencies and limited transparency. the advancement of web technologies, modern frameworks such as Django and Flask enabled the development of database-driven applications with secure authentication and structured data handling. Many e-commerce systems now implement role-based access control, allowing administrators to manage products, users, and orders efficiently. Relational database systems such as MySQL and SQLite are commonly used to maintain data integrity and ensure reliable transaction processing.

The ElectroMart system builds upon these concepts by integrating product management, cart functionality, order tracking, and administrative monitoring into a single platform specifically designed for electronic components. The use of Django and SQLite ensures secure data handling and efficient interaction between application and database layers

III. PROPOSEDSYSTEM

A. System Architecture

The proposed system follows a three-tier architecture consisting of presentation, application, and database layers.

1) Presentation Layer: Implemented using HTML and CSS, this layer provides user-friendly interfaces for customers and administrators.

2) Application Layer: Developed using Python Django, this layer handles business logic such as product management, order processing, authentication, and data validation.

3) Database Layer: SQLite is used to store user records, product details, order information, and transaction history.

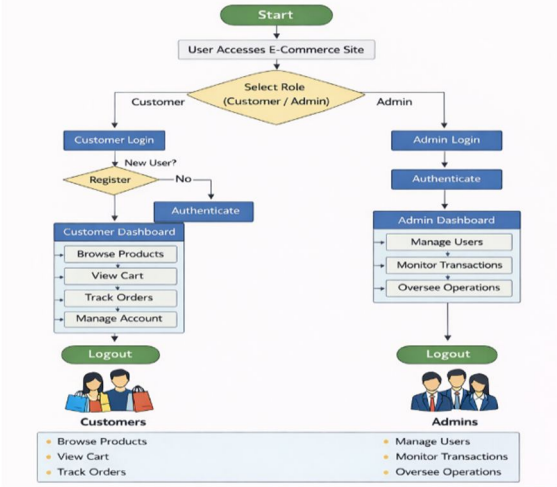


Fig 1: Unified Workflow of Ecommerce Website for Electronic Components

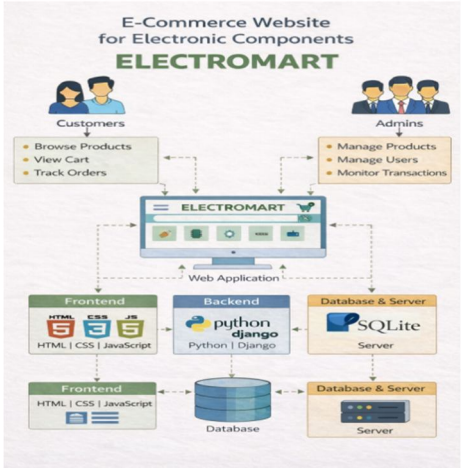


Fig2 : Unified Architecture of ElectroMart Ecommerce Management System

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B. Modules

Modules of the System

1) Authentication Module

Provides secure login and registration for users and administrators using encrypted passwords and session management

2) User Module

Allows users to:

- Register and log in
- Browse Electronic components
- Add products to cart and view order status

3) Product Management Module

Allows administrators to:

- Add new products
- Update price and stock quantity
- Delete products

4) Admin Module

Allows administrators to:

- Monitor users and Orders
- Update order status
- Manage system operations

5) Database Management Module

This module is responsible for storing and managing all system data using the SQLite database. It maintains user details, product records, order information, and cart data. Django ORM ensures efficient data handling and secure interaction between the application and the database.

C. System ***Implementation (Python Full Stack with Django)***

The backend of the system is implemented using Django, a Python web framework that supports structured development and clean URL routing. Django handles HTTP requests, session management, and database interactions using SQLite.

The frontend is built using standard web technologies to ensure browser compatibility and responsive design. SQLite is used for persistent data storage, maintaining user records, product information, and order details.

The integration of Django with SQLite enables efficient query execution, secure data handling, and smooth interaction between the application and database layers.

IV. RESULT AND DISCUSSION

The ElectroMart system was tested to ensure proper functionality of all modules. Users were able to register, log in, browse electronic components, add products to the cart, and place orders successfully. The system correctly stores user details, product information, and order records in the SQLite database. Stock quantities are automatically updated after order confirmation, ensuring accurate inventory management.

The admin module allows administrators to manage products, monitor orders, and update order status. Changes made by the admin are immediately reflected in the user dashboard. Role-based authentication restricts unauthorized access to the admin panel. Overall, the system performs efficiently and meets the objectives of developing a secure and user-friendly e-commerce platform for electronic components.

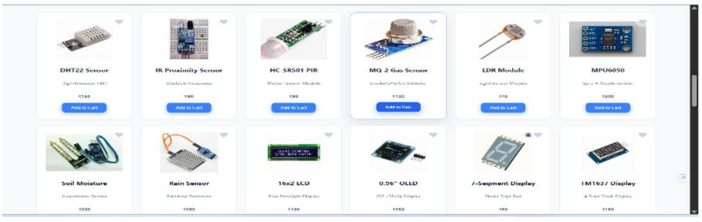


Fig.3.Result

V. ACKNOWLEDGEMENT

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VI. CONCLUSION

The ElectroMart system successfully implements a web-based e-commerce platform for electronic components using Django and SQLite. The system integrates user authentication, product management, cart functionality, order processing, and administrative monitoring within a structured three-tier architecture. The proposed platform eliminates the limitations of manual inventory tracking and fragmented purchasing systems by providing centralized management and real-time order status updates.

The implementation demonstrates secure authentication, efficient database handling, and smooth interaction between frontend and backend layers. The modular design ensures maintainability and scalability for future enhancements. Overall, the developed system provides a reliable and user-friendly solution for electronic component procurement and can be further extended with payment gateway integration and cloud deployment.

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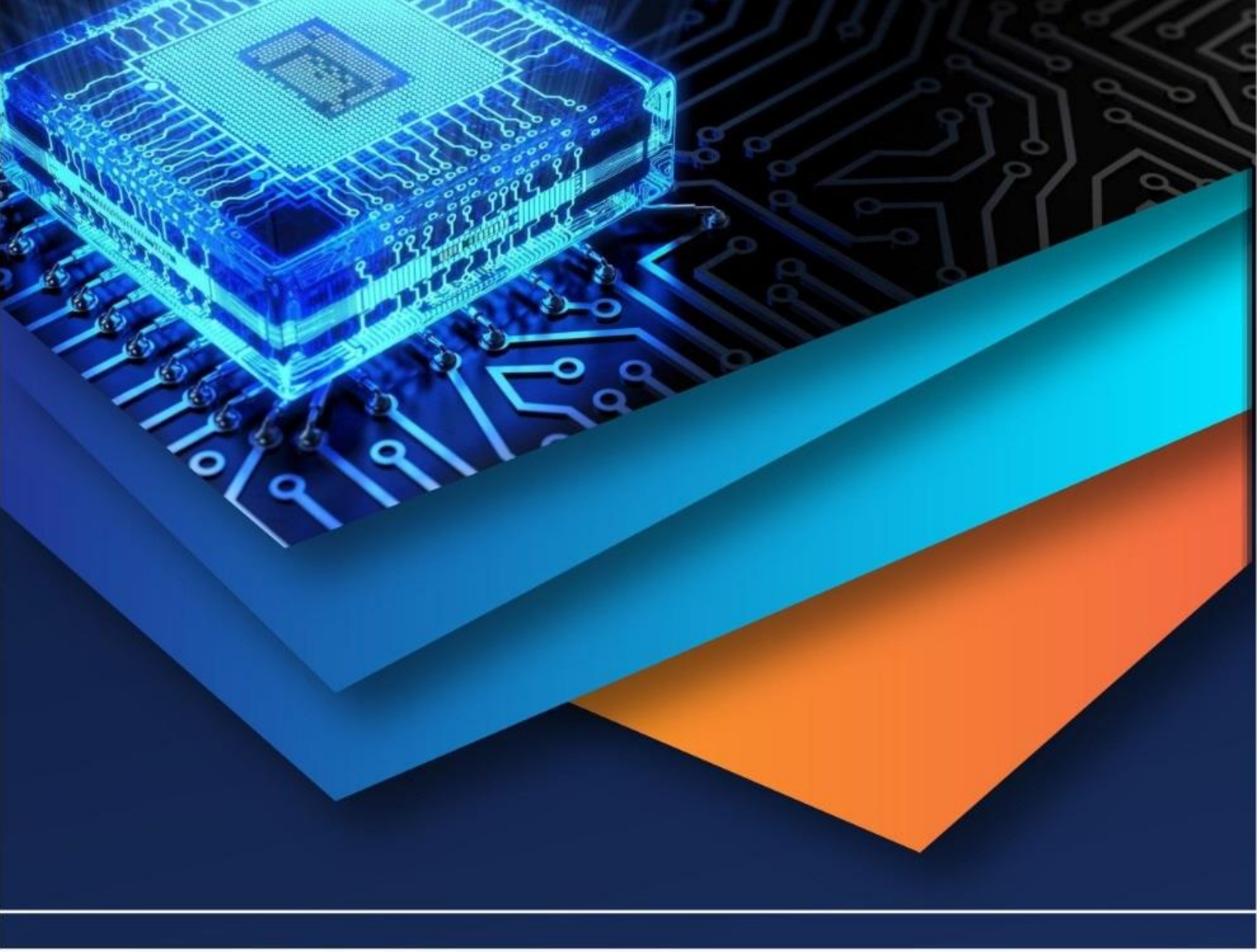
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