INTERNATIONAL JOURNAL OF PROGRESSIVE RESEARCH IN ENGINEERING MANAGEMENT AND SCIENCE (IJPREMS)
(Int Peer Reviewed Journal)
Vol. 05, Issue 09, September 2025, pp : 358-362

www.ijprems.com
editor@ijprems.com

e-ISSN : 2583-1062
Impact Factor : 7.001

ONLINE SHOPPING APP

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ABSTRACT

A web-based e-commerce application called OnlineShoppingML was created to offer a streamlined, safe, and customised purchasing experience. The system, which was created with Python 3.x, Flask, and SQLite, allows users to sign up, log in, explore products, add items to a shopping cart, and place orders. Administrators can effectively manage products and transactions. The use of machine learning-based product suggestions, which improve customer engagement by making pertinent item recommendations based on browsing and purchase history, is a crucial component of the system. With a focus on security, scalability, and usability, the project shows how web technologies and intelligent systems may be used practically in contemporary e-commerce.

1. INTRODUCTION

A machine learning recommendation system has been added to OnlineShoppingML, a web-based e-commerce application created with Flask and SQLite. It is meant to mimic an actual online store where customers can explore merchandise, control their shopping carts, place and monitor orders, and get tailored product recommendations. The project demonstrates how machine learning may be incorporated into real-world applications like e-commerce and also acts as a teaching tool for web development using Flask.

All of the essential features of a contemporary online shopping platform are offered by the program. With Flask-Login, users can create accounts, log in, and manage their profiles while maintaining secure access. While the shopping cart system enables the addition, deletion, and updating of items, the product catalogue facilitates browsing and searching. Customers may place orders, check the status of their transactions, and even obtain invoices in PDF format after making a purchase.

2. METHODOLOGY

The system is being developed using a methodical process:

1. **Requirement analysis:** compiled the e-commerce system's functional and non-functional needs.
2. **System Design:** Designed the system architecture, use case diagrams, and database structure.
3. **Technology Selection:** Flask, SQLite, and Python 3.x were selected for development.
4. **Frontend Development:** Using HTML, CSS, and Flask templates, a user interface was created for administrators and customers.
5. **Backend Development:** Applied transaction processing, authentication, and business logic.
6. **Database Integration:** To store users, goods, and orders, a SQLite database was created and connected.
7. **Testing:** Conducted security, system, integration, and unit tests.
8. **Deployment:** The application was hosted locally with the option to be deployed to the cloud.
9. **Maintenance:** Offered room for upcoming feature additions and improvements.

Fig 1: Login page

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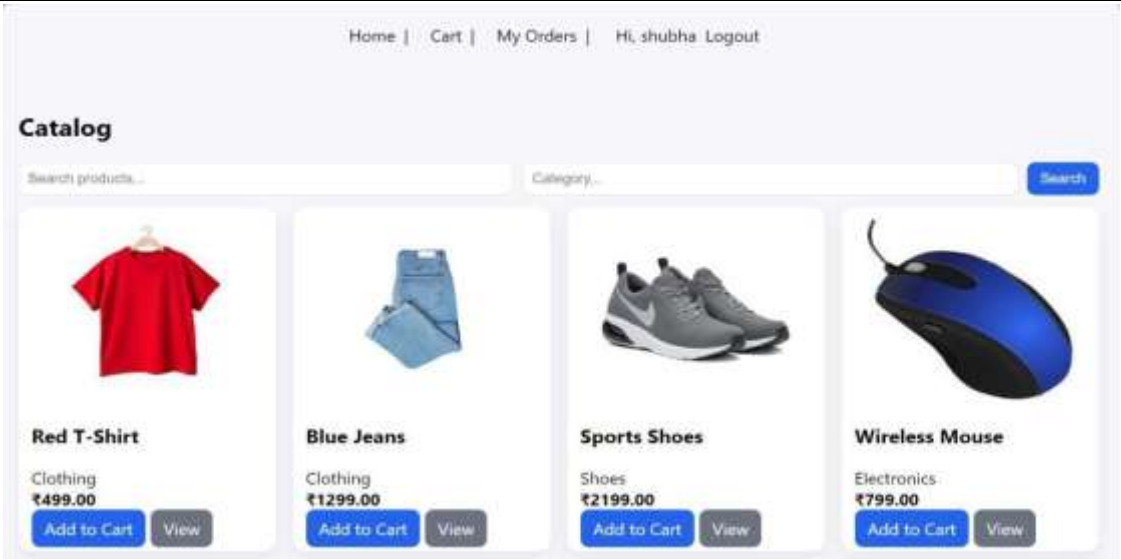

Fig 2: Home page

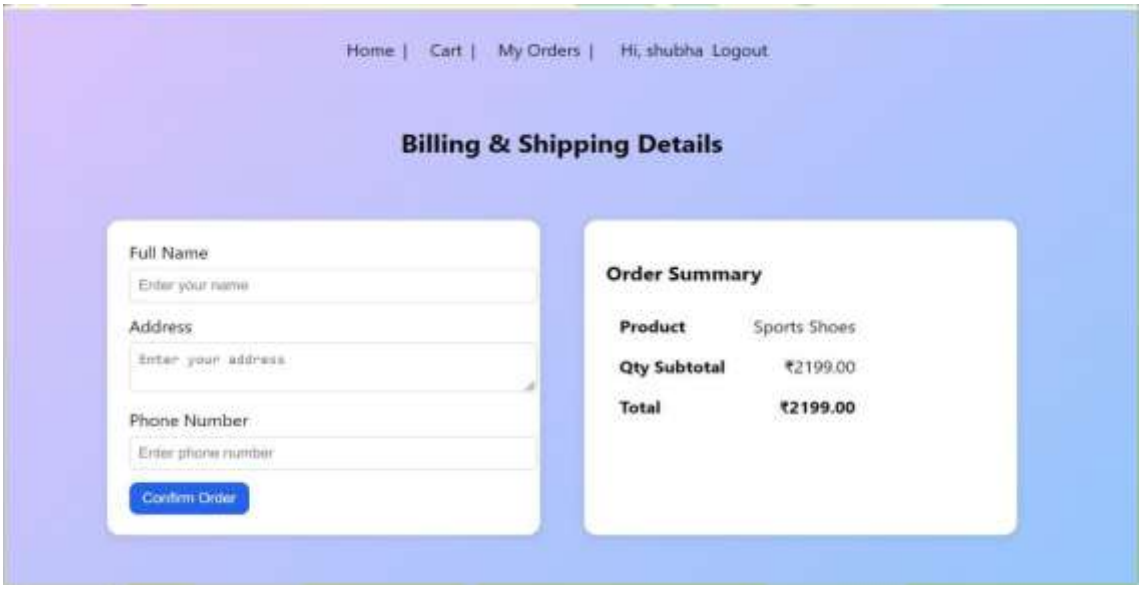

Fig 3: Billing and Shipping page

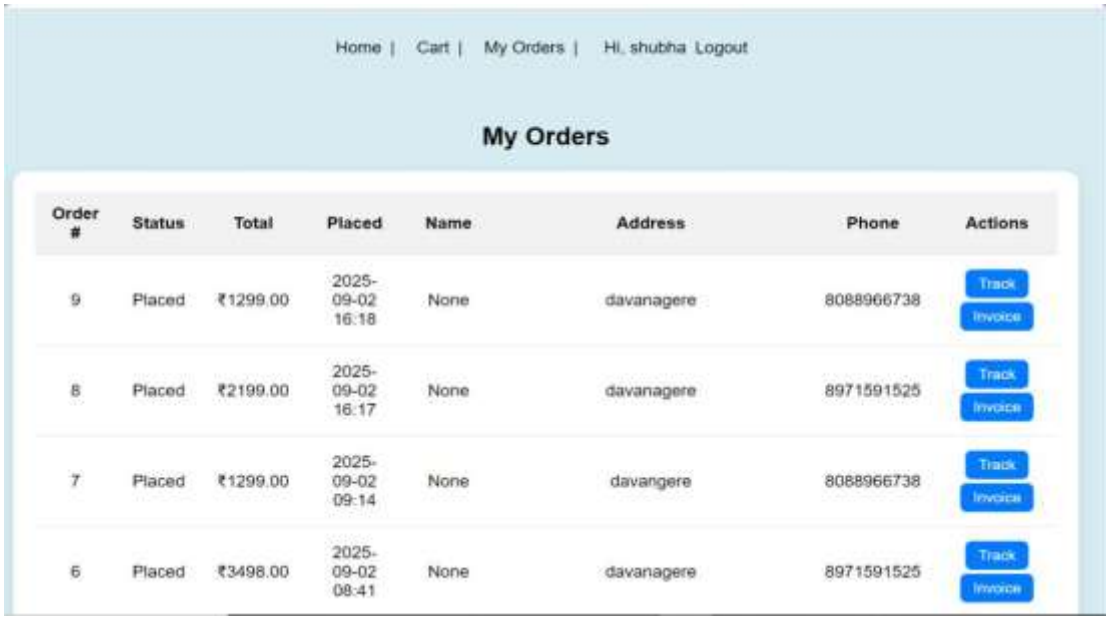

Fig 4: My Orders page

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3. INCREMENTAL MODEL

Software is developed using the Incremental Model, which divides the system into digestible chunks called increments. As the current system is tested and improved, new features are added with each increment. This lowers development risk, provides flexibility for modifications, and enables early delivery of a functional product.

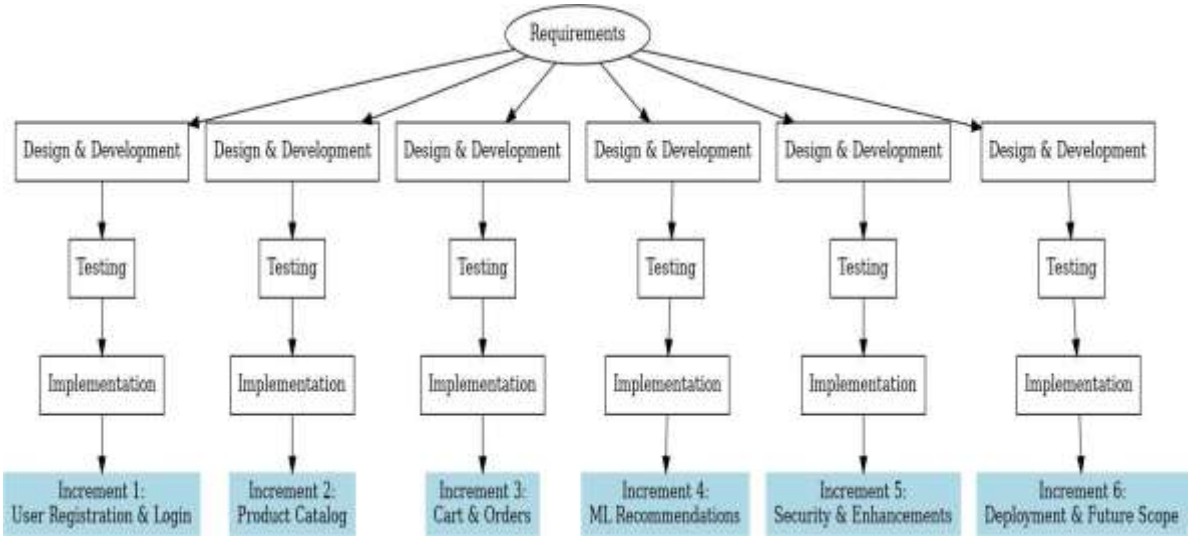

Fig 5: Incremental Model

Use Case Diagram

The Use Case Diagram illustrates how various actors carry out particular tasks and depicts the interaction between users and the system. Use cases like login, product browsing, cart management, order placing, and product management are all interacted with by actors like the customer and administrator in the OnlineShoppingML project. This diagram makes user requirements more clear and helps visualise system functionality.

Fig 6: Use case

Schema Diagram:

The OnlineShoppingML project's schema diagram illustrates the database's structure by displaying tables like Users, Products, Orders, Carts, and Transactions along with their connections. It shows how primary and foreign keys are used to store and link order records, product details, and customer data. For seamless system operations, this guarantees data consistency, integrity, and effective information retrieval.

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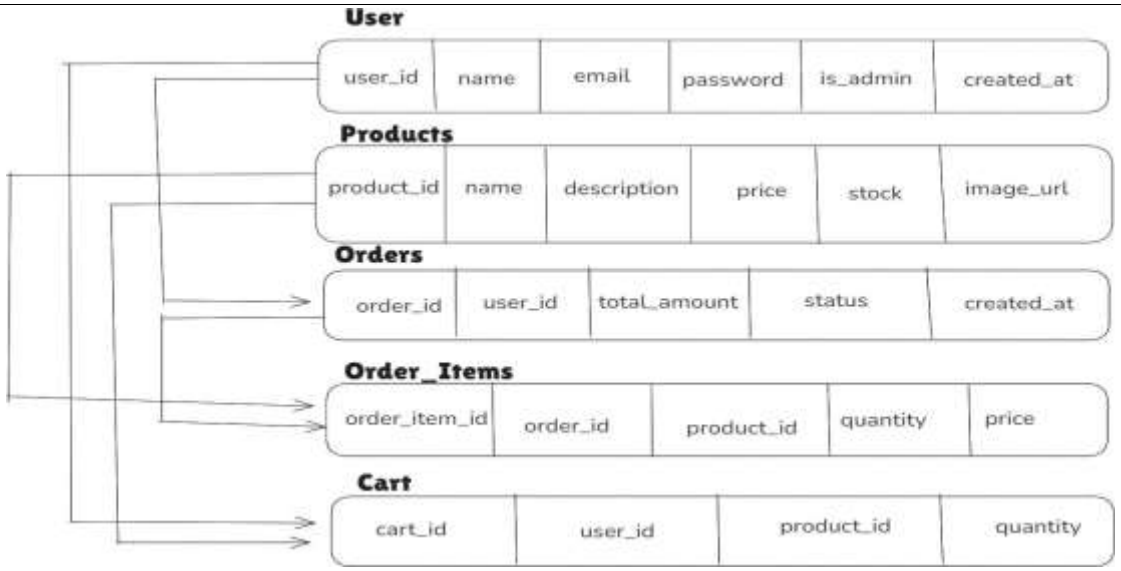

ER-Diagram:

The OnlineShoppingML project's Entity-Relationship (ER) Diagram shows the attributes and relationships of the system's entities, including Users, Products, Orders, Carts, and Payments. It facilitates comprehension of the data flow between administrators, users, and the system. This diagram facilitates effective communication between the application's many parts and guarantees a clear database design.

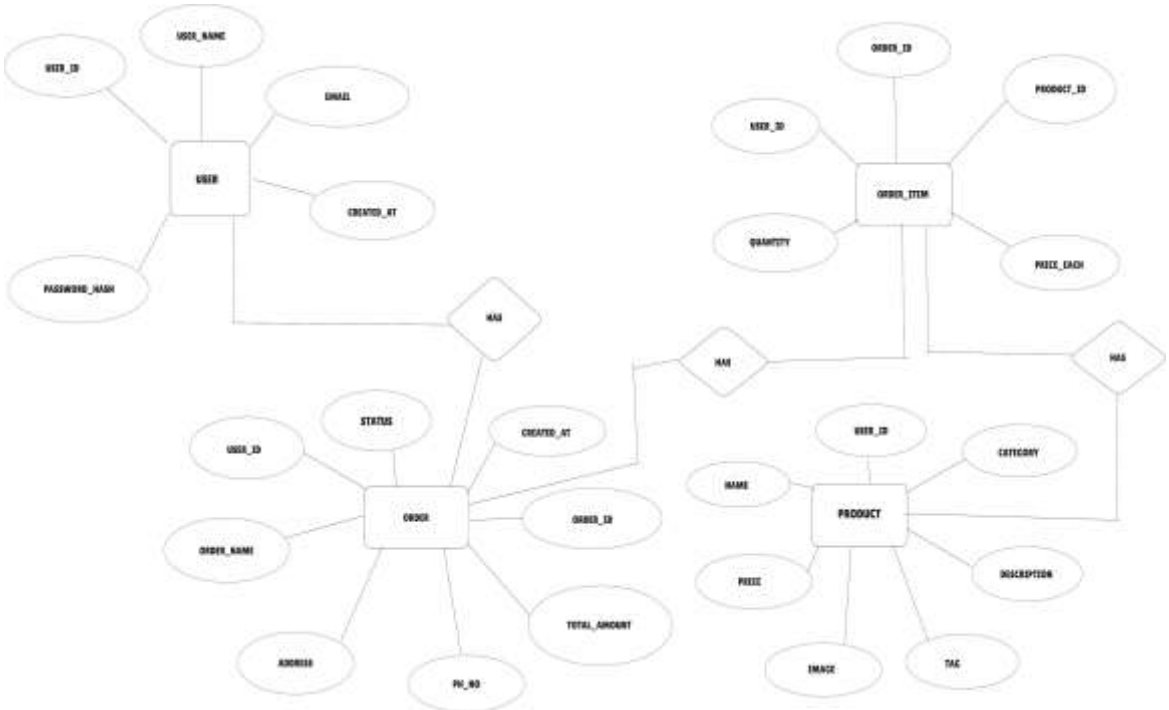

Fig 7: The above figure represents the ER Diagram

Connectivity steps with Database

- Establish a connection,
- import the SQLite library,
- create a cursor run queries
- commit and close

Languages

Python 3.x is the main backend language used by the OnlineShoppingML project to implement database functions, business logic, and machine learning features. To create interactive user interfaces and enhance user experience, the frontend uses HTML, CSS, and JavaScript. When combined, these languages provide a seamless integration of the application's data, logic, and user interaction.

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4. TESTING

Testing is essential to guaranteeing the OnlineShoppingML project's dependability and effectiveness. It confirms that every function, from user registration to product purchasing, operates flawlessly and as planned. The system's stability, security, and ability to manage real-world situations are all guaranteed by thorough testing.

Testing for functionality

To ensure that every system module functions as intended, functional testing was conducted. Comprehensive testing was done on features such user login, product browsing, cart addition, order placement, and purchase history generation. This made sure that each function produced the right result in accordance with the requirements.

Testing That Is Not Functional

Non-functional testing was carried out in addition to functional testing to assess the security, usability, and performance of the system. The system's speed in managing numerous users, consumer navigation simplicity, and data security features like password encryption were also evaluated. These testing contributed to the platform's user-friendliness and security.

Testing Outcomes

Both functional and non-functional tests were conducted, and the OnlineShoppingML system was determined to be dependable and strong. Every crucial operation ran without a hitch, and any problems found during testing were resolved before to release. All things considered, testing enhanced the system's quality and made sure it successfully satisfies user expectations.

5. CONCLUSION

The creation of an intuitive e-commerce platform with machine learning features is effectively demonstrated by the OnlineShoppingML project. The system offers a comprehensive shopping experience by integrating order processing, product administration, secure user authentication, and tailored recommendations. Using SQLite as the database, it guarantees seamless communication between administrators and clients while preserving system dependability and data consistency.

All things considered, this project demonstrates how web-based apps may streamline online transactions and improve customer happiness. It is scalable for upcoming improvements like chatbot support, payment gateway integration, and mobile application development because of its modular design, efficient database integration, and use of Python with Flask. As a result, the project not only achieves its goals but also lays a solid basis for practical implementation.

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