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**Software Engineering Project – E-Commerce Application**

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**1. Introduction**

*Purpose:*

This E-commerce project aims to develop a comprehensive and robust platform for online shopping, providing a comfortable and fun shopping experience for customers and empowering businesses to establish and grow their online presence. This project seeks to leverage the power of technology to bridge the gap between buyers and sellers, offering a user-friendly interface, secure transactions, and efficient inventory management.

*Audience:*

This project is designed to be useful to a wide range of users, including individuals, small businesses, and large enterprises. Whether you are a customer seeking a convenient online shopping experience or a business owner looking to expand your reach and boost sales, this platform will provide the necessary tools and features to meet your needs.

As for the Customers, this platform will offer a user-friendly interface and a wide selection of products, providing a convenient shopping experience. Customers can easily browse and compare products, read reviews and ratings, and make secure transactions, all from the comfort of their homes.

As for the businesses, it will offer a cost-effective easily accessible platform to showcase and sell their products. It will provide tools for inventory management, order tracking, and customer engagement.

As for the Developers and Technology Enthusiasts, they can contribute to the project, customize features, and build integrations, leveraging the power of open-source software development to drive innovation in the e-commerce space.

*Product Scope:*

This project encompasses various components essential for a successful online marketplace. It includes features such as product listings, shopping cart functionality, secure payment gateways, customer reviews and ratings, inventory management, and seller analytics. Additionally, the project will prioritize scalability and extensibility to accommodate future growth and advancements in the e-commerce industry.

With this E-commerce project, we aim to improve the way people buy and sell products online.

**2. Overall Description**

*Product Perspective:*

This project is a standalone online marketplace platform that connects buyers and sellers, facilitating smooth transactions and providing a good shopping experience. It will integrate essential functionalities such as product listings, shopping cart management, secure payment gateways, and inventory management. The platform will operate independently, serving as a centralized hub for various businesses and customers.

*Product Functions:*

1. User registration and authentication.

2. Product browsing, searching, and filtering.

3. Product listings with detailed descriptions, images, and pricing information.

4. Shopping cart management, allowing users to add, edit, and remove items.

5. Secure payment processing through various payment gateways.

6. Order tracking and status updates.

7. Customer reviews and ratings for products and sellers.

8. Inventory management for sellers, including stock tracking and updates.

9. Seller analytics and reporting.

10. Admin panel for platform management, user moderation, and content control.

*User Classes and Characteristics:*

Customers*:* Individuals or businesses looking to purchase products online, seeking convenience, a wide variety of choices, and secure transactions.

Sellers: Individuals, small businesses, or large enterprises offering products for sale, aiming to expand their customer base and streamline their sales operations.

Administrators: Platform administrators responsible for managing the overall system, monitoring user activities, and ensuring the platform's smooth operation.

*Operating Environment:*

This E-commerce platform will operate in a web-based environment, accessible through standard web browsers on desktop and mobile devices. It will utilize web technologies such as HTML, CSS, and JavaScript for the user interface, and PHP as the backend technology for server-side functionality. The platform will leverage secure communication protocols (e.g., HTTPS) and integrate with trusted third-party payment gateways to ensure data privacy and security.

*Design and Implementation Constraints:*

1. Scalability: The system must be scalable to handle a growing number of users, products, and transactions.
2. Performance: The platform should provide fast response times and handle concurrent user interactions efficiently.
3. Security: Robust security measures must be implemented to protect user data, prevent unauthorized access, and ensure secure transactions.
4. Compatibility: The platform should be compatible with major web browsers and responsive across different devices.
5. Usability: The user interface should be intuitive, easy to navigate, and accessible to users with varying levels of technical proficiency.

*Assumptions and Dependencies:*

1. Availability of reliable internet connectivity for users to access the platform.
2. Integration with trusted third-party payment gateways for secure online transactions.
3. Compliance with applicable legal and regulatory requirements for e-commerce platforms.
4. Availability of a hosting infrastructure capable of supporting the anticipated user traffic and data storage requirements.

**3. External Interface Requirements**

*User Interfaces:*

1. User Registration and Login: Users should be able to create accounts, log in securely, and manage their profile information.
2. Product Listings: Users should be able to view detailed product descriptions, images, pricing information, and seller ratings.
3. Shopping Cart Management: Users should be able to add products to their cart, edit quantities, and remove items easily.
4. Payment Processing: Users should be able to select preferred payment methods, enter payment details securely, and receive confirmation of successful transactions.
5. Order Tracking: Users should be able to track the status of their orders, view shipment details, and receive notifications.
6. Seller Dashboard: Sellers should have a dedicated dashboard to manage their inventory, update product information, track sales, and access analytics.

*Hardware Interfaces:*

This plaftorm does not require specific hardware interfaces.

It should be accessible through standard hardware devices such as desktop computers, laptops, smartphones, and tablets that support web browsing capabilities.

The platform should adapt responsively to different screen sizes.

*Software Interfaces:*

This platform will interact with various software components and services. The following software interfaces are required:

1. Payment Gateways: Integration with one or more payment gateway providers to process secure online payments.
2. Database Management System: Interaction with a database system to store and retrieve user data, product information, and transaction records.
3. External APIs: Integration with external services such as shipping carriers, inventory management systems, and social media platforms for extended functionality and data exchange.

*Communication Interfaces:*

This platform will communicate with external entities using the following interfaces:

1. HTTP/HTTPS: The platform will utilize the HTTP/HTTPS protocol for communication between the user's web browser and the web server hosting the application.
2. Email Notifications: The platform should be able to send email notifications to users for account verification, order confirmations, and password resets.
3. SMS Notifications (optional): Integration with SMS gateways to send text message notifications to users, if applicable.

This platform aims to provide seamless integration with these external interfaces, ensuring a smooth user experience and efficient data exchange between the platform and external systems or services.

**4. System Features**

This platform incorporates a range of features that enhance the overall functionality and user experience. These features are designed to meet the needs of both buyers and sellers, facilitating seamless transactions and efficient management. The key system features include:

*1. User Registration and Authentication:*

* + Allow users to create accounts, providing necessary information for registration.
  + Implement secure authentication mechanisms, such as password hashing and account verification.

1. *Product Listings and Search by category:*
   * Enable sellers to create detailed product listings with descriptions, images, and pricing information.
2. *Shopping Cart Management:*
   * Allow users to add products to their shopping cart, modify quantities, and remove items as needed.
   * Calculate and display the total cost of items in the cart.
3. *Inventory Management:*
   * Enable sellers to manage their product inventory
   * Provide sellers with tools to update product availability and manage pricing dynamically.
4. *Seller Analytics and Reporting:*
   * Offer sellers insights into sales performance, revenue, popular products, and customer behavior through comprehensive analytics and reporting features.
   * Generate reports on sales, inventory, and customer metrics to assist sellers in making informed business decisions.
5. *Admin Panel:*
   * Provide an administrative panel for platform administrators to manage user accounts, review and moderate listings etc...
   * Implement content control mechanisms to prevent fraudulent or inappropriate content.
6. *Responsive Design and Mobile Support:*
   * Ensures that the platform is accessible and provides optimal user experience across different devices, including desktops, laptops, tablets, and smartphones.
   * Implements a responsive design that adapts to various screen sizes and resolutions.