Project Title - Online commerce website

1. Abstract

An Online E-Commerce Website is a web-based application that enables users to buy and sell products or services over the internet in a convenient and secure manner. With the rapid growth of digital technologies and online shopping, e-commerce platforms have become an essential part of modern business. This project focuses on the design and development of an Online E-Commerce Website using the **Agile software development methodology**, which emphasizes flexibility, iterative development, and continuous user feedback.

The primary objective of this e-commerce system is to provide a user-friendly platform where customers can browse products, view detailed descriptions, add items to a shopping cart, and complete purchases through secure payment mechanisms. The system supports user registration and authentication, product search and filtering, order placement, order tracking, and payment confirmation. An admin module is also included to manage products, categories, inventory, pricing, and customer orders efficiently.

The Agile methodology is applied throughout the project lifecycle to ensure incremental and continuous delivery of functional modules. The development process is divided into multiple sprints, each focusing on specific features such as user authentication, product catalog management, shopping cart functionality, order processing, and report generation. Regular sprint reviews and feedback sessions help in identifying improvements early and adapting to changing requirements. Continuous testing during each sprint ensures high quality and reliability of the system.

The e-commerce website is developed using standard software engineering principles such as modular design, object-oriented programming, data validation, and exception handling. The system is designed to be scalable, allowing future enhancements such as mobile application support, personalized recommendations, and integration with third-party services. Security measures like user authentication and controlled access are considered to protect sensitive user and transaction data.

In conclusion, the Online E-Commerce Website developed using Agile methodology provides an efficient and reliable solution for online shopping and business management. The project demonstrates how Agile practices improve development efficiency, product quality, and customer satisfaction. This system helps businesses expand their reach, streamline operations, and offer a seamless shopping experience to customers while allowing continuous improvement through iterative development.

2. Introduction – Online E-Commerce Website Using Agile

2.1 Introduction

An Online E-Commerce Website is a digital platform that allows users to buy and sell products or services through the internet. It provides features such as product browsing, shopping cart, online payment, and order tracking. With the increasing use of smartphones and internet services, e-commerce platforms have become essential for businesses to reach a wider audience. This project focuses on developing an e-commerce website using the **Agile methodology**, ensuring flexibility, faster delivery, and continuous improvement based on user feedback.

2.2 Problem Identification

Traditional shopping methods require physical presence, which is time-consuming and limited by location and store hours. Many small businesses face difficulties in managing inventory, orders, and customer data manually. Customers often struggle with limited product choices, lack of price comparison, and delayed

services. Existing rigid systems are difficult to update and do not easily adapt to changing business requirements.

2.3 Need of the Project

There is a strong need for an efficient and user-friendly online e-commerce system that:

- Provides 24/7 access to products and services
- Reduces manual work in order and inventory management
- Ensures secure and fast online transactions
- Improves customer reach and satisfaction
- Supports easy updates and scalability using Agile practices

This project helps businesses automate sales operations and enhance the overall shopping experience.

2.4 Project Scheduling

The project is planned using the **Agile development model** and divided into multiple sprints:

- **Sprint 1:** User registration and login
- **Sprint 2:** Product catalog and category management
- **Sprint 3:** Shopping cart and order placement
- **Sprint 4:** Payment processing and order tracking
- **Sprint 5:** Admin module and report generation
- **Sprint 6:** Testing, feedback, and deployment

Each sprint includes design, development, testing, and review to ensure timely and quality delivery.

2.5 Objectives

- To design and develop a user-friendly e-commerce website
- To enable online product browsing and purchasing
- To provide secure payment and order management
- To reduce manual effort in business operations
- To implement Agile methodology for flexible development
- To ensure scalability for future enhancements

This project aims to deliver a reliable and efficient online shopping platform using Agile principles.

3. Software Requirement Specification (SRS) – Online E-Commerce Website

3.1 Purpose

The purpose of this Software Requirement Specification (SRS) document is to clearly define the functional and non-functional requirements of the Online E-Commerce Website. It serves as a reference for developers, testers, and stakeholders to understand the system's features, constraints, and expected behavior. The system aims to provide a secure, reliable, and user-friendly platform for online shopping and business management using Agile development practices.

3.2 Scope

The scope of the Online E-Commerce Website includes:

- User registration and authentication

- Product browsing, search, and filtering
- Shopping cart management
- Order placement and order tracking
- Secure online payment processing
- Admin module for product, inventory, and order management
- Report generation for sales and users

The system is designed to be scalable, allowing future enhancements such as mobile app support, personalized recommendations, and third-party integrations.

3.3 Hardware Requirement / Software Requirement (Minimum)

Hardware Requirements:

- Processor: Intel Core i3 or higher
- RAM: Minimum 4 GB
- Hard Disk: 10 GB free space
- Display: Resolution 1024×768 or above

Software Requirements:

- Operating System: Windows 10 / Linux
- Programming Language: Java / Python / PHP
- Database: MySQL
- Web Technologies: HTML, CSS, JavaScript
- Web Browser: Google Chrome / Mozilla Firefox
- IDE: Eclipse / IntelliJ IDEA / VS Code

3.4 Tools

- IDE: Eclipse / IntelliJ IDEA / Visual Studio Code
- Database Tool: MySQL Workbench / phpMyAdmin
- Version Control: Git / GitHub
- Testing Tools: JUnit / Selenium
- Build Tool: Maven / Gradle
- Documentation Tool: MS Word / Google Docs

3.5 Software Process Model

The project follows the **Agile Software Development Model**. Development is carried out in iterative cycles called sprints, where each sprint includes requirement analysis, design, development, testing, and review. Continuous user feedback and regular sprint reviews help in improving system quality and accommodating changing requirements. Agile ensures flexibility, faster delivery, and improved collaboration throughout the project lifecycle.

4. System Design – Online E-Commerce Website

4.1 Data Dictionary

The Data Dictionary describes the data elements used in the E-Commerce system.

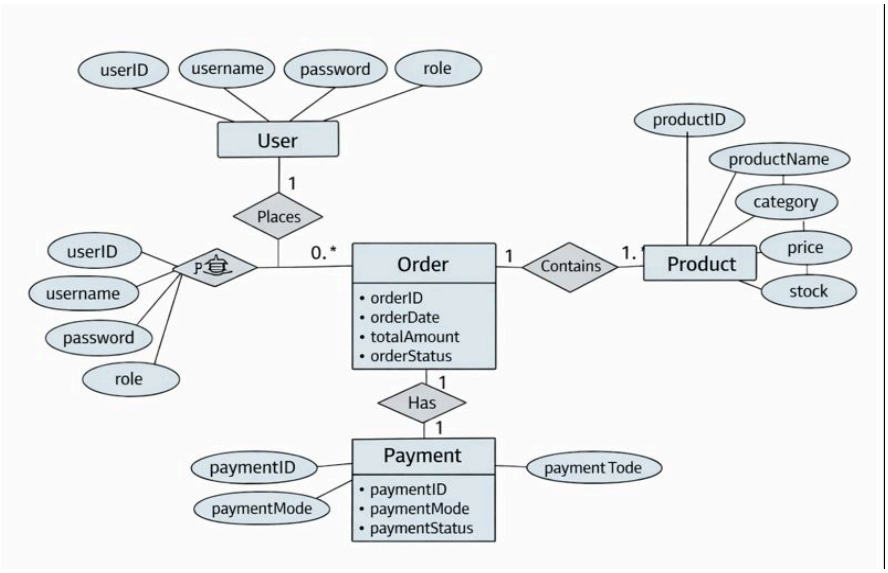
- **User**
    - userID: Unique identifier for user

    - username: Login name
    - password: Encrypted password
    - role: User/Admin
- **Product**
    - productID: Unique product identifier
    - productName: Name of the product
    - category: Product category
    - price: Product price
    - stock: Available quantity
- **Order**
    - orderID: Unique order identifier
    - orderDate: Date of order
    - totalAmount: Total order value
    - orderStatus: Placed/Shipped/Delivered
- **Payment**
    - paymentID: Unique payment identifier
    - paymentMode: Card/UPI/Net Banking
    - paymentStatus: Success/Failed

4.2 ER Diagram

The ER diagram represents the logical relationship between entities in the E-Commerce system. Main entities include **User, Product, Order, and Payment**.

- A User can place multiple Orders
- An Order can contain multiple Products
- Each Order is associated with one Payment
  This diagram ensures proper database structure and data integrity.



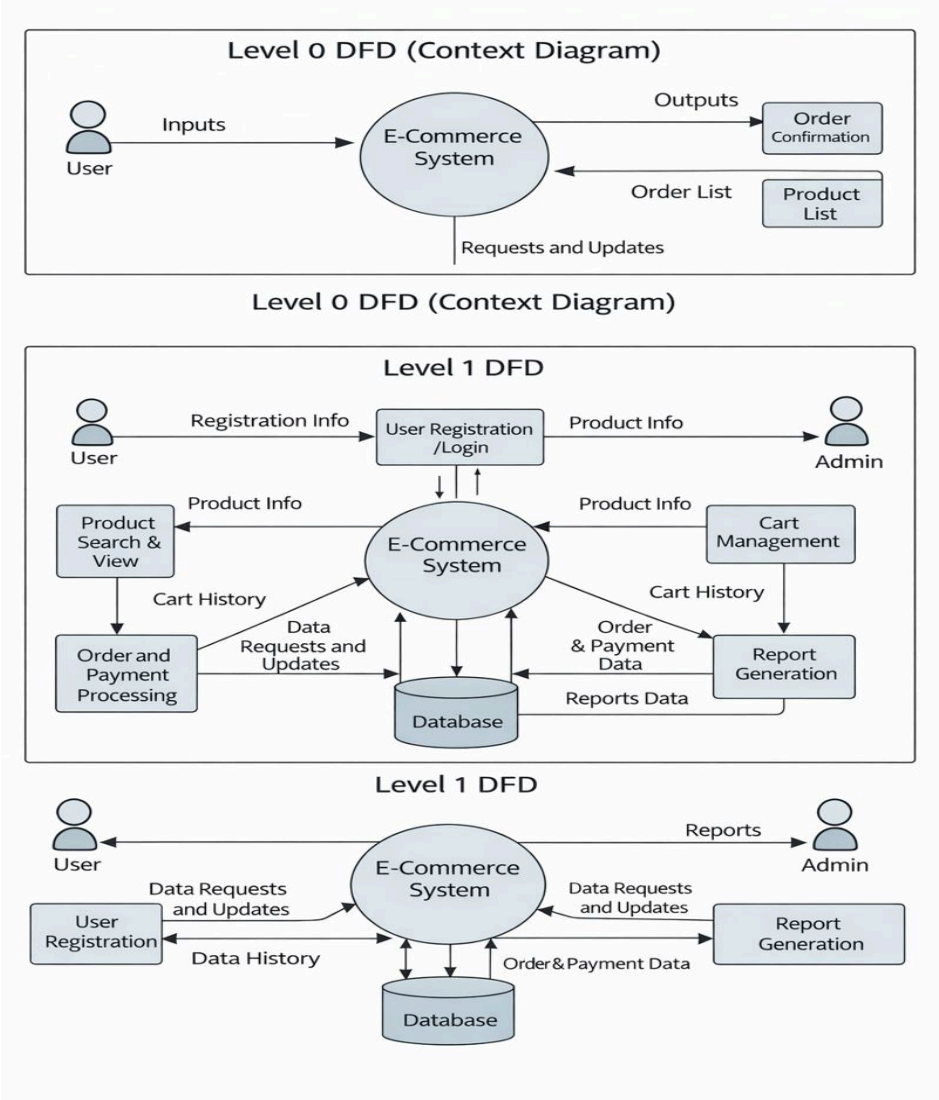
4.3 Data Flow Diagram (DFD)

Level 0 (Context Diagram):
User → E-Commerce System → Database → Output (order confirmation, product list)

Level 1 DFD:

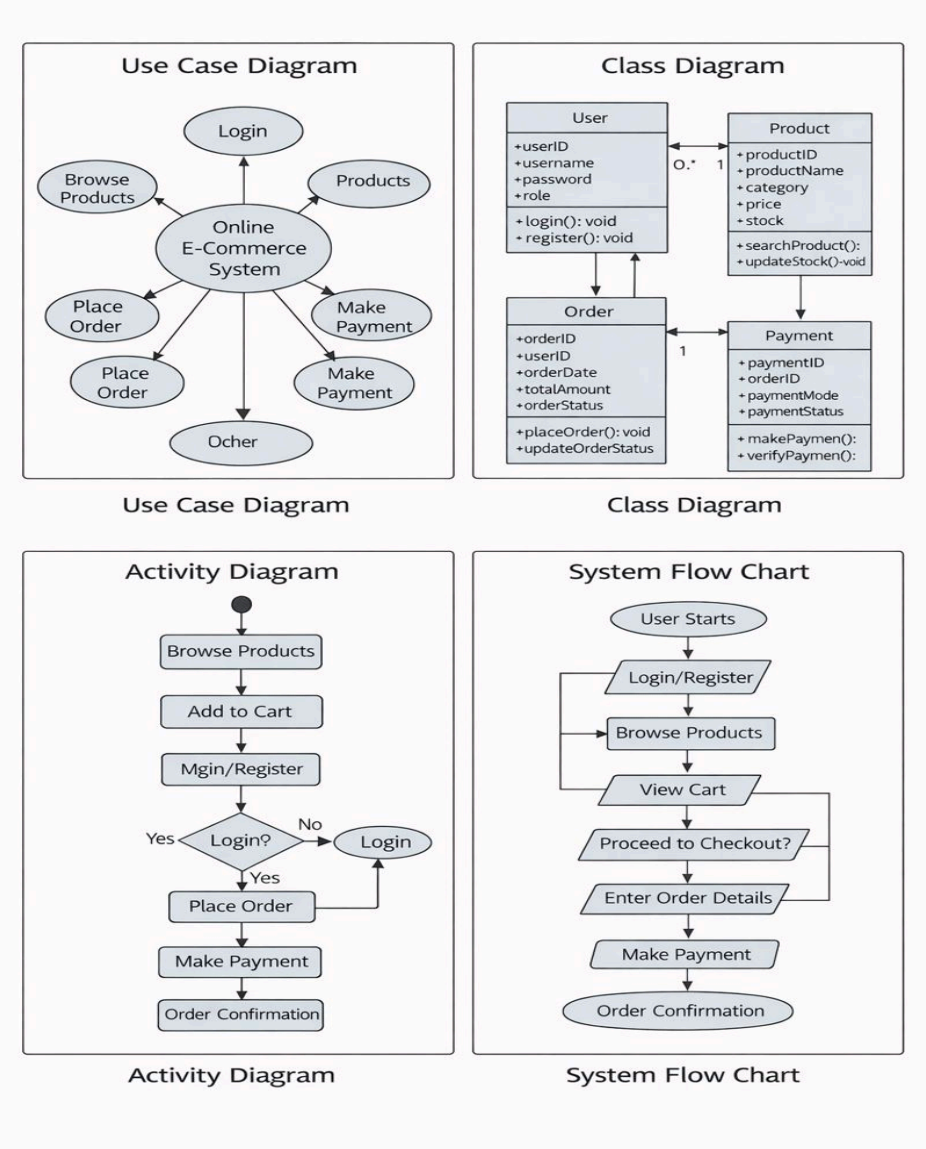
- User Registration/Login

- Product Search and View
- Cart Management
- Order and Payment Processing
- Report Generation



4.4 Other Diagrams (If Required)

- **Use Case Diagram:** User login, browse products, add to cart, place order, make payment, admin management
- **Class Diagram:** User, Product, Order, Payment classes with attributes and methods
- **Activity Diagram:** Flow from product selection to order confirmation
- **System Flow Chart:** Shows step-by-step execution of the system



These diagrams collectively explain the structure, behavior, and interaction of components within the Online E-Commerce Website.

5. Implementation – Online E-Commerce Website

5.1 Program Code

The Online E-Commerce Website is implemented using a modular and object-oriented approach. The system is developed using **Java (or web technologies)** following the Agile methodology. Separate modules/classes are created for **User, Product, Order, Cart, and Payment**, as defined in the class diagram.

Key implementation features:

- **User Authentication:** Allows users to register and log in securely using username and password.
- **Product Management:** Displays product list with categories, price, and availability.
- **Cart Management:** Users can add, update, or remove products from the cart.
- **Order Processing:** Handles order placement and order status updates.
- **Payment Processing:** Supports multiple payment modes and validates transactions.

- **Admin Module:** Manages products, inventory, and generates reports.
- **Data Storage:** Data is stored using MySQL database or collections.
- **Exception Handling:** Ensures smooth handling of invalid inputs and runtime errors.
- **Agile Development:** Features are developed incrementally and tested sprint-wise.

Sample Code Snippet (Login Validation):

```
if(username.equals(dbUser) && password.equals(dbPass)) {
   System.out.println("Login Successful");
} else {
   System.out.println("Invalid Username or Password");
}
```

5.2 Output Screens

The output of the Online E-Commerce Website is displayed through console-based screens or a web interface.

Main Menu Screen:
1. Register
2. Login
3. Browse Products
4. View Cart
5. Place Order
6. Make Payment
7. Exit

Product Display Screen:
Product ID: 201
Product Name: Wireless Mouse
Category: Electronics
Price: ₹799
Stock: Available

Cart Screen:
Product: Wireless Mouse
Quantity: 1
Total Price: ₹799

Order Confirmation Screen:
Order ID: 5001
Order Status: Confirmed
Payment Status: Successful

Report Screen (Admin):
Total Users: 120
Total Orders: 75
Total Sales: ₹1,25,000

These output screens confirm the correct functioning of the E-Commerce system and demonstrate successful execution of all major operations.

6. Testing – Online E-Commerce Website

6.1 Test Data

Testing is performed using sample and real-time data to verify the correctness and reliability of the system. The following test data is used:

- **User Login Test Data:**
  - Username: user01
  - Password: user@123
- **Product Data:**
  - Product ID: P101
  - Product Name: Mobile Phone
  - Category: Electronics
  - Price: ₹15,000
  - Stock: 20
- **Order Data:**
  - Order ID: O501
  - Product: Mobile Phone
  - Quantity: 1
  - Total Amount: ₹15,000
- **Payment Data:**
  - Payment Mode: UPI / Card
  - Payment Status: Success

Both valid and invalid inputs are tested to ensure proper validation and error handling.

6.2 Test Result

All functional modules of the Online E-Commerce Website were tested successfully.

- User registration and login worked correctly with valid credentials
- Invalid login attempts were handled with proper error messages
- Products were displayed accurately based on search and category
- Cart management functions (add, remove, update) performed correctly
- Order placement and payment processing completed successfully
- Order confirmation and reports were generated accurately

The system met all specified requirements and produced expected outputs, confirming that the application is reliable, user-friendly, and ready for deployment.

7. User Manual – Online E-Commerce Website

7.1 How to Use Project Guidelines

1. **Access the Website:**
   Open the e-commerce website using a supported web browser such as Google Chrome or Mozilla Firefox.
2. **User Registration / Login:**
   New users must register by providing basic details such as username, email, and password. Existing users can log in using valid credentials.

3. **Browse Products:**
   After successful login, users can browse products by category or use the search option to find specific items.
4. **View Product Details:**
   Click on a product to view details such as price, description, and availability.
5. **Add to Cart:**
   Select the desired product and add it to the shopping cart.
6. **Cart Management:**
   Users can view the cart, update quantities, or remove products before placing an order.
7. **Place Order and Payment:**
   Proceed to checkout, choose a payment method, and complete the payment securely.
8. **Order Confirmation:**
   After successful payment, an order confirmation message is displayed.
9. **Admin Functions (If Applicable):**
   Admin users can add, update, or delete products, manage orders, and generate reports.
10. **Logout:**
    Users can log out safely after completing their tasks.

7.2 Screen Layouts and Description

1. Login / Registration Screen

- **Fields:** Username, Email, Password
- **Purpose:** Allows users to create an account or log in securely.

2. Home Page / Product Listing Screen

- **Displays:** Product categories, product images, prices, search bar
- **Purpose:** Enables users to browse and select products.

3. Product Details Screen

- **Displays:** Product name, description, price, stock availability
- **Purpose:** Provides detailed information before purchase.

4. Shopping Cart Screen

- **Displays:** Selected products, quantity, total price
- **Purpose:** Allows users to manage selected items.

5. Checkout / Payment Screen

- **Displays:** Order summary, payment options
- **Purpose:** Completes the order and payment process.

6. Order Confirmation Screen

- **Displays:** Order ID, product details, total amount
- **Purpose:** Confirms successful order placement.

7. Admin Dashboard Screen

- **Displays:** Product management, order management, reports
- **Purpose:** Enables administrators to manage system operations.

These screen layouts ensure a smooth, user-friendly experience and help users navigate the Online E-Commerce Website effectively.

8. Project Applications and Limitations – Online E-Commerce Website

Project Applications

- **Online Shopping Platform:** Enables customers to browse, select, and purchase products anytime and from anywhere.
- **Business Expansion:** Helps businesses reach a wider audience beyond physical store locations.
- **Inventory Management:** Assists administrators in managing product stock, pricing, and availability efficiently.
- **Order Management:** Automates order placement, tracking, and history maintenance.
- **Customer Convenience:** Saves time and effort by providing doorstep shopping and multiple payment options.
- **Data Management:** Maintains organized records of users, products, orders, and payments.
- **Scalability:** Can be extended to support mobile apps, multiple vendors, and advanced analytics.

Project Limitations

- **Basic Security Features:** Advanced security mechanisms like multi-factor authentication are not implemented.
- **Internet Dependency:** Requires a stable internet connection for access and transactions.
- **Limited Payment Options:** Only basic payment modes are supported in the current version.
- **Performance Constraints:** May face performance issues with a very large number of users or products.
- **No AI-Based Recommendations:** Product recommendations are not personalized.
- **Maintenance Requirement:** Regular updates are required to manage bugs and enhance features.

9. Conclusion and Future Enhancement – Online E-Commerce Website

Conclusion

The Online E-Commerce Website developed using the Agile methodology provides an efficient, reliable, and user-friendly platform for buying and selling products online. The system successfully automates essential business processes such as user registration, product browsing, shopping cart management, order placement, and payment processing. By adopting Agile practices, the project enables iterative development, continuous testing, and timely delivery of functional modules. This approach improves software quality, allows quick adaptation to changing requirements, and enhances customer satisfaction. The system also helps businesses manage inventory and orders efficiently while providing customers with a seamless and convenient shopping experience.

Future Enhancement

- **Mobile Application Development:** Create Android and iOS applications for better accessibility.
- **Advanced Security:** Implement multi-factor authentication and data encryption to enhance security.
- **AI-Based Recommendations:** Suggest products based on user preferences and purchase history.
- **Multiple Payment Gateways:** Integrate more secure and diverse payment options.
- **Real-Time Notifications:** Email or SMS notifications for order updates and delivery status.
- **Multi-Vendor Support:** Allow multiple sellers to register and sell products on the platform.
- **Analytics Dashboard:** Provide detailed insights into sales, users, and product performance.

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