PROJECT REPORT
Online E-Commerce Website Using Agile Methodology

1. Introduction

In today's digital era, online shopping has become an essential part of daily life. An **E-Commerce website** allows users to browse products, place orders, make online payments, and track deliveries through the internet. Businesses benefit by reaching a wider audience, reducing operational costs, and improving customer satisfaction.

This project focuses on developing an **Online E-Commerce Website** using the **Agile Software Development Methodology**, which emphasizes flexibility, continuous improvement, and customer feedback.

2. Objectives of the Project

The main objectives of this project are:

- To design and develop a user-friendly online shopping platform
- To allow users to register, log in, and manage profiles
- To provide product browsing, searching, and filtering features
- To implement secure online payment and order management
- To develop the system using Agile methodology for better adaptability

3. Scope of the Project

The scope of the Online E-Commerce Website using Agile Methodology defines the boundaries, features, and functionalities covered in the project. This project focuses on designing and developing a web-based platform that enables users to perform online shopping efficiently and securely.

The project includes the following key components:

- User registration, login, and profile management
- Secure authentication and session handling
- Product listing with categories, search, and filter options
- Detailed product descriptions with images and pricing

- Shopping cart functionality (add, update, remove items)
- Order placement and order history management
- Online payment simulation
- Admin module for managing products, users, and orders
- Responsive and user-friendly user interface
- Iterative development and continuous improvement using Agile methodology

The project does not include real-time courier services, third-party delivery system integration, or live payment gateway implementation in the current phase. These features can be added as future enhancements.

4. Agile Methodology Overview

4.1 What is Agile?

Agile is a **modern software development methodology** that focuses on iterative development, collaboration, customer feedback, and flexibility. Instead of delivering the whole system at once, Agile delivers the product in small, usable parts called **iterations or sprints**.

4.2 Agile Principles

- Customer satisfaction through continuous delivery
- Welcome changing requirements
- Frequent delivery of working software
- Close collaboration between business and development teams
- Continuous improvement

4.3 Agile Framework Used

This project uses the **Scrum framework**, which includes:

- Product Backlog
- Sprint Planning
- Daily Stand-ups
- Sprint Review

5. Functional Requirements

Functional requirements describe the specific operations and features that the Online E-Commerce Website using Agile Methodology must perform. These requirements define how users and administrators interact with the system.

1. User Registration and Authentication

- The system shall allow new users to register using valid details.
- The system shall allow registered users to log in using a username and password.
- The system shall provide secure logout functionality.

2. User Profile Management

- The system shall allow users to view and update personal details.
- The system shall allow users to manage delivery addresses.

3. Product Management

- The system shall display a list of available products with images and prices.
- The system shall allow users to view detailed product information.
- The system shall support product categorization and filtering.

4. Search Functionality

- The system shall allow users to search products by name or category.
- The system shall display relevant search results.

5. Shopping Cart

- The system shall allow users to add products to the shopping cart.
- The system shall allow users to update product quantity or remove items from the cart.
- The system shall calculate total price automatically.

6. Order Management

- The system shall allow users to place orders.

- The system shall generate an order summary and confirmation.
- The system shall allow users to view order history.

7. Payment Processing

- The system shall provide online payment simulation.
- The system shall generate payment confirmation after successful transaction.

8. Admin Module

- The system shall allow administrators to log in securely.
- The system shall allow admins to add, update, and delete products.
- The system shall allow admins to view and manage user orders.
- The system shall allow admins to manage product categories.

6. System Architecture

The **Online E-Commerce Website** is designed using a **three-tier (layered) architecture**, which separates the system into independent layers. This architectural design improves **scalability, security, maintainability, and performance** and aligns well with **Agile development**, where features are developed and enhanced incrementally..

1. Presentation Layer (User Interface Layer):

This layer is responsible for interacting with users.

- Displays web pages such as login, product list, cart, and checkout
- Accepts user inputs like search queries, login details, and order requests
- Sends user requests to the application layer and displays responses

Technologies used: HTML, CSS, JavaScript

2. Application Layer (Business Logic Layer)

This layer acts as the brain of the system.

- Processes user requests
- Implements business rules such as order validation and payment handling
- Manages communication between the UI and the database

- Handles authentication, cart logic, and order processing

Technologies used: Java / Python / PHP

3. Data Layer (Database Layer)

This layer handles data storage and retrieval.

- Stores user details, product information, orders, and payment records
- Ensures data consistency and integrity
- Supports CRUD (Create, Read, Update, Delete) operations

Database used: MySQL

Architecture Workflow

1. User sends a request through the web interface
2. The request is processed by the application layer
3. Required data is fetched or updated in the database
4. The response is sent back to the user interface

7. Tools and Technologies Used

The development of the **Online E-Commerce Website using Agile Methodology** required various tools and technologies to ensure efficient design, development, testing, and deployment. Each tool was selected based on its reliability, scalability, and suitability for Agile development.

1. Frontend Technologies

These technologies are used to create the user interface and ensure a responsive user experience.

- **HTML (HyperText Markup Language):** Used to structure web pages
- **CSS (Cascading Style Sheets):** Used for styling and layout design
- **JavaScript:** Used to add interactivity and dynamic content

2. Backend Technologies

Backend technologies handle business logic and server-side operations.

- **Java / Python / PHP:** Used to process requests, implement application logic, and manage workflows
- **Servlets / Frameworks (optional):** Used for modular and scalable backend development

3. Database Technology

Used to store and manage application data.

- **MySQL:** Used to store user information, product details, orders, and payment records

4. Development Tools

Tools that support coding and project development.

- **Visual Studio Code:** Code editor for frontend and backend development
- **Eclipse IDE:** Used for Java-based backend development

5. Version Control System

Used to track code changes and support team collaboration.

- **Git:** Enables source code versioning and collaborative development

6. Methodology

Software development approach followed during the project.

- **Agile Methodology:** Used for iterative development, continuous testing, and regular feedback

7. Testing Tools

Used to ensure software quality.

- **Manual Testing:** Performed at each Agile sprint
- **Unit Testing Tools (optional):** JUnit / PyTest

9. Testing Strategy

Testing plays a crucial role in ensuring the quality, reliability, and performance of the **Online E-Commerce Website developed using Agile Methodology**. In Agile, testing is performed continuously in every sprint to identify defects early and deliver a high-quality product.

1. Unit Testing

- Each individual module (login, product listing, cart, payment) is tested separately.
- Ensures that each function works as expected.
- Performed by developers during the development phase.

Example: Testing user login validation logic.

2. Integration Testing

- Ensures proper interaction between integrated modules.
- Verifies data flow between frontend, backend, and database layers.

Example: Adding a product to cart and updating the database.

3. System Testing

- Tests the complete E-Commerce system as a whole.
- Ensures all functional requirements are met.

Example: End-to-end testing from product selection to order placement.

4. User Acceptance Testing (UAT)

- Conducted to ensure the system meets user expectations.
- Feedback is collected and improvements are implemented in the next Agile sprint.

10. Advantages of Agile in Travel Booking Platform

- Faster delivery of features
- Better response to changes
- Continuous user feedback

- Improved product quality
- Reduced development risk

11. Future Enhancements

- Integration of real payment gateways
- Mobile application development
- AI-based product recommendations
- Live order tracking
- Advanced security features

11. Conclusion

The **Online E-Commerce Website developed using Agile Methodology** successfully demonstrates how a modern web-based shopping platform can be designed and implemented through an iterative and flexible development approach. By following Agile practices, the project ensured continuous improvement, early detection of issues, and better alignment with user requirements.

The system provides essential features such as user registration, product browsing, shopping cart, order management, and payment simulation, fulfilling the primary objectives of an E-Commerce application. The use of a structured system architecture, well-defined functional requirements, and continuous testing throughout each sprint enhanced the overall quality and reliability of the software.

Agile methodology played a crucial role in enabling faster development cycles, effective team collaboration, and adaptability to changing requirements. Feedback received at the end of each sprint was incorporated into subsequent iterations, resulting in a more user-centric and efficient system.

In conclusion, this project highlights the effectiveness of Agile methodology in developing scalable and maintainable web applications. The **Online E-Commerce Website** serves as a practical example of how Agile practices contribute to successful software development and provides a strong foundation for future enhancements such as real-time payment integration, mobile application support, and intelligent recommendation systems.