

Online E-Commerce Website Using Agile Methodology

(Java – Console Based Application)

1. Abstract

The rapid growth of the internet and digital technologies has transformed the way businesses operate, leading to the widespread adoption of online shopping platforms. An Online E-Commerce website allows customers to browse products, place orders, and manage purchases electronically without visiting physical stores. Traditional shopping systems often involve manual billing, limited product visibility, and time-consuming processes. To overcome these limitations, automated e-commerce systems are widely used.

This project focuses on the development of an **Online E-Commerce Website using Agile methodology**, implemented as a **Java-based console application**. The system provides basic functionalities such as user registration, product listing, product search, adding items to cart, placing orders, and viewing order details. An admin module manages products, categories, and pricing. The console-based approach keeps the application simple, lightweight, and suitable for academic learning and small-scale businesses.

Agile methodology is adopted in this project to ensure flexibility, faster development, and continuous improvement. The project is divided into small iterations called sprints, where each sprint delivers a functional component of the system such as product management, cart operations, or order processing. Continuous testing and feedback during each sprint help in identifying errors early and improving system quality.

Java programming language is used due to its object-oriented features, platform independence, reliability, and security. The system is tested using different test cases to verify correct functionality. This project demonstrates the effective use of Agile principles in developing an e-commerce system and provides scope for

future enhancements such as database integration, graphical user interface, secure payment gateway, and web-based deployment.

2. Introduction

2.1 Introduction

An Online E-Commerce Website is a software platform that enables buying and selling of goods and services over the internet. It allows customers to view products, compare prices, and place orders conveniently from anywhere at any time.

2.2 Problem Identification

Traditional shopping systems and manual record-keeping methods are inefficient and error-prone. They lack real-time product availability, proper order tracking, and effective inventory management. As the number of customers and products increases, managing records manually becomes difficult.

2.3 Need of the Project

There is a need for an automated e-commerce system that can efficiently manage products, customers, and orders. A Java-based console application provides a simple and cost-effective solution for understanding the core concepts of e-commerce systems.

2.4 Project Scheduling

The project is developed using Agile methodology and divided into the following phases:

- Requirement Analysis and Planning
- System Design
- Implementation
- Testing
- Documentation

Each phase is completed in short iterations to allow flexibility and continuous improvement.

2.5 Objectives

- To develop an Online E-Commerce system using Java
 - To apply Agile methodology in software development
 - To manage products and orders efficiently
 - To understand object-oriented programming concepts
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3. Software Requirement Specification (SRS)

3.1 Purpose

The purpose of this Software Requirement Specification (SRS) is to describe the functional and non-functional requirements of the Online E-Commerce Website. It provides a clear understanding of system behavior and limitations.

3.2 Scope

The scope of the project includes basic e-commerce functionalities such as product management, cart operations, order placement, and order viewing. Features like online payment processing and real-time inventory synchronization are outside the current scope.

3.3 Hardware / Software Requirements

Hardware Requirements:

- Processor: Intel i3 or above
- RAM: Minimum 4 GB
- Hard Disk: Minimum 10 GB free space

Software Requirements:

- Operating System: Windows 10 / Windows 11

- Programming Language: Java (JDK 8 or above)
- IDE: Eclipse IDE

3.4 Tools

- Java Development Kit (JDK)
- Eclipse IDE
- GitHub (for report hosting)

3.5 Software Process Model

The Agile Software Development Model is used in this project. Agile focuses on iterative development, customer collaboration, continuous testing, and adaptability to change.

4. System Design

4.1 Data Dictionary

Field Name	Description
ProductID	Unique product identification number
ProductName	Name of the product
Category	Product category
Price	Cost of the product
Quantity	Available stock
UserID	Unique user identification number

OrderID Unique order identification number

4.2 ER Diagram

The Entity Relationship (ER) diagram includes entities such as User, Product, Order, and Admin. A user can place multiple orders, and each order contains one or more products.

4.3 Data Flow Diagram (DFD)

The Data Flow Diagram shows the flow of data between users and the e-commerce system for processes such as product browsing, order placement, and order management.

4.4 Use Case Diagram

Actors: User, Admin

Use cases: Register User, Login, View Products, Add to Cart, Place Order, View Orders, Manage Products.

5. Implementation

5.1 Program Code

The Online E-Commerce system is implemented using Java programming language and follows a menu-driven console approach. Object-oriented concepts such as classes, objects, inheritance, and collections are used to manage products, users, and orders.

5.2 Output Screens

The application displays text-based menus on the console, allowing users to interact with the system and view order confirmations or error messages.

6. Testing

6.1 Test Data

Sample product and user data are used to test system functionalities such as adding products to cart, placing orders, and viewing order details. Invalid inputs are also tested.

6.2 Test Result

All test cases were executed successfully. The system produced correct output for valid inputs and appropriate error messages for invalid operations.

7. User Manual

7.1 How to Use Project Guidelines

1. Run the Java application
2. Register or login as a user
3. Browse available products
4. Add products to cart and place orders
5. View order details and exit the application

7.2 Screen Layouts and Description

The application uses a simple console-based interface with clearly displayed menu options for ease of navigation.

8. Project Applications and Limitations

Applications

- Small online businesses
- Educational institutions

- Training and learning purposes

Limitations

- Console-based user interface
 - No online payment gateway
 - No database connectivity
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9. Conclusion and Future Enhancement

The Online E-Commerce Website developed using Java and Agile methodology successfully demonstrates how an e-commerce system can be implemented efficiently. The project enhanced understanding of Agile practices, requirement analysis, system design, and Java programming. Future enhancements may include database integration, graphical user interface development, secure payment gateways, and deployment as a full-scale web application.

10. Bibliography & References

- Agile Manifesto
- Java Programming Documentation
- Software Engineering Textbooks