HCL Project Report 3

Online E-Commerce Website using Agile Methodology

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1. Abstract (300–400 Words)

E-Commerce platforms have transformed the way businesses sell products and services, offering customers a convenient online shopping experience. In today's competitive market, businesses must provide seamless user experiences, secure transactions, and efficient order management to retain customers and increase revenue.

This project focuses on developing an **Online E-Commerce Website using Agile methodology**, which emphasizes iterative development, continuous feedback, and adaptability. Agile methodology ensures that the platform evolves according to user needs, business trends, and changing market requirements while maintaining high quality and faster delivery.

The system includes modules for product listing, inventory management, shopping cart, order processing, payment integration, and customer account management. Traditional software development approaches often face challenges such as delayed feedback, changing requirements, and higher risks of defects. Agile methodology overcomes these challenges by dividing the development into small iterations called **sprints**, where each sprint delivers a functional feature for testing and feedback.

The platform is designed to be **user-friendly, scalable, and secure**. Customers can browse products, add items to their cart, make payments, and track orders. Administrators can manage products, inventory, orders, and generate analytical reports to make informed business decisions. Agile practices like sprint planning, daily stand-ups, sprint reviews, and retrospectives ensure continuous improvement, collaboration, and transparency throughout the development lifecycle.

In conclusion, this project demonstrates how Agile principles can be applied to develop a robust, flexible, and scalable online E-Commerce solution. The platform improves customer engagement, streamlines order and inventory management, and supports business growth. Its modular architecture allows easy maintenance, integration of new features, and quick adaptation to changing business needs.

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2. Introduction

2.1 Introduction

In the digital era, online shopping has become a standard for customers worldwide. Businesses require efficient platforms to manage products, orders, payments, and customer relationships. An Online E-Commerce Website provides a centralized solution for sellers and customers, automating order processing, inventory management, and payment handling.

Traditional offline retail methods or fragmented online systems struggle to provide seamless experiences, leading to delays, errors, and customer dissatisfaction. A modern E-Commerce website integrates multiple functionalities into a single platform, allowing users to browse products, place orders, make secure payments, and track their purchases.

By implementing **Agile methodology**, this project ensures **flexibility, iterative delivery, and continuous feedback**. Agile divides the development process into sprints, allowing the system to be incrementally built and tested. This approach improves adaptability to changing requirements, reduces development risks, and enhances collaboration between developers, stakeholders, and end-users.

2.2 Problem Identification

Many businesses face the following challenges without a unified online platform:

- Managing product listings and inventory manually leads to errors and stock-outs.

- Order tracking and delivery management are inefficient.

- Customers experience inconsistent product information and delayed responses.

- Traditional development approaches cannot adapt quickly to changing business requirements.

- Payment handling and security concerns increase the risk of fraud.

These challenges highlight the need for a centralized, flexible, and automated E-Commerce platform that can scale with business growth and adapt to customer needs.

2.3 Need of the Project

The need for this project arises from the growing demand for efficient, reliable, and customer-friendly online shopping platforms:

- Centralize product, inventory, and order management.

- Automate checkout and payment processes.

- Improve customer experience with a responsive and intuitive interface.

- Enable secure online transactions.

- Provide analytical insights and reports for business decisions.

- Incorporate Agile methodology to allow continuous improvement and adaptability.

2.4 Project Scheduling

The project follows the **Agile methodology** and is divided into iterative sprints:

- **Sprint 1:** Requirement gathering, planning, and system design

- **Sprint 2:** User registration, login, and profile management module

- **Sprint 3:** Product catalog and inventory management module

- **Sprint 4:** Shopping cart, checkout, and payment processing module

- **Sprint 5:** Order tracking, reporting, testing, and deployment

Each sprint includes planning, development, testing, review, and retrospective phases, ensuring continuous improvement and timely delivery.

2.5 Objectives

The main objectives of this project are:

- To design and develop a fully functional Online E-Commerce Website

- To apply Agile methodology for flexible and iterative development

- To provide seamless customer experience and secure transactions

- To improve business efficiency through automated inventory and order management

- To deliver a high-quality, scalable, and maintainable software solution

Software Requirements Specification (SRS)

**Software Requirements Specification for
Online E-Commerce Website using Agile Methodology**

Version: 1.0 Approved
Prepared by: Arushi
Organization: Academic Project / HCL Training
Date Created: January 2026

SRS Table of Contents

- III. External Interface Requirements
- IV. Other Non-Functional Requirements

Revision History

Version	Date	Description	Author
1.0	Jan 2026	Initial creation of SRS document	Arushi

Overview

This SRS provides a comprehensive overview of the Online E-Commerce Website, including system functionality, design constraints, interface requirements, and quality attributes. It ensures clarity for developers, testers, and stakeholders.

Document Conventions

- Section headings are bold
- Tabular format is used for structured data
- Bullet points for easy readability

Intended Audience and Reading Suggestions

Intended for:

- Software developers
- Software testers
- Project managers
- System analysts
- End users

Readers should begin with the **Introduction** and **Overall Description** sections to understand system scope and functionality.

II. Overall Description

Product Perspective

The Online E-Commerce Website is a **web-based application** developed using Agile methodology. Users interact via web browsers, while the backend handles product listings, inventory, order processing, and payments. The system can integrate with third-party payment gateways, shipping providers, and analytics services.

Product Functions

The main functions include:

- User registration, login, and profile management

- Product catalog browsing with search and filter options

- Shopping cart management

- Checkout and payment processing

- Order confirmation and tracking

- Inventory management for administrators

- Reporting and analytics for business insights

- Role-based access and secure authentication

User Classes and Characteristics

- **Administrator:** Manages products, inventory, orders, and reports

- **Customer/User:** Browses products, places orders, makes payments

- **Payment Gateway:** Processes secure transactions

- **Delivery Staff / Third-party Logistics:** Updates order delivery status

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Operating Environment

- **OS:** Windows / Linux

- **Client Device:** Desktop, Laptop, Tablet, or Mobile

- **Browser:** Chrome, Firefox, Edge

- **Server Environment:** Cloud-based or local server with database integration

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Architectural Design, Use Case Model, and Diagrams

The system uses a **layered architecture** consisting of:

- Presentation Layer: Frontend UI for customers and admins

- Business Logic Layer: Handles product management, orders, and payment processing

- Data Layer: MySQL/PostgreSQL database for storing products, orders, users, and transactions

Diagrams include:

- Use Case Diagram

- Class Diagram

- Sequence Diagram

- ER Diagram

- Database Schema

4. System Design

System design provides a blueprint for the Online E-Commerce Website. It explains how different modules interact, how data flows, and how system components communicate. A **modular and scalable architecture** is used to allow future enhancements such as new payment gateways, product recommendation modules, or AI features. The design follows **Agile principles**: iterative development, continuous feedback, and incremental delivery of functional modules.

4.1 Data Dictionary

The data dictionary includes all key data elements with detailed descriptions and data types:

Data Item	Description	Data Type	Constraints
User_ID	Unique identifier for each user	Integer	Primary Key
User_Name	Full name of the user	Varchar(50)	Not Null
Email	User email address	Varchar(50)	Unique, Not Null
Contact_No	User contact number	Varchar(15)	Numeric, Not Null
Product_ID	Unique product identifier	Integer	Primary Key
Product_Name	Name of the product	Varchar(100)	Not Null

Data Item	Description	Data Type	Constraints
Category	Product category	Varchar(50)	Not Null
Price	Product price	Decimal(10,2)	Not Null
Stock_Quantity	Available quantity in inventory	Integer	Not Null
Order_ID	Unique order identifier	Integer	Primary Key
Order_Status	Status of the order	Varchar(20)	Values: Pending/Confirmed/Shipped/Delivered/Cancelled
Payment_Status	Status of payment	Varchar(20)	Values: Paid/Pending/Failed
Admin_ID	Identifier for admin users	Integer	Primary Key

4.2 ER Diagram

The Entity-Relationship (ER) diagram defines relationships among key entities:

- **User** → Can place multiple **Orders**
- **Order** → Contains multiple **Products**
- **Order** → Associated with **Payment**
- **Admin** → Manages Products, Orders, and Users

The ER Diagram ensures data integrity, enforces primary/foreign keys, and prevents data redundancy.

4.3 Data Flow Diagram (DFD)

- **Level 0 DFD:**
  Shows main interaction between Users, Admins, and the Online E-Commerce Website as a single process.
- **Level 1 DFD:**
  Breaks the system into modules:
    - User Registration & Login
    - Product Browsing & Search
    - Shopping Cart & Checkout
    - Payment Processing

o   Order Confirmation & Tracking
o   Reporting & Analytics

4.4 System Diagrams

The system includes:

1. **Use Case Diagram:** User registration, product search, add to cart, checkout, payment, order tracking, admin monitoring
2. **Class Diagram:** Classes: User, Product, Cart, Order, Payment, Admin; shows attributes and methods
3. **Activity Diagram:** Step-by-step flow of order placement and payment
4. **System Flow Chart:** Logical flow from login → search → add to cart → checkout → payment → order confirmation

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5. Implementation

The Online E-Commerce Website is implemented following **Agile methodology**, where each sprint delivers functional modules:

1. **Sprint 1:** User Registration and Login
2. **Sprint 2:** Product Catalog and Search
3. **Sprint 3:** Shopping Cart and Checkout
4. **Sprint 4:** Payment Integration
5. **Sprint 5:** Order Tracking, Reporting, and Deployment

5.1 Program Code

The system is implemented using:

- **Frontend:** HTML, CSS, JavaScript, React (optional for SPA)
- **Backend:** Node.js / Express.js
- **Database:** MySQL, with tables for Users, Products, Orders, Payments
- Modular design ensures maintainability, scalability, and separation of concerns

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5.2 Output Screens

- **Login / Registration Screen:** Secure login and account creation
- **Product Catalog Screen:** Search, filter, and view products
- **Shopping Cart Screen:** Add, remove, or update product quantities
- **Checkout / Payment Screen:** Payment processing via integrated gateway
- **Order Confirmation Screen:** Displays order details, invoice, and tracking

- **Admin Dashboard:** View/manage users, products, inventory, orders, and reports

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6. Testing

Testing ensures correctness, performance, security, and usability of the platform.

6.1 Test Data

- Valid/invalid user credentials
- Product data with stock availability
- Sample orders for testing checkout and payment
- Payment transactions (success, failure, pending)
- Order cancellation and return requests

6.2 Test Result

- Functional tests passed: login, product search, order creation, payment
- Error handling: invalid inputs, insufficient stock, payment failure
- Performance: System handled multiple users and concurrent orders without issues
- Security: Role-based access, encryption of sensitive data

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7. User Manual

The user manual guides users to operate the platform efficiently.

7.1 How to Use Project Guidelines

1. Open the E-Commerce website in a browser
2. Register a new account or login
3. Browse products using search and filter options
4. Add selected products to the shopping cart
5. Proceed to checkout and make payment
6. Receive order confirmation with invoice and tracking details
7. Admin can monitor all orders, users, and products

7.2 Screen Layouts and Description

- **Login Screen:** Email/password fields, "Forgot password" option

- **Product Catalog Screen:** Displays product name, price, category, stock status
- **Shopping Cart Screen:** Editable quantities, total amount, remove items option
- **Checkout / Payment Screen:** Integrated payment gateway, shows amount and status
- **Order Confirmation Screen:** Provides order reference, invoice, and tracking info
- **Admin Dashboard:** Displays overview of users, products, orders, payments

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8. Project Applications and Limitations

Applications

- Online shopping for products and services
- Inventory management for sellers
- Secure online payment processing
- Order tracking and reporting
- Useful for small to medium businesses and individual sellers

Limitations

- Requires stable internet connection
- Dependent on third-party payment gateways
- Limited offline functionality
- Real-time inventory updates need future enhancement

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9. Conclusion and Future Enhancement

The Online E-Commerce Website developed using Agile methodology provides a **secure, user-friendly, and scalable solution** for online shopping. Agile ensures iterative development, early feedback, and continuous improvement.

Future Enhancements:

- Mobile app for Android and iOS
- AI-based product recommendations
- Real-time stock updates and dynamic pricing
- Multi-language and multi-currency support
- Integration with loyalty programs and customer analytics

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10. Bibliography & References

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