Software Requirement Specification

For

Online E-commerce website

Version 1.0 approved

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1. Abstract

An **Online E-Commerce Website** is a digital platform that allows users to browse, select, and purchase products or services over the internet. With the rapid growth of digital transformation and online shopping, e-commerce platforms have become an essential part of modern business. Customers today expect fast product search, secure payments, smooth checkout, and reliable delivery services. This project focuses on the design and development of an **Online E-Commerce Website using Agile methodology**, which emphasizes **flexibility, iterative development, continuous feedback, and rapid delivery**.

The proposed e-commerce system provides a centralized platform where users can **register, browse products, add items to cart, place orders, make secure online payments, and track order status**. Traditional shopping methods require physical visits to stores, which is time-consuming and limits product comparison. Manual inventory handling and order management often lead to errors, delays, and poor customer experience. The proposed system overcomes these limitations by automating the entire shopping and order management process.

The system includes essential modules such as **user authentication, product catalog, shopping cart, order management, payment processing, and order tracking**. It supports features like **real-time product availability, price comparison, discounts, and order history**. These features improve transparency, enhance user convenience, and reduce operational workload for businesses.

The project follows the **Agile Software Development Model**, where development is divided into multiple **sprints**. Each sprint delivers a working module such as user registration, product listing, cart management, or payment integration. Agile practices such as **sprint planning, daily stand-ups, sprint reviews, and retrospectives** ensure continuous improvement and high-quality output. This approach allows quick adaptation to changing business requirements and customer expectations.

The e-commerce platform is designed with a **modular and scalable architecture**, enabling future enhancements such as mobile application support, AI-based product recommendations, and advanced analytics. The system ensures **data security** through secure login and encrypted payment gateways. A responsive and user-friendly interface allows customers to shop seamlessly across different devices.

Overall, this project demonstrates how the integration of a **robust Online E-Commerce Website** with **Agile methodology** can significantly improve shopping convenience, enhance customer satisfaction, streamline business operations, and provide a reliable digital solution for modern online retail businesses.

2. Introduction

2.1 Introduction

In today's digital era, online shopping has become one of the most preferred ways of purchasing goods and services. An Online E-Commerce Website provides customers with the convenience of shopping anytime and anywhere. It allows businesses to reach a global audience and manage sales efficiently.

This project aims to develop a modern e-commerce platform that simplifies online shopping and automates business operations. Agile methodology is used to ensure continuous development, flexibility, and improvement.

2.2. Problem Identification

In the traditional shopping system, customers need to visit physical stores to purchase products, which is time-consuming and limits their ability to compare prices and product features. Many customers face difficulties in finding the desired products due to limited stock availability, lack of product variety, and restricted store operating hours. Manual billing and inventory management often lead to billing errors, incorrect stock updates, and delays in order processing.

From a business perspective, managing large volumes of products, customer data, and orders manually is inefficient and prone to errors. There is no proper system for tracking customer behavior, managing promotions, or handling order history effectively. Customers also face issues such as lack of order tracking, delayed delivery updates, and poor after-sales support. These challenges highlight the need for a digital and automated e-commerce platform that can provide a seamless and reliable shopping experience.

2.3. Need of the Project

With the rapid growth of internet usage and digital payments, customers now prefer online shopping due to its convenience, speed, and accessibility. There is a strong need for an automated e-commerce system that allows customers to browse products, compare prices, place orders, and make payments from anywhere at any time.

For businesses, an online e-commerce platform helps in managing inventory efficiently, processing orders faster, and reaching a wider customer base globally. It reduces manual workload, minimizes errors, and improves customer satisfaction through real-time order updates and quick support. The proposed project fulfills this need by providing a secure, scalable, and user-friendly online shopping solution that supports modern digital commerce requirements.

2.4 .Project Scheduling

The project is developed using Agile methodology, where the entire development process is divided into multiple sprints. Each sprint focuses on completing specific tasks and delivering a working module of the system. This approach ensures continuous improvement, flexibility, and faster delivery of the application.

Sprint No.	Duration	Sprint Goal	Activities	Deliverables
Sprint 1	Week 1	Requirement Analysis	Requirement gathering, user stories, backlog creation	Requirement document
Sprint 2	Week 2	System Design	UI design, database design, architecture planning	Design diagrams
Sprint 3	Week 3	Core Module Development	User module, product catalog	Working modules
Sprint 4	Week 4	Cart & Order Management	Cart system, order processing	Integrated features
Sprint 5	Week 5	Payment & Security	Payment gateway, authentication	Secure checkout
Sprint 6	Week 6	Testing & Deployment	Testing, bug fixing, deployment	Live system

2.5 Objectives

The main objective of this project is to design and develop a modern Online E-Commerce Website that provides customers with a smooth and secure shopping experience while enabling businesses to manage sales efficiently.

The specific objectives of the project are:

- To develop an online platform for buying and selling products
- To provide product search, filtering, and comparison features
- To automate shopping cart and order management processes
- To implement secure online payment and checkout system
- To provide real-time order tracking and history
- To improve customer experience through a user-friendly interface
- To support business growth through digital sales channels
- To implement Agile methodology for continuous improvement and scalability

3. Software Requirement Specification

3.1 Purpose

The purpose of this project is to design and develop a secure, reliable, and user-friendly Online E-Commerce Website that allows customers to purchase products online easily and enables businesses to manage sales digitally. The system aims to automate the entire shopping process, including product browsing, cart management, order placement, and payment processing.

The platform helps businesses improve operational efficiency, reduce manual effort, and expand their reach to a global customer base. It also ensures secure transactions, accurate order processing, and better customer engagement through digital services.

3.2 Scope

The scope of this project includes the development of a web-based Online E-Commerce Website that supports user registration, product browsing, shopping cart management, order placement, and online payment processing. The system allows users to view product details, check availability, place orders, and track their order status.

The platform also includes features such as order history, customer account management, and basic product management for administrators. The system is designed to be scalable, allowing future enhancements such as mobile application support, AI-based product recommendations, multi-language support, and integration with third-party logistics and payment services. However, advanced analytics and third-party API integrations are not included in the current phase and can be implemented in future versions.

3.3 Hardware Requirements

The following hardware components are required for the development and execution of the Online E-Commerce Website:

Component	**Specification**	**Description**
Processor	Intel Core i3 or above	Required for smooth system execution
RAM	Minimum 4 GB (8 GB recommended)	Ensures efficient multitasking
Hard Disk	Minimum 250 GB free space	Stores application and database
System Type	64-bit Architecture	Supports modern OS and tools
Input Devices	Keyboard, Mouse	User interaction
Output Devices	Monitor, Printer (optional)	Display and report output
Internet Connection	Required	Online shopping and payment

3.4 Software Requirements

The following software components are required for the development and execution of the Online E-Commerce Website:

Software Component	Specification	Description
Operating System	Windows 10 / Linux / macOS	Application platform
Programming Language	Java / Python	Backend development
Frontend Technologies	HTML, CSS, JavaScript	User interface
Database	MySQL	Data storage
Server	Apache Tomcat	Application hosting
IDE	Visual Studio Code / Eclipse	Development environment
Version Control	Git & GitHub	Code management
Testing Tool	Selenium	Automated testing
Documentation Tool	MS Word / Google Docs	Project documentation

3.5 Tools

The following tools are used for the development, testing, and documentation of the E-Commerce Website:

Tool	Purpose
Visual Studio Code / Eclipse	Application development
MySQL Workbench	Database design
Apache Tomcat	Web server
Git & GitHub	Version control
Selenium	Testing
Postman	API testing
Figma	UI/UX design
Draw.io	Diagrams

Tool	Purpose
Google Chrome / Firefox	Browser testing

3.6 Software Process Model

The Agile Software Process Model is used for the development of the Online E-Commerce Website. Agile is an iterative and incremental approach that focuses on flexibility, continuous feedback, and fast delivery.

The entire project is divided into multiple development cycles called **sprints**. Each sprint delivers a working module such as user management, product catalog, shopping cart, or payment system. Requirements are collected as user stories and maintained in a product backlog.

Agile practices such as sprint planning, daily stand-up meetings, sprint reviews, and retrospectives are conducted regularly. This approach ensures high software quality, faster development, and continuous improvement.

4 System Design

4.1 Data Dictionary

The Data Dictionary defines the core data elements used in the Online E-Commerce Website. It describes the structure of the main tables required for managing users, products, and orders.

User Table

Field Name	Data Type	Description
user_id	INT (PK)	Unique user ID
name	VARCHAR(100)	User full name
email	VARCHAR(100)	User email address
password	VARCHAR(100)	Encrypted password
phone	VARCHAR(15)	Contact number

Product Table

Field Name	Data Type	Description
product_id	INT (PK)	Unique product ID

Field Name	Data Type	Description
name	VARCHAR(100)	Product name
category	VARCHAR(50)	Product category
price	DECIMAL	Product price
stock	INT	Available quantity

Order Table

Field Name	Data Type	Description
order_id	INT (PK)	Unique order ID
user_id	INT (FK)	Reference to User table
product_id	INT (FK)	Reference to Product table
quantity	INT	Ordered quantity
status	VARCHAR(20)	Order status

4.2 ER Diagram

The ER Diagram represents the structure of the Online E-Commerce Website by showing the relationship between User, Product, and Order entities. A user can place multiple orders, and each order is associated with a product.

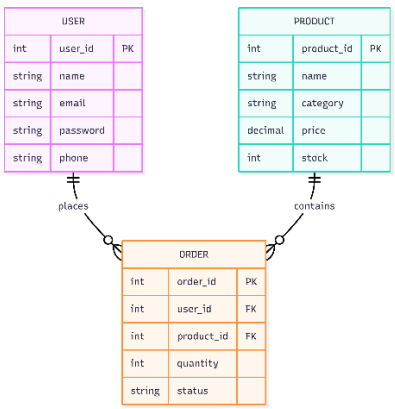

Fig 4.2 ER DIAGRAM

4.3 Data Flow Diagram (DFD)

The Data Flow Diagram shows how data moves between the user, system processes, and the e-commerce database. It illustrates the flow of information through browsing, cart, order, and user management modules.

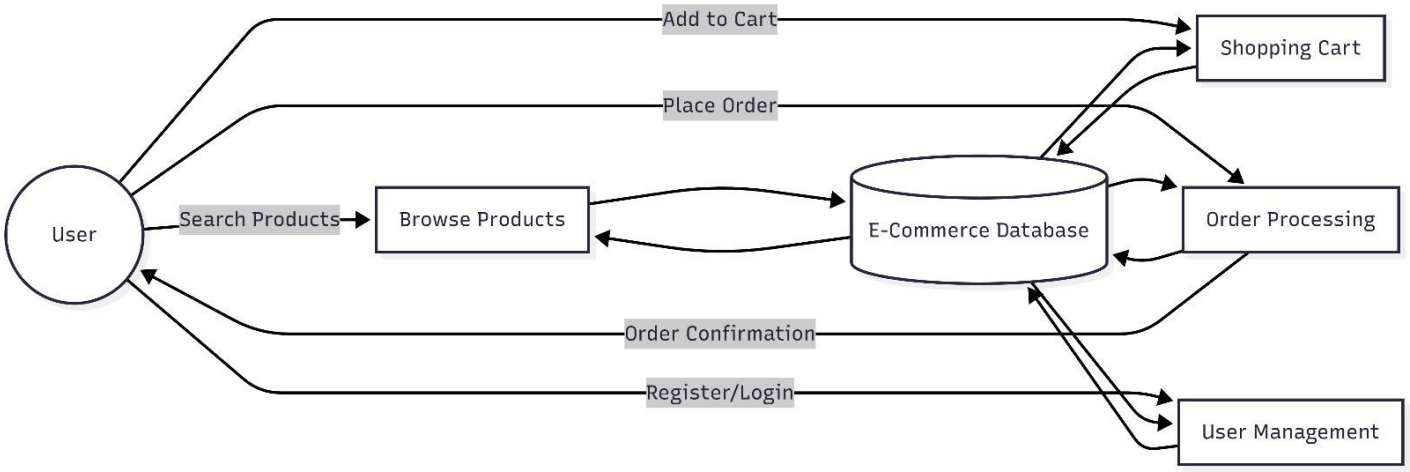

FIG 4.3 DATA FLOW DIAGRAM

4.4 Use Case Diagram

The Use Case Diagram shows how users and administrators interact with the Online E-Commerce Website. It represents major system functions such as browsing products, placing orders, and managing products.

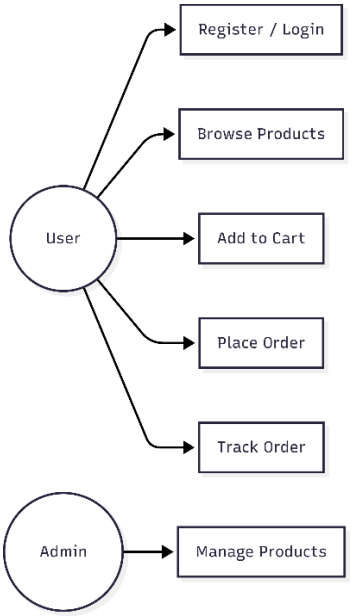

FIG 4.4 USE CASE DIAGRAM

5 Implementation

The implementation phase focuses on converting the system design into a fully functional Online E-Commerce Website. The application is developed using modern web technologies for the frontend and a secure backend for handling business logic and database operations. The system follows a modular architecture, where each major functionality is implemented as a separate module.

The main modules include User Management, Product Catalog, Shopping Cart, Order Management, and Payment Processing. The frontend provides a responsive and user-friendly interface that allows users to browse products, add items to the cart, and place orders easily. The backend handles user authentication, product availability, order processing, and data validation.

The database is designed using normalized tables to store user details, product information, and order records. Secure login mechanisms and encrypted payment gateways are implemented to ensure data protection. Proper exception handling and validation checks are added to maintain system reliability and accuracy.

Overall, the implementation ensures that the e-commerce platform is scalable, secure, and capable of delivering a smooth online shopping experience.

6 Testing

Testing is performed to verify that the Online E-Commerce Website works correctly and meets all functional requirements. The main objective of testing is to identify errors, validate system behavior, and ensure that the platform provides accurate and reliable results for different user operations.

Different modules such as user registration, product browsing, shopping cart, order processing, and payment are tested using valid and invalid inputs. Both manual and automated testing techniques are used to validate form inputs, database operations, and system responses.

6.1 Test Data

TEST DATA TABLE

Test Case ID	User Name	Product	Quantity	Expected Result
TC01	Rahul	Mobile	1	Order placed successfully
TC02	Anjali	Laptop	1	Order placed successfully
TC03	Karan	Headphones	2	Order placed successfully
TC04	Priya	Shoes	1	Order placed successfully
TC05	Amit	Smart Watch	1	Order placed successfully

6.2 Test Result

The test results show that all the test cases were executed successfully and the system performed as expected. Each module of the Online E-Commerce Website, including user login, product browsing, shopping cart, order placement, and payment processing, worked correctly without any errors. The system stored and retrieved data accurately from the database, and order confirmations were generated instantly. Input validation prevented incorrect entries, and secure authentication ensured data protection. Based on the test execution, the application is stable, reliable, and ready for deployment.

TEST RESULT TABLE

Test Case ID	Module	Test Scenario	Expected Result	Actual Result	Status
TC01	Order	Place order	Order placed	Order placed	Pass
TC02	Payment	Make payment	Payment successful	Payment successful	Pass
TC03	Login	Login with valid user	Login successful	Login successful	Pass
TC04	Cart	Add to cart	Item added	Item added	Pass
TC05	Tracking	Track order	Order status shown	Order status shown	Pass

7 User Manual

The User Manual provides step-by-step instructions to help users operate the Online E-Commerce Website efficiently. The platform is designed with a simple and user-friendly interface so that users can shop products easily without technical knowledge.

7.1 How to Use Project Guidelines

- Open the Online E-Commerce Website in a web browser.
- Register a new account or log in using valid credentials.
- Browse products using categories or search option.
- Select a product and add it to the shopping cart.
- Proceed to checkout and enter delivery details.
- Make payment using available payment options.
- View order confirmation and track order status.
- Log out after completing shopping.

7.2 Screen Layouts and Description

- **Login/Register Screen:** User authentication
- **Dashboard Screen:** Product categories and offers
- **Product List Screen:** Displays available products
- **Cart Screen:** Shows selected items
- **Checkout Screen:** Order confirmation and payment
- **Order History Screen:** Displays past orders

8 Project Applications and Limitations

8.1 Applications

- Online shopping platform for retail businesses
- Used for selling electronics, fashion, groceries, etc.
- Useful for small and large e-commerce businesses
- Supports digital payments and online order tracking
- Reduces manual billing and inventory management
- Enhances customer shopping experience

8.2 Limitations

- Requires internet connectivity
- No mobile application in current version
- Limited third-party logistics integration
- No AI-based product recommendations
- Depends on external payment gateways
- Limited analytics and reporting

9 Conclusion and Future Enhancement

9.1 Conclusion

The Online E-Commerce Website project successfully provides a secure and efficient digital platform for online shopping. The system simplifies product browsing, order placement, and payment processing through a user-friendly interface. Testing confirms that all modules function correctly and produce accurate results.

The platform improves customer convenience, reduces manual workload for businesses, and supports modern digital commerce. Overall, this project demonstrates how an automated e-commerce system can transform traditional shopping into a fast and reliable online experience.

The platform ensures secure user authentication and payment processing. Testing confirms that all modules function correctly and provide accurate booking results. Overall, this project demonstrates how digital travel platforms can transform traditional travel booking methods into fast, reliable, and convenient online services.

9.2 Future Enhancement

The following features can be added in future versions of the system:

- Mobile application for Android and iOS
- AI-based product recommendations
- Multi-language and multi-currency support
- Integration with logistics and tracking APIs
- Advanced analytics and sales reports
- Chatbot for customer support
- Cloud-based deployment for scalability
- Voice-based shopping support

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