Software Requirements Specification

for

E-MarketPlace

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29 August 2024

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Revision History

Name	Date	Reason For Changes	Version

1. Introduction

1.1 Purpose

The purpose of this Software Requirements Specification (SRS) document is to provide a detailed description of the e-commerce website, E-MarketPlace. This website is intended to offer a seamless and user-friendly platform where customers can browse, search, and purchase products online. The document outlines the functionalities, design constraints, and system requirements that will guide the development and implementation of the website.

1.2 Document Conventions

This Software Requirements Specification (SRS) document follows the conventions and standards listed below to ensure clarity and consistency throughout:

Text Formatting:

Bold: Used for section headers and to emphasize key terms or concepts.
Italics: Used for emphasis on important points or to indicate document-specific terminology.
Underlining: Used to highlight important terms that require attention.
Numbering:

Sections and subsections are numbered hierarchically (e.g., 1, 1.1, 1.1.1) for easy reference.
References:

All external documents, standards, and references are cited using APA format.
Terminology:

Shall: Indicates a mandatory requirement.
Should: Indicates a recommendation that is not mandatory but would improve the system if implemented.
May: Indicates an optional feature or requirement.
User: Refers to any person interacting with the system, including customers, admins, and guest users.
Abbreviations:

SRS: Software Requirements Specification
UI: User Interface
API: Application Programming Interface
SSL: Secure Sockets Layer
Diagrams and Figures:

All diagrams and figures are labeled sequentially (e.g., Figure 1, Figure 2) and include a brief description.

1.3 Intended Audience and Reading Suggestions

Intended Audience
Project Stakeholders: To understand project goals and ensure alignment with business objectives.
Development Team: To design and build the system according to specified requirements.
Quality Assurance Team: To develop and execute tests based on the requirements.
Project Managers: To manage project execution and resource allocation.
End Users: To provide feedback and ensure the system meets user needs.
Reading Suggestions
Start with the Introduction: For an overview of purpose and scope.

Review the Overall Description: To understand general functionalities and system context.
Examine Detailed Requirements: For specifics on system functionalities and constraints.
Consult Glossary and References: For definitions and sources.

1.4 Product Scope

1.User Accounts:

Registration and Authentication: Users can create accounts, log in, and manage their profiles.
Roles: Distinct roles for buyers and sellers, each with specific functionalities.

2.Product Management:

Product Listings: Sellers can list products with descriptions, images, and prices.
Search and Filtering: Buyers can search for products and filter results based on various criteria.
3.Shopping Cart and Checkout:

Cart Management: Buyers can add items to their cart and review their selections.
Payment Processing: Integration with payment gateways for secure transactions.
4.Order Management:

Order Tracking: Buyers and sellers can track the status of orders.
Order History: Users can view their past orders and transaction history.
5.Reviews and Ratings:

Product Reviews: Buyers can leave reviews and rate products.
Seller Ratings: Buyers can rate sellers based on their experience.
6.Admin Dashboard:

User Management: Admins can manage user accounts and permissions.
Analytics: Admins can access reports and analytics for monitoring site performance.

Constraints

Performance: The system must handle high traffic volumes and large numbers of transactions.
Security: Protection of user data and secure payment processing are essential.
Compliance: Adherence to relevant regulations and standards for e-commerce and data protection.

Exclusions

Physical Store Integration: The system does not support integration with physical store inventories.
Custom Product Development: The platform does not offer custom product development services.

1.5 References

ISO/IEC 12207:2017 – Information technology — Software life cycle processes.

Provides guidelines for software life cycle processes and best practices.
IEEE 830-1998 – IEEE Recommended Practice for Software Requirements Specifications.

Offers a standard format and guidelines for writing software requirements specifications.
W3C Web Content Accessibility Guidelines (WCAG) 2.1 – Guidelines for web content accessibility to ensure inclusivity for users with disabilities.

Payment Card Industry Data Security Standard (PCI DSS) – Requirements for securing payment transactions and protecting cardholder data.

OWASP Top Ten – A list of the top ten most critical web application security risks.

2. Overall Description

2.1 Product Perspective

The E-Market Place is a web-based e-commerce platform that facilitates buying and selling products. It operates as an independent system but integrates with:

Payment Gateways: For secure transaction processing.
Shipping Services: For shipping rates and tracking.
Email Services: For notifications and user communication.
Key Aspects:

User Interface: Accessible via modern web browsers with a responsive design.
System Dependencies: Utilizes a cloud-based server and a relational database.
Security: Employs SSL encryption and data protection measures.
Exclusions:

Physical Store Integration: No connection with physical store inventories.
Extensive Customization: Limited support for highly customized business processes.

2.2 Product Functions

The E-Market Place provides the following core functions:

1.User Management

Account Creation and Login: Allows users to register, log in, and manage their accounts.
Role-Based Access: Differentiates between buyer and seller roles with appropriate permissions.
2.Product Management

Product Listings: Sellers can create, update, and delete product listings with details such as descriptions, images, and prices.
Search and Filtering: Buyers can search for products and filter results based on categories, price ranges, and other criteria.
3.Shopping Cart and Checkout

Cart Management: Buyers can add items to their cart, view cart contents, and modify quantities.
Checkout Process: Facilitates the purchase process, including address entry, payment processing, and order confirmation.
4.Order Management

Order Tracking: Users can track the status of their orders from placement to delivery.
Order History: Provides users with a history of their past orders and transactions.
Reviews and Ratings

5.Product Reviews: Buyers can leave reviews and ratings for purchased products.
Seller Ratings: Buyers can rate sellers based on their transaction experience.
6.Admin Functions

User Management: Admins can oversee and manage user accounts and roles.
Analytics and Reporting: Admins can access performance reports and analytics to monitor site activity and user behavior.

2.3 User Classes and Characteristics

The E-Market Place caters to different types of users, each with specific roles and characteristics:

1.Buyers

Characteristics: Individuals or businesses looking to purchase products.
Needs:

- *Ability to browse and search for products.*
- *Secure checkout process and multiple payment options.*
- *Order tracking and history.*
- *Access to product reviews and ratings.*

2.Sellers

Characteristics: Individuals or businesses offering products for sale.
Needs:

- *Tools to create and manage product listings.*
- *Sales and inventory management features.*
- *Order processing and fulfillment capabilities.*
- *Access to performance analytics and sales reports.*

3.Administrators

Characteristics: Users responsible for managing the platform and ensuring its smooth operation.
Needs:

- *Capabilities to manage user accounts and roles.*
- *Tools for monitoring site performance and generating reports.*
- *Access to configuration settings and system maintenance features.*

4.Support Staff

Characteristics: Individuals assisting users with issues or inquiries.
Needs:

- *Access to support and troubleshooting tools.*
- *Ability to view user issues and resolve complaints.*
- *Communication tools to interact with buyers and sellers.*

2.4 Operating Environment

The E-Market Place operates within the following environment:

1.Software Environment

Web Browser Compatibility: Supports modern web browsers including Chrome, Firefox, Safari, and Edge.
Operating Systems: Accessible on major operating systems like Windows, macOS, iOS, and Android.
Server-Side Technologies: Utilizes server technologies such as Node.js, Ruby on Rails, or Django, and integrates with relational databases like MySQL or PostgreSQL.

2.Hardware Environment

Server Infrastructure: Hosted on cloud-based servers (e.g., AWS, Azure) to ensure scalability and high availability.
User Devices: Designed to be compatible with a range of devices, including desktop computers, tablets, and smartphones.

3.Network Environment

Internet Connectivity: Requires stable internet access for users to interact with the platform.
Content Delivery Network (CDN): May use a CDN to enhance site performance and reduce latency for global users.

4.Security Measures

Encryption: Employs SSL/TLS encryption for secure data transmission.
Data Protection: Implements robust security protocols to protect user data and prevent unauthorized access.

5.Compliance and Standards

Accessibility: Adheres to web accessibility standards (e.g., WCAG) to ensure usability for users with disabilities.
Regulatory Compliance: Complies with relevant data protection regulations (e.g., GDPR, CCPA) and industry standards.

2.5 Design and Implementation Constraints

The E-Market Place e-commerce website must adhere to the following constraints during design and implementation:

1.Performance Requirements

Scalability: The system must handle high traffic volumes and a large number of concurrent users without performance degradation.
Response Time: Web pages and transactions should load within a few seconds to ensure a smooth user experience.

2.Security Constraints

Data Protection: Must implement encryption (e.g., SSL/TLS) and secure authentication methods to protect user data and transactions.
Compliance: Adhere to industry standards and regulations for data privacy (e.g., GDPR, CCPA) and payment security (e.g., PCI DSS).

3.Technical Constraints

Browser Compatibility: Must support modern web browsers and ensure functionality across various versions and devices.
Platform Dependencies: The system may be constrained by the capabilities and limitations of the chosen server-side technologies and database systems.

4.Budget and Resource Constraints

Cost: Design and implementation must stay within the allocated budget, considering development, hosting, and maintenance expenses.
Resource Availability: The project should utilize available development tools and technologies efficiently, without requiring extensive new resources or custom solutions.

5.Time Constraints

Project Timeline: Development and deployment must adhere to the project schedule, ensuring timely delivery of key milestones and final launch.

6.Integration Constraints

Third-Party Services: Integration with external payment gateways, shipping services, and email systems must be compatible and reliable.

2.6 User Documentation

1. User Guide

Overview: Introduction to the platform.
Account Management: How to create, manage, and recover accounts.
Product Browsing: Searching, filtering, and viewing products.

Shopping Cart & Checkout: Adding items, managing cart, and completing purchases.
Order Management: Tracking orders and managing returns.
Reviews & Ratings: How to leave reviews and rate products.
2. Seller Guide

Account Setup: Registering and setting up a seller profile.
Product Management: Listing, updating, and removing products.
Order Fulfillment: Managing and processing orders.
Performance Monitoring: Accessing sales reports and analytics.
3. Administrator Guide

System Management: Managing user accounts and permissions.
Site Configuration: Setting up system and site settings.
Monitoring & Reporting: Accessing performance reports and analytics.
Troubleshooting: Common issues and solutions.
4. FAQs

Common Questions: Answers to frequently asked questions.
5. Glossary

Terms and Definitions: Key terms and jargon explained.
6. Help Resources

Contact Information: Details for customer and technical support.

2.7 Assumptions and Dependencies

Assumptions:

Internet Connectivity: Users will have stable internet access to interact with the E-Market Place.
Browser Compatibility: Users will use modern web browsers that support HTML5, CSS3, and JavaScript.
User Competence: Users have a basic understanding of how to navigate web-based applications and perform online transactions.
Payment Systems: Payment gateways will be functional and integrate seamlessly with the platform.
Compliance with Regulations: The system will adhere to relevant data protection and e-commerce regulations.

Dependencies:

Third-Party Services:
Payment Gateways: Integration with external payment processors (e.g., PayPal, Stripe) for transaction handling.
Shipping Providers: Integration with logistics services for real-time shipping rates and tracking.
Email Services: Use of email providers for notifications and user communications.
Technical Infrastructure:

Hosting Environment: The application relies on cloud-based servers (e.g., AWS, Azure) for hosting and scalability.
Database Management: Dependency on a relational database (e.g., MySQL, PostgreSQL) for data storage and management.
Compliance and Standards:

Security Standards: Adherence to industry standards such as PCI DSS for payment security.
Accessibility Standards: Compliance with WCAG guidelines to ensure accessibility for all users.
Development Tools:

Programming Languages and Frameworks: Dependence on chosen languages (e.g., JavaScript, Python) and frameworks (e.g., React, Django) for development and implementation.

3. External Interface Requirements

3.1 User Interfaces

1.Web Interface

Overview: The primary interface for all users, including buyers, sellers, and administrators. Accessible via modern web browsers (e.g., Chrome, Firefox, Safari, Edge) and optimized for both desktop and mobile devices.
Design Requirements:
Responsive Design: Adapts to various screen sizes and devices to ensure a seamless user experience.
Accessibility: Complies with web accessibility standards (e.g., WCAG) to ensure usability for users with disabilities.
User-Friendly Navigation: Intuitive layout with clear menus, search functionalities, and easy access to key features.
2 Buyer Interface

Homepage: Features product categories, search bar, and promotional banners.
Product Pages: Displays detailed information about products, including images, descriptions, and pricing.
Shopping Cart: Allows buyers to view, modify, and proceed to checkout.
Checkout Process: Streamlined process for entering shipping information, selecting payment methods, and confirming orders.
Order Tracking: Interface for tracking order status and viewing order history.
3 Seller Interface

Dashboard: Provides an overview of sales performance, active listings, and order statuses.
Product Management: Tools for adding, editing, and removing product listings.
Order Management: Functions for processing orders, updating statuses, and managing shipments.
Analytics: Access to sales reports, performance metrics, and customer feedback.
4 Administrator Interface

Admin Dashboard: Centralized interface for managing user accounts, system settings, and monitoring site activity.
User Management: Tools for creating, editing, and deleting user accounts and managing roles and permissions.
Site Configuration: Options for configuring system settings, content, and policies.
Reports and Analytics: Access to site performance metrics, usage reports, and analytics.
5 Help and Support Interface

Help Center: Provides access to FAQs, user guides, and support documentation.
Contact Support: Interface for submitting support requests, live chat, or accessing customer service contact details.
6 Integration with External Interfaces

Payment Gateways: Integration with third-party payment processors (e.g., PayPal, Stripe) for secure transactions.
Shipping Providers: Interfaces with logistics services for real-time shipping rates and tracking.
Email Services: Integration for sending notifications, confirmations, and other communications.

3.2 Hardware Interfaces

1 Server Hardware

Cloud Hosting: Use of scalable cloud servers (e.g., AWS, Azure) with sufficient CPU, memory, and storage.
2 User Devices

Desktops/Laptops: Standard modern hardware with up-to-date browsers.
Mobile Devices: Recent iOS or Android devices with stable internet.
3 Network Infrastructure

Internet: High-speed, reliable internet connectivity.
CDN: For global content delivery and reduced latency.
4 External Hardware Integrations

Payment Terminals: For in-store transactions (optional).
Barcode Scanners: For physical inventory management (optional).
5 Backup and Recovery

Backup Systems: Regular data backups and disaster recovery solutions.
Redundancy: Systems for failover and high availability.

3.3 Software Interfaces

1 Web Interface

Browsers: Support for modern web browsers (e.g., Chrome, Firefox, Safari, Edge) for all user interactions.
Operating Systems: Compatible with major operating systems including Windows, macOS, iOS, and Android.
2 Integration with External Systems

Payment Gateways: Integration with third-party payment processors (e.g., PayPal, Stripe) for handling transactions.
Shipping Providers: Interfaces with logistics services for real-time shipping rates, tracking, and label generation.
Email Services: Integration with email platforms for sending notifications, order confirmations, and marketing emails.
3 APIs

RESTful APIs: For communication between the E-Market Place and external systems, such as payment gateways, shipping services, and analytics tools.
Data Exchange: Support for standard data formats (e.g., JSON, XML) for API interactions.
4 Security Software

Encryption: SSL/TLS for secure data transmission.
Firewall and Anti-Malware: Security measures to protect against unauthorized access and malicious threats.
5 Development Tools

Frameworks: Utilization of frameworks and libraries (e.g., React, Angular, Django) for building and maintaining the web application.
Database Management: Support for relational databases (e.g., MySQL, PostgreSQL) for data storage and management.
6 Compliance and Accessibility

Regulatory Compliance: Adherence to data protection regulations (e.g., GDPR, CCPA) and payment security standards (e.g., PCI DSS).

Accessibility Standards: Compliance with web accessibility guidelines (e.g., WCAG) to ensure usability for all users.

3.4 Communications Interfaces

1. User Communication

Email: For notifications, confirmations, and promotions via services like SendGrid.
In-App Messaging: Real-time updates and support within the app using push notifications.
2 Customer Support

Live Chat: Real-time assistance via tools like Zendesk Chat.
Support Tickets: For submitting and tracking support requests through systems like Freshdesk.
3 External System Communication

APIs: RESTful APIs for data exchange with payment gateways, shipping providers, and other services.
Webhooks: Real-time notifications from external systems for events like payment confirmations.
4 Data Transfer

File Uploads/Downloads: Secure handling of product images and documents.
Data Synchronization: Ensures data consistency across systems.
5 Security Measures

Encryption: SSL/TLS for secure data transmission.
Authentication: OAuth and API keys for secure access to interfaces.

4. System Features

1. User Management

Account Creation: Allows users to register, log in, and manage their profiles.
Role-Based Access: Differentiates permissions for buyers, sellers, and administrators.
2. Product Management

Product Listings: Enables sellers to create, update, and remove product listings with details and images.
Search and Filtering: Allows buyers to search for products and apply filters based on categories, price, and other criteria.
3. Shopping Cart and Checkout

Cart Management: Users can add items to the cart, modify quantities, and view cart contents.
Checkout Process: Facilitates the purchase process, including address entry, payment options, and order confirmation.
4. Order Management

Order Tracking: Provides buyers and sellers with status updates on their orders.
Order History: Users can view past orders and manage returns or exchanges.
5. Reviews and Ratings

Product Reviews: Buyers can leave feedback and rate products.
Seller Ratings: Buyers can rate their experience with sellers.
6. Admin Features

User Management: Admins can oversee user accounts, roles, and permissions.
Site Configuration: Allows for the configuration of site settings, policies, and content.
Analytics and Reporting: Access to performance metrics, sales reports, and user activity logs.
7. Security Features

Data Encryption: SSL/TLS for secure data transmission.

Authentication: Secure login methods and access controls for different user roles.
Fraud Detection: Systems in place to detect and prevent fraudulent activities.
8. Integration Features

Payment Processing: Integration with external payment gateways for secure transactions.
Shipping Integration: Interfaces with logistics providers for shipping rates and tracking.
Email Notifications: Automated emails for order confirmations, updates, and promotions.
9. Support Features

Help Center: Access to FAQs, guides, and support resources.
Customer Support: Contact options for live chat, ticket submissions, and email support.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

5.1 Performance Requirements
5.1.1 Scalability

Support: Handle concurrent users and scale automatically during peak times.
5.1.2 Response Time

Page Load: Under 2-3 seconds.
Transaction Processing: Within 5-10 seconds.
5.1.3 System Availability

Uptime: 99.9% target.
Redundancy: Redundant systems for failover.
5.1.4 Data Handling

Database: Fast read/write operations with optimized performance.
Backup: Regular backups with defined recovery objectives.
5.1.5 Load Testing

Stress Testing: Ensure handling of high transaction volumes.
Capacity Planning: Regular assessments for future scaling.
5.1.6 Security Performance

Encryption: Minimal impact on performance.
Threat Detection: Efficient without affecting user experience.
5.1.7 Response to Failures

Error Handling: Effective mechanisms with minimal impact.
Recovery: Fast restoration of services and data.

5.2 Safety Requirements

5.2.1 Data Protection

Encryption: Encrypt data in transit and at rest.
Access Control: Restrict data access to authorized personnel.
5.2.2 User Privacy

Compliance: Follow data privacy regulations (e.g., GDPR, CCPA).

Consent: Manage user consent for data collection.
5.2.3 Transaction Security

Fraud Detection: Monitor and prevent fraudulent activities.
Secure Payments: Use PCI DSS-compliant payment gateways.
5.2.4 System Integrity

Backup: Regular data backups for recovery.
Integrity Checks: Regular checks to prevent data corruption.
5.2.5 Physical Security

Data Center: Ensure physical security with surveillance and access controls.
5.2.6 Incident Response

Plan: Have a response plan for security breaches.
Monitoring: Continuous monitoring for threats.
5.2.7 User Safety

Authentication: Use multi-factor authentication (MFA).
Secure Communication: Protect communication channels.

5.3 Security Requirements

5.3.1 Data Protection

Encryption: Encrypt sensitive data in transit and at rest.
5.3.2 Access Control

Authentication: Use multi-factor authentication (MFA).
Authorization: Implement role-based access control (RBAC).
5.3.3 Secure Transactions

Payment Security: Use PCI DSS-compliant payment gateways.
Fraud Prevention: Monitor for and prevent fraud.
5.3.4 System Security

Vulnerability Management: Regularly patch security vulnerabilities.
Firewalls and IDS: Protect with firewalls and intrusion detection systems.
5.3.5 Data Integrity

Integrity Checks: Ensure data is not altered or corrupted.
Backup and Recovery: Regular backups with recovery procedures.
5.3.6 Incident Management

Incident Response Plan: Have a plan for handling breaches.
Monitoring and Logging: Continuous system monitoring and logging.
5.3.7 Compliance

Regulatory Compliance: Follow relevant security regulations.
Security Audits: Regular audits to identify security gaps.

5.4 Software Quality Attributes

5.4.1 Performance

Efficiency: Pages load within 2-3 seconds; transactions complete in 5-10 seconds.
Scalability: Handles increasing users and transactions effectively.

5.4.2 Reliability

Uptime: 99.9% availability.
Error Handling: Robust mechanisms for handling and recovering from errors.
5.4.3 Usability

User Experience: Intuitive and user-friendly interface.
Accessibility: Meets accessibility standards (e.g., WCAG).
5.4.4 Maintainability

Code Quality: Well-documented, modular code for easy updates.
Testing: Automated testing and regular code reviews.
5.4.5 Security

Data Protection: Encryption and controlled access.
Vulnerability Management: Regular updates and patches.
5.4.6 Portability

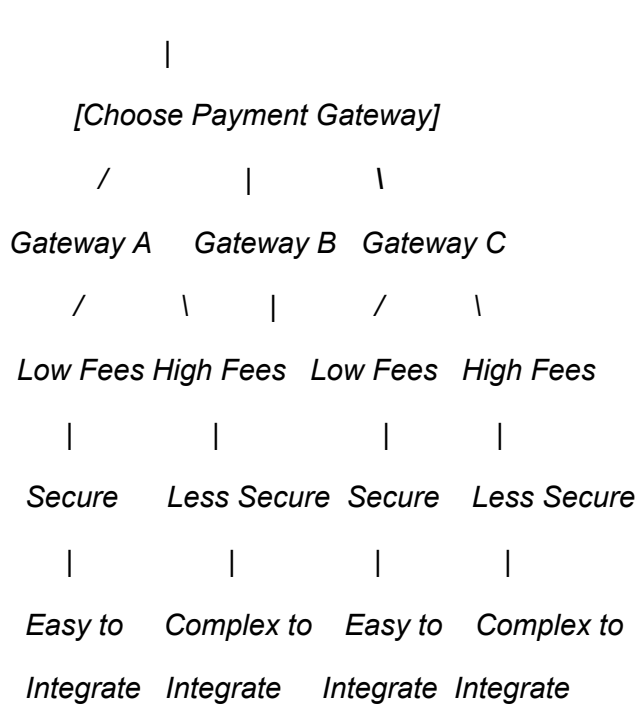
Cross-Platform: Operates across various platforms and devices.
5.4.7 Compatibility

Integration: Smooth integration with external services and support for different data formats.

6.Decision Tree and Decision Table

6.1 Decision Tree

A decision tree helps in making decisions by mapping out possible options and their outcomes. For the E-Market Place project, we can use a decision tree to choose between different payment gateway options based on criteria such as fees, security, and ease of integration.



Explanation:

Choose Payment Gateway: The decision starts here.

Gateway Options: Choose between Gateway A, B, or C.

Fee Structure: Low Fees or High Fees.

Security: Evaluate if the option is Secure or Less Secure.

Integration: Determine if it is Easy or Complex to Integrate.

6.2 Decision Table

A decision table systematically outlines different conditions and their respective actions. For the E-Market Place, a decision table could help decide how to handle order processing based on order size and payment status.

Decision Table: Order Processing

Condition	Order Size	Payment Status	Action
1	Small	Paid	Process Order and Ship Immediately
2	Small	Unpaid	Send Payment Reminder
3	Large	Paid	Review for Fraud, then Ship
4	Large	Unpaid	Cancel Order and Notify Customer

Explanation:

- ***Order Size****: Determines if the order is Small or Large.*
- ***Payment Status****: Indicates if the payment is Paid or Unpaid.*
- ***Action****: Based on the conditions, execute the appropriate action.*

These tools help in systematically evaluating options and making informed decisions by considering various factors and their impacts.