Software Requirements Specification

For

E-Commerce Software

Version 1.0

Prepared by Product Prodigies

PES UNIVERSITY

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Revision History

Name	Date	Reason For Changes	Version
Product Prodigies	10/09/2023	Initial Draft	1.0 Draft 1

1. Introduction

1.1 Purpose

The primary purpose of this SRS document is to articulate the specific features, functionalities, and performance expectations of the e-commerce software. It serves as a blueprint for the development team, providing a clear and unambiguous description of the system's behavior, constraints, and requirements.Unless otherwise noted, all requirements specified here are high priority and committed for release 1.0.

1.2 Intended Audience and Reading Suggestions

This document outlines the intended recipients of the project and provides details about the user interface, as well as the necessary hardware and software prerequisites. It establishes a clear understanding of how our client, team, and audience envision the product and its functionalities. Moreover, it serves as a valuable resource for designers and developers, aiding them in the various stages of the software delivery lifecycle (SDLC) process.

This software is designed to cater to a diverse range of users, including:
Customers: Individuals seeking a seamless online shopping experience.
Merchants: Businesses looking to establish or expand their online presence.
Administrators: System administrators responsible for managing and monitoring the platform.
Delivery Partners : Third party delivery services completing orders from the sellers to the customers

1.3 Product Scope

E-commerce encompasses various forms of business activities and commercial transactions conducted through the internet, involving the exchange of information. This category includes a wide spectrum of businesses, ranging from online retail platforms serving consumers and business-to-business exchanges facilitating the trade of goods and services among corporations. It stands as a pivotal and prominent facet of the modern internet landscape.

1.4 References

1. Data Privacy Regulations: https://gdpr.eu/

2. User Interface Style Guide : https://designcode.io/ui-design-handbook/

3.PCI DSS (Payment Card Industry Data Security Standard) : https://docs-prv.pcisecuritystandards.org

2. Overall Description

2.1 Product Perspective

The e-commerce software being specified in this SRS is a standalone product designed to serve as a comprehensive online marketplace platform. It is not part of an existing product family or a replacement for any existing systems. However, it may offer integration capabilities with existing payment gateways, shipping providers, and other external services to enhance its functionality.

2.2 Product Functions

The e-commerce software will perform the following major functions:

- User Registration and Authentication
- Product Listing and Categorization
- Shopping Cart Management
- Order Placement and Payment Processing
- Inventory Management
- User Reviews and Ratings
- Admin Dashboard for Analytics and Content Management
- Provide a user-friendly interface and platform for easy online buying and selling.
- Ensure smooth functionality to boost buyer confidence.
- Allocate sufficient space for the Offers zone and deal of the day to attract user attention.
- Focus on creating new categories and expanding product offerings.
- Implement ads and promotional activities to incentivize online shopping.
- Enable order tracking for both sellers and buyers.
- Provide timely updates on pending deliveries.
- Send order and delivery reports to customers and sellers.

2.3 User Classes and Characteristics

2.3.1 Shoppers
Frequency of Use: High
Characteristics:
- General consumers who visit the platform to browse and purchase products.
- Varied technical expertise, ranging from tech-savvy to less tech-savvy users.
- Diverse educational backgrounds and ages.

- Expect an intuitive and user-friendly interface for easy shopping.
- May require assistance or recommendations for product selection.

2.3.2 Sellers (Merchants)
Frequency of Use: High (for managing their stores)
Characteristics:

- Business owners and sellers who use the platform to list and manage their products.
- Moderate to high technical expertise, as they need to manage their online stores.
- Require tools for product management, inventory tracking, and order processing.
- Expect detailed sales analytics and reporting.

2.3.3 Customer Support Agents
Frequency of Use: High (for providing support)
Characteristics:

- Trained customer support representatives who assist shoppers with inquiries, orders, and issues.
- Need access to customer order history and support ticketing systems.
- Require real-time communication tools for chat and email support.
- Prioritize quick issue resolution and positive customer interactions.

2.3.4 Administrators
Frequency of Use: Continuous (for system maintenance)
Characteristics:

- System administrators responsible for platform maintenance, security, and updates.
- High technical expertise in server management, security protocols, and database administration.
- Require access to backend systems and tools for system monitoring and updates.
- Focus on system performance, security, and data integrity.

2.3.5 Data Analysts
Frequency of Use: Regular (for data analysis)
Characteristics:

- Data analysts who extract and analyze data to gain insights into user behavior and sales trends.
- Strong analytical skills and proficiency in data analysis tools.
- Access to historical sales and user data for generating reports and recommendations.
- Use data to optimize marketing strategies and improve the platform's user experience.

2.3.6 Marketing Team
Frequency of Use: Regular (for marketing campaigns)
Characteristics:

- Marketing professionals responsible for creating and managing marketing campaigns.
- Need access to user data, purchase history, and analytics to target campaigns effectively.
- Collaborate on promotional strategies and require campaign tracking tools.
- Focus on user engagement, retention, and conversion rates.
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In an SRS for an ecommerce platform like Flipkart, it's crucial to distinguish the most important user classes, such as Shoppers and Sellers, as their needs and interactions drive the core functionality of the platform. However, all user classes must be considered to ensure a well-rounded and successful product. Each user class may have specific requirements and features that cater to their needs within the platform.

2.4 Operating Environment

The software will operate in the following environment:

- **Hardware Platform**: Standard web servers with appropriate processing power and memory capacity.
- **Operating System**: Compatible with major operating systems, including Windows, Linux, and macOS, as well as mobile platforms such as IOS and android.
- **Software Components**: Requires a web server (e.g., Apache, Nginx), database server (e.g., MySQL, PostgreSQL), and necessary libraries/frameworks (e.g., Django, React).
- **External Interfaces**: Integration with payment gateways, shipping providers, and third-party APIs.

2.5 Design and Implementation Constraints

The following constraints will impact the development:
Regulatory Compliance: Adherence to data protection laws (e.g., GDPR, CCPA) and e-commerce regulations.
Technology Stack: Specific technologies and frameworks as outlined in the project plan.
Security Considerations: Implementation of encryption protocols, secure payment gateways, and secure coding practices.
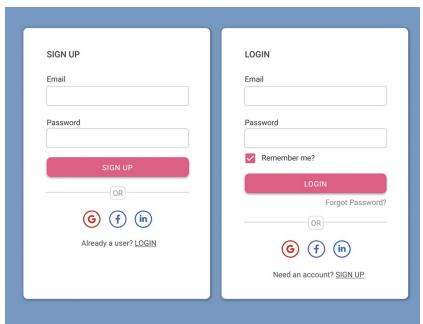
2.6 Assumptions and Dependencies

- The customer and seller must have basic knowledge of computers and English language.
- Each User must have a User ID and password.
- Each Seller must have a Seller ID and password.
- There must be an Administrator.
- Internet connection is a must.
- Proper browsers should be installed in the user's system.

- Availability of stable internet connections for users.
- Continued support and updates for third-party components used in the system.

3. External Interface Requirements

3.1 User Interfaces

- Login or Sign-up Page
- Homepage tailored to the customer's interests, showcasing relevant products.
- Search results page providing comprehensive information on user's queried products.
- Selection of a product leads to a dedicated page with detailed information.
- Post-transaction, the system generates a portable document file (PDF) selling report, which is sent to the customer's email address.

3.2 Hardware Interfaces

As the application operates via the internet, any necessary hardware components must have the capability to connect to the internet, serving as the hardware interface for the system.

- Supported Device Types: Desktop computers, laptops, tablets, and smartphones with modern web browsers.
- Nature of Interactions: Data exchanges will be primarily via HTTP requests and responses.
- Communication Protocols: Utilization of standard web protocols (HTTP/HTTPS) for client-server interactions.

3.3 Software Interfaces

The e-commerce software will integrate with various software components, including:

- **Database:** MySQL version 8.0 for persistent data storage and retrieval.
- **Operating System:** Compatible with Windows, Linux, and macOS.
- **Web Server:** Apache 2.4.41 for handling web requests and serving content.
- **Frameworks/Libraries:** Django 3.2 for backend development, React 17 for frontend, and Redux for state management.
- **Deployment:** Vercel platforms to host the website globally with a relevant domain name.
- **Third-Party Services:**
  Payment Gateways: Integration with PayPal, Stripe, and other standard payment processors.
  Shipping Providers: Integration with FedEx, UPS, and other major shipping services.
- **Data Items/Messages:**
  Inbound: User requests (e.g., product search, order placement).
  Outbound: Responses, notifications, and updates (e.g., order confirmation, inventory updates).

3.4 Communications Interfaces

The e-commerce software will utilize the following communication functions:

- **E-mail**: Integration with SMTP for sending order confirmations, notifications, and user communication.SMTP can be customized or use existing SMTP servers provided by services like Sendgrid , AWS SNS.
- **Web Browser**: Compatibility with major web browsers (Chrome, Firefox, Safari, Edge) for optimal user experience.
- **Network Server Communications Protocols**: HTTP/HTTPS for secure data transmission.
- **Electronic Forms**: Utilization of web-based forms for user input (e.g., registration, checkout).
- **Message Formatting**: Standard JSON format for data exchange to ensure compatibility and consistency.
- **Communication Security**: Implementation of TLS/SSL for secure data encryption during transmission.
- **Data Transfer Rates**: Aim for low-latency efficient responses to ensure a smooth user experience.
- **Synchronization Mechanisms**: Real-time updates for inventory and order status.

4. System Features

4.1 Searching and Categorizing Items

4.1.1 Description and Priority
Allows users to search for products and browse items by categories. Priority: High.

4.1.2 Stimulus/Response Sequences
User enters search keywords or selects a category.
System displays relevant products.
User clicks on a product for more details.

4.1.3 Functional Requirements
REQ-1: The system shall provide a search bar on the homepage for users to enter keywords.
REQ-2: The system shall allow users to filter search results by category, price range, and other relevant attributes.
REQ-3: The system shall display search results with product names, images, and brief descriptions and product costs.
REQ-4: Users shall be able to click on a product to view detailed information.

4.1.4 Performance Requirements
REQ-1.1: The system shall provide search results within 2 seconds of a user's query.
REQ-1.2: The system shall support concurrent searches from multiple users without performance degradation.

4.1.5 Error Handling
REQ-1.3: If no results match the user's search query, the system shall display a relevant error message.

4.2 Gamification for Offers

4.2.1 Description and Priority
Incorporates gamified elements in the user interface to unlock special offers. Priority: Medium.

4.2.2 Stimulus/Response Sequences
User engages with gamification elements (e.g., spinning wheel, quizzes).
System calculates rewards based on user actions.
Users receive offers or discounts upon successful completion.

4.2.3 Functional Requirements
REQ-5: The system shall include gamification elements on the user interface, such as spin-to-win wheels and quizzes.
REQ-6: The system shall track user engagement with gamification elements and calculate rewards accordingly.
REQ-7: Users who successfully complete gamification challenges shall receive offers or discounts applied to their cart.

4.2.4 Security Requirements

REQ-5.1: The system shall ensure the integrity of gamification results and prevent manipulation.

REQ-5.2: User data used in gamification shall be handled securely and in compliance with data protection regulations.

4.3 Payment Functionality

4.3.1 Description and Priority

Enables users to make secure payments for their orders. Priority: High.

4.3.2 Stimulus/Response Sequences

User selects products and adds them to the cart.

User proceeds to the checkout page.

User enters payment details and confirms the purchase.

System processes the payment and sends a confirmation.

4.3.3 Functional Requirements

REQ-8: The system shall provide a secure payment gateway for users to enter payment information.

REQ-9: Users shall be able to review their order summary before making a payment.REQ-10: The system shall support various payment methods, including credit/debit cards and digital wallets.

4.3.4 Security Requirements

REQ-8.1: The payment gateway shall use encryption to secure user payment information.

REQ-8.2: The system shall comply with PCI DSS (Payment Card Industry Data Security Standard) for handling credit card data.

4.4 Cart Management

4.4.1 Description and Priority

Allows users to add, remove, and manage items in their shopping cart. Priority: High.

4.4.2 Stimulus/Response Sequences

User adds items to the cart.

User views and modifies the cart contents.

User proceeds to checkout from the cart.

4.4.3 Functional Requirements

REQ-11: The system shall provide an "Add to Cart" button for users to add items to their cart.

REQ-12: Users shall be able to view and update the quantity of items in the cart.REQ-13: The system shall calculate and display the total cost of items in the cart.

4.4.4 Usability and User Experience
REQ-11.1: Users shall be able to easily remove items from the cart with a "Remove" button.REQ-11.2: The system shall display a confirmation prompt before removing items from the cart to prevent accidental deletions.

4.5 Order Summary and Tracking

4.5.1 Description and Priority
Enables users to view order summaries and track the status of their orders. Priority: High.

4.5.2 Stimulus/Response Sequences
User clicks on the "My Orders" section.
User selects an order to view details.
System displays order summary and current status.

4.5.3 Functional Requirements
REQ-14: Users shall have access to an "Order History" section to view past orders.
REQ-15: Users shall be able to click on an order to see a detailed summary, including items, prices, and delivery status.

4.5.4 Notifications
REQ-14.1: Users shall receive email notifications for order confirmation and shipment tracking.
REQ-14.2: The system shall allow users to opt-in or opt-out of receiving order-related email notifications.

4.6 Seller Functionality (For Seller User Class)

4.6.1 Description and Priority
Allows sellers to list and manage their products and receive payment confirmation. Priority: High.

4.6.2 Stimulus/Response Sequences
Seller logs in to their seller account.
Sellers add new products to their store.
Seller receives payment confirmation for sold products.

4.6.3 Functional Requirements
REQ-16: Sellers shall have access to a seller dashboard to manage their product listings and inventory.
REQ-17: Sellers shall be notified and receive payment confirmation when their products are sold.

4.6.4 Inventory Management

REQ-16.1: Sellers shall be able to set stock levels for their products and receive low-stock notifications.
REQ-16.2: Sellers shall have the option to temporarily disable product listings when out of stock.

4.6.5 Payment Confirmation
REQ-17.1: Sellers shall receive payment confirmation along with detailed transaction records for each sale.
REQ-17.2: Payment confirmation notifications shall be sent to sellers' registered email addresses.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

The e-commerce software must meet the following performance requirements:
Response Time: The system should respond to user actions (e.g., search, page loading) within 2 seconds under standard operating conditions.
Concurrency: Support at least 1000 simultaneous users without a significant degradation in performance.
Database Queries: Database queries for product retrieval and order processing should execute in less than 200 milliseconds.
Rationale: These requirements ensure a smooth and responsive user experience, even during periods of high traffic.

5.2 Safety Requirements

There are no specific safety requirements associated with the use of the e-commerce software. However, merchants are responsible for ensuring that the products they list comply with all relevant safety regulations and standards.

5.3 Security Requirements

- **Data Transfer**
  •The system shall use secure sockets in all transactions that include any confidential customer information.
  •The system shall automatically log out all customers after a period of inactivity.
  •The system shall confirm all transactions with the customer's web browser.
  •The system shall not leave any cookies on the customer's computer containing the user's password or confidential information.

- **Data Storage**
  •The customer's web browser shall never display a customer's password. It shall always be echoed with special characters representing typed characters.
  •The customer's web browser shall never display a customer's credit card number after retrieving from the database. It shall always be shown with just the last 4 digits of the credit card number.

•The system's back-end servers shall never display a customer's password. The customer's password may be reset but never shown.
•The system's back-end servers shall only be accessible to authenticated administrators.
•The system's back-end databases shall be encrypted and within the company's perimeter.

- **Reliability**
•The system provides storage of all databases on redundant computers with automatic switchover.
•The reliability of the overall program depends on the reliability of the separate components.
•The main pillar of reliability of the system is the backup of the database which is continuously maintained and updated to reflect the most recent changes.

- **Safety**
•It is the state of being "safe", the condition of being protected against physical, social, spiritual, financial, political, emotional, occupational, psychological, educational or other types or consequences of failure, damage, error, accidents, harm or any other event which could be considered non-desirable.
•This can take the form of being protected from the event or from exposure to something that causes health or economical losses.
•It can include protection of people or of possessions.

- **Maintainability**
•A commercial database is used for maintaining the database and the application care of the site.
•In case of a failure, a re-initialization of the program will be done.
•Also the software design is being done with modularity in mind so that maintainability can be done efficiently

5.4 Software Quality Attributes

- **Usability**: The system should prioritize ease of use over complexity. A user satisfaction survey should be conducted, aiming for a minimum score of 4 out of 5.
- **Maintainability**: Code should be well-documented and structured to facilitate future updates and enhancements. Code maintainability should be measured using static code analysis tools with a target maintainability index of 75 or above.
- **Reliability**: The system should aim for a 99.9% uptime, with planned maintenance communicated in advance to users.
- **Scalability**: The software architecture should be designed to allow for easy horizontal scaling to accommodate increased user loads.

6. Other Nonfunctional Requirements

Appendix A: Data Dictionary and Data Model

delivery instruction	customer name + customer phone number + order date + delivery location+ delivery time window
delivery location	building and room to which the order is to be delivered
item description	text description of the item; maximum 100 characters
item price	pre-tax cost of a single unit of a item, in rupees
order	order number + order date + delivery instruction + order status
order number	a unique, sequential integer that the system assigns to each accepted order; initial value is 1
order status	[incomplete	accepted	prepared	pending delivery	delivered	canceled]
payment	payment amount + payment method

	+ (payroll deduction transaction number)
order cutoff time	the time of day before which all orders for that date must be placed
order date	the date on which a patron placed an order; format MM/DD/YYYY
customer	customer name + employee ID + customer phone number + customer location + customer e-mail
customer e-mail	e-mail address of the employee who placed a order; 50 character alphanumeric
customer location	building and room numbers of the customer who placed a order; 50 character alphanumeric
customer name	name of the customer who placed a order; 30 character alphanumeric
customer phone number	telephone number of the customer who placed a meal order
payment amount	total price of an order in rupees

quantity ordered	the number of units of each item that the customer is ordering; default = 1; maximum = quantity presently in inventory

Appendix B: Analysis Models