Software Requirements Specification
for
E-Commerce Management System

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Contents

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Chapter 1

Introduction

The Software Requirements Specification serves as a comprehensive document that outlines and defines the mutual agreement between the client and the developer concerning the specifications of the requested software product. Its main purpose is to provide a clear and descriptive "statement of user requirements that will serve as a guiding reference for the ongoing development of the software system. The software requirements specification's aim is to outline the features, external interfaces, attributes, and design constraints that are placed on the software system that is being defined in the remainder of the document in order to prevent it from being implemented. Each part of the document is focused on explaining a specific aspect, ensuring a complete understanding of the software's requirements.

1.1   Purpose

E-commerce, an emerging and fast-growing technique, facilitates the buying and selling of categorized products or services, product management, cart management, sending notifications, enabling chat, transactions, return and refund policy, report generation, and customer history tracking.

The software serves as a platform for sellers and buyers. Sellers can promote and sell products, while buyers can purchase and post their demanded products on our site. Addressing trust issues between these groups, the software creates an interactive platform where both parties can meet their demands.

The main purpose of this Software Requirements Specification is to verify the correctness of all specifications and ensure their validation. It plays a crucial role in ensuring the traceability of the software throughout its development life cycle.

1.2   Intended Audience

The Software Requirements Specification is intended for use by a diverse audience, including:

- Administrators of the software
- Business Analysts (BAs)
- Project Managers (PMs)
- Developers
- QA/QC engineers
- Users (sellers and buyers)
- Marketing staff
- Testers
- Investors

- Others

1.3   Intended Use

This software is designed with the primary aim of offering convenient assistance to both customers and sellers through a well-organized database and information system.

Administrator Facilities

- Administrator can add, update, and delete products.
- Administrator can generate reports on business growth, performance, or other criteria.

Customer Facilities

- Customers register with their detailed information, receiving authentication for secure access.
- Authenticated customers access up-to-date product information, conveniently categorized.
- Using a virtual shopping cart, customers can add, review, and modify selected items.
- Customers can delete the entire cart items at once if they want.
- Customers select preferred shipping options during the purchase process.
- The software accommodates various payment options, including both cash on delivery and using other payment gateways.
- After a successful purchase and payment, the ordered products are promptly dispatched.
- Customers receive timely notifications and updates about their order status, ensuring transparency and satisfaction throughout the buying process.

1.4   Product Scope

The product scope includes, but is not limited to, the following features:

- Ensure secure customer registration and profile management.
- Provide detailed product information with organized categorizations.
- Enable user-friendly product search functionality for quick access.
- Offer personalized product recommendations based on individual user preferences.
- Create a seamless shopping experience with a functional shopping cart for multiple items.
- Provide customers with multiple shipping options and online shipment tracking.
- Showcase popular items in each product category.
- Keep registered customers informed about new arrivals, sales, and offers through regular updates.
- Supply administrators and sellers with strategic data and graphs showcasing item popularity.
- Maintain a comprehensive database of regular customers and diverse products for various needs.
- Assign specific roles to employees for internal affairs such as order processing, home delivery, customer feedback on delivery times, updating order statuses, and addressing customer queries.
- Implement a customer feedback mechanism for products and services, enhancing transparency and customer engagement.
- Offer a secure payment mechanism and gateway supporting popular credit cards, bKash, Rocket, Nagad, and other relevant payment options for seamless transactions.

1.5   Risk Definition

In the domain of e-commerce, risks encompass potential challenges that can disrupt operations. Key concerns include online security breaches, client disputes over refunds, vendor conflicts, shipment issues, and the ever-present threat of credit card scams. Identifying these risks is crucial for the smooth functioning and credibility of the e-commerce platform.

Online Security Breach

The foremost risk in the digital realm involves online security breaches, where hackers may compromise the network, gaining unauthorized access to sensitive data such as company information and customers' credit card details. Ensuring robust protection for our e-commerce website is imperative.

Client Disputes

On-site client disputes, notably concerning customer refunds, pose a significant challenge. Refunds may arise due to undelivered items, customer dissatisfaction, damaged products, or delivery mismatches. Effectively managing and resolving these disputes is crucial for customer satisfaction.

Seller Disputes

Similar to physical stores, vendor disputes can be complex, particularly when sellers fail to deliver products on time or at all. Such issues can significantly impact our e-commerce website, especially during the initial stages.

Shipment Problems

The reliance on courier services for product delivery introduces potential challenges. Issues may include high shipping fees, delayed or undelivered packages, damaged goods, and incorrect deliveries. Swift resolution of shipment problems is vital for enhancing customer retention and loyalty.

Credit Card Scams

Dealing with stolen credit card information is a common concern for e-commerce websites. Hackers, thieves, and fraudsters can exploit unauthorized credit card transactions, emphasizing the need for robust security measures to counteract such scams.

Chapter 2

Overall Description

In this section we will discuss about what is and is not expected of our E-commerce system. In addition to the cases which are intentionally unsupported and assumptions that will be used in the creation of the E-commerce system.

2.1 User Classes and Characteristics

1. Sytem: It is the system administrator class who will maintain the overall web activities
2. Login: Customer and Admin use this class to access the system
3. Cutomer: User who will will purchase the things and save the attributes of product sale.
4. Merchant: User who will upload their products on the web
5. Recommendation- It recommends the users for choosing their best products.
6. Exchanging: User who will upload their products on the web
7. Offers: It offers promotion to the products
8. Notification: It will notify users about offers and discounts

2.2 User Needs

1. As many people including students don't have enough time to go for shopping so they can easily find their desired products through this system
2. Through this system user not only can purchase the products but also exchange their old products and sell them.
3. User can request for any kind of products
4. In case of product's delivery, any customer's desire is to get the product fast and this case this system will help to make the fastest delivery.
5. User can also enhance their communication skills through this interactive system

2.3 Operating Environment

1. First it will operate on Internet explorer version 6 and Google Chrome. In next increment it will browse other browsers such as Mozilla, Firefox and for their different version also.
2. Firesbase:To store data in database we will use Firebase

3. Distributed database :For Distributing the data we will use Github

4. Operating System : It can be open on any OS like android, ios, windows as well as Mac.

5. Ram : The RAM should be at least 1GB. But for better performance we recommend 2GB

6. Platform: .net/Java/JavaScript/PHP

2.4   Constraints

Constraints in the system outline any limitations or restrictions that may impact the development or functionality of the E-commerce management system.

1. Technology Compatibility : The system may face compatibility issues with outdated browsers.

2. Internet Connectivity : Users must have a stable internet connection to access and use the E-commerce system.

3. Data Security : Security measures will be implemented to protect user data.

4. Hardware Requirements : The system's performance is dependent on the user's device capabilities.

5. User Authentication : he security of user accounts relies on the strength of their passwords and the security of their login credentials.

2.5   Assumptions

Assumptions highlight the expectations or suppositions made during the planning and development of the E-commerce system.

1. User Familiarity : It is assumed that users have a basic understanding of online shopping practices and are familiar with common e-commerce platform interactions.

2. Internet Availability : The assumption is made that users will have consistent access to the internet for the system to function optimally.

3. Data Accuracy : The system assumes that information provided by users, merchants, and administrators is accurate.

4. Firebase Reliability : The system assumes the reliability of the Firebase platform for data storage.

5. Legal Compliance : It is assumed that users and merchants will adhere to legal and ethical standards in their interactions and transactions within the E-commerce system.

Chapter 3

Requirements

3.1 Functional Requirements

User Registration

As an Unregistered user, I want to be able to register to the website so that I can sign up my register account.

Success

1. A registration form is given when clicked on 'signup'.

2. Provide valid information including a unique username, email address, a strong password, and other required details.

3. Users are required to agree to the terms and conditions before completing the registration process.

4. After successful registration, user receives an email with a verification link to confirm their email address.

5. After registration, users are prompted to complete profile by adding additional information such as a profile picture or preferences.

Failure

1. Email Already Registered - display an error message.

2. Weak Password Rejection - system rejects the password, prompting the user to create a stronger password.

3. 'Entered Password' and 'Re-enter Password' do not match - show error alert 'Password entries do not match'.

4. User does not receive or encounters issues with the email verification link - display error message "Link expired or invalid".

5. Heavy traffic or undergoes maintenance - alert message "Service temporarily unavailable".

User Login

As a registered user, I want to login to be able to sign in to a website so that I can access my personal profile or dashboard.

Success

1. Enter a username and password. The username is most often the user's email address.

2. "Remember me" ticked – store cookie/automatic login next time. If not ticked force to login next time.

3. Verify identity via CAPTCHA or other security measures to prevent unauthorized access.

4. Click submit, the username/email is searched. If found, an encrypted version of the password is then compared with the stored encrypted version.

5. The profile is updated with the latest login date time.

6. Finally the user is shown a screen that they are entitled to see based on the outcome of the previous steps.

Failure

1. User id is incorrect – display an error message

2. Password does not match or has expired – display an error message

3. Account has been disabled – display an error message.

4. Attempting to log in during system maintenance hours are unable to access their accounts.

5. The "Forgot Password" link fails to send a password reset email.

Product Discovery

Product Discovery is a crucial components of an e-commerce system that significantly enhance the user experience by helping customers to find products more efficiently.

As a customer I need to be able to search,filter,sort and view product details so that I can navigate through the vast array of products available on an e-commerce system.

Search Functionality

As a customer,I need to initiate search by entering keywords, product names, or phrases into the search bar so that I can find the desired products quickly.

Success

- Login to the system

- Enter a product name or keywords to find the specific product

- Successfully display the product

Failure

- The system rejects the operation if the user is not registered

- Irrelevant or incomplete search results when attempt to ambiguous queries

- Addressing issues as out-of-stock visibility

Filtering options

As a customer,after the initial search, I need to use filters to refine results. It is based on criteria such as price range, brand, size, color, and customer ratings, tailoring the results to meet the preferences.

Success

- Login to the system

- Utilize filtering options to refine search results based on criteria such as price range, brand, size, color, and customer ratings.

- Filters should be dynamic and update in real-time as users make selections

- Successfully display filters in a clear and user-friendly manner, possibly in a sidebar or dropdown menu

Failure

- The system rejects the operation if the user is not logged in

- Ineffective filtering options leading to an inability to refine search results as intended

- Issues with the visibility or accuracy of out-of-stock products in the filtered results, impacting the ability to make informed choices.

Sorting Features

As a customer, I need the ability to sort search results to quickly locate products based on my preferences, allowing for a more efficient and personalized shopping experience.

Success

- Login to the system

- Perform a search using keywords, product names, or phrases.

- Utilize sorting options to arrange search results based on criteria such as relevance, price (low to high or high to low), customer ratings, and newest arrivals.

- Successfully view search results sorted according to the chosen criteria.

Failure

- The system rejects the operation if the user is not logged in

- Sorting options are ineffective, leading to an inability to organize search results as intended.

- Technical glitches resulting in incorrect sorting or disruption of the sorting functionality.

- Out-of-date or inaccurate product information impacting the reliability of sorting results.

Viewing Product Details

As a customer, I need to access comprehensive information about a product by viewing its details, enabling me to make informed purchase decisions.

Success

- Login to the system

- Navigate to a product of interest, either through search, filtering, or sorting

- Click on the product to access detailed information, including product description, specifications, pricing, availability, customer reviews, and high-quality images.

- Successfully view and understand all relevant details about the selected product.

Failure

- The system rejects the operation if the user is not logged in

- Technical issues preventing the proper loading or display of product details

- Incomplete or inaccurate product information impacting the customer's ability to make informed decisions

- Limited availability of high-quality images or customer reviews for the selected product.

Offers and Discounts

As an admin, I need to manage and optimize the "Offers and Discounts" feature to attract and retain customers,stimulate sales, and enhance the overall shopping experience.

Success

- Log in to the system with administrative credentials
- Create and configure various promotions, including percentage discounts, fixed amount discounts, BOGO offers, bundle deals, and loyalty program benefits
- Generate and distribute unique and secure coupon codes for specific promotions
- Set expiration dates for promotions to control their duration.
- Monitor and analyze the performance of different promotions using analytics tools
- Plan and execute targeted email campaigns to communicate ongoing and upcoming offers to customers

Failure

- The system denies access if the administrator credentials are incorrect
- Technical glitches affecting the creation, configuration, or monitoring of promotions
- Ambiguous or incomplete terms and conditions leading to confusion among customers
- Limited visibility or accuracy of out-of-stock products in the promotion results
- Challenges in maintaining accurate pricing or discount information

Cart Management

In our E-commerce system, Cart Management is paramount to providing a user-friendly shopping experience.

Success:

1. Customer can easily and effortlessly purchase products by adding their desired items to the cart from the product pages through an intuitive "Add to Cart" button. Customers search for the product by category, choose them, and add them to the cart.

2. The "View Cart" option allows customers to review selected items, providing a detailed overview, including productID, ProductName, productQuantities, and prices. This feature empowers customers with transparency and facilitates informed decision-making before proceeding to checkout.

3. Customers can effortlessly modify their carts by adjusting quantities or promptly removing items, enhancing flexibility.

4. The "Clear Cart" option allows customers to swiftly empty their entire cart when needed.

5. The system ensures cart persistence, preserving selections even if customers log out or close their browsers. This persistence enables a continuous and convenient shopping journey.

Failure:

1. If any product added to the cart becomes unavailable, it does not proceed to the further checkout process. Showing the message: "Stock out"

2. During the checkout process, if the payment gateway encounters an error, users may face difficulties completing the transaction, leading to potential order cancellations. Showing the message: "Payment gateway error"

3. Poorly designed cart modification options may lead to accidental removal of items or unintentional changes in quantities, causing inconvenience for users.

4. If the cart review page does not display accurate product details or fails to load, users may face confusion and hesitation during the checkout process.

5. Users encounter problems adding items to the cart, leading to frustration and potential abandonment of the purchase.

6. No internet connection.

7. Page not found or 404 error occurs.

Return and Refund Policy

In our E-commerce system, a customer can initiate a return and request a refund for a product that he/she is not satisfied with or that is defective. Customers should be able to easily find information about the return and refund policy on the platform.

Success:

1. From the customer's order history or account settings, there should be an option to initiate a return for a specific product.

2. During the return process, the customer wants to be able to provide reasons for returning the item, such as defects, dissatisfaction, or receiving the wrong product.

3. The customer should be able to select the specific items from his/her order that he/she wants to return.

4. After initiating a return, the customer wants to be able to track the status of his/her return request.

5. Receive timely notifications regarding the approval or decline of the customer's return request.

6. Upon approval, the system should clearly communicate the refund amount and provide information on how the refund will be processed.

7. The system should provide an estimated timeline for when the refund will be processed, and the funds returned to the original payment method.

8. The customer should have access to a history of his/her past return requests for reference.

By implementing these features, the Return and Refund functionality aims to provide a transparent and user-friendly process for customers seeking to return items and obtain refunds in a simple manner.

Failure:

- When a customer requests a return for a product and, during the processing period, the product becomes out of stock or discontinued, the system may face challenges in fulfilling the return request, potentially leading to delays or complications in the refund process.

- Lack of communication about the status of a return request causes uncertainty for the customer, resulting in a negative experience.

- The system fails to clearly communicate the refund amount or provides inaccurate information, leading to confusion and dissatisfaction.

- Delays in processing refunds beyond the estimated timeline may result in customer frustration and a loss of trust in the return and refund process.

Notification Management

Notification management is an integral part of any Ecommerce site, ensuring continuous connection with customers and keeping them informed about day-to-day business, offers, policies, order confirmation, and

cancellations.

Users' Perspective

As a customer, I want to be notified about my order confirmation, cancellation, refunding, and all updates such as offers, discounts, and campaigns on the site.

Success

- Upon a customer's first registration, they will successfully receive a verification email with a secret code for authenticity confirmation.
- Order confirmations trigger notifications via email/sms to the customer.
- Cancellation requests result in notifications via email/sms according to the site's policy.
- Refund requests, following the return policy, trigger corresponding notifications to the customer.
- Customers can successfully receive updates by enabling the 'notification on' feature and can disable it to turn off notifications.

Failure

- Notification delivery may experience delays or failures caused by unexpected network issues, slow response from the system, or system failures.

Admin's Perspective

As an admin, I want to manage the notification functionality.

Success

- Admins can selectively notify a limited group of customers for special events, e.g., special discounts for those with transactions over 10,000 Tk in a month.
- Admins have the authority to block suspected client accounts from receiving site updates.
- Admins can set notification limits for any customer.

Failure

- There may be a delay in updating notification settings due to any network or system issues.
- Notification delivery process may encounter challenges, and failures due to any issues related to the network or the system.

Wishlist Feature

As a customer, I want to create and manage a wishlist on the Ecommerce site for tracking products I am interested in for future purchase.

Success

- A customer can successfully add his/her interested products to the wishlist by selecting the "Add to Wishlist" option.
- Customers can successfully remove products they no longer have interest in from the wishlist by choosing the "Remove from Wishlist" option.
- Customers can successfully move a product from the wishlist to the cart for purchase by selecting the "Proceed to Cart" option.

Failure

- Unable to proceed from wishlist to cart due to stock unavailability: "Stock out."

- Issues with adding/removing products to/from wishlist due to network problems: "Network issue."

Product Management

Product management Enables admins to add, edit, or remove products with details like name, description, price, and images.

As an admin, I want to efficiently manage the inventory and products on the e-commerce platform so that I can ensure accurate stock levels and proper presentation to customers.

Addition and Editing of Products

As an admin, I should be able to add new products to the inventory so that the products are sufficient.
I should be able to edit existing product details so that product information are up-to-date.

Success

- Successfully add a new shirt to the system, and it is visible on the website for customers to browse and purchase.

- Successfully update the price of a dress, and the changes reflect on the product page.

Failure

- The system rejects the addition if mandatory details like price or product image are missing, providing an error message.

- Attempt to edit a non-existent product, the system displays an error message.

Inventory Management

As an admin, I need to view current stock levels for each product.
As an admin, I should receive notifications so that I can view low stock levels or out-of-stock products.

Success

- The admin accurately monitors and views the stock levels for various products.

- Low stock notifications are received promptly, allowing timely restocking.

Failure

- The system fails to update in real-time, leading to incorrect stock levels displayed on the website.

- Customers may order products that are actually out of stock.

- If the notification system fails, admin may not be aware of low stock, leading to potential stockouts.

Product Categorization and Organization

As an admin, I need to be able to categorize products into different categories or collections so that customers can easily browse.

Success

- Successfully add new products to relevant categories.

- Rearrange the order of products displayed within a category.

- I assign products to multiple categories for broader visibility.

Failure

- Products do not display correctly on the storefront.

- Error occurs when attempting to create new categories.

- Products are mistakenly tagged or misplaced in irrelevant categories.

Analytics and Reporting

As an admin, I need to access analytics and reporting features so that I gain insights into the e-commerce platform's performance, enabling data-driven decision-making.
It includes insights into user behavior, sales patterns, popular products, and other key metrics.

Success

- Successfully view a detailed report on the platform's sales performance over the last month.

- Successfully access analytics on user engagement, including page views, click-through rates, and time spent on the platform.

- Generate a report highlighting the most popular products and categories.

- Review analytics on conversion rates for different products and product categories.

Failure

- Analytics tool fails to integrate with the database, resulting in incomplete or outdated data.

- The reporting tools become temporarily inaccessible due to server issues or software glitches.

- Admins misinterpret the data presented in the reports, leading to incorrect conclusions.

- Reporting tools have a delay in updating, causing admins to rely on outdated information.

Order Processing and Management

Actor: Admin

As an admin, I need to efficiently manage and process incoming orders to ensure a smooth workflow and timely fulfillment.

Success

- Access the admin dashboard with the necessary credentials.

- Receive real-time notifications for new orders, displaying essential details such as order ID, products, and customer information.

- View a comprehensive order list with order status (pending,processing,shipped, delivered).

- Update order status based on the progress of order fulfillment (mark as processed, shipped, or delivered).

- Access detailed order information, including product quantities, prices, and customer shipping details.

- Easily identify and manage orders with special requests or specific instructions.

Failure

- Experience delays in order status updates due to technical glitches, with a system message alerting to the delay.

- Encounter system errors preventing the display of new orders, triggering an error message for investigation.

- Receive immediate alerts for high-priority orders or those requiring urgent attention, such as expedited shipping requests.

Actor: Customer

As a registered user, I want to seamlessly place orders for products I wish to purchase, ensuring a straightforward and secure payment process.

Success

- Login to the system with my credentials.

- Browse the products and add desired items to my cart.

- Proceed to checkout, providing accurate shipping details.

- Select a preferred payment method (credit card,PayPal,Bkash etc.).

- Complete the order by confirming payment through a secure payment gateway.

- Receive an order confirmation email with detailed information about the purchased items and delivery estimates.

- View the order history in "My Account" to track the status of my recent purchases.

Failure

- If any product in my order becomes unavailable during checkout, prevent the order completion and display a "Product Out of Stock" message.

- Encounter difficulties during the payment process, leading to an error message and guidance on resolving the issue.

- Experience delays in order confirmation emails or fail to receive them, resulting in uncertainty about the successful order placement.

Payment Gateway Integration

Actor: Admin

As an admin, I want to oversee the integration and functionality of the payment gateway for secure and efficient transaction processing.

Success

- Verify successful integration of the chosen payment gateway into the e-commerce platform.

- Ensure encrypted and secure transmission of customer payment information during transactions.

- Monitor successful payment confirmations and verify payment details for each order.

- Receive notifications for failed payment transactions and take appropriate actions.

- Access a comprehensive log of all transactions, including successful and unsuccessful payments.

Failure

- Receive immediate alerts for any payment gateway issues, such as downtime or connection failures.

- Address and resolve payment discrepancies, ensuring accurate financial records.

- Collaborate with technical support to resolve any integration issues impacting the payment process.

- Regularly review and update payment gateway settings, including security protocols and supported payment methods.

Ratings

Actor: Customer

As a customer, I want to share my feedback, provide ratings, and write reviews for products I have purchased.

Success

- Log in to the system with my credentials.
- Navigate to the product I want to review.
- Submit a rating (star rating) and provide written feedback about my experience with the product.
- View my submitted reviews in my account's order history.

Failure

- Encounter technical issues preventing the submission of feedback or ratings, displaying an error message.
- Receive a confirmation message upon successful submission of feedback, ensuring that my input is recorded.
- In case of a negative experience, access a "Contact Us" feature to provide additional comments or seek support from customer service.

3.2   Non Functional Requirements

Non-functional requirements, rather than to specific behaviors or capabilities, provide the qualities and traits that specify how an e-commerce system runs. These requirements address the system's performance, usability, security, scalability, and other qualities. Here are some non-functional requirements for our e-commerce system:

3.2.1   Performance Requirements

- The system should respond within a defined time frame. user log in under 10 seconds.
- The system should handle 40% increased user traffic and at least 200 users without significant degradation in performance.
- Handle a certain number of transactions or requests per unit of time, processing 1000 orders per hour.
- Search result for product within 10 seconds.

3.2.2   Safety Requirements

- Robust user authentication measures to prevent unauthorized access to user accounts.
- User data, especially payment details, will be encrypted using industry-standard protocols.
- All financial transactions will be encrypted and comply with industry standards.

3.2.3   Security Requirements

- User roles and permissions are set to control access to sensitive information or functionalities.
- System will lock an account after 5 unsuccessful login attempts.
- Install firewalls and intrusion detection systems.

3.2.4 Software Quality Attributes

- System is user-friendly and easy to operate.
- System responds promptly and efficiently to user interactions.
- Minimal latency during peak usage.
- Maintain functionality even in the event of hardware failure or unexpected issues.
- System is designed to scale both vertically and horizontally.

3.2.5 Business Rules

- Only administrators have the authority to add or remove products from the inventory.
- Customers can edit or cancel orders within 48 hours of purchase, except for items already shipped.
- Only managers are authorized to create offers, promotions and discounts.
- Marketing customer service representatives can initiate return authorizations based on specific criteria outlined in the return policy.
- Management teams can propose new products.

Appendices

Appendix A

Glossary