

Software Requirements Specification

for

Tech Hub

Version 2.0

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Revision History

Name	Date	Reason For Changes	Version
Nour	16 Dec 2023	Changed the backend framework to ASP.NET and the SQL Server to MSSQL	Version 2.0

1. Introduction

1.1. Purpose

The purpose of this software project is to develop version 1.0 of an Tech Hub, aiming to provide a streamlined and user-friendly platform for customers to browse, select, and purchase tech products. This Software Requirements Specification (SRS) document identifies the specified product and outlines the entire scope of the system. Encompassing user registration, product management, order processing, inventory management, and promotional features, the SRS details the comprehensive functionalities for customers, administrators, and employees. The project's objective is to optimize the online retail experience and backend operations within the specified system version.

1.2. Document Conventions

Document conventions establish the standards and formatting rules applied in the Software Requirements Specification (SRS). In this document, standard typographical conventions have been followed, with no specific fonts or highlighting indicating special significance. Priority levels for higher-level requirements are assumed to be inherited by detailed requirements, ensuring a consistent prioritization structure throughout the document. Each requirement statement is assigned its own priority to maintain clarity and facilitate effective traceability.

1.3. Intended Audience and Reading Suggestions

Intended Audience and Reading Suggestions for a Teaching Assistant at Zewail City:

This Software Requirements Specification (SRS) is primarily crafted for the evaluation of our university project by the teaching assistant at Zewail City. The document caters to a technical audience involved in project assessment. The teaching assistant will find detailed insights into the purpose, scope, and functional requirements of the Tech Hub.

Document Organization:

1. Overview Sections: *Begin with the overview sections (Purpose of the Project, Product Identification, Scope of the Product) to gain a comprehensive understanding of the project's goals and context.*

2. Functional Requirements: *Dive into the detailed functional requirements to evaluate the specific features and functionalities outlined for the online tech store.*

3. Non-Functional Requirements: *Review the non-functional requirements to assess system characteristics, including performance, security, and usability.*

4. User Roles and Privileges: *Understand the roles and privileges assigned to different users, providing insights into how stakeholders interact with the system.*

5. Testing Criteria: *Examine the testing criteria section to gauge the comprehensiveness of the testing plan and the thoroughness of test coverage.*

6. **Constraints:** Consider system constraints, which may impact project feasibility, implementation, or scalability.

1.4. Project Scope

The Tech Hub is a comprehensive software solution designed to facilitate efficient and user-friendly management of an online technology store. The primary purpose is to provide customers with a seamless and secure platform for browsing, selecting, and purchasing tech products. The system aims to streamline backend operations, optimize order processing, and enhance the overall user experience in the online retail environment. Key objectives include the creation of a robust product catalog, efficient order fulfillment, and the implementation of promotions to drive customer engagement. By aligning with corporate goals, the system seeks to increase sales, customer satisfaction, and operational efficiency in the tech retail sector. This scope statement outlines the immediate goals of the project while contributing to the long-term strategic vision of maintaining a competitive and customer-centric online tech store. For a more detailed understanding of the project's vision, objectives, and long-term strategies, please refer to the separate Vision and Scope document.

2. Overall Description

2.1. Product Perspective

The Tech Hub represents a new and self-contained product, purpose-built to address the dynamic requirements of online tech retail. It is not a replacement for existing systems but is conceived as an independent and innovative solution. This software aims to streamline and elevate the management of an online technology store by providing a robust platform for product catalog management, order processing, and customer engagement. As a self-contained product, its design is tailored to meet the unique demands of the online retail sector, offering a comprehensive suite of functionalities within a singular and cohesive solution. This new system stands alone in fulfilling the specific needs of an efficient and customer-centric online tech store.

2.2. Product Features

The Tech Hub introduces a range of key features to enhance the online shopping experience. Users can securely register and authenticate, accessing a user-friendly platform with a robust product catalog management system, including search and filtering options. The system facilitates a seamless transaction process through a virtual shopping cart and efficient order processing, allowing users to track their order history. Real-time inventory management ensures accurate stock levels, while the incorporation of product reviews and ratings enhances user engagement. The system also supports promotional offers and discounts, associated with specific products, and defines user roles and privileges for effective management. A visual representation of these features will be presented in Section 3 through a top-level data flow diagram or class diagram.

2.3. User Classes and Characteristics

The Tech Hub accommodates distinct user classes, each with unique characteristics and activities. Customers, characterized by frequent interactions, engage in purchasing and reviewing products, exhibiting varying levels of technical expertise. Administrators, infrequent users with high technical proficiency,

undertake tasks such as managing the product catalog, overseeing orders, and applying promotions. Employees, frequent users with moderate technical skills, handle inventory, process orders, and manage user accounts. Guest Users, with infrequent interactions and minimal technical expertise, focus on proceeding to checkout without creating an account. This classification ensures a tailored user experience, with a focus on the favored user classes—Customers, Administrators, and Employees—who play crucial roles in regular system operations, while addressing the needs of less important user classes such as Guest Users.

2.4. Operating Environment

The Tech Hub operates within a simplified environment using ASP.NET, HTML, and CSS, with Microsoft SQL as the database management system. It is compatible with standard hardware configurations, including desktops, laptops, and mobile devices, providing accessibility across various platforms. The system supports major operating systems such as Windows, macOS, and Linux. The streamlined environment focuses on simplicity and ease of deployment while leveraging ASP.NET and Microsoft SQL for a responsive and functional Tech Hub.

2.5. Design and Implementation Constraints

The design and implementation of the Tech Hub are constrained by the specified technological stack, utilizing ASP.NET for the backend, HTML, and CSS for the frontend, and Microsoft SQL as the database management system. Adherence to these technologies is crucial for seamless integration and compatibility. Consideration for potential hardware limitations on user devices, adherence to design conventions and programming standards for future maintainability, management of parallel operations during peak usage, and compliance with established communications protocols further shape the development process.

2.6. Assumptions and Dependencies

The project is founded on critical assumptions and dependencies essential for successful development. It assumes the availability and compatibility of third-party components and external APIs for shipping integration. Relying on a stable development environment, compatibility with widely used operating systems, and the implementation of a chosen database system are also integral. Effective team collaboration contributes to the project's foundational elements. Timely monitoring and adaptation to changes in these factors are essential for ensuring a smooth and successful project delivery.

3. System Features

3.1. User Account Registration

3.1.1 Description and Priority:

This feature allows users to create accounts on the platform, enabling personalized experiences and order tracking. It is of High priority as it establishes a fundamental user interaction point.

3.1.2 Stimulus/Response Sequences:

- *Stimulus: User selects the "Sign-Up" option.*
 - *Response: System prompts the user with a registration form.*
- *Stimulus: User fills in the required registration details.*
 - *Response: System validates the information and creates a user account.*

3.1.3 Functional Requirements

- REQ-1: The system shall provide a "Sign-Up" option on the user interface.
- REQ-2: The registration form shall include fields for the user's name, email, and other required details.
- REQ-3: The system shall validate the email format and ensure its uniqueness in the database.
- REQ-4: Upon successful registration, the system shall generate a confirmation message and REQ-5: The system shall securely store user registration information in the database.
- REQ-6: The system shall handle and inform users of registration errors, such as invalid email format.

3.2. Order Checkout and Payment

3.2.1 Description and Priority:

This feature enables users to complete the order process by providing shipping details and making secure payments. It is of High priority as it directly impacts the conversion of user interest into successful transactions.

3.2.2 Stimulus/Response Sequences:

- *Stimulus: User selects the "Checkout" option after adding products to the cart.*
 - *Response: System prompts the user to enter shipping information.*
- *Stimulus: User enters shipping details and proceeds to payment.*
 - *Response: System displays available payment options*
- *Stimulus: User selects a payment method and provides required details.*
 - *Response: System securely processes the payment and confirms the order.*

3.2.3 Functional Requirements:

- REQ-1: The system shall provide a "Checkout" option in the shopping cart interface.
- REQ-2: The checkout process shall include steps for entering shipping details and selecting a payment method.
- REQ-3: The system shall validate and securely store shipping information.

- REQ-4: The system shall generate and display an order confirmation with details such as order number and estimated delivery date.
- REQ-5: The system shall update the order status to "Shipped" upon successful payment processing.
- REQ-6: In case of payment failure, the system shall provide clear error messages and allow users to retry or choose an alternative payment method.
- REQ-7: The system shall securely store order details for future reference and tracking.

3.3. Product Reviews and Ratings

3.3.1. Description and Priority:

This feature enables users to leave reviews and ratings for products, providing valuable feedback to other customers. It is of Medium priority, contributing to the overall user engagement and decision-making process.

3.3.2. Stimulus/Response Sequences:

- *Stimulus: User navigates to a product's detail page.*
 - *Response: System displays existing reviews and ratings, if any.*
- *Stimulus: User selects the option to leave a review.*
 - *Response: System presents a form for the user to submit a review and rating.*

3.3.3. Functional Requirements:

- REQ-1: The system shall display existing product reviews and ratings on the product detail page.
- REQ-2: The system shall provide an option for users to leave a review and rate a product.
- REQ-3: The review form shall include fields for the user's comments, a star rating, and an optional title.
- REQ-4: The system shall validate the user's input in the review form.
- REQ-5: Upon submission, the system shall store the review and rating in the database associated with the respective product.
- REQ-6: The system shall calculate and display the average product rating based on user reviews.
- REQ-7: Users shall have the ability to edit or delete their own reviews.

- REQ-8: The system shall notify users when their reviews are successfully submitted.

4. External Interface Requirements

4.1. User Interfaces

The Tech Store Management System features user interfaces designed for different roles, ensuring a cohesive and intuitive experience. The graphical user interface (GUI) follows a clean and responsive design with standardized navigation, buttons, and layouts. Standardized buttons, keyboard shortcuts, and error handling contribute to a user-friendly interface. Accessible help features, adherence to accessibility guidelines, and user feedback mechanisms enhance usability. Each interface caters to specific user roles, maintaining consistency while accommodating diverse functionalities.

4.2. Hardware Interfaces

The Tech Store Management System interfaces seamlessly with diverse hardware components, ensuring compatibility across devices through responsive design. Standard communication protocols secure data interactions, while interfaces with the database system, payment gateways, and shipping partners enable efficient operations. The system's adaptability extends to barcode scanners, POS devices, printers, and server infrastructure, creating a robust and integrated ecosystem for streamlined functionality.

4.3. Software Interfaces

The software interfaces with various components, accommodating user interactions through a graphical interface accessible on desktops, laptops, tablets, and smartphones. The logical and physical database interface involves querying and managing data using database-specific protocols. For third-party APIs, the software communicates through HTTP to send requests and receive responses, facilitating functionalities like Catalog searches. External systems exchange data with the software using industry-standard formats, while the operating system interface manages device-specific functionalities. Network interfaces employ TCP/IP for seamless data transfer across all connected devices. These interfaces collectively contribute to the smooth operation of the system.

4.4. Communications Interfaces

The software product establishes essential connections to ensure seamless functionality. It interacts with external systems for product information, exchanging data using industry-standard formats. Network communication, governed by TCP/IP, facilitates data exchange with devices, handling user requests and providing product details. These connections collectively contribute to a robust and efficient system operation.

5. Other Nonfunctional Requirements

5.1. Performance Requirements

5.1.1. Page Loading Time:

- Requirement: All pages, including product listings and detail pages, shall load within 5 seconds under standard user bandwidth conditions.
- Rationale: Fast page loading times improve user engagement and reduce bounce rates, ensuring a smooth browsing experience.

5.1.2. Concurrent User Handling:

- Requirement: The system shall support a minimum of 500 concurrent users without significant performance degradation.
- Rationale: Ensuring the system can handle concurrent user loads is crucial for scalability and user accessibility during peak usage periods.

5.1.3. Inventory Update Frequency:

- Requirement: The system shall update product inventory in real-time, reflecting changes within 1 minute of order placement or stock adjustments.
- Rationale: Real-time inventory updates prevent overselling and ensure accurate product availability information.

5.1.4. Database Query Performance:

- Requirement: Database queries for common operations (e.g., product retrieval, user authentication) shall have an average response time of 100 milliseconds.
- Rationale: Efficient database queries contribute to overall system responsiveness and reduced latency.

5.1.5. Shipping Information Retrieval:

- Requirement: Retrieval of shipping information for order tracking shall occur within 5 seconds.
- Rationale: Timely access to shipping information is crucial for providing customers with up-to-date order status.

5.2. Safety Requirements

5.2.1 Product Information Accuracy:

- Concerns: Inaccurate or misleading product information.
- Safeguards/Actions: Regularly update and verify product information. Provide a mechanism for users to report inaccuracies.

5.2.2 Data Backup:

- Concerns: Potential loss of project data.
- Safeguards/Actions: Regularly back up project files to prevent data loss

5.2.3 Regular System Check:

- Concerns: System glitches or malfunctions.
- Safeguards/Actions: Conduct regular checks to identify and address system issues promptly.

5.2.4 Project Documentation:

- Concerns: Loss of project knowledge due to lack of documentation.*
- Safeguards/Actions: Maintain comprehensive project documentation for future reference.*

5.3. Software Quality Attributes

5.3.1 Usability:

- Objective: Ensure an intuitive and user-friendly interface for ease of navigation.*
- Measure: Conduct user testing sessions to evaluate the ease of use and gather feedback for improvements.*
- Preference: Prioritize ease of use over intricate design for a smoother user experience.*

5.3.2 Reliability:

- Objective: Ensure consistent and dependable system performance.*
- Measure: Track system uptime, identify and resolve any reported issues promptly.*
- Preference: Prioritize reliability to instill confidence in users.*

5.3.3 Feedback Responsiveness:

- Objective: Enable prompt responses to user feedback and reported issues.*
- Measure: Evaluate the time taken to address and resolve user feedback.*
- Preference: Emphasize responsiveness to enhance user satisfaction and engagement.*