

SWE 530 - BookStore Application

Software Requirements Specifications

Boğaziçi University
M.S. in Software Engineering
SWE 530 Software Design Process Course

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1. Introduction

1.1 Purpose

The purpose of this document is to build an online Book Store e-Commerce Web Application software to sell books to customers.

1.2 Project Scope

The aim of the Book Store is to ease buying books for customers , selling books for companies and to create a convenient and easy-to-use application for customers trying to buy online books and for company staff trying to manage, organize and fulfill their related business processes.

1.3 Intended Audience

The system requirements specification document describes what the system is to do, and how the system will perform each function. The audiences for this document include the system developers and the users. The system developer uses this document as the authority on designing and building system capabilities. The users review the document to ensure the documentation completely and accurately describes the intended functionality.

This version – version 1.0 - provides general descriptions of the system. The system developer should review the document to ensure there is adequate information for defining an initial design of the system. The users should review the document to affirm the features described are needed, to clarify features, and to identify additional features needed within the system.

The next version – version 2.0 – will be the result of more detailed requirements analysis. When Version 2.0 is written, the system developer and users will be asked to review this document. The document is structured to follow IEEE 830-1998 standards for recording system requirements.

1.4 Definitions, Acronyms and Abbreviations

BOUN : Boğaziçi University

SWE : Software Engineering Master Program Of BOUN

SWE 530: Software Design Process Course Of SWE

Book Store : Online Book Store e-Commerce Web Application software to be.

Front-office : The Front-office features refer to the design, content, images and features that customers routinely see on the company's website and Web pages.

Back-office : The Back-office features refer to ERP and CRM software, inventory management, fulfillment processes, accounting and staff management.

DB or db refers to the database of the application.

Web Application : An application program that is stored on a remote server and delivered over the Internet through a browser interface.

Database , A collection of related data stored in one or more computerized files in a manner that can be accessed by users or computer programs via a database management system.

Server – A central computer (server) which provides services such as file storage, printing, and communications in a network computing system

Client – A computer process that requests a service from another computer and accepts the server's responses / the individual computers in a network computing system

System - A composite of equipment, skills, and techniques capable of performing or supporting an operational role or both. A complete system includes all equipment, related facilities, material, software, services and personnel required for its operation and support to the degree that it can be considered a self-sufficient item in its intended operational environment.

Requirement -A statement of need for some aspect of a system, often elicited directly from a stakeholder or captured from a source document

System Requirement - A condition or capability that must be met or possessed by a system or system component to satisfy a condition or capability needed by a user to solve a problem.

Software requirement – (1) A software capability needed by a user to solve a problem to achieve an objective; (2) A software capability that must be met or possessed by a system or system component to satisfy a contract, standard, specification, or other formally imposed document.

Functional requirement: A statement of a piece of required functionality or a behavior that a system will exhibit under specific conditions. These include inputs, outputs, calculations, external interfaces, communications, and special management information needs. Functional requirements are also called behavioral requirements because they address what the system does.

Use cases - A task analysis technique often used in software engineering. For each module of a system, common tasks are written up with the prerequisites for each task, the steps to take for the user and the system, and the changes that will be true after the task is completed. Use cases are especially useful for making sure that common tasks are supported by the system, that they are relatively straightforward, and that the system architecture reflects the task structure.

User class - A group of users for a system who have similar characteristics and requirements for the system.

User interface – A user interface is what you have to learn to operate a machine. For example, the graphical user interfaces (GUIs) -- windows, icons, and pop-up menus have become standard on personal computers.

Authentication - The procedure (essentially approval) used by the approval authority in verifying that specification content is acceptable. Authentication does not imply acceptance or responsibility for the specified item to perform successfully.

1.5 Document Conventions

This document follows the IEEE standard. Bold faces used to emphasize section and subsection headings. Highlighting is to point out words in the glossary and italicized text used to label and recognize diagrams and tables.

1.6 References

Project Github Repository :

<https://github.com/BounSweFerhatSal/swe530>

IEEE 830-1998 :

<https://standards.ieee.org/standard/830-1998.html>

2. Overall Description

2.1 Product Perspective

Book Store Project aims to provide an efficient way for companies who want to sell books to individual customers and an easy to use web application for individuals who want to find and buy books via internet, hence this project envisages the bridge between the seller and the customer , so Book Store must provide an easy to learn and user-friendly interface , it also must be a reliable and a secure software for this purpose.

2.2 Product Functions

The product functions of the system include the system providing different types of services based on the type (class) of users which are explained in the “2.3 User Classes and Characteristics” section.

For the customer users the book store provides standard e-commerce functionality such as viewing the home page, registering and logging in to the system, searching for books, adding books to cart, purchasing via only with credit card (online payment) , viewing the status of orders and shipping, returning a product, creating and viewing issues for support department, and other basic online commerce processes.

For the back-office users the book store provides some of ERP and CRM functionality such as defining authors, publishers, categories and suppliers, adding new books, modifying book prices, managing supply orders, creating invoices, shipping the books , supporting customer issues, receiving returned books.

2.3 User Classes and Characteristics

Book Store has two different user class groups : “**Customers**” and “**Back Office Users**.” Back Office users classification consists of different user classes.

Customer User (or shortly customer) : Any individual who wants to use the "Book Store" to search,investigate and buy books. Customer users register themselves to the system and confirm their identities using an email confirmation link or code. A Customer can search and browse through the books in the store and choose them to place in a virtual shopping cart. The shopping cart details can be viewed and items can be removed from the cart. To proceed with the purchase, the customers are prompted to login or register if they are not registered before. Also, the customer can modify personal profile information (such as phone number and shipping address) stored by the application. The customer can also view the status of any previous orders.

Back-Office Users :

Administrator : The Administrator is the super user and has complete control over all the activities that can be performed. All back office users can only be created by the administrator user and all of the user management processes can only be done by the administrator.

Company Staff (or shortly user) : All employees of the book store owner company have to be registered to the system and different roles, access rights and privileges can be assigned to them by the administrator. Company staff users can create/update/activate/deactivate books, can create/update/delete authors, can create/update/delete publishers, can create/update/delete suppliers, can list orders and investigate the details of orders created by customers , can create/update/delete supply orders for books not exist in the storage of the company , can create/update/delete invoices , can check the payment status of orders , can ship the books to the customers, can investigate the shipping status of an order can accept the returns , can list the issues created by customers , can answer the issues and can realize other related task on the system due to their assigned roles.

2.4 Assumptions and Dependencies

1. The users have sufficient knowledge of computers and basic internet browsing.
2. The users are familiar with the Shopping Mall related terminology like shopping carts,checking out, transactions, etc.
3. The users know the English language, as the user interface will be provided in English.
4. Every user has an active email address and a GSM phone number.
5. Customer users have Credit-Cards and the cards are allowed to be used for payments via the internet.
6. Customer users have physical addresses to receive the books.
7. Related software dependencies (Application Server, Database,etc.) are installed and accessible on the server.

2.5 Operating Environment

The Book Store shall operate in all famous Web browsers such as Chrome, Firefox, IE and any modern day browsers.

3. Specific Requirements

3.1 Functional Requirements

3.1.1 Front Office Functional Requirements

3.1.1.1 : User Profile

- The user should be able to create order address
- The user should be able to modify order address
- The user should be able to remove order address
- The user should be able to create billing address
- The user should be able to modify billing address
- The user should be able to remove billing address
- The user should be able to create their user details
- The user should be able to modify their user details
- The user should be able to remove their user details
- The user should get acknowledgement about legal information

3.1.1.2 : Book List, Rating & Reviews

- The user should be able to view book list
- The user should be able to see book details
- The user should be able to filter the books
- The user should be able to sort the books
- The user should be able rate the books
- The user should be able to create a book review

3.1.1.3 : Order & Purchase

- The user should be able to add book into cart
- The user should be able to remove book from cart

- The user should be able to see the total cart price
- The user should be able to pay with credit card information
- The user should be able to track order
- The user should be able to see their previous orders

3.1.2 Back Office Functional Requirements

3.1.2.1 : User Management

- The system must contain at least one back-office user with the administrator role when deployed to the production server.
- Back-office users can not register themselves, they must be registered by administrators using the related admin panel.
- Users should be able to change the password whenever they want. To change the password, the user must provide the current password.
- The system should provide a way to define a new password when the user forgets the password.
- The system must approve the email address by sending a link to the newly registered user which includes confirmation data generated by the system. When the user clicks the link, it should go to the confirmation page of the web application. Confirmation page must show a success message then must redirect to the user's profile page after 10 seconds automatically.
- All back-office users must log in to the system to access the application.
- Users can log-out the system anytime.

3.1.2.2 : Definitions

- Users should be able to create new authors.
- Users should be able to modify authors
- Users should be able to delete authors if there is no dependency between the author and any of book records.
- Users should be able to create new publishers.
- Users should be able to modify publishers.
- Users should be able to delete publishers if there is no dependency between the publisher and any of book records.
- Users should be able to create new suppliers.
- Users should be able to modify suppliers.
- Users should be able to delete suppliers if there is no dependency between the supplier and any of purchase (supply order) records.
- Users should be able to create new categories.

- Users should be able to modify categories.
- Users should be able to delete categories if there is no dependency between the category and any of book records
- Users should be able to create new books.
- Users should be able to modify books.
- Users should be able to delete books if there is no dependency between the book and any of the order records.
- Users should be able to assign new categories for books
- Users should be able to modify/remove the assigned categories of books.

3.1.2.3 : Sales

- Users should be able to list newly created and old orders created by customers.
- Users should be able to search the orders by username , email , date range , payment status.
- Users should be able to sort the orders list by username , email , date and total price.
- Users should be able to view the details of any order including books in the order lists , amount of them, payment status, inventory of products, related purchase status, invoice status, shipping status.
- Users should be able to check the stock amount of the books in the order.
- Users should be able to create a purchase request order if needed.
- Users should be able to check the purchase (supply order) status of the order.
- Users should be able to create an invoice request for the order.
- Users should be able create an shipping request to start the shipping process for the order.

3.1.2.4 : Inventory & Purchases

- Users should be able enter the amount of products in the storage
- Users should be able to decrease the amount of books in the storage if they are damaged.
- Users should be able view all stocks in the storage and search for a specific book.
- Users should be able to set critical stock levels for books.
- Users should be able to view all purchase requests created by the sales department.
- Users should be able to create supply orders due to request or directly to the inventory data.
- Users should be able to receive books coming from suppliers and then increase the amount of them.

3.1.2.5 : Invoices

- Users should be able to view all invoice requests created by the sales department.
- Users should be able to create sale invoices due to only sales department requests.
- Users should be able to modify sale invoices due to only sales department requests.

3.1.2.6 : Logistics

- Users should be able to view all shipping requests created by the sales department.
- Users should be able to create a shipping record for an order.
- Users should be able to send the shipping request to the logistic firm.
- Users should be able to set the shipping status as “given to logistic”.
- Users should be able to save cargo tracking number that is given by the firm.
- Users should be able to view the current status of shipping.

3.2 Non-Functional Requirements

3.2.1 Performance and Scalability Requirements

- The landing page's response time shall be 3 seconds or less in any browser over an LTE connection.
- Application shall have enough capacity for 10.000 books.
- Landing page shall have bandwidth capacity for 2000 users
- When a transaction request is sent, the system shall respond in 10 seconds with a message.

3.2.2 Compatibility Requirements Requirements:

- System shall support these browsers:
 - Microsoft Windows 10
 - Google Chrome (latest stable version)
 - Firefox (latest stable version)
 - Microsoft Edge
 - Microsoft Internet Explorer 11

- MacOS 10.12 and newer
 - Google Chrome (latest stable version)
 - Safari

3.2.3 Reliability, Availability, and Maintainability Requirements

- The system shall be available to users 99 percent of the time every day.
- The error rate of users submitting their payment details at the checkout page shall not exceed 8 percent.
- Backups shall be defined to 1 day interval.

3.2.4 Accessibility

- Images shall have explanatory alternative text.
- Links shall have significant titles.
- Forms shall have labels for fields.
- Nested tables shall not be used.
- Applications shall not have heavy content.
- Application shall have consistent navigation mechanism.
- Application shall have max. 3 different text fonts.
- Texts shall have adequate line length and height.
- White spaces shall be used.
- A search option shall be provided.

3.2.5 Security Requirements

- The application shall have 256-bit Wildcard SSL.
- Forms shall have validation feau
- The system shall ensure that data is protected from unauthorized access.

3.2.6 Localization Requirements

- The date format shall be as follows: date.month.year.

3.2.7 Usability Requirements

- Registration time shall be under 15 seconds.
- Customers shall have a page that sends messages to admin about technical errors.
- Customers shall send messages to the admin.

3.4 External Requirements

3.4.1 Personal Data Privacy

GDPR is a regulation that requires businesses to protect the personal data and privacy of EU citizens for transactions that occur within EU member states. KVVK is the corresponding law for Turkey Citizens and it stands for Kişisel Verilerin Korunması Kanunu. Since Book Store is aiming to sell books all over the the Europe Union and Turkey both of the regulations should be implemented by the book store application.

3.4.2 Credit Card Information Storing

Although regulation allows software systems to store the credit card information under some constraints, book store applications will not store any credit card information in the application database or any other resource belongs to it to avoid risks.

3.5 Hardware Requirements

3.5.1 : Data Storage :

3.5.1.1 : Online Storage - The system needs to be able to store hundreds of megabytes of data on demand. The potential for needing Gigabytes of data storage capacity is also in the realm of possibilities. Further requirements gathering is needed to get real-world estimates of such data storage needs.

3.5.1.2 : Near-line Storage – All User and Application data as well as software installation and configuration files must be fully backed up weekly. Further, secure, offsite storage will be performed on a weekly basis.

3.5.2 : Networking

3.5.2.1 : Load Balancing - Application Servers and Database servers must be load balanced at the application level to ensure maximum stability and availability. Specific scenarios, such as fail-over versus session-managed load balancing need to be addressed in the functional requirements specification.

3.5.2.2 : The system will use, where appropriate, the standard hardware and data communications resources provided by the Books Store Data center. This includes, but is not limited to, the general Ethernet networkT1 connection at the server/hosting site, network servers, and network management tools.

3.6 Software Requirements

3.6.1 Backup Software : Data and application backups will be managed through fully supported backup software solutions.

3.6.2 : HTTP and Application Server Applications – As the Web will be the primary delivery protocol for the application, HTTP and related Application server applications will be required to support system functionality.

3.6.3 : Web Browsers: In support of External Interface requirements, commonly supported web browsers will be used to implement a thin-client architecture.

3.6.4 : Email Services: for alerts email server applications will be required to support system functionality.

3.6.5 : Relational Database Management System : As the primary data storage mechanism for the corporate standard relational database management system, a RDBMS such as Postgre SQL Server will be required to support system functionality.

4. External Interface Requirements

4.1 User Interfaces

The user interface will be simple and consistent, using terminology commonly understood by the intended users of the system. The system will have a simple interface, consistent with industry standard interfaces, to eliminate the need for user training of infrequent users. The Books Store team will evaluate the user interface of similar systems and apply appropriately. User testing will be used to ensure the user interface is clear (simple, commonly

understood vocabulary, intuitive to use without training), complete (users can perform all functions from the interface), and consistent (buttons and wording are the same throughout the system).

4.2 Hardware Interfaces

No extra hardware interfaces are needed. The system will use the standard hardware and data communications resources provided by the Books Store data center. This includes, but is not limited to, the general Ethernet network/T1 connection at the server/hosting site, network servers, and network management tools. This system will include a warning message when a low transmission speed is detected, and a non-graphical interface option will be available.

4.3 Software Interfaces

The system will use the standard software resources available on the Internet and some other resources provided by the Book Store data center. This includes, but is not limited to, Javascript, HTML, CSS, Web Frameworks, RDMS Server (Postgre SQL), and Application server (IIS/Apache or Node.js) and also if there is another necessary resource needed by the Book Store system this should be included when it is developing.

4.4 Communication Interfaces

The system will use the communications resources provided by the Book Store data center. This includes, but is not limited to HTTP protocol for communication with the web browser and the web server and TCP/IP network protocol with HTTP protocol.