

# **CS43002 : DATABASE MANAGEMENT LABORATORY**

## **GROUP NUMBER 1**

***InfinityBooks*: Online Bookstore  
Software**

## **Software Requirements Specifications**

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# SOFTWARE REQUIREMENTS SPECIFICATION

## 1.0 Introduction

This document describes the software requirements specifications for *InfinityBooks* specifically developed for use in any bookstore that would want to automate its book sales. This document includes a description of the software and its subsystems. Throughout this document, *InfinityBooks* will sometimes be referred to as "this software" or "our software system".

## 1.1 Goals and objectives

*InfinityBooks* will be a web-based software system written in JavaSwing and HTML/JavaScript to aid book store customers and owners to manage their book purchases and sales with regard to simplifying and speeding up the process of selection, ordering and purchasing books for customers as well as managing a database of users and a database of products for book store owners through a conveniently designed Graphical User Interface which will utilize a user-friendly intuitive design approach.

The system will be designed to be used by book store customers with little or no experience in using computerized systems and by book store owners who will be trained to use *InfinityBooks*. To aid users, documentation will be provided in the form of a user manual which will contain a detailed description of all system functions.

## 1.2 Statement of scope

*InfinityBooks* will be an e-commerce software system which will be designed to automate a book store sales. The main function of the software will be to aid book sales for both customers and the store owners. The system will be therefore designed to allow a user to perform the following functions:

- log on either as a customer or a store owner
- browse through the database of available products
- register
- add a product to a shopping cart
- provide a credit card information
- select a shipping method
- select the next screen to view
- update or delete a record information depending on the user authorization level

The system will have two external interfaces: for a credit card verification and for order shipping.

The system will have a means of communicating with the user (customer or store owner) via dialogue boxes and will provide assistance via help screens.

The software will be designed for use by any book store customers with little or no experience in using computerized systems and by book store owners who will be trained to use *InfinityBooks* and our documentation in the form of user manuals providing detailed description of all software functions.

The software system will accept a number of user **inputs when a user:**

- 1 logs on to the system either as a store owner or as a customer;
- 2 fills out a registration form;
- 3 fills out an order form;
- 4 selects a GUI component to submit input or to navigate through the system. The GUI component can be either a search engine or a button;
- 5 adds a product to his or her shopping cart;
- 6 updates or deletes an existing user record;

User inputs will result in the following **outputs (screens)** based on a user's selection:

- 1 a welcome screen if the user login was successful;
- 2 customer registration screens and registration confirmation screens;
- 3 order confirmation screens;
- 4 screens displaying a list of products or customers matching a selection criteria;
- 5 screens displaying a customer's shopping cart;
- 6 screens for managing the tables of customers or products;

### 1.3 Software context

The software will be designed as an e-commerce web site for selling books. The software will be deployed in stores and it will be possible to use the store's web site. The software *InfinityBooks* will be marketed as a book store sales software allowing to organize a book store sales in an efficient manner.

#### **user interface:**

The user interface will consist of four main types of screens: Login Screen, Customer Screens, Store Owner Screens and Goodbye Screen.

The **Login Screen** will consist of a user dialogue box with two text boxes and two labels to accept User Name(Login) and User Password. There will be three buttons: Submit, Cancel and Clear. This screen will be used to authenticate the user to the system. Depending on the login values, the user will be directed to either Customer Screens or Store Owner Screens.

The main function of the **Customer Screens** will be to sell books therefore they will be designed according to the sequence of steps that a customer needs to perform to buy a book. These screens will include the following: **Home Screen, Data Display Screen, Register Screen, Check-Out Screen, Credit Card Input Screen, Help Screen, Goodbye Screen.**

The **Home Screen** will be the default screen displayed upon processing the user login and the user log out options.

The **Data Display Screen** will be used for displaying a record's data.

The **Register Screen** will be used for customer registration.

The **Check-Out Screen** will be used for displaying the item's title, description and selected quantity.

The **Credit Card Input Screen** will be used to prompt the customer to input their credit card information again.

All **Customer Screens** except **Login Screen, Goodbye Screen** and **Help**

**Screen** will display a search engine and help options located at the top of each respective screen.

The **Help Screen** will be used for displaying a list of help topics.

The **Goodbye Screen** will be the last screen a customer can see after logging off the system. The system will then return to the default **Home Screen**.

The main function of the **Store Owner Screens** will be to manage the database consisting of two tables, TableCustomers and TableProducts therefore they will contain **Manage Database Screen** in addition to all the Customer Screens. The **Store Owner Screens** will display a search engine and help options located at the top of each respective screen.

The **Manage Database Screen** will be used for adding a new product or customer, updating a customer or a product's record, or deleting a record.

The functionality of all Customer and Store Owner Screens will be carried out through **GUI components** such as buttons, text boxes, labels, URL buttons, images, tables, navigation bars, and message boxes.

#### **DATABASE:**

The Microsoft Access database used in this project will consist of two tables **TableCustomers** and **TableProducts** and will be used for storing customers' records and products' information. The search engine located on each Customer Screen will interact with the way of retrieving data from the database via the user interface.

The screens associated with the database use will be **Data Display Screen** and **Manage Database Screen**.

The functionality of this subsystem will be carried out through GUI components such as buttons, text input boxes, URL buttons, images, tables, navigation bars, labels and message boxes.

#### **CREDIT CARD AUTHORIZATION SYSTEM:**

The credit card authorization system will be used to accept and verify a customer's credit card information.

The **Customer Screen** associated with this subsystem will be the **CheckOut Screen**. The **Check-Out Screen** will direct the user to the **Credit Card Input Screen**. The information supplied in this screen will be sent directly to a credit card verification company. The Credit Card Input Screen will be displayed repeatedly with a prompt to re-enter the information in case of a credit card rejection.

The functionality of this screen will be carried out through the following GUI components: forms, text boxes, labels, buttons and message boxes.

#### **SHIPPING SYSTEM:**

The shipping system will be used to select a shipping method and to confirm the customer's shipping address and will be connected directly to a shipping company.

The **Customer Screens** associated with this screen will be the **Check-Out Screen** where the customer will be able to select a shipping method.

The functionality of this screen will be carried out through text input boxes, labels, images, forms, and message boxes.

#### **1.4 MAJOR CONSTRAINTS:**

##### ***Business Constraints***

The software will require a fast Internet connection to operate to its full capacity. Fast Internet connections are vital to this type of software's functionality due to the presence of two external service systems necessary for processing a customer's purchases.

##### ***Product Constraints***

The software needs to be designed in a user-friendly manner to ensure its competitiveness and effectiveness.

##### ***Time Constraints***

The project's delivery date is 9/4/15. The development of this software will require a minimum of twenty hours per week during the next month, which will amount to a total of eighty hours. The average daily development time should be about three hours a day.

## **2.0 Usage scenario**

This section provides a usage scenario for the software. It organized information collected during requirements elicitation into use-cases.

### **2.1 User profiles**

The profiles of all user categories are described here.

The user profiles will be of two categories: Customer and Store Owner.

Customer will be able to use the software to purchase books.

Store Owner will be able to manage the database.

### **2.2 Use-cases**

All use-cases for the software are presented.

The use-cases will have the following sequence:

Login or Register

If Login as Customer:

Browse

Select

Check-Out

Credit Card Information Input

Select Shipping Method

If Login as Store Owner:

Manage Database

### **2.3 Special usage considerations**

Special requirements associated with the use of the software are presented.

The special requirements will be checking the order status, checking the inventory, canceling order and user feedback.

### 3.0 Data Model and Description

This software encompasses two major informational domains: Customer data and warehouse or inventory data.

#### 3.1 Data Description

*Customer* - a user who can use the software system in a book store to purchase books;  
*Administrator* - the storeowner or a manager with authority to update a database of users and products.

*Product* - books storing the information about the products sold in the store. *Inventory* – dynamic information related to the product

*Shopping cart* – placeholder to store customer selections.

*Order* - Itemized summary of books being purchased by customer. *Billing* – billing and shipping information.

##### 3.1.1 Data objects

Customer – user name, email, password,

address Administrator – user name, password

Product – title, author, publisher, copyright, ISBN, description Inventory – product ID, price, qty in stock

Shopping cart – product ID,

qty Order – product ID, qty,

price,

Billing – billing name, billing address, phone number, credit card number, expiration date, shipping name, shipping address, shipping method.

### 4.0 Functional Model and Description

A description of each major software function, along with data flow or class hierarchy (OO) is presented.

#### 4.1 Description for Function n

A detailed description of each software function is presented. Section 4.1 is repeated for each of n functions.

##### 4.1.1 Processing narrative (PSPEC) for function n

A processing narrative for function n is presented

##### **DATABASE SUBSYSTEM :**

This subsystem will provide the backend for the Graphical User Interface. It will store a database consisting of two tables TableCustomers and TableProducts. TableCustomers will store the information about the users. TableProducts will store the information about products. Both tables will be linked to the GUI via a search engine which will provide a means of conducting a database search, a product selection, viewing a list of available products, viewing and managing product and user records, and managing the inventory.

##### **CREDIT CARD AUTHORIZATION SUBSYSTEM :**

This subsystem will provide the functionality for checking the validity of a customer's credit card information.

##### **USER INTERFACE SUBSYSTEM :**

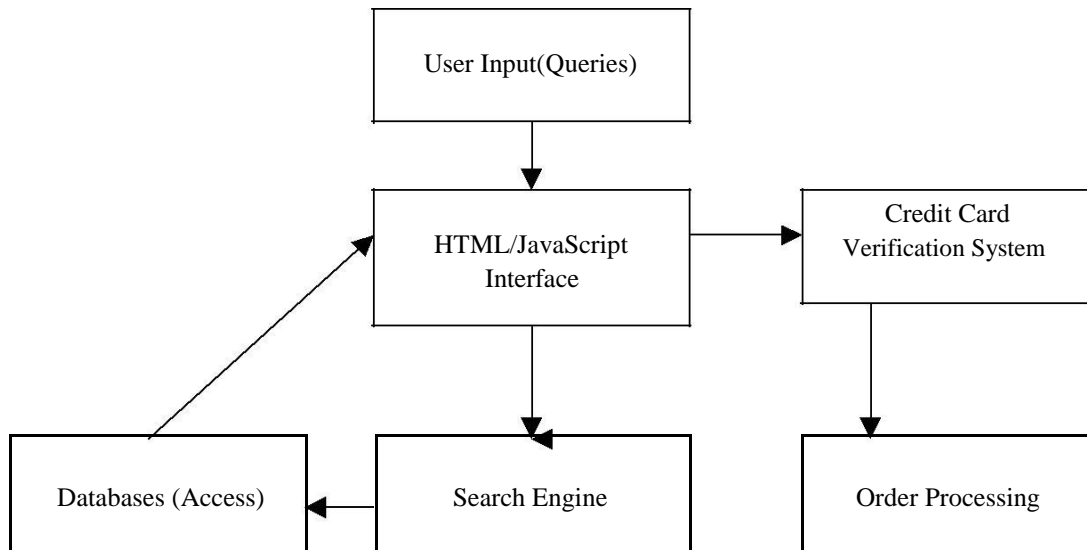
This subsystem will be the Graphical User Interface through which the user interacts with the system.

**SHIPPING SUBSYSTEM :**

This subsystem will be used for processing a customer's orders and shipping.



#### 4.1.2 Function purchase flow diagram



#### 4.1.3 Function purchase interface description

#### 4.1.4 Function purchase transforms

##### 4.1.4.1 Transform descriptions (processing narrative, PSPEC)

The main functions will be the following:

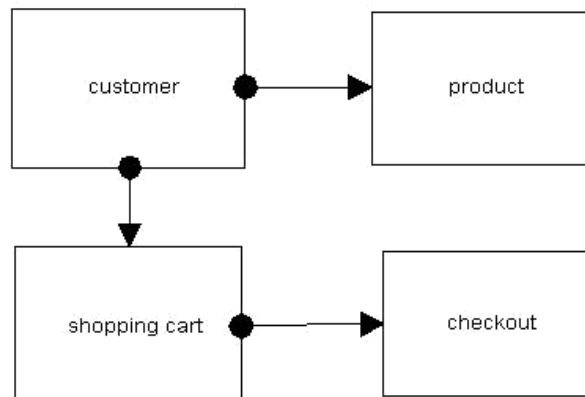
Browse through a database of products and select a product. The Customer will be able to select a search criterion and press the submit button. Pressing the submit button will trigger an SQL query which will be sent to the database.

Upon viewing the product information, the Customer will be able to add the product to their shopping cart by the way of pressing the button "Add To Shopping Cart". Pressing Add To Shopping Cart button will direct the Customer to the Check-Out Screen where they will be able to submit their credit card information.

Upon submitting the credit card information, the Customer will see either a Select Shipping Method Screen or a message box prompting them to re-submit the information.

Provided the credit card authorization has been successful, the Customer will be able to select a shipping method in the Select Shipping Method Screen.

##### 4.1.4.3 Transform lower level flow diagrams :



##### 4.1.4.4 Transform interface description

The user inputs will be billing and shipping information, then the payment type will be validated.

#### 4.1.5 Performance Issues

The software's performance will be affected by Internet connection speed.

Data access speed is important.

The application must be scalable to handle many concurrent users.

#### **4.1.6 Design Constraints**

The design allows for simple prototyping in JavaScript and HTML.

### **4.2 Software Interface Description**

#### **4.2.1 External machine interfaces**

Interfaces to other machines (computers or devices) are described.

As all computing will be done in Microsoft Windows OS environment, no external machine interfaces will be needed.

#### **4.2.2 External system interfaces**

The communication with the external subsystems (a remotely stored database, a credit card authorization system and a shipping system) will be carried out via the software interface.

#### **4.2.3 Human interface**

An overview of any human interfaces to be designed for the software is presented.

The software will use a Graphical User Interface coded in HTML and JavaScript.

### **4.3 Control flow description**

The control flow for the system is presented with reference to Section 5.0 of this document.

## **5.0 Behavioral Model and Description**

A description of the behavior of the software is presented.

### **5.1 Description for software behavior**

A detailed description of major events and states is presented in this section.

#### **5.1.1 Events**

A listing of events (control, items) that will cause behavioral change within the system is presented.

The consequence of events will be as follows:

The user will need to log on to the system either as a Customer or a Store Owner.

A Customer will be directed to the default Home screen where they will be able to select Register button or an option in the search engine.

Pressing Register button will direct the user to the Register Screen. Upon supplying the registration information the Customer will be able to select an item from the database via the search engine and add that item to the shopping cart by pressing Add To Shopping Cart button.

Pressing Add To Shopping Cart button will direct the Customer to the shopping cart screen where they will be able to update the contents of the cart.

Pressing Check-Out button will direct the Customer to the Credit Card Input Screen. Supplying the correct credit card information will present a confirmation screen to the Customer and submitting the incorrect information will cause a prompt message to be displayed asking the Customer to re-enter the information.

Pressing Select Shipping Method button in the Select Shipping Method Screen will direct the Customer to a screen where they will be able to select a radio button to indicate the preferred shipping method.

A Store Owner will be directed to Database Management Screen where they will be able to add a new user, update or delete a record.

In general, the system will respond to the user's actions according to their selection. All Customer Screens will have Home, Register, Check-Out and Help buttons which will direct the user to the respective screen.

Each Customer Screen will have a search engine. Selecting a search criterion and pressing the submit button will direct the user to Data Display Screen where the product information will be displayed.

Manage Database Screen will contain GUI components for managing the database: add a new user, update and delete labels and text input boxes. Each data manipulation screen will have Submit, Cancel and Clear buttons.

Pressing Submit button will submit the filled in information to the database.

Pressing Cancel button will direct the user to the default Home screen.

Pressing Clear button will clear the contents of the input fields.

### **5.1.2 States**

A listing of states (modes of behavior) that will result as a consequence of events is presented.

The software will have the following modes of behavior:

Accept input from the user;

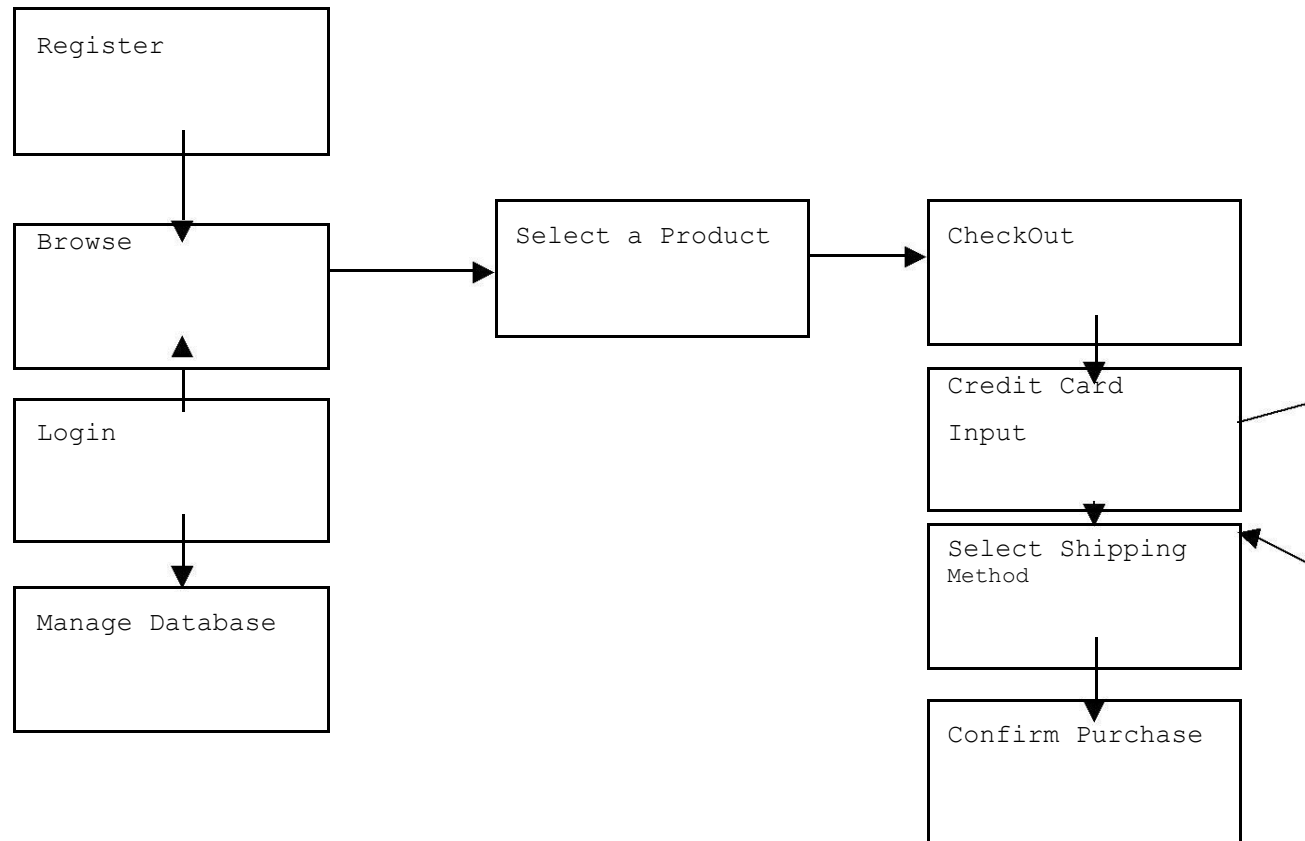
Retrieve information from the database and display it to the user;

Send information to outside entities (credit card authorization company).

Accept information from outside entities (credit card authorization company).

## 5.2 State Transition Diagrams

Depict the overall behavior of the system.



### **5.3 Control specification (CSPEC)**

Depict the manner in which control is managed by the software.

The control will be handled according to the user selection. The user will be able to select a GUI component, launch the search engine, input data and submit it. The software will respond by displaying a respective screen to the user.

## **6.0 Restrictions, Limitations, and Constraints**

The Server side will require a high-speed Internet connection to deal with multiple customers visiting the web site simultaneously and the presence of two external service systems necessary for processing a customer's purchases

On the Client side there is no connection speed or operating system restrictions.

## **7.0 Validation Criteria**

The approach to software validation is described.

### **7.1 Tests**

Function:

1. Log In
  - a. Member – enter Name and Password
  - b. Join – click to open new account
  - c. Guest – click to view sight as guest
2. Browse – click category, sub category, est.... until at desired level of book criteria
3. Search
  - a. Title – enter title of desired book
  - b. Author – enter author of desired book
  - c. Keyword – enter a keyword describing subject of desired book
  - d. ISBN – enter ISBN of desired book
4. Select – click desired book
5. Purchase – click Purchase button on selected book
6. Check Out – click Check Out button
7. Credit card Validation – click to submit credit information
8. Log Out – click Log Out button

### **7.2 Expected software response**

1. Log In
  - a. Member – all information stored about user is loaded
  - b. Join – directed to registration form
  - c. Guest – sight is entered with all customer default values
2. Browse – chain of commands are followed till desired books are listed
3. Search
  - d. Title – displays books of specified title
  - e. Author – displays books of specified author
  - f. Keyword – displays books with specified keyword in their keyword bank

- g. ISBN – displays book of specified ISBN
- 4. Select – brings up all existing information on that particular book
- 5. Purchase – adds book to shopping cart
- 6. Check out – asks for payment and delivery information
- 7. Credit card Validation – information sent to bank and verified
- 8. Log Out – clears registry of all user information and returns to home page

### **7.3 Performance bounds**

Performance is bounded only by internet connection speed (assuming software is deployed and a remote client is accessing it).