1. Introduction

1.1 Goal

Shopping has long been considered a recreational activity by many. Shopping online is no exception. The goal of this application is to develop a web based interface for online retailers. The system would be easy to use and hence make the shopping experience pleasant for the users. The goal of this application is

- To develop an easy to use web based interface where users can search for products, view a complete description of the products and order the products.
- A search engine that provides an easy and convenient way to search for products specific to their needs. The search engine would list a set of products based on the search term and the user can further filter the list based on various parameters.
- An AJAX enabled website with the latest AJAX controls giving attractive and interactive look to the web pages and prevents the annoying post backs.
- Drag and Drop feature which would allow the users to add a product to or remove a product from the shopping cart by dragging the product in to the shopping cart or out of the shopping cart.
- A user can view the complete specification of the product along with various images and also view the customer reviews of the product. They can also write their own reviews.

1.2 Need of the application

There are large numbers of commercial Online Shopping websites offering large number of products tailored to meet the shopping interests of large number of customers. These online marketplaces have thousands of products listed under various categories.

Problem:

- The basic problems with the existing systems are the non-interactive environment they provide to the users.
- The use of traditional user interfaces which make continuous post backs to the server; each post back makes a call to the server, gets the response and then refreshes the entire web form to display the result. This scenario adds an extra trade off causing a delay in displaying the results
- A search engine that would display the results without allowing the users to further filter the results based on various parameters.
- Use of traditional and non-user friendly interfaces that are hard to use

Solution:

- The motive of this Online Shopping Web Application is to allow the user to play with the search tool and create different combinatorial search criterion to perform exhaustive search.
- Making the application AJAX enabled gets rid of these unnecessary delays letting the user to perform exhaustive search. The users of this application can easily feel the difference between the Ajax empowered user interfaces vs. traditional user interfaces.
- Provide Interactive interface through which a user can interact with different areas of application easily.
- A search engine that provides an easy and convenient way to search for products specific to their needs. The search engine would list a set of products based on the search term and the user can further filter the list based on various parameters.
- Provide Drag and Drop feature thereby allowing the user to add products to or remove products from the shopping cart by dragging the products in to or out of the shopping cart.

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1.3 Scope

- The current system can be extended to allow the users to create accounts and save products in to wish list.
- The users could subscribe for price alerts which would enable them to receive messages when price for products fall below a particular level.
- The current system is confined only to the shopping cart process. It can be extended to have a easy to use check out process.
- Users can have multiple shipping and billing information saved. During checkout they can use the drag and drop feature to select shipping and billing information.

1.4 Platform Specifications – Deployment

1.4.1 Hardware Specification

Processor P IV

RAM 250 MB

Minimum Space Required 100 MB

Display 16 bit color

1.4.2 Software Specification

Operating Environment Win 10

Platform .Net Framework & IIS Visual Studio

Database SQL Server

2. System Requirement Analysis

2.1 Information Gathering

As the goal of the application is ease of use and to provide an interactive interface, extensive research has been done to gain an insight into the needs and behaviors of various users. The working of the application is made convenient and easy to use for the end user.

Users can be classified into two types based on their knowledge of the products that suit their needs. They can be classified as users who know about the product that would satisfy their needs and users who have to figure out the product that would satisfy their needs. Users who know about the product should be able to find the product easily with the click of a button. Such users can search for the product by using the product name as the search term. Users who have to figure out the product that would satisfy their needs could use a search term to find a list of products and then should be able to filter the results based on various parameters like product type, manufacturer, price range, platform supported etc.

The users should be able to view the complete specification of the product and various images at different Zoom levels. The user should be able to read the customer reviews for the product and the ratings provided. They should be able to write their own reviews. They should be able to print out the specifications for a product or email the product page to a friend's etc.

To increase the ease of use the user should be able to add a product to the shopping cart by dragging a product and dropping it in the shopping cart. A user should able to edit the contents of a shopping cart. They should be able to update the quantities of the products added to the cart and remove the products from the cart. The user should be able to remove the product from the shopping cart by dragging the product and dropping it outside the cart.

The application can be made interactive by pop up messages when a product has been dropped in to the shopping cart or out of the shopping cart. The user can be notified

if the cursor enters a drop area and the object that could be dropped. Also users are impatient making it important to load pages soon.

Other than this, I did a lot of research on various other methods of building this application which and was able to incorporate a few stronger features into the application. The tools and controls used in the application are recommended ASP.NET controls and AJAX Toolkit controls which improves the navigation and usability and interactivity.

2.2 System Feasibility

The system feasibility can be divided into the following sections:

2.2.1 Economic Feasibility

The project is economically feasible as the only cost involved is having a computer with the minimum requirements mentioned earlier. For the users to access the application, the only cost involved will be in getting access to the Internet.

2.2.2 Technical Feasibility

To deploy the application, the only technical aspects needed are mentioned below:

Operating Environment Win 2000/XP

Platform .Net Framework & IIS

Database SQL Server 2005

For Users:

Internet Browser

Internet Connection

2.2.3 Behavioral Feasibility

The application requires no special technical guidance and all the views available in the application are self explanatory. The users are well guided with warning and failure messages for all the actions taken.

3. System Analysis

After carefully analyzing the requirements and functionality of the web application, I had two important diagrams by the end of the analysis phase. They are the ER diagram and data flow diagram which were the basis for finding out entities and relationships between them, the flow of information.

3.1 ER Diagram

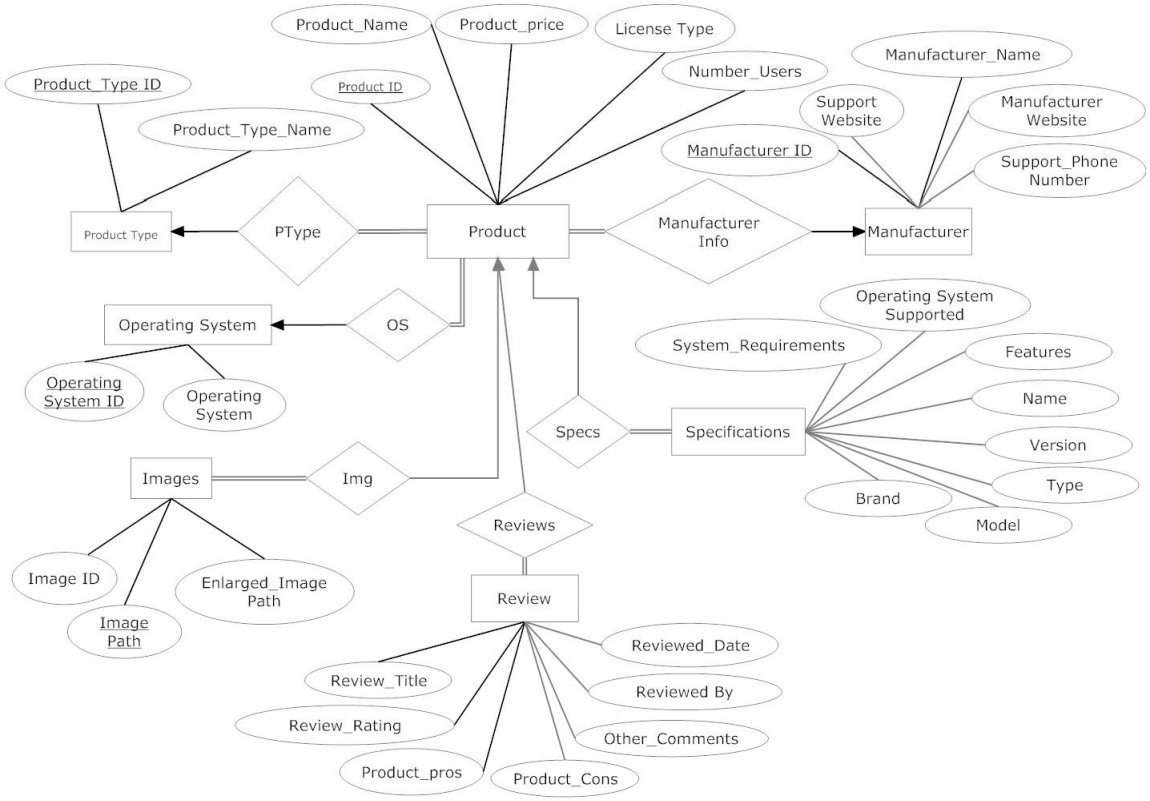


Figure 3.1 Entity Relation Ship Diagram

3.2 Data Flow Diagram

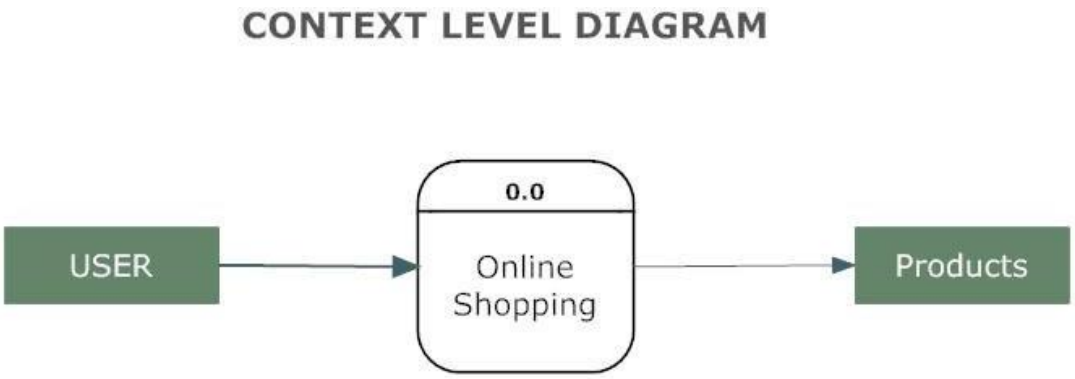


Figure 3.2: A Context Level Diagram

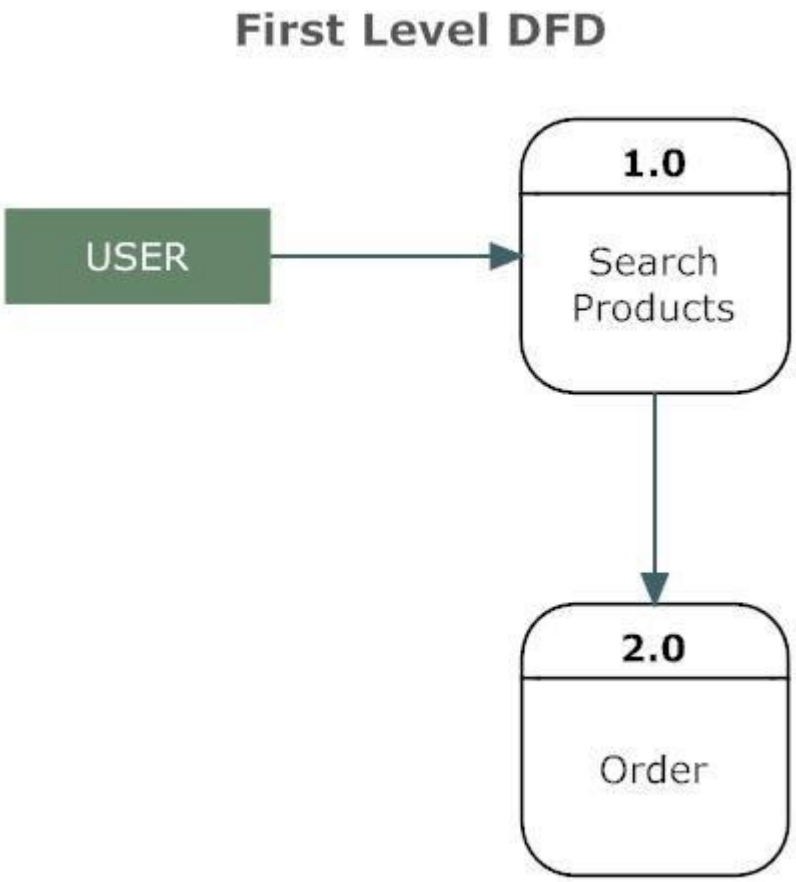


Figure 3.3: A First Level Diagram

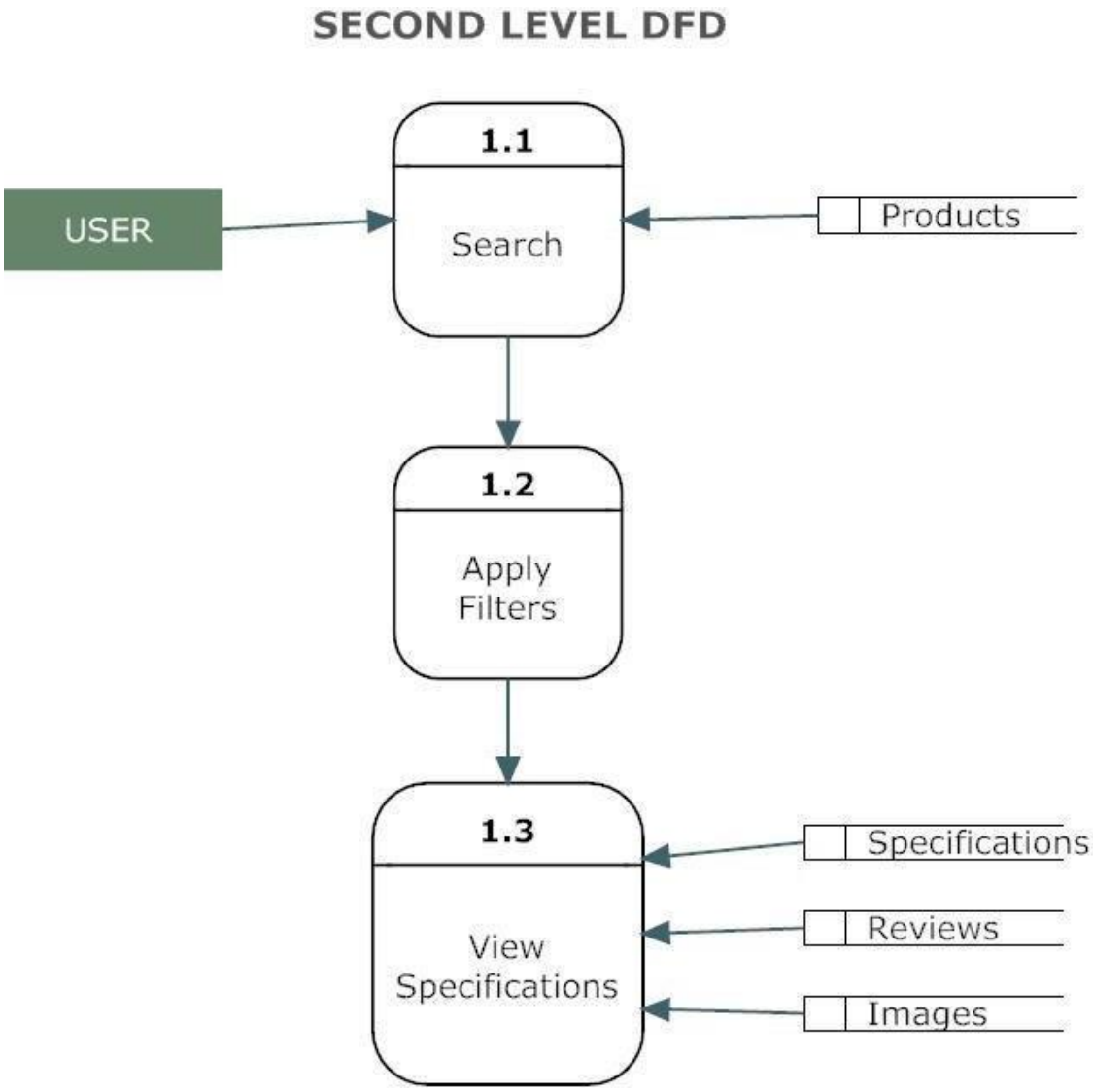


Figure 3.4: A Second Level Diagram

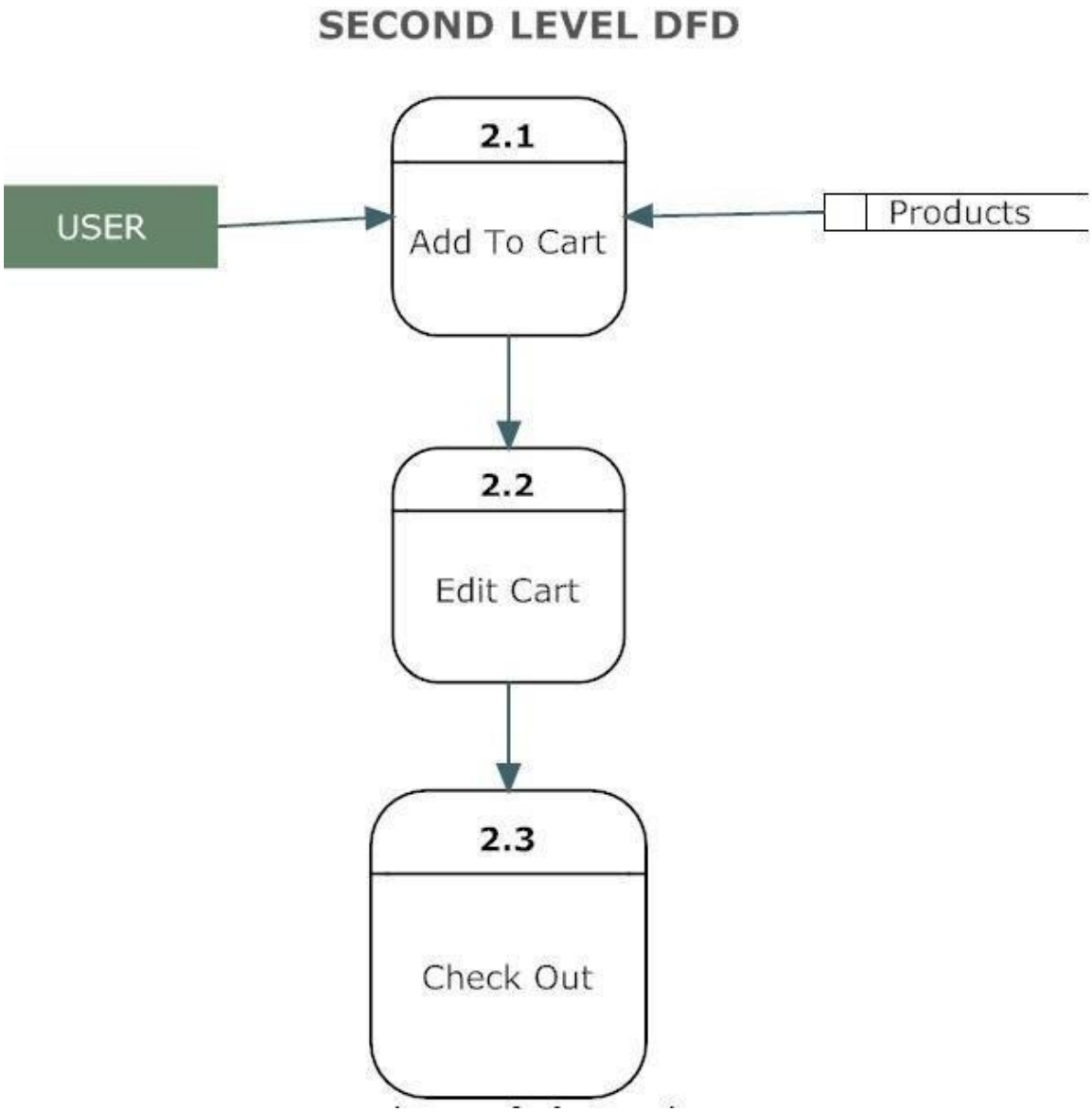


Figure 3.5: A Second Level Diagram

3.3 Use Case Diagram

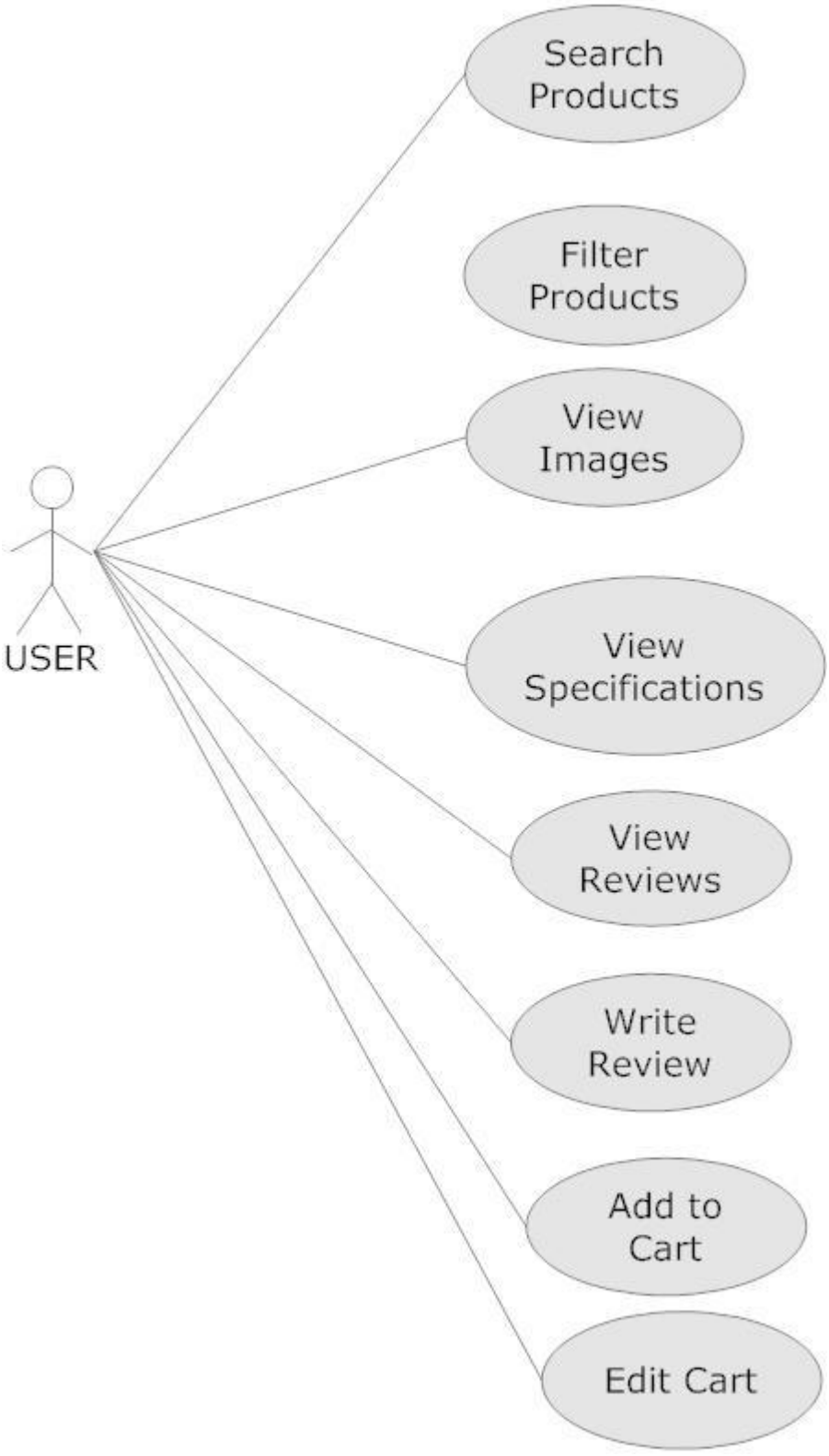
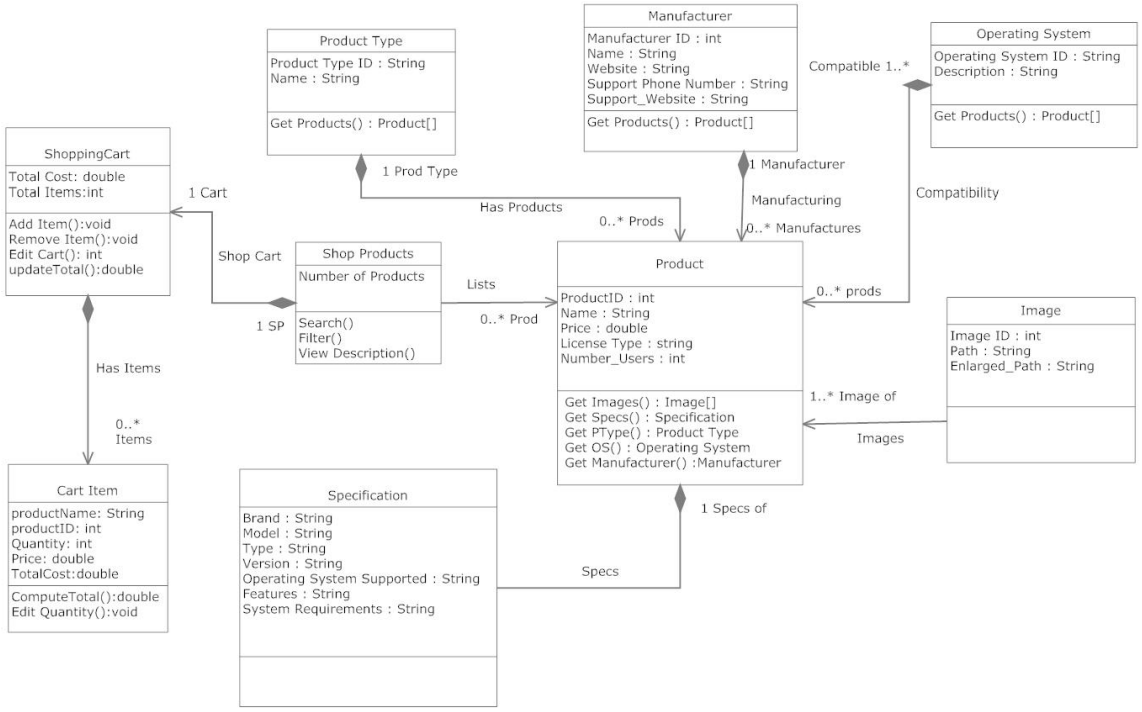


Figure 3.6: Use Case Diagram

3.4 Class Diagram



CLASS DIAGRAM

Figure 3.7: Class Diagram

4. Design

4.1 Design Goals

- The design of the web application involves the design of the forms for listing the products, search for products, display the complete specification for the product, and design a shopping cart that is easy to use.
- Design of an interactive application that enables the user to filter the products based on different parameters.
- Design of an application that has features like drag and drop etc.
- Design of application that decreases data transfers between the client and the server.

4.2Architectural Design

4.2.1 Architectural Context Diagram

Figure 4.1 Architectural Context Diagram

4.2.2 Description of Architectural Design

In this context diagram, the information provided to and received from the 'Online Shopping' is identified. The arrows represent the information received or generated by the application. The closed boxes represent the set of sources and sinks of information.

In the system, we can observe that the user interacts with the application through a graphical user interface. The inputs to the system are the Search and Filter criteria provided by the user and a new review written by the user. Also, the output is in the form of Repeater and grid views which present the users with list of Products available. The users can view complete specification, view Images and reviews by other users.

4.3 Procedural/Modular Approach

Following are all the modules designed for the Online Shopping System.

4.3.1 Shop Products Module

This module starts when the user visits the home page or when a user searches for a product by entering a search term. This part of the application includes displaying all the products that are available or the products that match the search term entered by the user. The user can then filter these products based on various parameters like manufacturer, product type, operating system supported or a price range. The user browse through the products and each product would be displayed with an image and its features like operating system supported, number of user licenses and if it is a full version or an upgrade version. A user can add a product to the cart either by dragging the product and dropping it in the cart or by clicking a button. The user would be able to see the shopping cart summary.

4.3.2 Product Description Module

This module starts when a user visits the product description page. A user can view various images of the product of different sizes. The use can see an enlarged image in a popup window. The user can view the complete specification of the product like its features, operating system supported, system requirements etc. A user can also view the manufacturer information and also information about rebates, exchange policies etc. A user can also view the reviews of the product. A user can also write a review for the product.

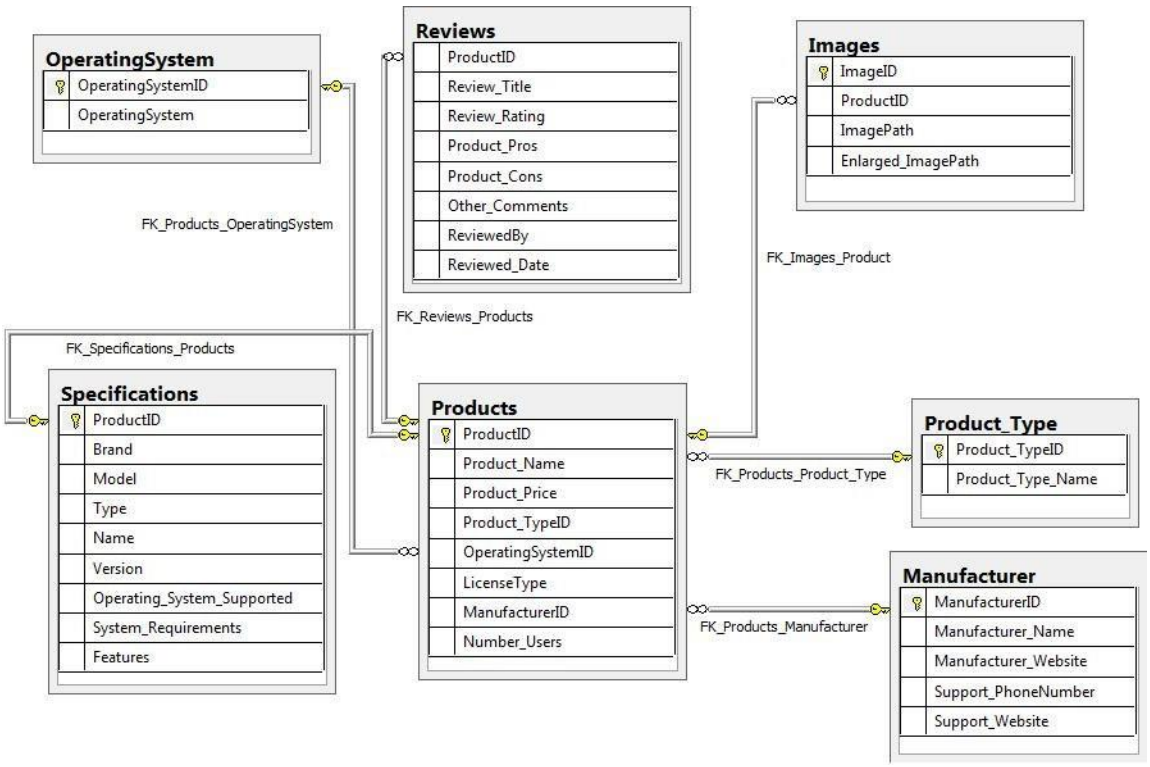
4.3.3 Shopping Cart Module

This module starts when the user views the shopping cart. All the products that have been added to the shopping cart by the user are listed along with their price and the quantity. The total price of all the products added to cart is displayed. A user can edit the quantity of each product or remove the product from the shopping cart. A user can remove the product from the cart by clicking a button or by dragging the product and dropping it outside the cart. The total price changes accordingly when a user edits the quantity of a product or when a product is removed from the cart.

5. Implementation

5.1 Database Design and Implementation

The design of the database was similar to the analysis phase. The database has been developed using SQL Server.

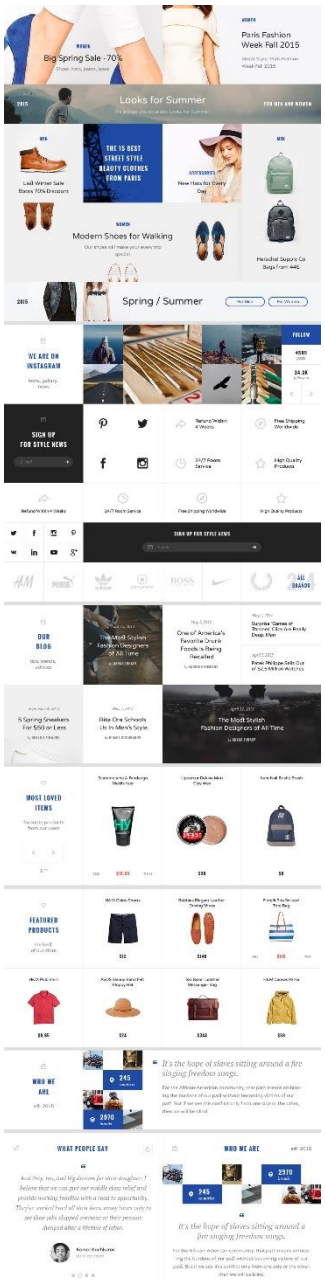


These are the main tables in the application and others are lookup and query tables. The tables were derived from the ER-Diagram.

5.2 User Interface Design and Implementation

In integration testing a system consisting of different modules is tested for problems arising from component interaction. Integration testing should be developed from the system specification. Firstly, a minimum configuration must be integrated and tested.

In my project I have done integration testing in a bottom up fashion i.e. in this project I have started construction and testing with atomic modules. After unit testing the modules are integrated one by one and then tested the system for problems arising from component interaction.



← ***Home Page of the Site***
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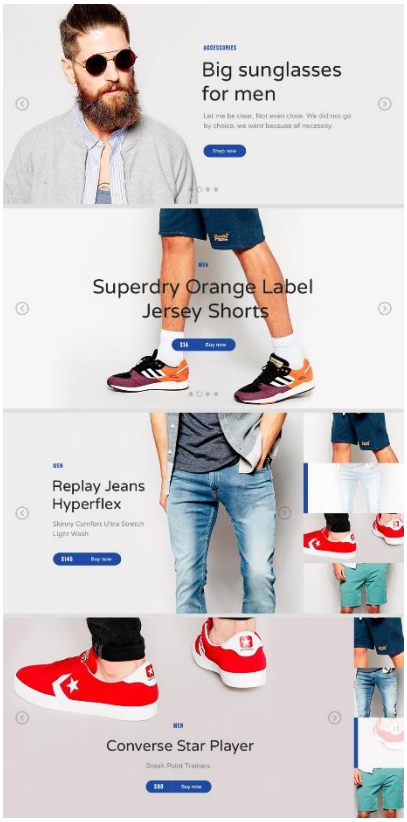

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Item view on the page →
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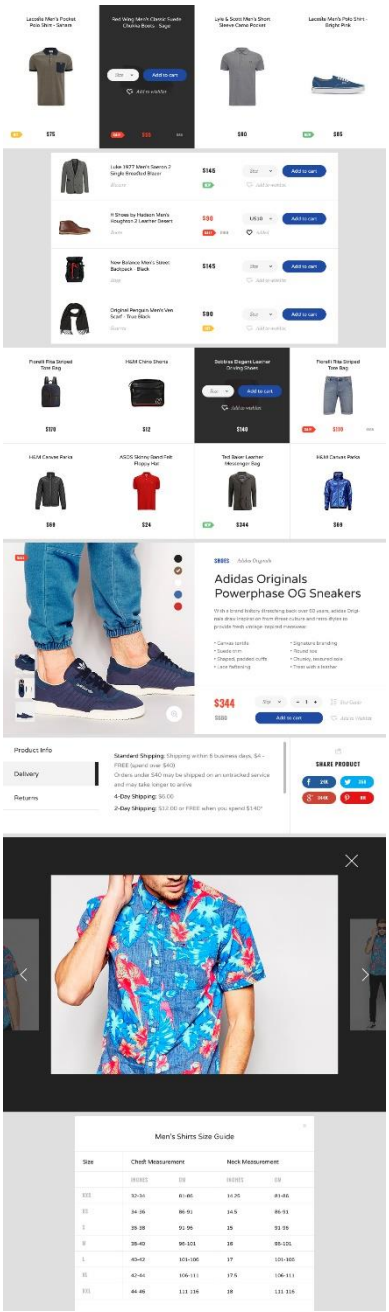

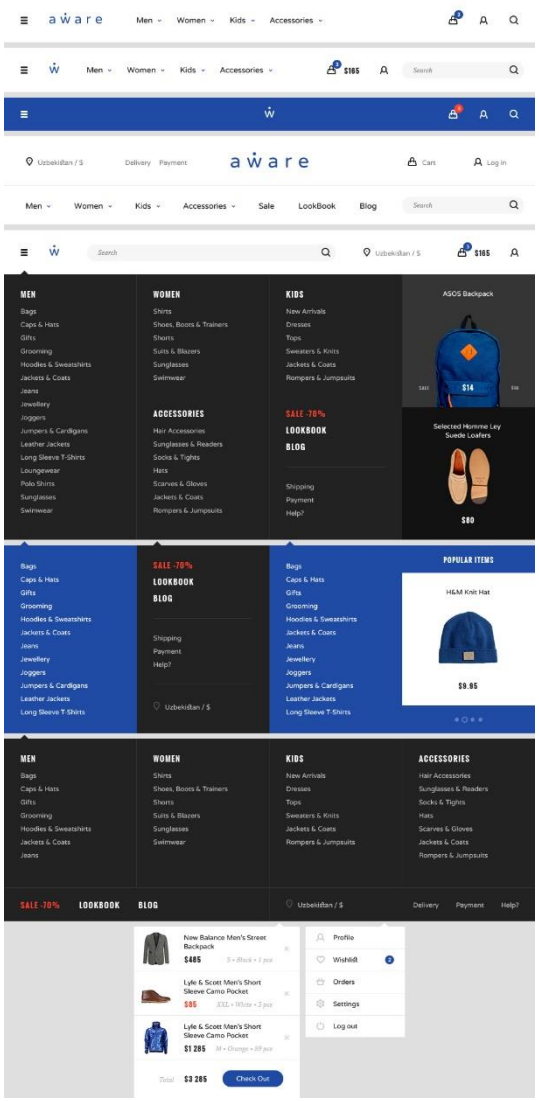

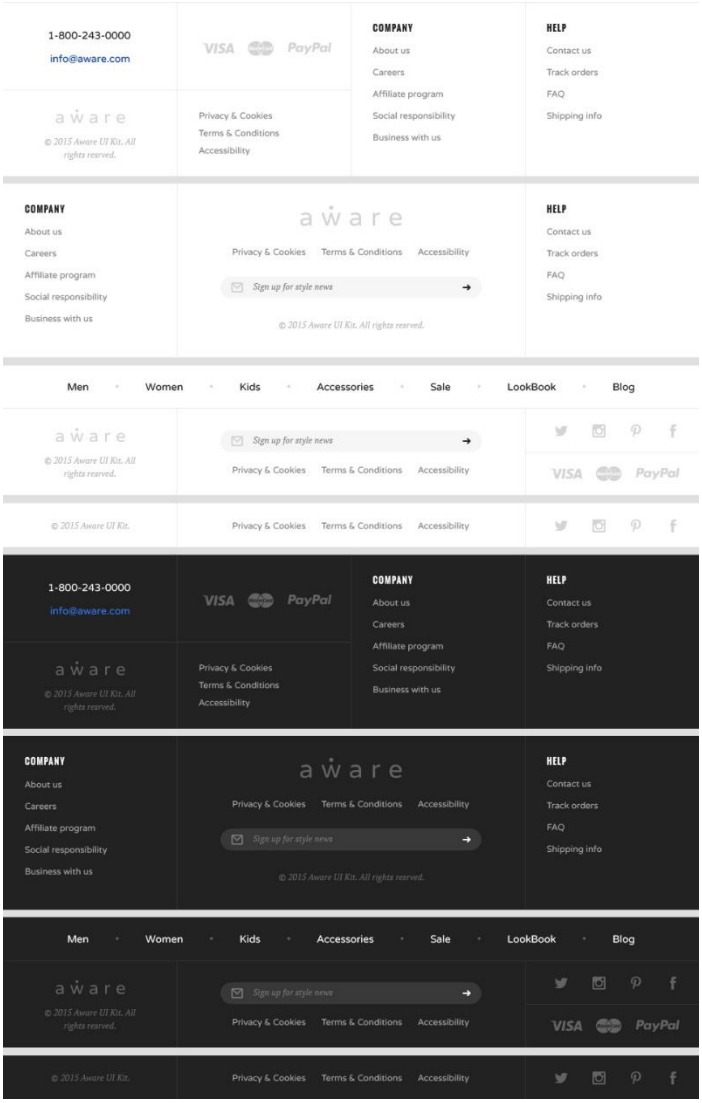

Header view of the page
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Footer view if the page
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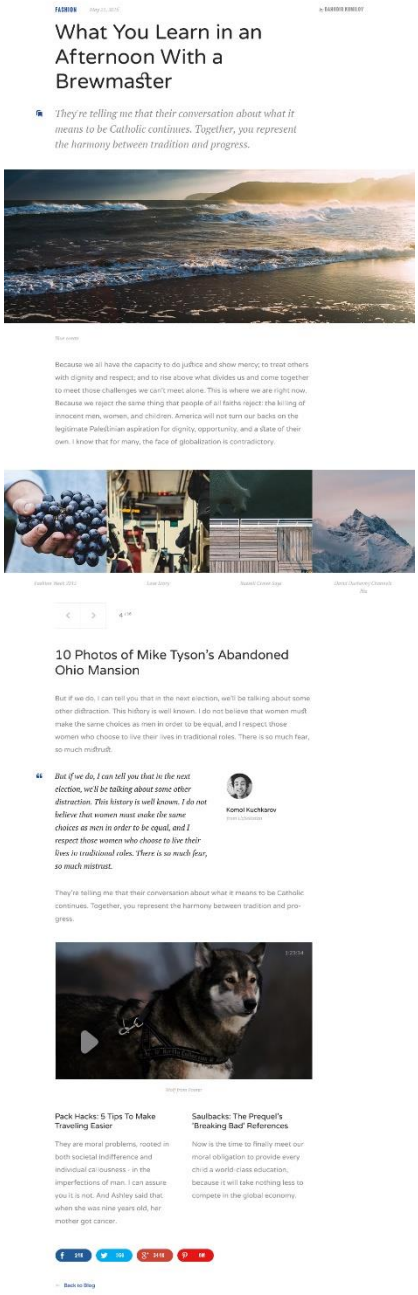

Article page of the site
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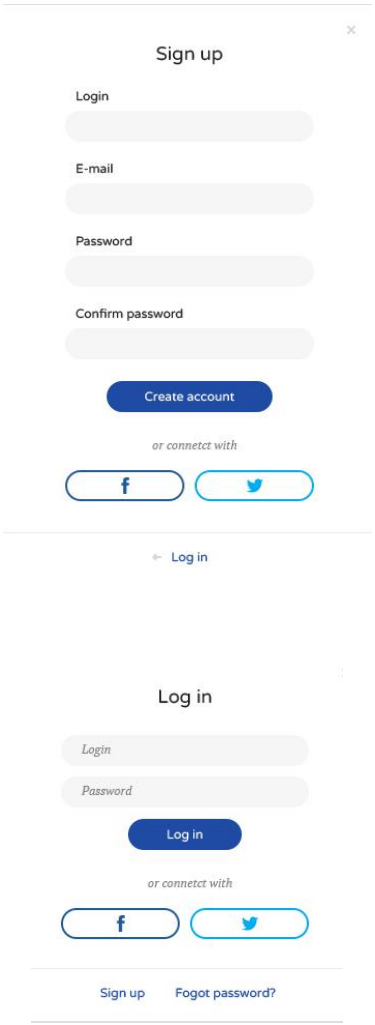

Sign up/Log in page
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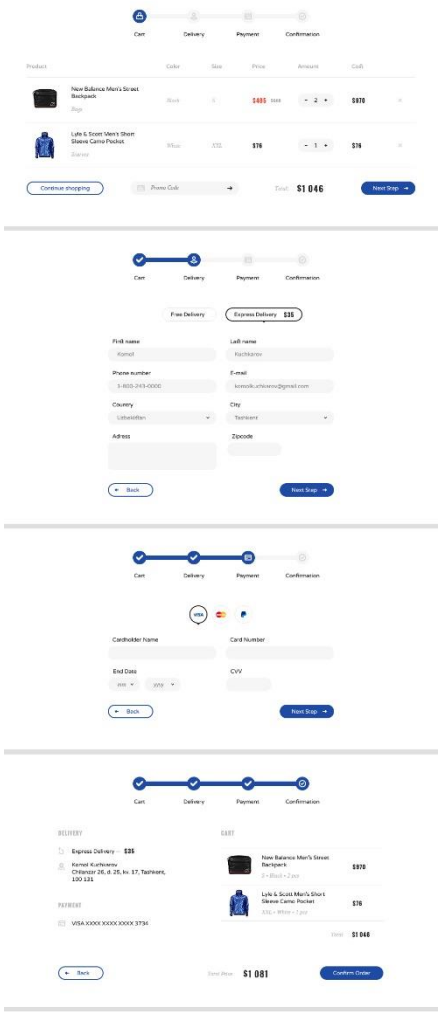

Cart checkout page
(Created in Adobe Photoshop CC)

6. Results & Challenges

The application can be used for any Ecommerce application. It is easy to use, since it uses the GUI provided in the user dialog. User friendly screens are provided. The application is easy to use and interactive making online shopping a recreational activity for users. It has been thoroughly tested and implemented.

6.1 Challenges

- Compatibility with browsers like Mozilla Firefox, Internet explorer etc
- Using a layered approach in developing the application which would make the application maintainable.
- Learning new technologies like using JavaScript for drag and drop behavior and Ajax toolkit controls with little guidance.

The overall idea of doing this project is to get a real time experience. Learn new technologies.

7. Conclusions

The 'Online Shopping' is designed to provide a web based application that would make searching, viewing and selection of a product easier. The search engine provides an easy and convenient way to search for products where a user can Search for a product interactively and the search engine would refine the products available based on the user's input. The user can then view the complete specification of each product. They can also view the product reviews and also write their own reviews. Use of Ajax components would make the application interactive and prevents annoying post backs. Its drag and drop feature would make it easy to use.

7.1 Limitations

This application does not have a built in check out process. An external checkout package has to be integrated in to this application. Also users cannot save the shopping carts so that they can access later i.e. they cannot create wish lists which they can access later. This application does not have features by which user can set price ranges for products and receive alerts once the price reaches the particular range.

7.2 Scope for Future Work

The following things can be done in future.

- The current system can be extended to allow the users to create accounts and save products in to wish list.
- The users could subscribe for price alerts which would enable them to receive messages when price for products fall below a particular level.
- The current system is confined only to the shopping cart process. It can be extended to have an easy to use check out process.
- Users can have multiple shipping and billing information saved. During checkout they can use the drag and drop feature to select shipping and billing information.

8. References

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- Smart Draw for drawing all the Diagrams used in this report.
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- Sample Ecommerce Application
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- Ajax Toolkit controls
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