Chapter 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 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 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 numbers of products tailored to meet the shopping interests of large number of customers. These online marketplaces have thousands of products listed under various categories.

Problems:

• The basic problems with the existing systems are the non-interactive environment the 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 refund and then refreshes the entire web form to display the result. This scenario adds an extra trade of 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 easily feel application can 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.

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 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 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 colour.

1.4.2 Software Specification

Operating Environment Win: 2000/XP Platform

Net Framework & IIS: Visual Studio 2008

Database: SQL Server 2005.

Chapter 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 behaviours of various users. The working of the application is made convenient and easy to use for the end user. Dr Andresen, Associate Professor, CIS provided regular feedback on the project.

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 3 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 Behavioural 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.

Chapter 3

SYSTEM ANALYSIS

After carefully analysing 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

Entity relationship diagram for online shopping system is an ER model of online shopping website entities. It is basically a graphical representation of online shopping database tables and relation between shopping website, customer, order, product, supplier and order tracking**.**

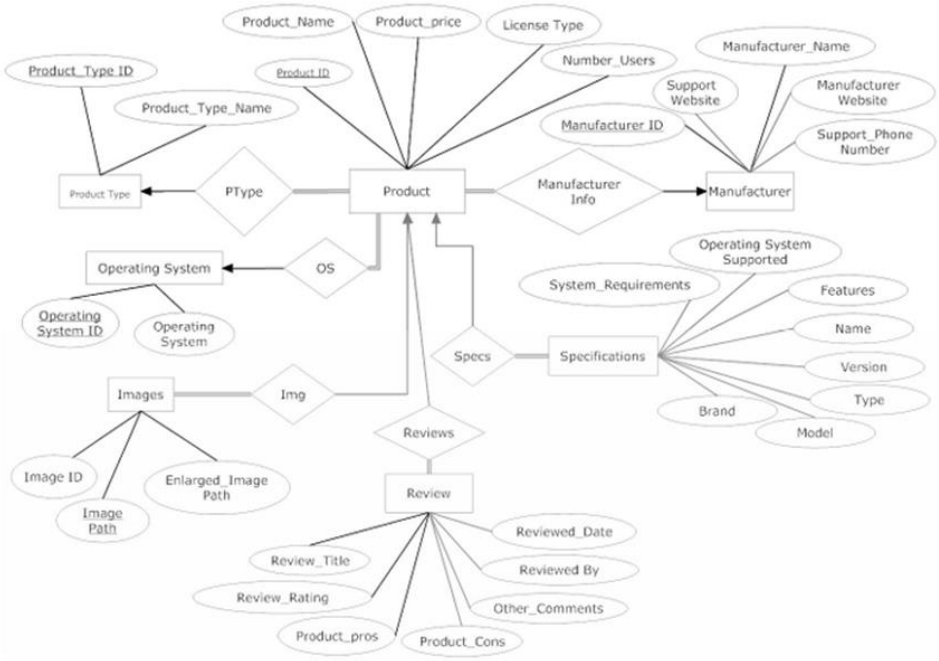

Fig 3.1: Entity Relation Ship Diagram

3.2 Data Flow Diagram

A Data Flow Diagram (DFD) is a graphical representation used to depict the flow of data through a system. In the context of an online shopping system, it shows how data moves between different components, such as the customer, shopping cart, inventory database, payment gateway, and others.

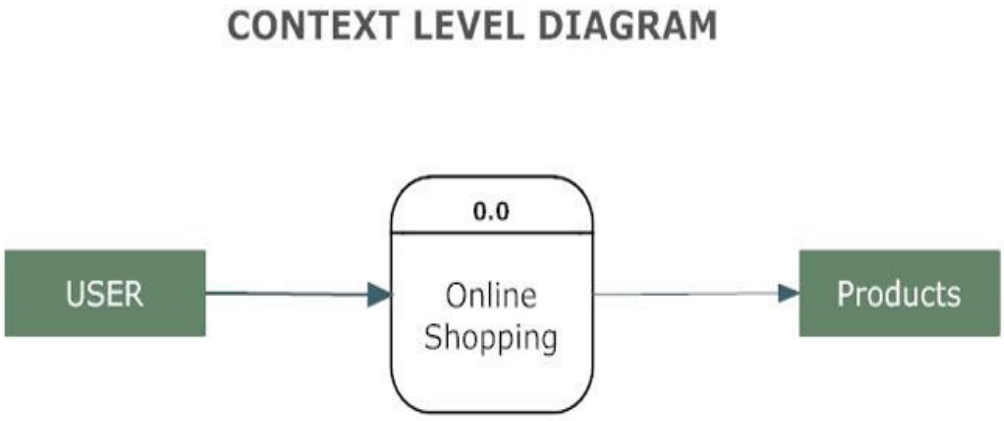

Fig 3.2: Data Flow Diagram

This Online Shopping Cart Level 1 Data Flow Diagram is a diagram of the software system which helps developers build a new e-commerce platform. It provides a visual representation of the system's components, their relationships, and the necessary processes and data flow between them.

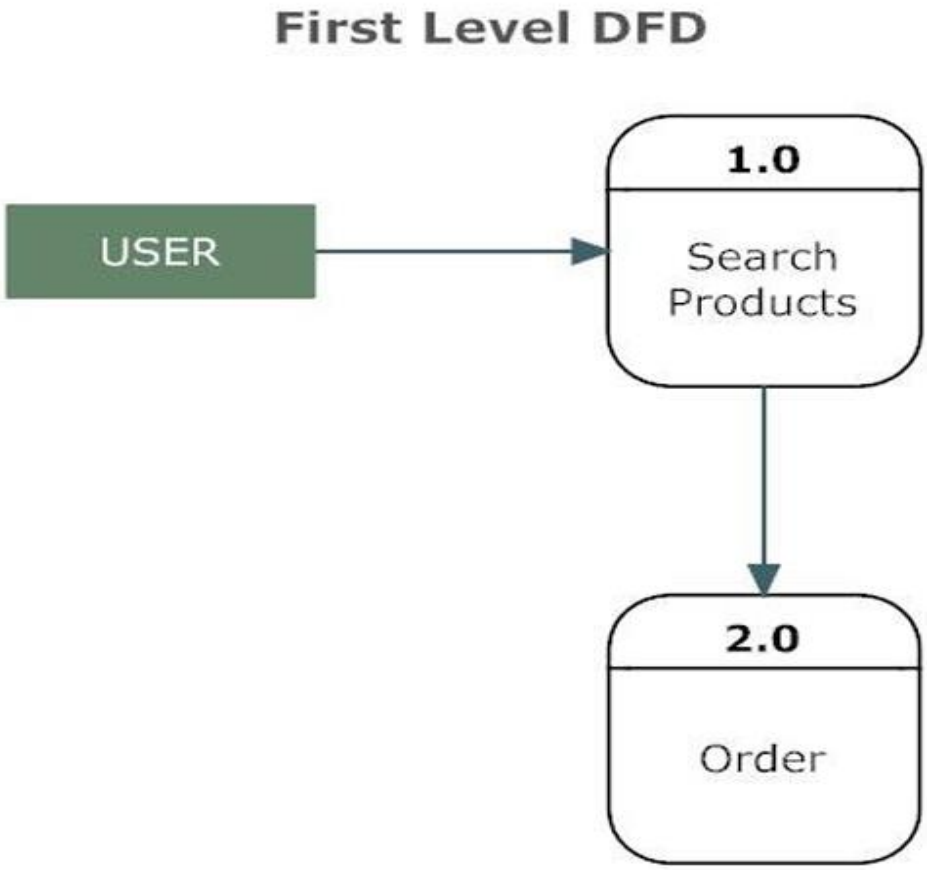

Fig 3.2.1: A First Level Diagram

Second Level provides an even more detailed view of the system by breaking down the sub-processes identified in the level 1 Data Flow Diagram (DFD) into further sub-processes. Each sub-process is depicted as a separate process on the level 2 DFD. The data flows and data stores associated with each sub-process are also shown in fig.

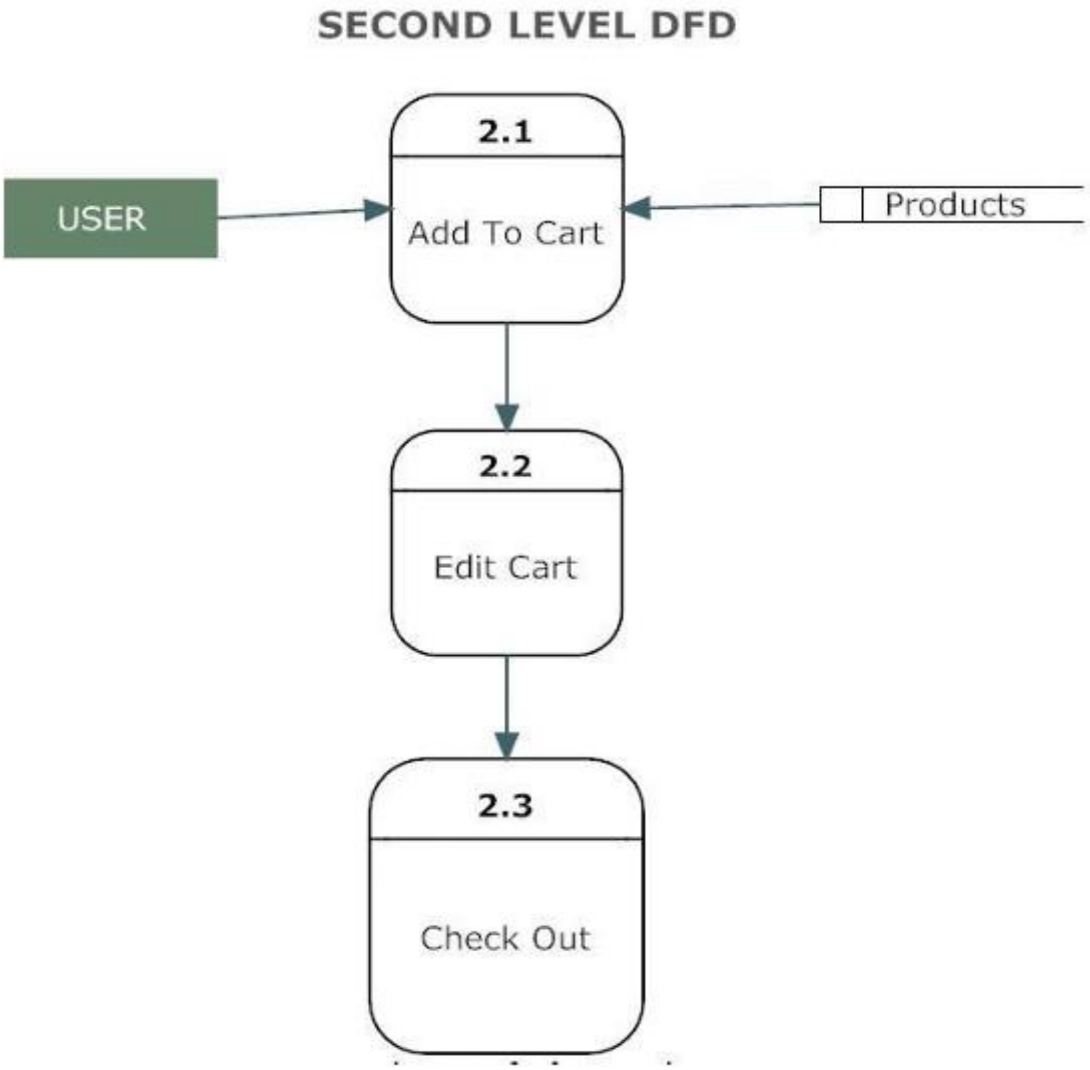

Fig 3.2.2: A Second Level Diagram

3.3 Use Case Diagram

The use case diagram includes essential actions such as searching for products, viewing product details, adding items to the cart, updating the cart, and viewing the cart contents. It also depicts the checkout process, which involves steps like placing an order, selecting a payment method, and choosing a shipping address. Additionally, the diagram reflects features related to managing user accounts, including updating profile information and viewing order history.

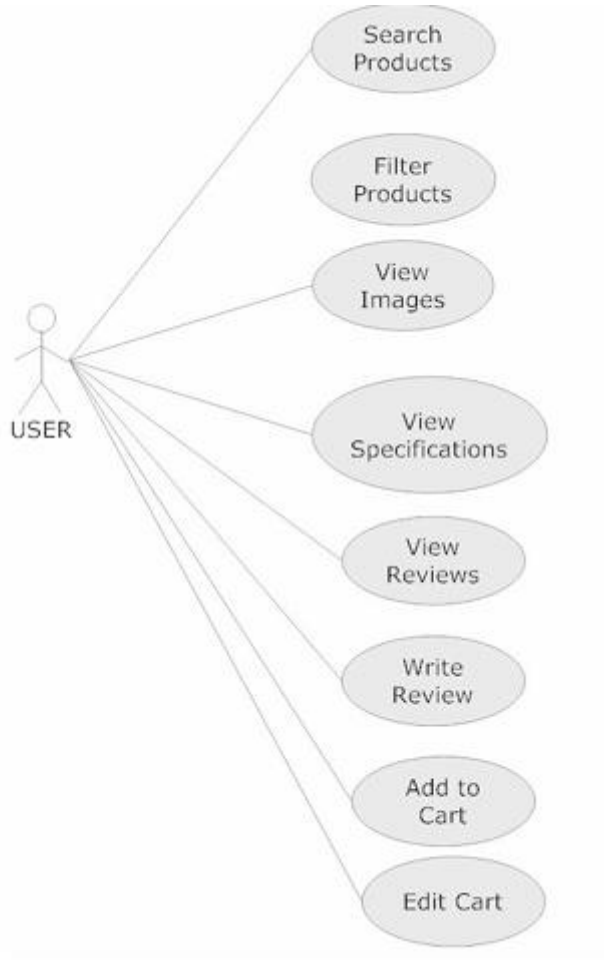

Fig 3.3: Use Case Diagram

3.4 Class Diagram

This class diagram visualizes how an online shopping system works. Each online store has an admin who controls one or many items in the website. Customers can place orders and make payments. Each order has shipping information.

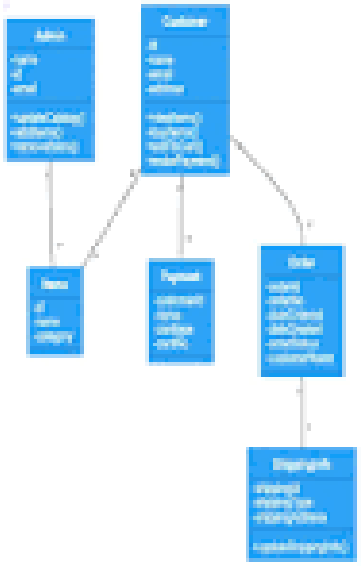

Fig 3.4: Class Diagram

Chapter 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.

4.2 Architectural Design

4.2.1Architectural Context Diagram

Fig 4.2.1: 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. Test the website's responsiveness and functionality across different devices and browsers.

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.

4.4 Database Design and Implementation

The design of the database was similar to the analysis phase. The database has been developed using SQL Server 2005.

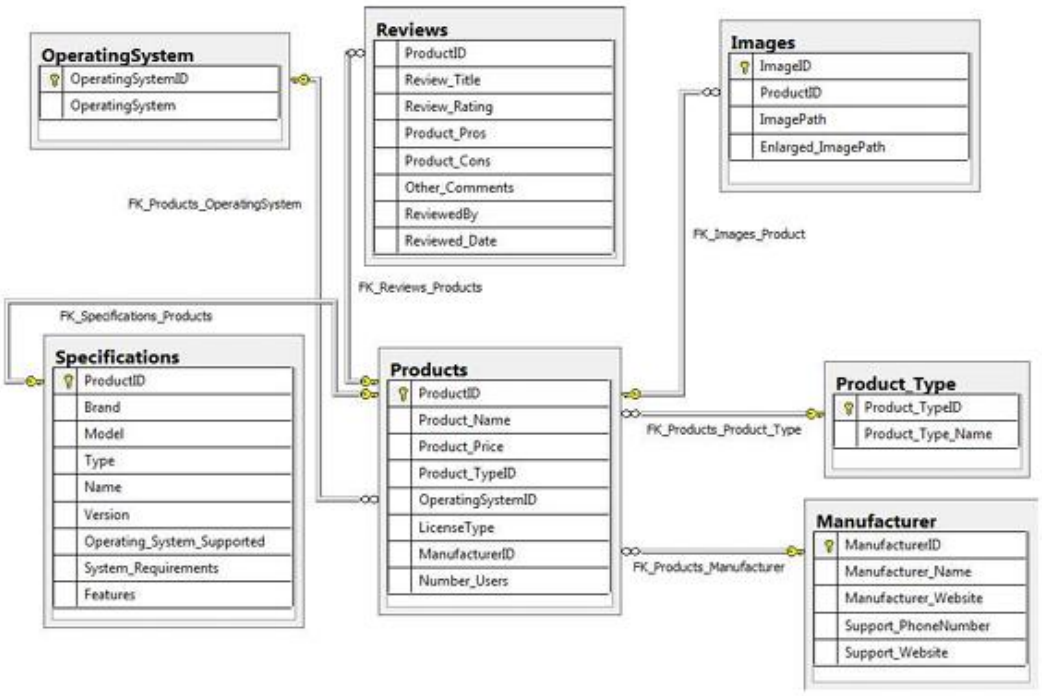

Fig 4.4: Database Implementation using SQL Server 2005

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

4.5 User Interface Design and Implementation

The user interface of the application has been designed using Microsoft Visual Studio 2008. The main controls used in the design are Repeaters, Ajax Update panels, Ajax toolkit controls like modal popup, textbox watermark and auto complete controls.

4.5.1 Register Page

The signup page plays a vital role in on boarding new users and expanding the user base of a real estate website. By providing a straightforward and secure registration process, it allows users to create accounts, customize their profiles, and access personalized features and functionalities. A user-friendly signup page contributes to a positive user experience and fosters engagement within the real estate platform. The signup page of a real estate website is essential for onboarding new users and expanding the user base. Key aspects include:

- Purpose: Collects necessary information and creates user accounts for accessing personalized features.
- User Information: Fields for name, email, and password, with additional details like contact information and property preferences if needed.
- Account Verification: Ensures authenticity through email verification or other methods, enhancing platform security.
- Password Creation: Requires users to create secure passwords, following guidelines for strength and security best practices.

The user can click on the Register button to Register their Information in the page as shown in figure 4.5.1

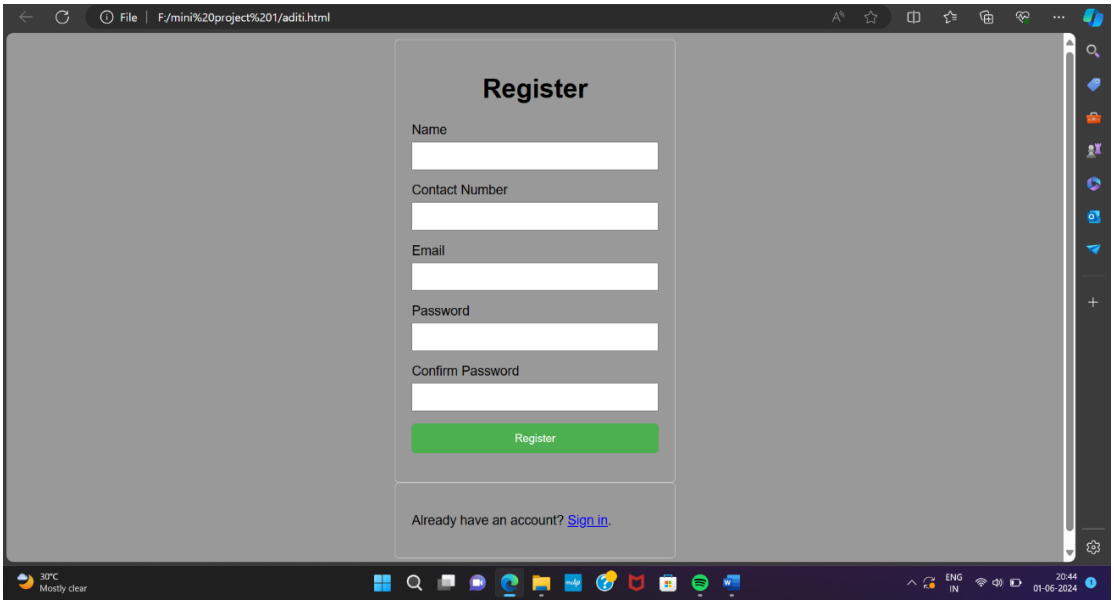

Fig 4.5.1: Register Page

4.5.2 Login Page

The login page plays a crucial role in maintaining the security and user experience of a real estate website. By implementing appropriate authentication measures and user-friendly functionalities, it establishes a trusted connection between the user and the platform, enabling personalized interactions and facilitating a seamless browsing and transaction process. The login page of a real estate website serves as a gateway for users, balancing security and user experience through key features:

- Purpose: Verifies user identity for accessing specific features and functionalities.
- User Credentials: Provides fields for entering username/email and password.
- User Registration: Offers an option for new users to register by providing necessary information.
- Forgot Password: Includes a feature for password recovery via email, ensuring users can regain access to their accounts.
- Error Handling: Displays informative messages for invalid login attempts, guiding users through troubleshooting.
- Security Measures: Implements encryption, secure transmission, and protection against common security threats like brute-force attacks.

After Registered opens login page where user put their password to login as shown in figure 4.5.2

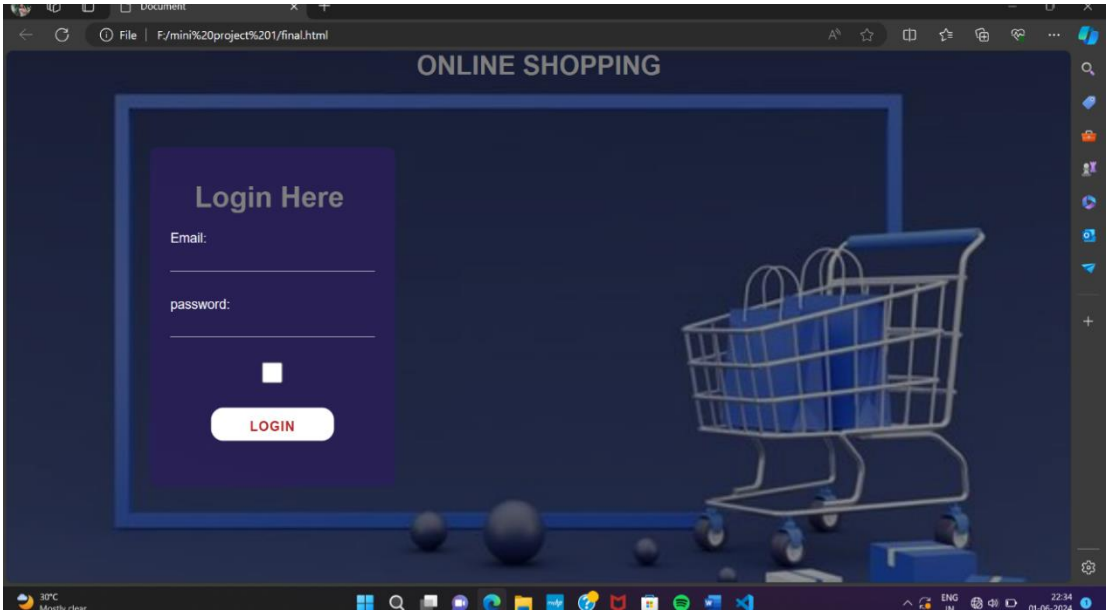

Fig 4.5.2: Login Page

4.5.3 Home Page:

The home page of a real estate website is the main landing page that users encounter when they visit the website. It serves as the gateway to the website and provides an overview of the available features, properties, and navigation options. Here is some information about the home page: The home page of a real estate website serves as the main landing page, offering users an introduction to the platform and its features:

- Introduction and Branding: Showcases the website's branding and key highlights, including a tagline, mission, vision, and imagery representing the real estate market.
- Navigation Menu: Provides a prominent menu for easy exploration of different sections like property search, listings, agent profiles, blog, and contact information.
- Property Search: Features a search functionality allowing users to find properties based on location, price range, and property type, with intuitive search fields and refinement options.

Overall, the home page creates a positive first impression, guiding users to explore further and engage with the website's offerings.

After logged in opens Home page as shown in figure 4.5.3.

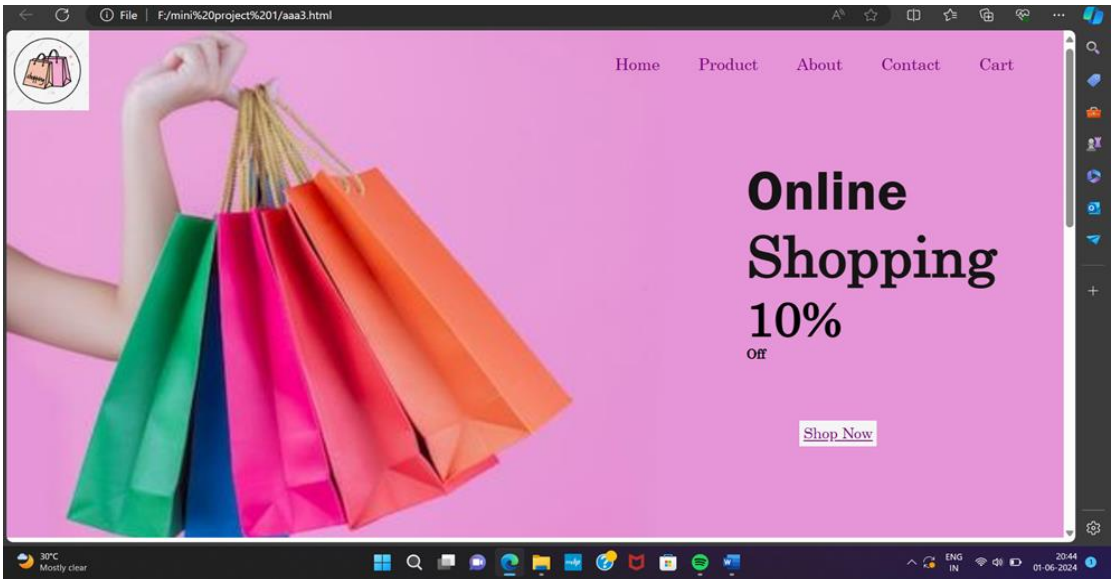

Fig 4.5.3: Home Page

4.5.4 Shop Product Page

The user can see the list of products that are available. The user can search for products by entering the shop Now button into the textbox provided on the bottom. The user can filter the products by using the dropdown lists as shown in fig 4.5.4

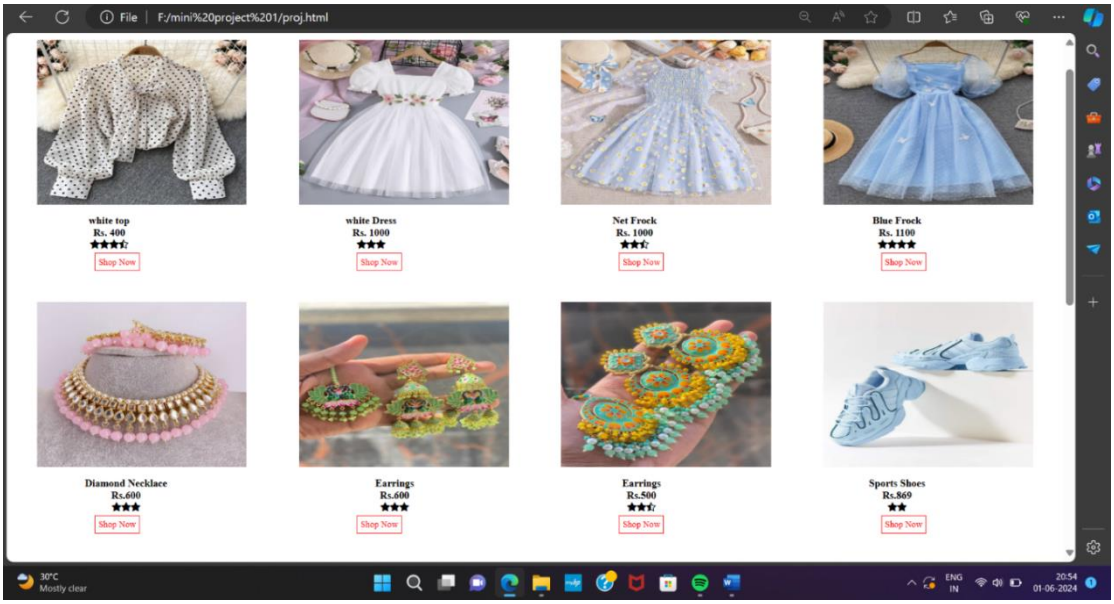

Fig 4.5.4: Shop Products Page

4.5.5 Drag and Drop a Product in Cart

A user can drag and drop a product in the shopping cart. This is shown in the figure 4.5.5

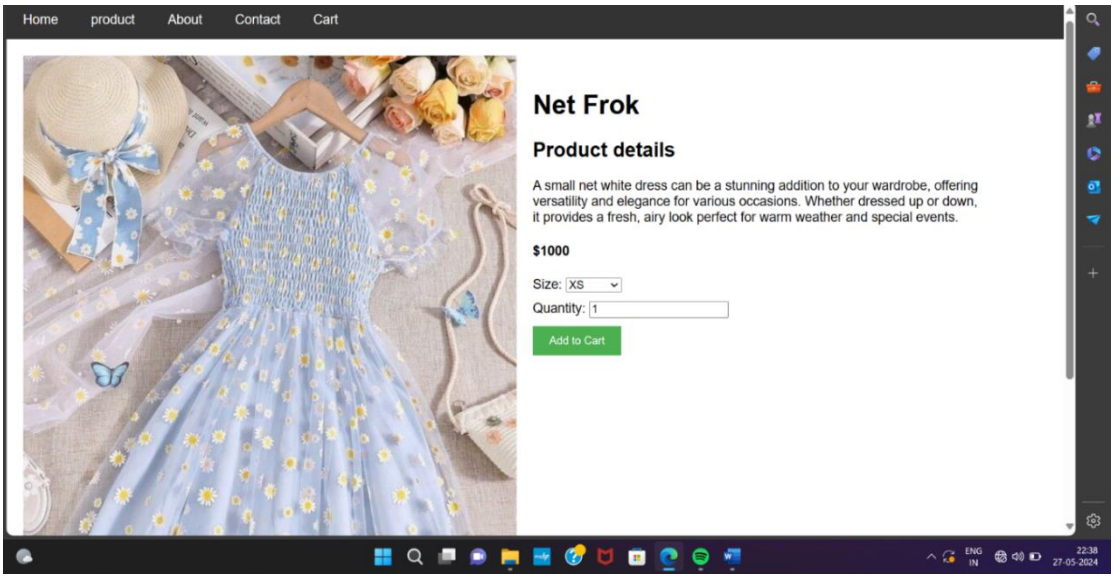

Fig 4.5.5: Figure showing Drag and Drop a Product in the Cart

4.5.6 Added to Cart

The user can click on the Add to cart button to see the Items in the cart as shown in figure 4.5.6 The Summary is at the page.

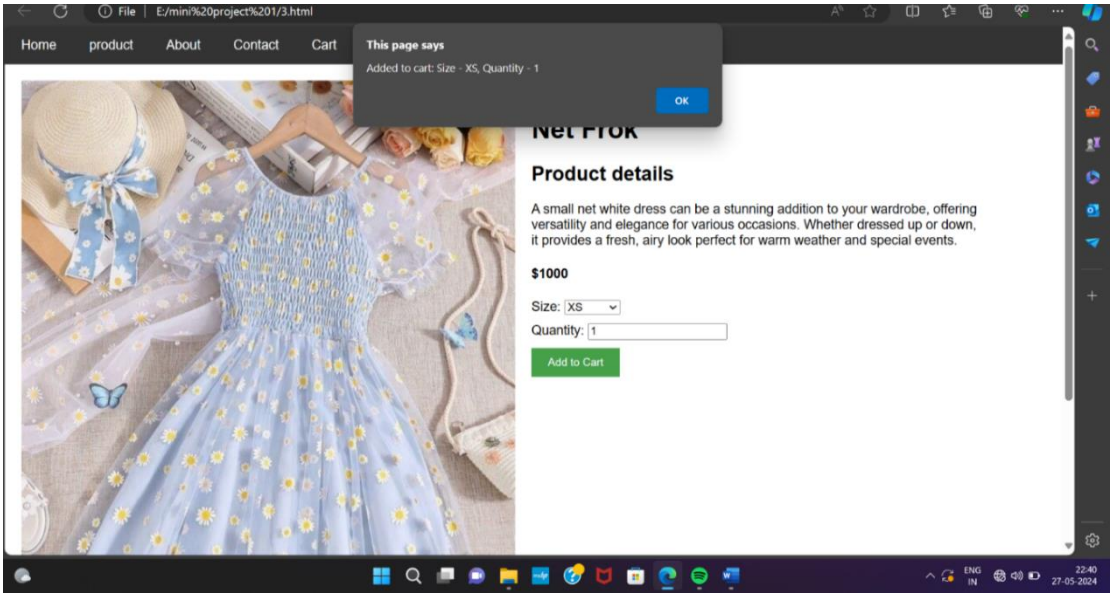

Fig 4.5.6: Figure Showing the Product is added to Cart

4.5.7 Cart Details Page

The cart page serves as the final step before the checkout process in online shopping. It allows customers to review and modify their selected items, view the total cost, and proceed to the Checkout. The cart is updated accordingly as shown in figure 4.5.7

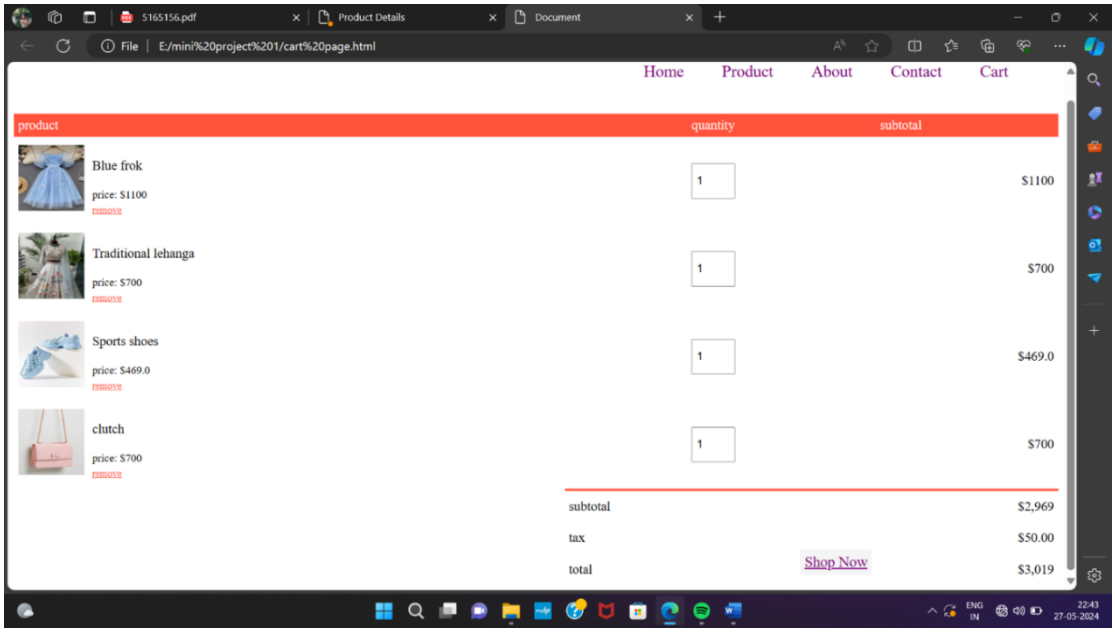

Figure 4.5.7 Cart Details Page

4.5.8 Contact us Page

The main purpose of this page is to help resolve t

he concerns of existing customers who are having issues with their order, want to return or exchange a product, or are having trouble completing an order.

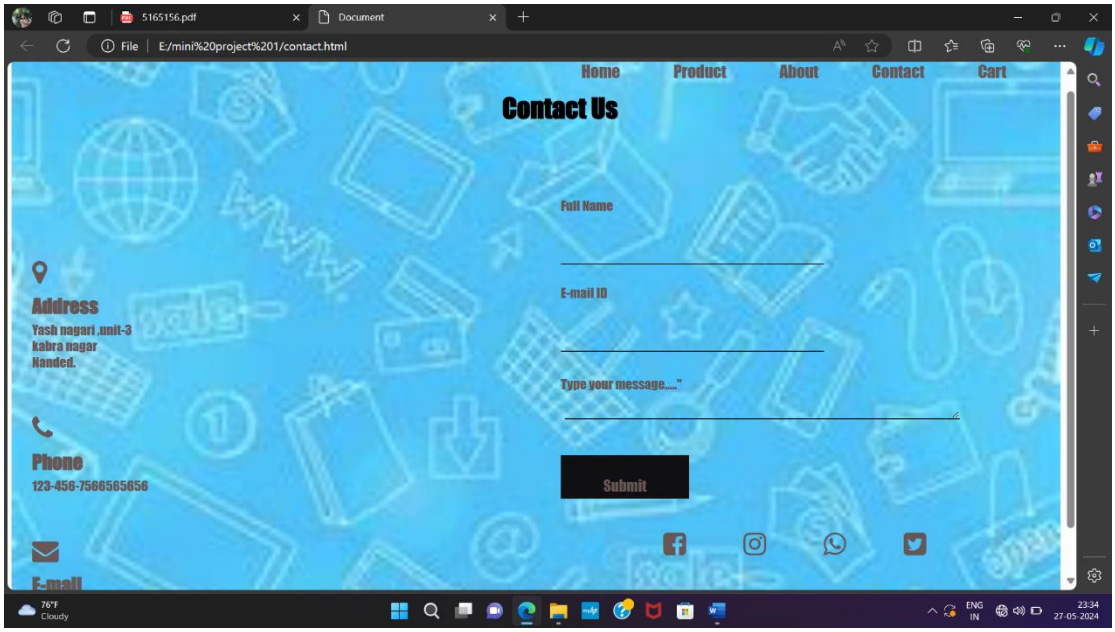

Figure 4.5.8 Contact Us Page

4.6 Technical Discussions

The products can be filtered based on various parameters like Manufacturer, Product Type, Operating System supported etc. Initially it was decided to have the various list items predefined. But with time new manufacturers and product types could be added. So, the values for the list of manufacturers and product types are loaded dynamically by retrieving from the database. also, it was decided initially to have a drop-down list for price range and the user could select a price range from the ranges available. But this would limit the user's ability to filter the products based on different price ranges. Instead providing two text fields so that the user can enter their price range would give them more flexibility.

A product could be added to a shopping cart by dragging it and dropping it in the cart area. Items in the cart could be removed by clicking a button. To maintain symmetry and ease of use products could be removed from the cart by dragging the product out of the cart.

A product can be added to the cart by dragging it and dropping it in the cart. Initially it was decided that when a product is dropped in the cart the cart summary label could be updated on the client side without any call to the server and later the session variables (Shopping cart) could be updated. This would result in loss of information when.
the user loses internet connection. So, when a product is dropped in the cart area a web service is called and this service updates the session variables for the shopping cart and the cart summary is recalculated and sent back to the client. This would improve the reliability of the application.

4.6.1 HTML

HTML stands for Hypertext Markup Language and it is used to create webpages. It uses HTML tags and attributes to describe the structure and formatting of a web page.HTML consists of various elements, that are responsible for telling search engines how to display page content. For example, headings, lists, images, links, and more. HTML uses predefined tags and elements that instruct the browser on how to display the content. HTML elements include an opening tag, some content, and a closing tag. It's important to remember to include closing tags. If omitted, the browser applies the effect of the opening tag until the end of the page. The basic structure of an HTML page contains the essential building-block elements (i.e. doctype declaration, HTML, head, title, and body elements) upon which all web pages are created.

4.6.2 CSS

CSS (Cascading Style Sheets) is a simply designed language intended to simplify the process of making web pages presentable. CSS allows you to apply styles to HTML documents. It describes how a webpage should look. It prescribes colours, fonts, spacing, etc. In short, you can make your website look however you want. CSS lets developers and designers define how it behaves, including how elements are positioned in the browser.

CSS styles are applied to the HTML element using selectors. CSS is easy to learn and understand, but it provides powerful control over the presentation of an HTML document. You can write CSS once and reuse the same sheet in multiple HTML pages. CSS declaration always ends with a semicolon, and declaration blocks are surrounded by curly braces. In this example, all paragraph element (<p> tag) will be centre-aligned, with a blue text colour.

4.6.3 JAVASCRIPT

JavaScript is a lightweight, cross-platform, single-threaded, and interpreted compiled programming language. It is also known as the scripting language for webpages. It is well-known for the development of web pages, and many non-browser environments also use it.

JavaScript is a weakly typed language (dynamically typed). JavaScript can be used for Client-side developments as well as Server-side developments. JavaScript is both an imperative and declarative type of language. JavaScript contains a standard library of objects, like Array, Date, and Math, and a core set of language elements like operators, control structures, and statements.

JavaScript is considered lightweight due to the fact that it has low CPU usage, is easy to implement, and has a minimalist syntax. Minimalist syntax as in, has no data types. Everything is treated here as an object. It is very easy to learn because of its syntax similar to C++ and Java.

Chapter 5

FEATURES AND FUNCTIONALITY

An online shopping website typically includes a variety of features and functionalities to provide a seamless and efficient shopping experience for users. Here are some key aspects:

5.1 User Experience (UX) Features:

- User-Friendly Interface: Intuitive navigation, easy-to-use search bar, and clear categories.
- Responsive Design: Compatibility with various devices, including desktops, tablets, and smartphones.
- Personalization: Recommendations based on user behaviour, preferences, and purchase history.
- Multilingual Support: Language options for a global audience.

5.2 Product Management:

- Product Listings: Detailed product descriptions, high-quality images, and videos.
- Product Reviews and Ratings: Customer feedback and star ratings for products.
- Inventory Management: Real-time stock updates and notifications for out-of-stock items.
- Product Comparison: Tools to compare multiple products based on features and prices.

5.3 Shopping Cart and Checkout:

- Shopping Cart: Add, remove, and update products in the cart with a clear view of total costs.
- Wishlist: Save items for future purchases.
- Secure Checkout Process: Multiple payment options, including credit/debit cards, PayPal, and other digital wallets.
- Guest Checkout: Option for users to purchase without creating an account.

5.4 Customer Support:

- Live Chat Support: Real-time assistance through chat.
- Help Centre and FAQs: Comprehensive information on common issues and queries.
- Order Tracking: Real-time updates on order status and shipping details.

- Return and Refund Policy: Clear guidelines on how to return products and get refunds.

The functionality of an online shopping website encompasses various features and processes that facilitate a smooth and efficient shopping experience for users. Here's an overview of the core functionalities.

5.5 User Account Management:

Registration and Login:

- Users can create accounts using email or social media credentials.
- Secure login functionality.

5.6 Profile Management:

- Users can update personal details, such as contact information and addresses.
- Manage saved payment methods.

5.7 Checkout and Payment:

1.Checkout Process:

- Guest checkout option.
- Multiple steps including shipping details, payment options, and order review.

2.Payment Integration:

- Support for various payment methods (credit/debit cards, digital wallets, etc.).
- Secure payment processing with encryption

5.8 Order Management:

1. Order Tracking:

- Real-time tracking of order status from processing to delivery.
- Notifications for order confirmation, shipping, and delivery.

2.Order History:

- Access to previous orders with details for reordering or returns.

5.9 Customer Support:

1.Live Chat and Contact Forms:

- Real-time customer support via chat.
- Contact forms for inquiries and support requests.

2.FAQs and Help Centre:

- Comprehensive answers to common questions.
- Step-by-step guides for common issues.

5.10 Product Reviews and Ratings:

1.Customer Reviews:

- Users can leave reviews and ratings for products.
- Display average ratings and detailed reviews on product pages.

5.11 promotions and Discounts:

1.Coupons and Discount Codes:

- Apply promotional codes during checkout.
- Automated discounts for sales events.

2. Loyalty Programs:

- Earn points or rewards for purchases.
- Special offers for repeat customers.

These functionalities collectively ensure that an online shopping website is user-friendly, secure, and capable of handling various aspects of e-commerce, from browsing and purchasing to customer support and order management.

CONCLUSION

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.

As we focus on the costs of online shopping, it seems that online shopping is really detrimental for the environment. Online shopping brings us great convenience, but it also encourages irresponsible consumption habits like exploiting the advantages of free returns and expedited shipping. These add on to the existing pool of environmental problems that we are dealing with – global warming, wastes and pollution. Therefore, we should change our attitude towards e-commerce –to be more responsible, less exploitative and more thoughtful for the environment.

➢ 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.

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