Green Delivery

Smart Customer Services (SCS) Website:

Technical Report

CPS630: Web Applications

Team 21

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Names	Contributions	Responsibilities
Asgar Ayman	20%	UI
Marco Bozic	20%	UI
Hodo Abdirizak	20%	Back-End
Kevin Ahn	20%	Back-End
Mubariz Afzal	20%	UI

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Project Overview:

The main objective of this project is to design, develop, and test a "Furniture Store" web-application that provides an efficient online shopping experience for customers interested in buying furniture. The web-application focuses on designing the user interface and implementing a relational database to manage inventory, orders, and customer information. The Green Delivery website aims to make the process of selecting, purchasing, and delivering furniture items as seamless and user-friendly as possible.

Languages and Tools:

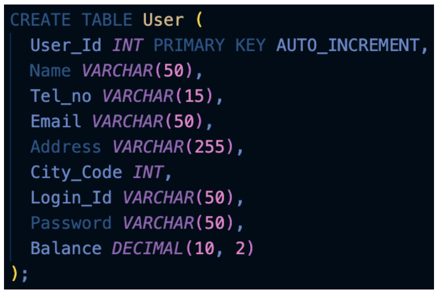
In this project, we utilized a robust technology stack consisting of HTML and CSS for front-end development, complemented by PHP for server-side scripting. Additionally, we employed MySQL for efficient database management, while leveraging the capabilities of JavaScript and the React library for seamless user interactions and dynamic content.

Database Maintain Mode:

The database maintain mode is designed to be used exclusively by Green Delivery's administrator. It allows the administrator to perform various operations on the database tables, such as inserting, deleting, selecting, and updating records related to inventory, orders, and customer information. MySQL commands are used to implement these operations.

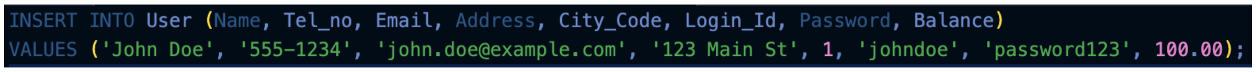
Implementation:

1. **Create Tables:** The tables are created using the CREATE TABLE command in MySQL. For example, to create the User table:



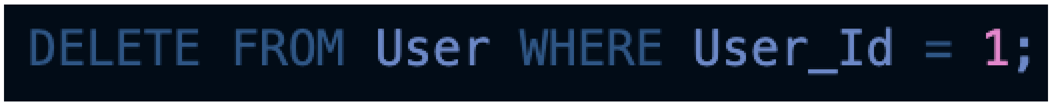
```
CREATE TABLE User (
  User_Id INT PRIMARY KEY AUTO_INCREMENT,
  Name VARCHAR(50),
  Tel_no VARCHAR(15),
  Email VARCHAR(50),
  Address VARCHAR(255),
  City_Code INT,
  Login_Id VARCHAR(50),
  Password VARCHAR(50),
  Balance DECIMAL(10, 2)
);
```

2. **Add Records:** To add a record, we use the INSERT INTO command. For example, to add a user:



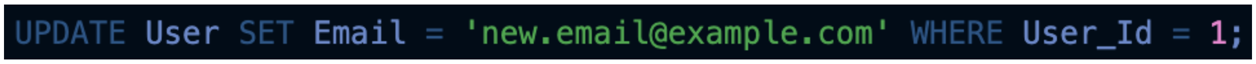
```
INSERT INTO User (Name, Tel_no, Email, Address, City_Code, Login_Id, Password, Balance)
VALUES ('John Doe', '555-1234', 'john.doe@example.com', '123 Main St', 1, 'johndoe', 'password123', 100.00);
```

3. **Delete Records:** To delete a record, we use the DELETE FROM command. For example, to delete a user with a specific User_Id:



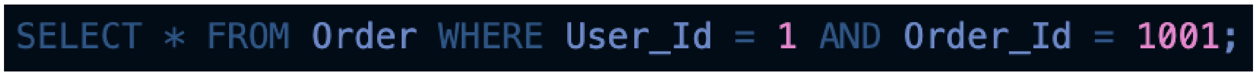
```
DELETE FROM User WHERE User_Id = 1;
```

4. **Modify Records:** To modify a record, we use the UPDATE command. For example, to update the email address of a user:



```
UPDATE User SET Email = 'new.email@example.com' WHERE User_Id = 1;
```

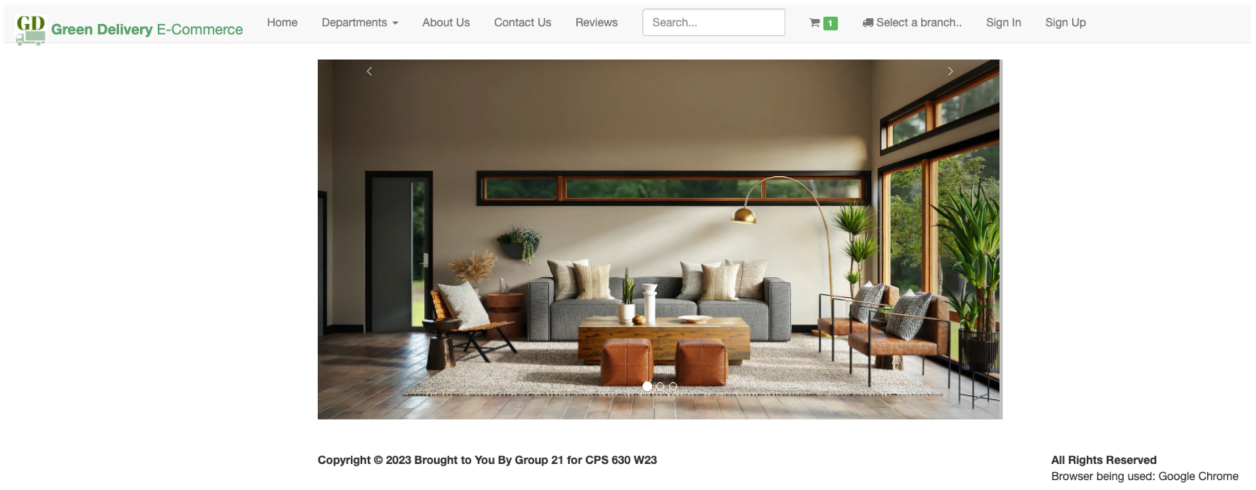
5. **Search Records:** To search records, we use the SELECT command. For example, to search for a specific order based on User-Id and Order-Id:



```
SELECT * FROM Order WHERE User_Id = 1 AND Order_Id = 1001;
```

Design and Layout of the User Interfaces (UIs):

- **Main Page:** The main page features a clean, modern design with easy-to-read fonts and a visually appealing color scheme. It includes a header section welcoming the customer to our site, navigation options such as "Home", "Departments", "About Us", "Contact Us", "Reviews", "Search", “Shopping Cart”, “Select a branch”, “DB Maintain”, “Sign-in”, and "Sign-up". The main content area showcases featured furniture items, with high-quality images and displays the browser the user is using at the bottom.



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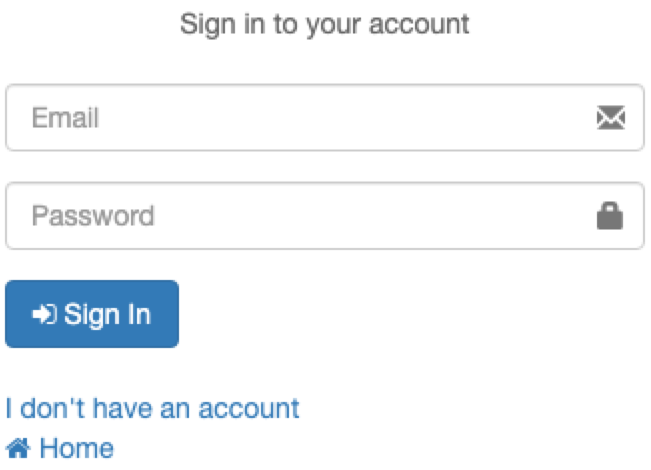
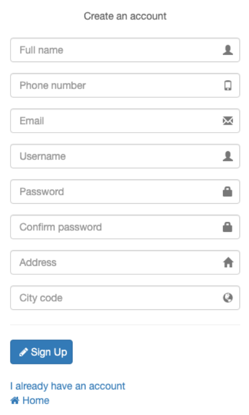
Browser being used: Google Chrome

- **Sign-In Page:** The Login page offers a streamlined and secure experience for users to access their accounts on the Green Delivery website effortlessly. It features straightforward navigation to the Sign-up page or the Homepage. The primary focus of the Login page is the user-friendly form, ensuring a seamless authentication process.



- **Sign-Up Page:** The Sign-Up page is designed to provide a seamless and user-friendly registration process for new users who wish to create an account on the Green Delivery website. It requires the user to create a username along with a password, and provide their full name, telephone, email, address, and city code. The main content area of the Sign-Up page is focused on the registration form.



Design and Structure of the Application Database:

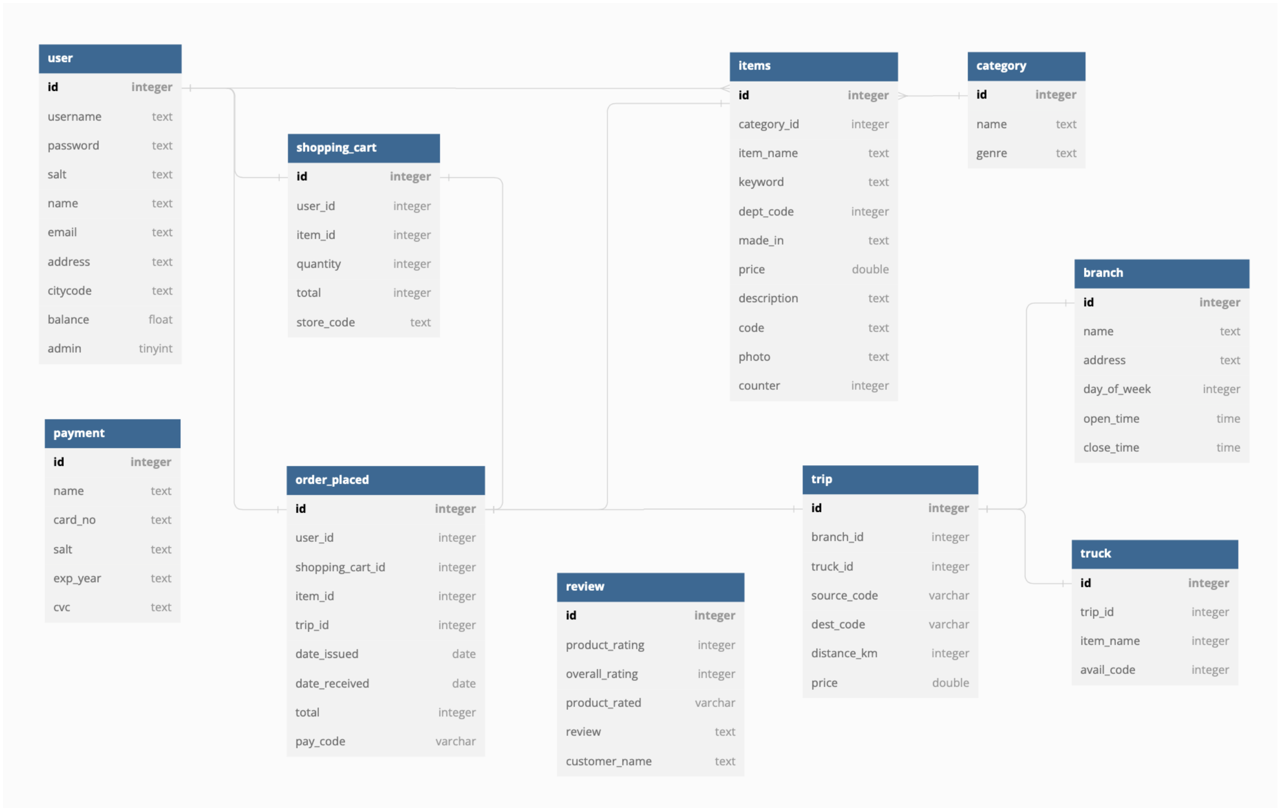
The database for the Green Delivery web application consists of several tables designed to store information related to users, products, orders, and other relevant data. The tables, their fields, keys, and relationships are described below:

- **User table:** id [Primary Key], username, password, salt, name, email, address, citycode, balance, admin. The Users table is designed to store and manage user account information. This table is essential for managing user authentication, authorization, and maintaining user-related data.
- **Category table:** id [Primary Key], name, genre. The Categories table is designed to store and manage information about distinct categories within an application. This table is particularly useful for organizing and classifying items or content into meaningful groups, enabling better navigation and filtering capabilities for users.
- **Order_placed table:** id [Primary Key], user_id, shopping_cart_id, item_id, trip_id, date_issued, date_recieved, total, pay_code. The Order_placed table is designed to store and manage information about orders placed by users. This table is essential for tracking orders, managing order fulfillment, and maintaining records of customer transactions.

- **Items table:** id [Primary Key], category_id, item_name, keyword, dept_code, made_in, price, description, code, photo, counter. The Items table is a SQL database table designed to store and manage information about various items in an organized manner. This table is particularly useful for product inventory management.
- **Shopping_cart table:** id [Primary Key], user_id, item_id, quantity, total, store_code. The Shopping_cart table is designed to store and manage information about users' shopping carts. This table plays a crucial role in tracking user shopping carts, managing inventory, and providing a seamless online shopping experience for customers.
- **Payment table:** id [Primary Key], name, card_no, salt, exp_year, cvc. The Payment table is designed to store and manage sensitive payment information for users. This table is vital for securely handling user payment information, ensuring transactions are processed accurately, and maintaining compliance with data protection standards.
- **Review table:** id [Primary Key], product_rating, overall_rating, product_rating, review, customer_name. The Review table is designed to store and manage customer reviews and ratings for products. This table plays a crucial role in capturing customer feedback, helping potential buyers make informed decisions, and enabling businesses to improve their products and services based on customer insights.
- **Truck table:** id [Primary Key], trip_id, item_name, avail_code. The Truck table is designed to store and manage information about trucks, their associated trips, and the items they transport within a logistics or supply chain system. This table is essential for tracking truck movements, managing cargo transportation, and ensuring efficient logistics operations.
- **Trip table:** id [Primary Key], branch_id, truck_id, source_code, dest_code, distance_km, price. The Trip table is designed to store and manage information about trips. This table is essential for

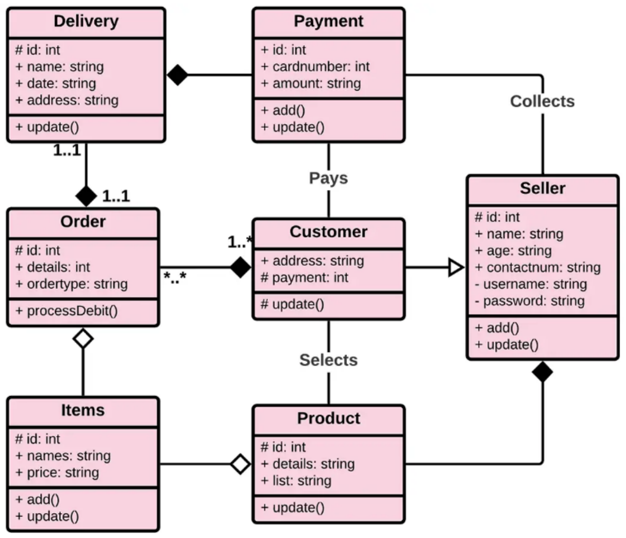
planning, monitoring, and optimizing logistics operations, as well as tracking costs and performance metrics related to transportation.

- **Branch table:** id [Primary Key], name, address, day_of_week, open_time, close_time. The Branch table is designed to store and manage information about the branches of Green Delivery. This table is crucial for managing and organizing branch-specific data, supporting location-based operations, and enabling efficient planning and scheduling of resources within this multi-location organization.



Application Architecture

The Green Delivery web application is designed using the Model-View-Controller (MVC) pattern, which helps organize the application into three main components: Models, Views, and Controllers. The class diagram below illustrates the architecture of the application and the relationships between the classes.



1. **Models:** The Models represent the data structures and business logic of the application. In our case, we have the following classes as models: Customer, Product, Items, Order, Seller, Delivery and Payment. These classes are responsible for managing the data and interactions with the database.
2. **Views:** The Views are responsible for displaying the data from the Models to the users. In our application, we have several views, such as HomePageView, ProductListView, ShoppingCartView, SignInView, SignUpView, and ReviewsView, ServicesView. These views display the information in a user-friendly format and handle user inputs.
3. **Controllers:** The Controllers manage the flow of data between the Models and Views. They receive input from the Views, process it, and update the Models accordingly. In our application, we have controllers such as UserController, ProductController, OrderController, and ShippingController, which handle the interactions between the Views and the Models.

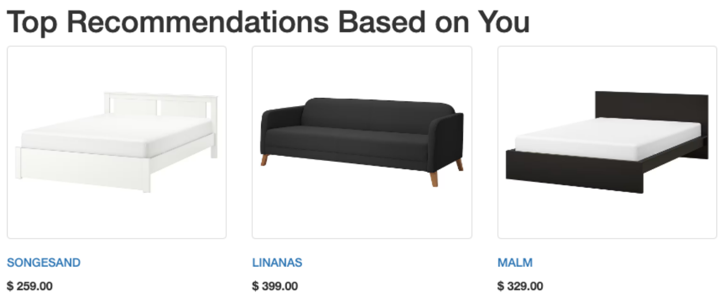
The class diagram demonstrates how the MVC pattern is applied to the system architecture. The Models, Views, and Controllers are separated into distinct components, allowing for better organization and maintainability of the application.

Modes of Operation

The website offers two distinct modes: Customer Mode and Administrator Mode. While both modes share similar functionality, the key difference lies in the access granted to administrators. Upon logging in with their credentials, admins can access the DB Maintain feature, which enables them full control over the database tables. This exclusive feature allows admins to add, delete, search, and edit data, ensuring efficient management of the website's content.

Services

One of the most prominent services added to the website is the intelligent recommendation system. It analyzes the user's cart contents and suggests the top three products tailored to their preferences, enhancing the shopping experience. Based on the user's contents, the system factors in and recommends items that either match similarly in price range or in department selections.



Additionally another unique service that was implemented within the project was within the homepage in the form of daily offers. Of which the site provides exclusive offers based on the day of the week, and cycles through different offers daily.

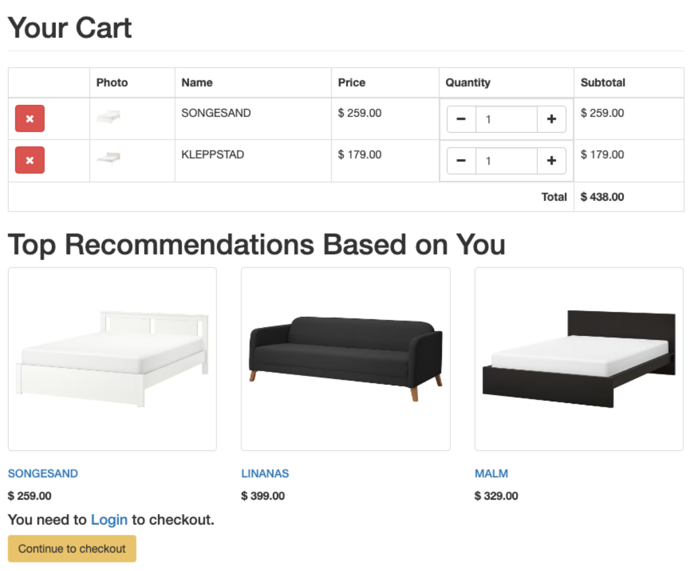
**TODAYS
DAILY
SPECIAL**

GLOSTAD

$ 249.00

Shopping Cart

The shopping cart presents a comprehensive view of all saved items, featuring a thumbnail image, product name, price, quantity, and individual subtotals. After the user enters their payment details and places the order, they are provided with the delivery route to their address, along with a well-organized invoice that summarizes their total purchase.



Your Cart

	Photo	Name	Price	Quantity	Subtotal
×		SONGESAND	$ 259.00	− 1 +	$ 259.00
×		KLEPPSTAD	$ 179.00	− 1 +	$ 179.00
				Total	$ 438.00

Top Recommendations Based on You

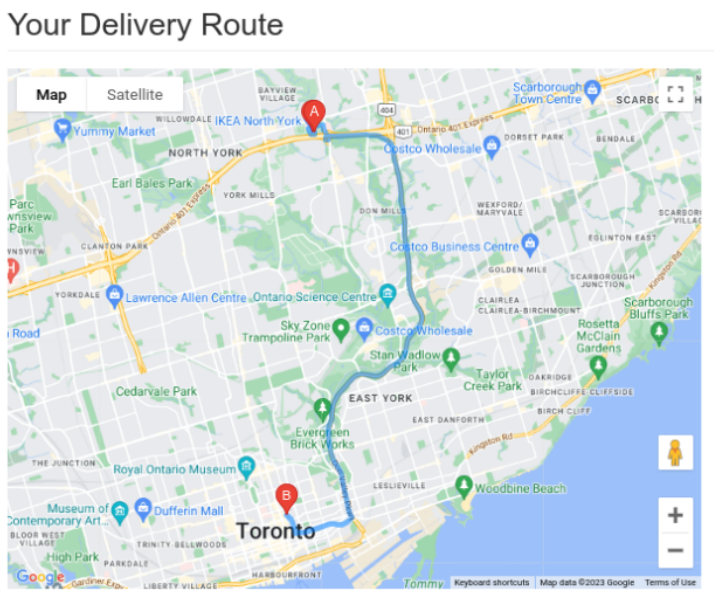
SONGESAND
$ 259.00

LINANAS
$ 399.00

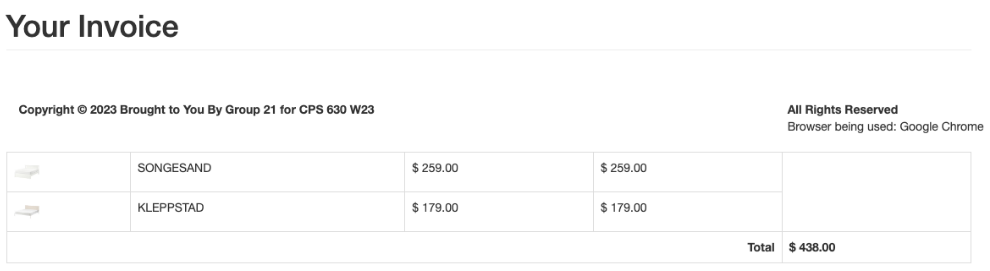
MALM
$ 329.00

You need to Login to checkout.

Continue to checkout



Your Delivery Route



Your Invoice

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Browser being used: Google Chrome

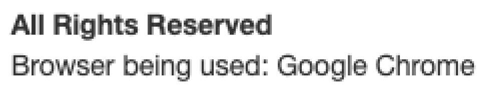
	SONGESAND	$ 259.00	$ 259.00	
	KLEPPSTAD	$ 179.00	$ 179.00	
			Total	$ 438.00

Reviews

The review page plays a pivotal role in our web application, as it enables customers to evaluate both their purchased products and the overall shopping experience. Reviews can be submitted with a rating ranging from 1-5 stars, and are structured to display the rated item first, followed by the star rating, the review text, and the reviewer's name. Users can contribute reviews at their convenience, with all data securely stored in our database, fostering an informative and transparent shopping environment.

Browsers

Our web application has been thoughtfully designed to ensure compatibility across a wide variety of browsers, acknowledging that customers access the website using diverse devices and browser preferences. By prioritizing cross-browser compatibility, we provide a seamless and consistent user experience for all visitors, regardless of their chosen browser. To enhance user awareness, the name of the browser currently being used is conveniently displayed at the bottom right corner of every page, serving as a subtle reminder of the application's adaptability and commitment to accessibility.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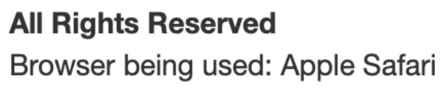
Browser being used: Google Chrome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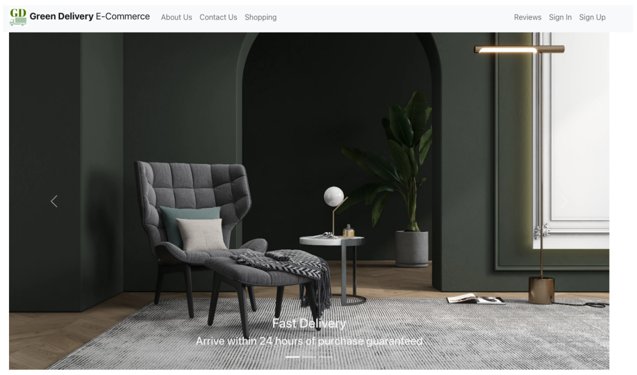
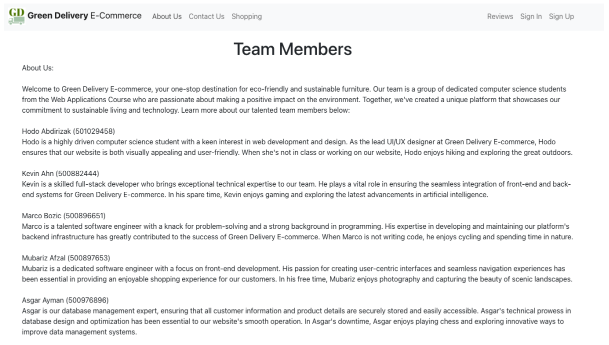
Browser being used: Apple Safari

Single Page Architecture (SPA)Design

Our Single Page Application (SPA) design was developed to create an efficient and seamless browsing experience. Initially, our web application consisted of multiple separate pages, each serving a specific purpose, such as Home, About Us, Products, Contact, and more. To transition to a SPA design, we consolidated these individual pages into a single interface, with elements from the separate pages being collected and integrated into the unified layout. This approach eliminates the need to load new pages for each navigation action, streamlining the user experience. React was chosen as the framework for implementing our SPA. React's component-based architecture allowed us to create modular, reusable components for the UI, making the development process more manageable and maintainable. Additionally, we employed the React Router library for client-side routing, enabling smooth navigation between different views without reloading the entire page. In our SPA, when a user clicks on a navigation option, such as "About Us," React Router dynamically updates the page content, displaying the corresponding element within the existing layout. This process is made possible by React's virtual DOM, which efficiently updates the real DOM by only changing the parts affected by the user's action, resulting in faster updates and smoother interactions.


Green Delivery E-Commerce
About Us
Contact Us
Shopping
Reviews
Sign In
Sign Up
Fast Delivery
Arrive within 24 hours of purchase guaranteed



Team Members

About Us:

Welcome to Green Delivery E-commerce, your one-stop destination for eco-friendly and sustainable furniture. Our team is a group of dedicated computer science students from the Web Applications Course who are passionate about making a positive impact on the environment. Together, we've created a unique platform that showcases our commitment to sustainable living and technology. Learn more about our talented team members below:

Hodo Abdirizak (501029458)
Hodo is a highly driven computer science student with a keen interest in web development and design. As the lead UI/UX designer at Green Delivery E-commerce, Hodo ensures that our website is both visually appealing and user-friendly. When she's not in class or working on our website, Hodo enjoys hiking and exploring the great outdoors.

Kevin Ahn (500882444)
Kevin is a skilled full-stack developer who brings exceptional technical expertise to our team. He plays a vital role in ensuring the seamless integration of front-end and back-end systems for Green Delivery E-commerce. In his spare time, Kevin enjoys gaming and exploring the latest advancements in artificial intelligence.

Marco Bozic (500896651)
Marco is a talented software engineer with a knack for problem-solving and a strong background in programming. His expertise in developing and maintaining our platform's backend infrastructure has greatly contributed to the success of Green Delivery E-commerce. When Marco is not writing code, he enjoys cycling and spending time in nature.

Mubariz Afzal (500897653)
Mubariz is a dedicated software engineer with a focus on front-end development. His passion for creating user-centric interfaces and seamless navigation experiences has been essential in providing an enjoyable shopping experience for our customers. In his free time, Mubariz enjoys photography and capturing the beauty of scenic landscapes.

Asgar Ayman (500976896)
Asgar is our database management expert, ensuring that all customer information and product details are securely stored and easily accessible. Asgar's technical prowess in database design and optimization has been essential to our website's smooth operation. In Asgar's downtime, Asgar enjoys playing chess and exploring innovative ways to improve data management systems.

Security

In the final iteration of our project, we focused on enhancing the security features to protect sensitive data such as passwords and credit card numbers. We implemented various techniques and made relevant changes to the database to achieve a higher level of security for both administrators and end-users. To securely store passwords, we applied a combination of "Salting the Hash" and "Secure Hash" MD5 functions. We first attached a random "salt" to each password and then applied the MD5 hash function on the salted password. Our database design was modified to accommodate both the "salt" and the MD5 hash of the salted password with appropriate formats. The authentication code for validating the login and password process was updated to reflect these changes. When a user attempts to log in, we first retrieve the salt from the database based on the submitted user ID (login name). Next, we create a salted password using the submitted password and the retrieved salt, and run it through the one-way hash. The generated MD5 hash value, along with its user ID, is then compared with the ones saved in the database. If they match, the login is successful; otherwise, an error is returned. We applied the same process to secure other sensitive data, such as credit card numbers. This ensures that the stored data remains protected and inaccessible to unauthorized users. By detailing our approach, we demonstrate our commitment to maintaining a secure and reliable application for all users, while also providing transparency on the security measures we have implemented. Overall, the security features, techniques, and database changes made in Iteration IV significantly enhance the protection of sensitive user information, ensuring a more secure environment for administrators and end-users alike.