High Level Design

Team: [0]

Project: Drone Cones

Architecture

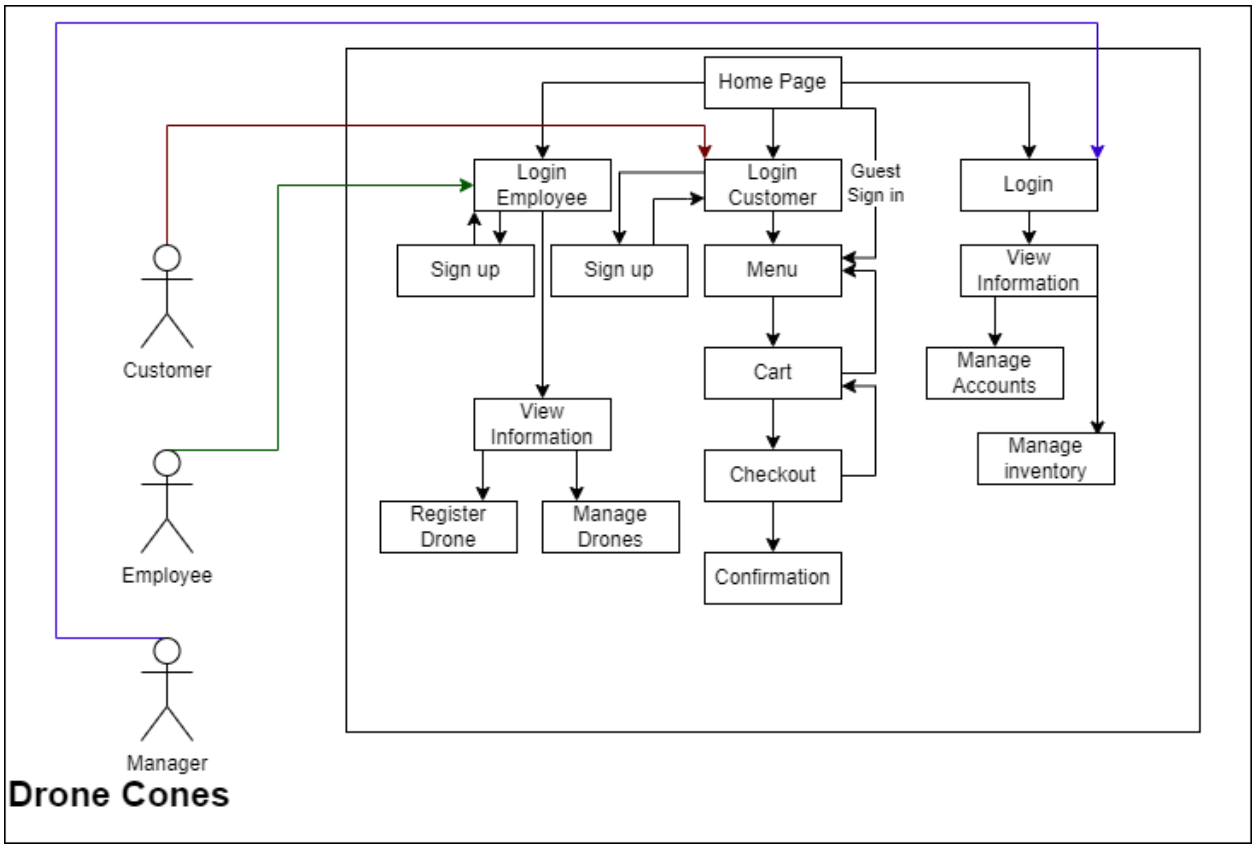
Pattern: Drone Cones will use a Two-Layer architecture pattern, with the first layer serving as the Client/User interface, where information is displayed and interacted with the User, and the second layer serving as the server/database. When information is needed by the first layer, an API request is made to the second layer, which will retrieve necessary data from the database, parse and package it if necessary, and return the requested data (or an error message) as the response to the Client layer.

Platform: This project will be developed as a web application, for use by a variety of users through a web browser. As such, a web framework will be used to manage the Client layer, and a server framework coupled with a relational database will be used for the Server layer. This will allow quick and easy access for our range of users, as well as being easily scalable in the future through use of cloud computing providers.

Security Risk Mitigation

User credentials will be encrypted and stored securely in our server layer database. To lower the damage of a potential data breach as much as possible, we plan to only store exactly what is necessary. Currently, little sensitive data on our users will be stored (passwords) and order history will not be connected to the user who made the order. We will require that users create passably strong passwords as well, to mitigate brute force hacking risk.

User Interface Flow



This application will focus on three different user ends. The customer, the employee, and the manager. All three will be linked to the home page and will have access to login in their respective accounts from there.

POST-DESIGN CHANGE: Login pages do not need to be differentiated. All 3 user types will use the same login, and Customers and Employees will share the same Signup page.

Customer

The only one that is not required to have a log in is the customer. They have an option to log in as a guest. This process will not save any information that a normal customer with a user login would have. They will also be prompted to sign in on the login page. After the user has either signed in or skipped they will be presented with the menu. From there they may browse and add items to cart as they please. Once they are satisfied they can view their cart. Once that looks fine they may proceed to checkout. If at any of the previous steps they change their mind they

can go back. Once they hit the confirm button they will be transferred to the confirmation page with information on the delivery of their order.

POST-DESIGN CHANGE: Checkout page is unnecessary. Checkout will be done on the Cart page, and will lead directly to the Confirmation page.

Manager

The Manager end will have access to information about the location. They will be able to see inventory, hot selling items, order history Inventory, and profit. From there, they may go into accounts and ban accounts as needed if any suspicious activity is happening. They will also be able to manage their inventory and restock when needed in a separate page.

Employee

Lastly the employee will be prompted to login or sign up then they will be directed to a spot where they can see how many orders they have completed and how much money their drones have made. If they wish to register a drone there will be a separate page that they can go to to enter in the specs of their drone. Drone sizes, serial number, and availability will be registered here. They are also able to manage their drones and toggle on or off if they are available to deliver.

User Interface

Home Page: This page will be the splash page of the website. Which will include details of the company and have three different navigation buttons to take you to the three different logins(Customer, Manager, Employee).

Login Customer: The customer login page will have a username and password input where the user can either login or click a button to take them to the sign up page.

POST-DESIGN CHANGE: Login will be shared by all user types.

Sign up(Customer): Will have fields where the user can input a new username and password and then a button that will create the account.

POST-DESIGN CHANGE: Signup will be shared by Customers and Employee types.

Menu: The menu will contain different sections for each type of selection showing all different types of flavors, sizes, and etc. The customer can then add the ice cream to the cart and have a button to go to the cart.

Cart: The cart will display what product the user has added to the cart and have an option to modify or delete the item. The user will also be provided with a checkout button and a back to menu button.

Checkout: The checkout will display the price and location of the user for the ice cream to be delivered to. There will be a confirm option or a go back option.

POST-DESIGN CHANGE: Page removed.

Confirmation: After the user confirms the user will be brought to the confirmation page where their order will be displayed along with the drones ETA. The page will notify them if the page refreshes the ETA will be lost.

POST-DESIGN CHANGE: ETA will not be lost on refresh.

Login Employee: The employee login page will have design to specify it is the Employee Login page. It will have a username and password input where the user can either login or click a button to take them to the sign up page.

POST-DESIGN CHANGE: Login will be shared by all user types.

Sign up(Employee): Will have fields where the user can input a new username and password and then a button that will create the account.

POST-DESIGN CHANGE: Signup will be shared by Customers and Employee types.

View Information(Employee): Will show income of the drones to the employee and will have buttons to take the user to Manage Drones or Register Drones.

Register Drone: The user will be able to enter the serial number of drone and drone size and click a button to register their drone.

Manage Drones: Each of the users drones will be displayed on this page with delete drone or pause drone options.

Login(Manager): The manager login page will have design to specify it is the Manager Login page. It will have a username and password input where the user can login.

POST-DESIGN CHANGE: Login will be shared by all user types.

View Information: This will display income to the user and will have options to either manage accounts or manage inventory.

POST-DESIGN CHANGE: This functionality has been split between Restock and Manager Users pages.

Manage Accounts: The user will be able to view accounts and have an option to remove accounts.

POST-DESIGN CHANGE: Removing accounts is done by site admin, Manager may only activate/deactivate accounts.

Manage Inventory: This is where the user will be able to see their current inventory status and will be able to add more inventory with an input window and enter button.

Big Picture Development Overview

Division of Labor: As a two layer application, tasks may be split between those affecting the front and back end of the software. Specifically, development will be split (perhaps unevenly) into the following pieces:

0. Graphical User Interface Design
   Synthwave theming, consistent branding and design.
   Simple and easy to understand app flow.
   Separate interfaces for Customers, Employees, and Managers.
   Lightweight, fast performance.
1. Client Logic / API call structure
   Relevant data persists between pages of application, i.e customer order.
   API calls are utilized to store data efficiently, or to retrieve data from the database.
   Logic for API calls is not over-complicated, keeping performance fast and bugs low.
   Client stores user authentication token for easy repeat access.
2. Server Data-parsing and Validation
   Data stored and retrieved via the database is ensured to be valid by the Server.
   As required by the API calls, only necessary data is returned to the Client.
   Database queries are efficient and not over-complicated.
3. Database Design
   Database tables are potentially scalable, and non-restrictive of future use cases (i.e. distribution of software to multiple managers).

Database is organized and minimal, and semi-optimized for performance.

Individual tasks and further specification of goals for each section will be determined in the low-level design phase. These segments are all internally developed. For version one, we don't plan to include many external interfaces, although a future implementation may include mapping service from Google and digital payment through PayPal or Stripe. The one external feature we plan to utilize is an API to ping each customer's location for delivery purposes.

Risks and Challenges: This project entails several technologies and patterns that many members of our team are inexperienced with. This comes with the risk of overestimating our speed or skill in these areas, so we plan to stay vigilant and reassess our goals if necessary during the project.

There are potential security risks to our customer and users, and we plan to mitigate those by following best industry practice when possible, and avoiding storage of sensitive information unless strictly necessary.

Through minimalist design and thorough testing, we will lower the existence of software bugs to as low a level as possible.

There may be physical risk to customers via use of drones flown by artificial intelligence, but we leave risks of that nature to be managed by our customer's competent legal team.