DesignDoc

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Introduction

We plan to create a user-friendly and intuitive mobile application for tracking dogs on a College Campus. We also Aim to provide real-time updates on dog locations, so that users can quickly and easily locate their pets. Moreover, the Project ensures the safety and security of the Dogs and all the Residents of the college campus by providing a way for all the App Users to keep track of Dogs and their Live Location at the same time.

System Overview

The Campus Canine Tracker is a software system designed to track the real-time location of dogs and their owners on a map. The system uses RFID and WiSUN technology to Track the location of the dogs registered with the Database and displays this information on a user-friendly interface. This can be particularly useful for all the Campus Residents to be Aware of Real-Time Location of Dogs so that the Incidents against the Users are Reduced in the Campus.

The Campus Canine Tracker app can also be used to solve several problems for Campus Residents using the App, such as the fear of getting Bitten or Chased away by Dogs. This will help in creating a Peaceful Environment within the Campus.

Design Overview

Architectural design

1) The App will Trace the Live Locations of all the Dogs connected to the IIIT Light Poles.

2) A Unique RFID is assigned to all the Collars attached to the Dogs which then gives us Information about the Dogs Characteristics

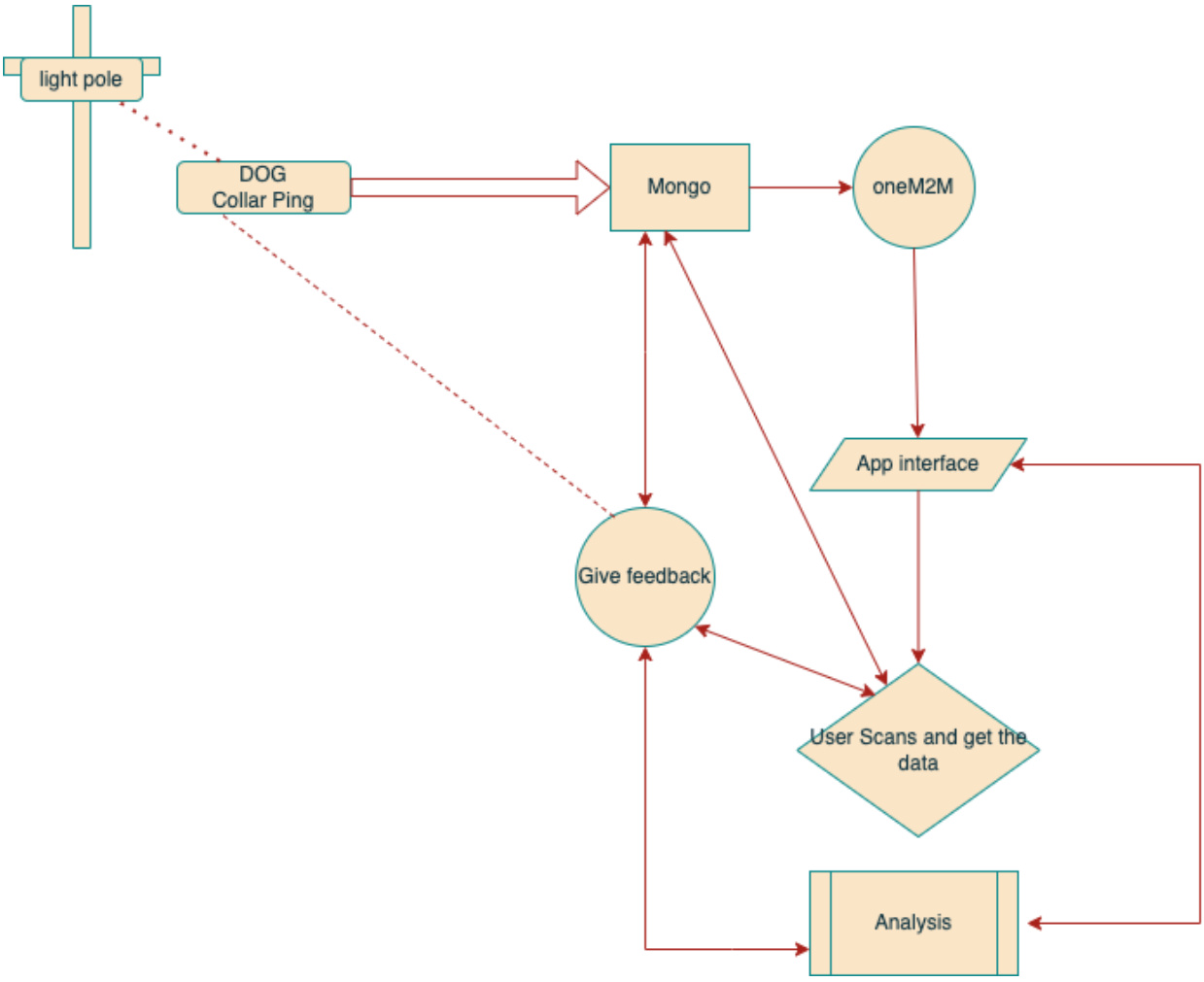
3) User can vote about the Nature of dog depending upon the Past Experiences with the Dog. The answer can be of 3 Types-Friendly, Docile and Aggressive.

4) User also has option to recall all their Stories as Input associated with the Dogs.

5) Also, the User has an Option to add Comments and General Features about the Dog Registered with the Database.

5) Based upon the Responses by the Users, we can decide whether the Dog is Friendly/Docile or Aggressive or not.

6) In Case a Dog from out of the Campus Appears in Vicinity of the User, the User can Report against the Dog.

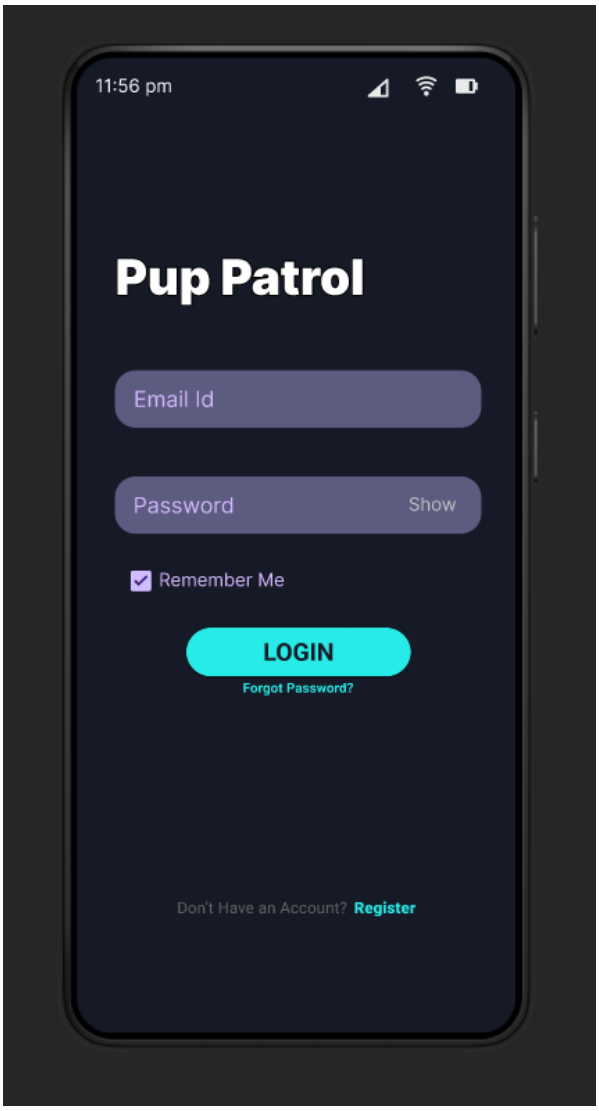


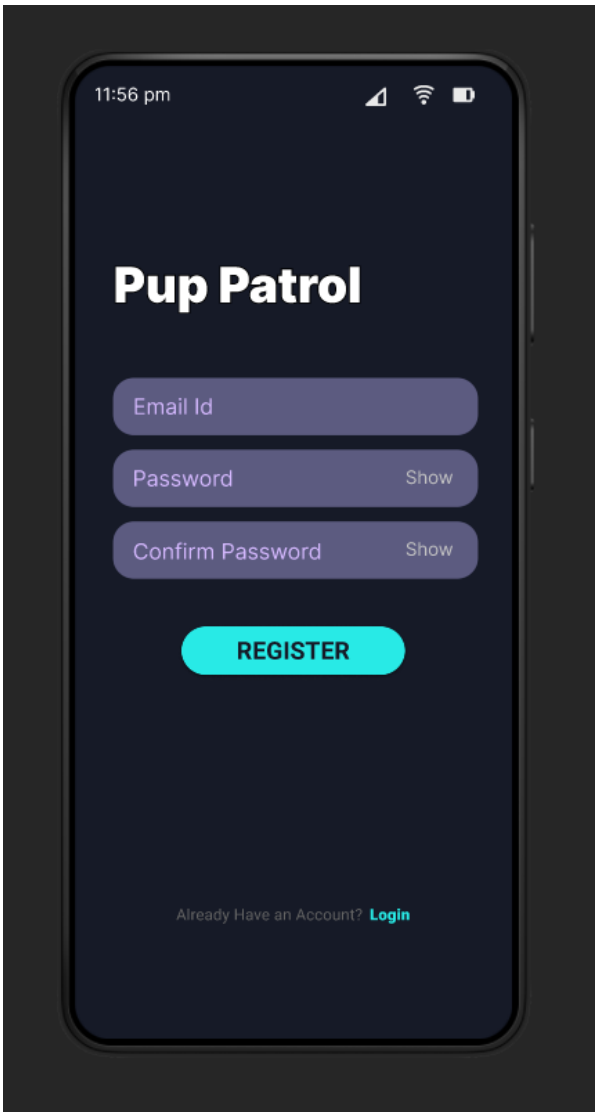
System interfaces

User Interface

- To create the UI model of our app, we looked for inspiration from various online sources. We looked at other android and IOS apps, how their UI have been designed and what kind of designs do the users like.
- We looked at popular apps in general to observer how they approach color schemes and layout design and learn what works and what doesn't for different use cases.
- We ensured consistent layout designs and color schemes across different pages of the app to ensure the quality and aesthetics of the app.

- We considered dozens of color schemes and selected this one based on the usability of the design, how easy it is to navigate, read text, etc.
- We also considered the aesthetic appeal of the layout design along with color scheme when put together, ensuring color harmony, typography and visual hierarchy.
- In the end, we had the valuable feedback from our client and made the changes requested by them to add the finishing touches.






11:56 pm
Search Location
Dogs
Map
Log Out


11:56 pm
Search Dog
Dog 1
Dog 2
Dog 3
Dog 4
Dog 5
Dog 6
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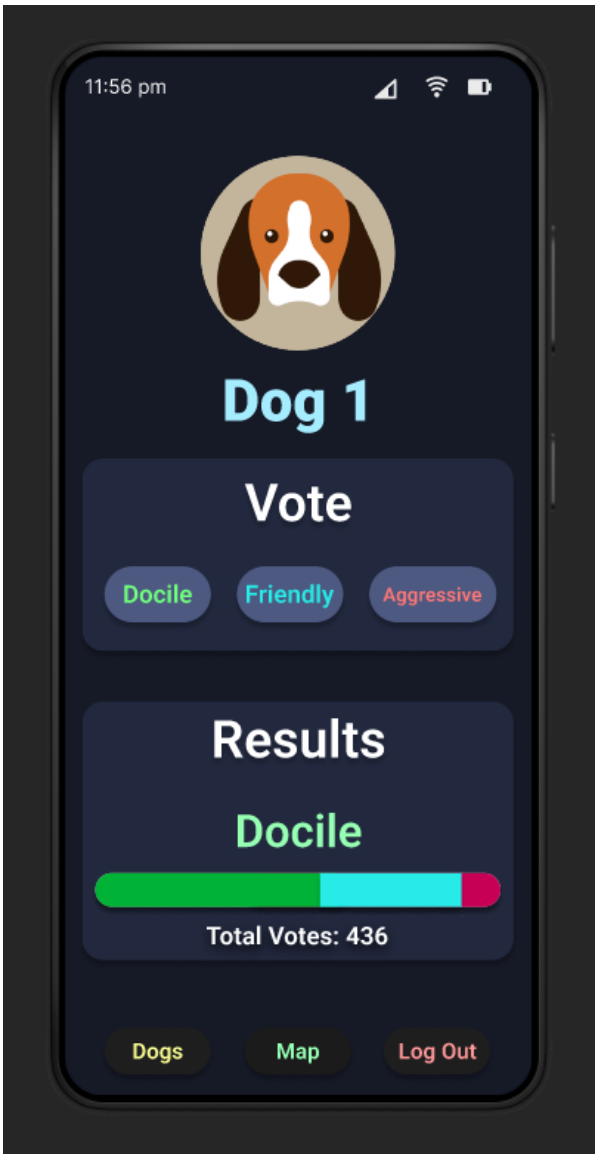


APIs

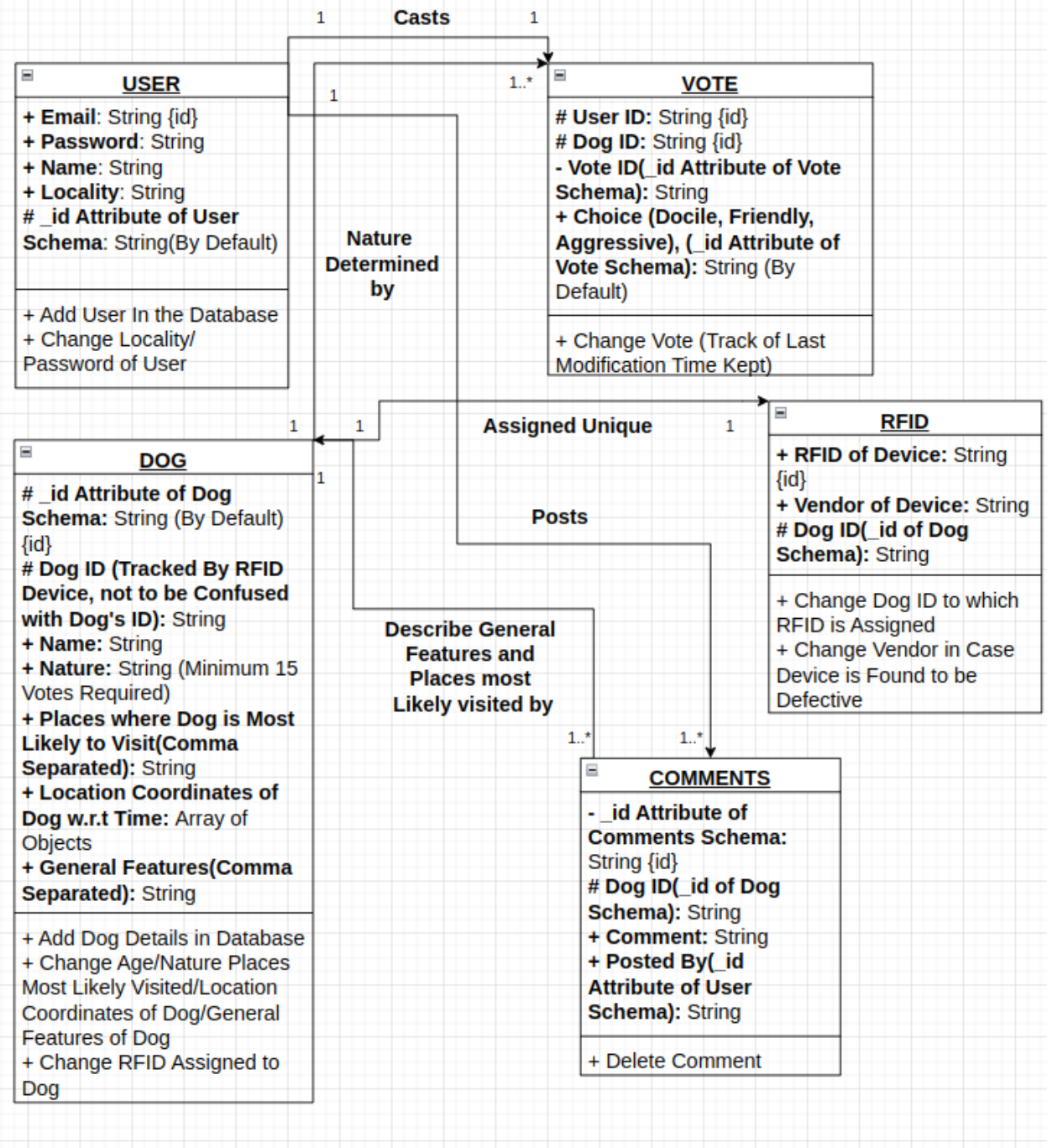
Google API - It is a set of software development tools and protocols provided by Google that allows us to build Map Defined in our Application and integrate it with Google services such as Google Maps. The Google APIs provide a standardized and secure way for developers to access and interact with these services through a series of pre-built functions, classes, and methods.

Custom API (Defined by using Express JS and Node JS Combination Defined in Backend)

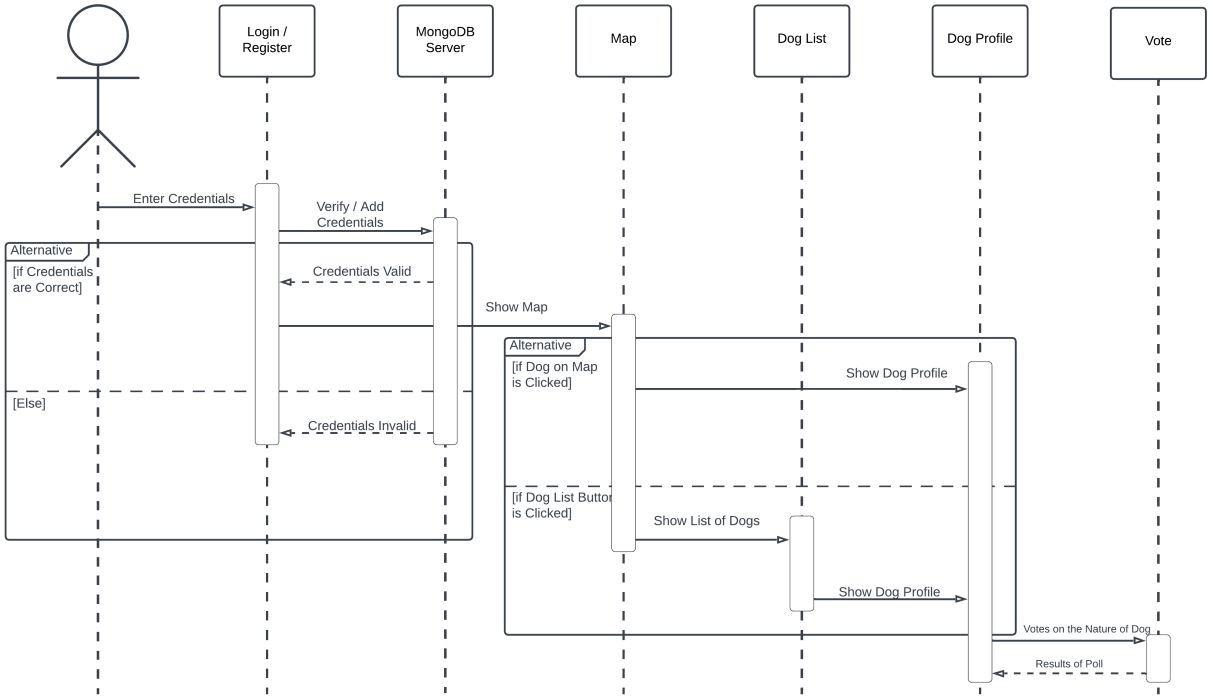
MongoDB API to Interact with MongoDB Database

Model

USER	• This Class Contains Information regarding the Information of all the Campus Residents who are Authenticated with the Database to use the App. It also Contains the Basic Information Regarding the Live Location of the User on the Map. Also, this Class is Essential to Maintain the Security Features of the App. • What methods does the class implement? We can Add a Newly Created User by Registering him/her on the Database and also Change the Locality/Password of User at any Point of Time.
DOG	Class state • This Class Maintains the Information regarding the Dogs Registered in the Database. Also, it is Responsible for Storing General Information Regarding the Dogs Based Upon Responses made by Campus Residents(General Characteristics and Features of Each Dog). • What methods does the class implement? This Class Implements Methods Like Adding Details of Dogs in the Database, Changing Details of Dog such as Age/Nature of Dogs(These Fields can Change over Time), Most Likely Visited Location/Places in the Campus by the Dog, Location Coordinates of Dog w.r.t Time, General Features of Dog, etc. Also RFID Associated with the Dog can Change over Time and this can be one of the Methods in the App.
VOTE	• This Class Keeps Information Regarding the Vote Casted by the User and also keeps a Record of the Choice made by User at any point of Time which can be Updated by Keeping a TimeStamp Field Record which Denotes Last Modification Time. • The User can also Change his/her Vote which can be Tracked as well(but Vote Casted by User will be Updated and not be Considered as another vote in The Database.
RFID	• This Class Keeps Information Regarding the RFID of Each Device which is Bought by the Institute. It also Keeps a Record of Assigning of a Particular RFID Device to a Particular Dog. • In Case the Device is Found to be Defective, there is a Field that Keeps Track of Vendor who Sold the Device to Claim the Required Compensation and also Report the Vendor about Complaints Regarding Collar Bands. We can Also change the Dog ID to whom this RFID is Assigned.
COMMENTS	• This Class Keeps Information Regarding the Comments Posted by the Users Registered in the Database Regarding the Dogs at any Point of Time. • The User can Delete Comments in Case User wants to Change Comments Posted by him/her.



Sequence Diagram(s)



Design Rationale

During our design process for the Canine Tracker app, we faced several issues that required us to make changes and consider multiple alternatives. Initially, our team had no prior experience with Figma, so our first design was quite plain and simple, with rectangular shapes and bright colors. However, it lacked consistency in design elements and color scheme, and the end result was not aesthetically pleasing.

To address these issues, we consulted with our client, who suggested we use the Material UI pack in Figma and look for inspiration from online sources, such as Pinterest. We studied color theory and different tools for generating color schemes to develop a cohesive and aesthetically pleasing color palette. We then began selecting relevant components from the Material UI pack and modifying them to fit our design and color scheme.

As we continued to iterate on our design, we encountered several challenges. One issue was maintaining consistency in design elements throughout the app. Since every element was modified independently, we found that there were minute differences that made the app look unaesthetic. To address this, we developed a design system that

included reusable components with consistent styles, such as color, typography, and spacing.

Another challenge was choosing the right color scheme. Initially, we just picked colors that looked pretty, but we soon realized that we needed to select colors that were not only aesthetically pleasing but also conveyed the intended emotions and associations. We experimented with different color palettes, such as analogous, complementary, and monochromatic, and consulted with our client to select the most appropriate color scheme.

We also considered several alternatives in our design process, such as different layouts, navigation styles, and typography choices. We evaluated each alternative based on its feasibility, usability, and aesthetic appeal. Ultimately, we selected the design that best addressed our requirements while being feasible to implement, test, and deliver on schedule.

Throughout the design process, we received valuable feedback from our client, which helped us refine our design and address any issues that arose. The running list of issues we encountered and decisions we made will serve as a valuable reference for future changes to the product. We learned the importance of taking a systematic approach to design, considering multiple alternatives, and incorporating user feedback to create a cohesive, consistent, and aesthetically pleasing design.