CS 463 Fall 2021

Final Report: Bicycle Kollective

Development Team Members

Kenneth Castellano
Bobby Craft
Riley Joinnides

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I. Introduction

Bikes are a great form of transportation for anyone who wants to explore their city, or for people commuting to and from work. They are also a great form of exercise for people of all ages. One problem many people face is the cost of owning a bike.

Many companies are offering ride sharing apps with either electric bikes or electric scooters. The company will supply the rides in cities around the world. In order to use them, the company charges an unlock fee, and then charges a per minute rate to rent until the ride is complete. The Bicycle Kollective aims to connect riders with free bikes.

The Bicycle Kollective is an Android mobile application for a bicycle sharing system managed and maintained by its members. It will allow members to check-in and check-out a bike from a collection of donated bikes parked at different locations throughout the US. It will also allow users to donate additional bikes to the collection. With the ability to ride for free, more people from all backgrounds now have the ability to bike without worrying about the cost.

II. Description of Software from the user's perspective

When the user first opens the app, they will be prompted to sign up with their email. Once logged in, the user can donate a bike, or see nearby bicycles.

If the user chooses to donate a bike, they will be taken to a form to complete a 'Release of Interest' for the bike where they will input their name, the bike description, the bike lock combination, take a picture of the bike, select the type of bike from a list (Mountain Bike, Road Bike, Commuter, or Cruiser), and agree to the release of interest.

If the user chooses to see nearby bicycles, they will be brought to a list of the bikes nearby that shows what each bike looks like and a star rating. The user can filter by the rating or distance and can search the list for specific types of bikes they want to ride.

If they click a specific bike they will be taken to the bicycle checkout screen. Here they can check the map to see where the bike is located, report the bike missing or checkout the bike.

If they click the button to report the bike missing, the bike will be removed from the list of available bikes for other users.

If they click the map, they will be taken to a map that shows where the bike is located and it will also show their location. If they are close enough to the bike, they can check it out, if not they can go to the bike to check it out. Once close enough to checkout, the user can click the checkout button and the combination will be given to the user and the 24 hour timer will be started.

When the user is finished with their ride, they can park the bike in a safe location and lock it up for the next user. The user then will click the end ride button where they can rate the bike and leave any comments about the bike. Once the rating and comments are submitted, the user will be brought back to the bicycle list.

III. Description of development efforts compared and contrasted with the project plan.

The initial plan was to create an application with 6 screens using Flutter backed by Firebase and it is presented below.

Screens:
1. Signup/Login Screen
    o   Contains buttons that allow a user to login, signup, or add a bicycle to the collective.
    o   Displays accident waiver for creation (user cannot create account if they do not accept accident waiver) if creating a new account.

2. Bicycle List Screen
    o   Main screen of the application, can navigate to checkout, add bicycle or end ride screens.
    o   Displays nearby bicycles in a list.
    o   If the user has a bike checked out, it displays an option to end the ride.
    o   Tapping on a list tile brings the user to the bicycle checkout page.

3. Bicycle Checkout Screen
    o   Appears when the user taps on a list tile on the bicycle list screen..
    o   Option for the user to report a bicycle as not present in location.
    o   Tappable map icon that brings up map screen.
    o   Allow the user to check out a bicycle, and display the lock combo to the user.

4. End Ride Screen
    o   Appears when the user selects "end ride" on the list screen.
    o   Allows the user to rate the bicycle.
    o   Allows the user to add comments to the bicycle.

5. Add Bicycle Screen
    o   Allows the user to add a bicycle to the collective
    o   Users can add tags to the bicycle.
    o   Users can upload pictures of the bicycle.
    o   Users enter the combination for the lock used to secure the bicycle.

6. Map Screen
    o   Opens when the user clicks a button on the bicycle checkout screen.
    o   Displays location of bicycle on map using marker and location of user.

For the Signup/Login Screen, there was one deviation from the project plan, there is no signup button. If the user attempts to sign-in with email without having an account, they will be prompted to create an account and agree to the accident waiver.

For the Map Screen, the project plan was followed and a checkout button was added to the map to allow the user to also check out the bike from the map instead of having to go back to the bicycle checkout screen to check out the bike.

For the other screens, there were no major deviations from the project plan.

IV. A listing of major software used

Flutter SDK
Firebase Firestore DB
Firebase Authentication
Firebase Storage
Google Maps API
Android Emulator
Dart

V. Conclusion

The development team hopes to create a bike-sharing mobile application for everyone. The user will be able to donate their old bikes to the system. They will also be able to see a list of bikes in their area and will be able to check out a bike of their choosing. When they are finished with their ride, they can park the bike anywhere and end the session. Bike riding is a wonderful way to travel. With the ability to ride for free, more people from all backgrounds now have the ability to travel without worrying about the cost.