Krowded

The all in one crowdsourced, night out concierge.

PREPARED BY

Kenya Foster

Nick Chadwick

Liam Treutel

Nathan Brinda

Josh Collins

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Kenya Foster	2/27/18	Added Competing Apps Table
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Josh Collins	2/28/18	Added Project Description
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Nick Chadwick	3/1/18	Added Class Diagram
Nick Chadwick	3/1/18	Added Activity Diagrams
Kenya Foster	3/1/18	Added Activity Diagram Descriptions

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1. Introduction

A. Purpose

The purpose of this document is to outline the functional and nonfunctional features and requirements for the Krowded mobile application, as well as provide a detailed analysis of the various competitors to this app. To address these requirements and provide an insight into the hierarchical, underlying structure of the app, this document provides UML use case diagrams, class diagrams, and activity diagrams. By viewing this document, the reader should be given a general understanding of the purpose, implementation, and procedure behind the creation of this software.

B. Scope

This application will provide users the information that will help them determine where to visit, eat at, or simply attend for a night out on the town. By providing live analytical data for crowd sizes, wait times, and many other metrics, this app creates an informative experience for any user wishing to go out and experience both familiar and unfamiliar local life.

C. Definitions

Crowdsourcing - The method of using user provided feedback and location monitoring as the source for collected data.

Outing locations - Any place in which a user of the application would be interested in visiting in real life. For the purpose of the initial build of this application, outing locations will refer to restaurants, bars, clubs, and various other forms of nightlife.

Location services - Data pulled through the app's integration with Google Maps API and Android OS's location tracking. Location services includes anything from a user's current location to the coordinates of outing locations mined from Google Maps.

Android SDK - The software environment in which the application was programmed and tested.

API - An application programming interface is a method or collection of methods that allows developers to query, send, or edit data and code from an already existing piece of software to another piece of software.

2. Project Description

A. Initial Problem

When going out to a location, whether the outing is for dinner or a drink with a coworker, a person can often find themselves going to one or two locations before finally settling on a place to spend their evening. The reasons for so many changes could be anything from crowd sizes and wait times to price of entry and already in-progress events. The Krowded team believes that any individual should be able to find a location that best fits the mood of their outing before that individual ever leaves their home. This is the problem that Krowded and the Krowded team seek to solve. In a modern day society, where big data and location services abound, an individual should not have to physically arrive at a location before deciding if it is the right fit for their evening. Coupled with Google Maps API, user location tracking, and crowdsourced feedback, Krowded supplies users with real time information about outing locations, which individuals can use to better inform their decision on where to host their outing for the evening. In an effort to not only incentivise everyday individuals to use the app, but also to incentivise business owners to become involved in the community and provide feedback for their locations, Krowded allows business owners to receive hand tailored, private analytical data on their own businesses following a simple verification process.

B. Usability

Upon initial use of the application, each individual will be given a guest account with an associated guest id. That user will be presented a map view, centered on his or her location, presenting local options for whatever outing locations they may be interested in. From this view users will notice different colored pins on each location allowing him or her to quickly

recognize which places of business are particularly busy, and which are less full. When one of the pins is selected, the individual will receive a brief overview on certain statistics that the location has to offer including crowd size, wait times, food and drink specials, etc. The user will also be able to click further into that overview to bring up the location's individual page which will house pictures and more detailed data. Users can toggle this map view into a list view, with identical functionality, and vice versa. If the person has a verified business account, that person can request certain, more business minded data, in the form of an emailed report, from their own business' page, as well as modify their page to add more information. While this is a summary of usability, full functionality and individual user's options can be found in more detail under the "Functional Requirements" section.

C. Accounts

The Krowded application supports two distinct account types, each with their own method of authentication. The first is a user account. The user account has access to both of the views and "public data" previously described in the "Usability" section, The second account type is a business account. The business account acts as an incentive for business owners to engage with the Krowded community, and embrace the Krowded experience. Currently, business owners measure their success and revenue in total sales for the evening, and some form of population count (which could be a bouncer counting "in and outs" at a bar or a number of tables seated at a restaurant in one night). While these two data points are useful, big data analytics can certainly provide a much more improved picture for these owners. This application will record, and when requested, provide business owners with much more detailed information, such as unique app user visits, average time of stay, and aggregated account metadata (such as sex, age, etc.). This data allows for a more complete analysis of a night's success for that particular organization.

3. Functional Requirements

A. User Interaction

Name	Description	Priority
Account Creation	A user shall be able to create an account.	Requirement
Profile Management	A user shall be able to create and edit their own profile.	Requirement
Information Provision	A user shall be able to view and provide information on location traffic	Requirement
Information Verification	A user shall be able, if they are a business, to provide and verify information on their business	Requirement

B. Information Display and FIltering

Name	Description	Priority
Search Filtering	A user shall be able to filter search results based on preferences	Possible
Map View	A user shall be provided a map of the surrounding area that shows nearby businesses.	Requirement

List View	A user shall be able to view nearby businesses in list form, and view information.	Requirement

C. Back-End Functionality

Name	Description	Priority
Analytics	A user shall, if they are listed as a business owner, be able to request and view data based on analytics for their establishment via email.	Possible
Reliability Score	The system will calculate a reliability score for each user by comparing their feedback with consensus.	Requirement
Feedback Weighting	The system will adjust user feedback weight based on a reliability score.	Requirement
Verification Code Generation	The system will generate a verification code for business owners, and provide a phone number to call.	Possible
Confirmation Email Generation	The system will generate an account confirmation email for non-business users.	Requirement

4. Non-Functional Requirements

A. Design Goals

Name	Description	Priority
Compatibility	The app will work on a sufficient number of recent versions (though maximum compatibility is not the goal).	Possible
Minimal Battery Usage	The app will not cause a significant increase in battery usage.	Possible
Simplicity and Responsiveness	The app will prioritize responsiveness over abundance of features.	Requirement

B. Feature Availability

Name	Description	Priority
Feature Availability	A majority of the app's features - and all of the basic features - will be available to all users.	Requirement

Name	Description	Priority

Controlled Features	Features requiring identification/authorization will require the creation of an account.	Requirement

C. Security

| Name	Description	Priority
Security and Verification	The app will ensure the integrity of user information through sufficient security and a verification process.	Requirement
Data Integrity	The app will ensure data integrity and accuracy.	Requirement

5. Competing Apps Table

App	Map View with Pins	Table View	Business and User Accounts	Statistics and Reporting
Yelp	Partial: Yelp offers a map view of nearby locations, but the map view does not indicate crowdedness or give other information other a number that corresponds to the tabular view.	Full: Yelp offers a tabular view of nearby restaurants with a focus on user reviews.	Full: Yelp offers both user and business accounts with separate features and functionality. Note: Yelp accounts are not optional and Yelp cannot be used without an account.	Partial: Yelp Business owners can see reports rather on how many people view their page and estimates on sales gained from app exposure. No reports on the congested times of the day or stats about users.
CockTail Compass	Partial: Cocktail Compass offers a map view of nearby locations but focuses on which bars show Happy Hours rather than crowdedness. Only available in certain cities.	Full: CockTail Compass offers a tabular view with a details page.	None: No optional user account as all data is stored on the phone; no business account.	None: No reporting options.

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Happy Hour Finder	Partial: Happy Hour Finder offers a map view of nearby bars, but focuses on which ones are currently offering Happy Hour.	Partial: Happy Hour Finder offers a tabular view but the details page view only show information on Happy Hour times and nothing else.	None: No user or business accounts.	None: No Statistics or Reporting features.
Trip Advisor	Partial: It shows nearby locations but does not show crowdedness.	Full: Trip Advisor offers a tabular view a details page per establishment.	Full: Trip Advisor offers optional user and business accounts.	Partial: Trip Advisor's business accounts only offer ability to manage and respond to reviews and no type of reporting or stat views.
Google Maps	Partial: Google Maps app offers a view of searched locations only and does not offer any information on crowdedness, instead focusing on GPS capabilities.	Partial: Google offers a tabular view of searched type of locations.	Full: Google offers user and business accounts. Note: Not necessarily tied to the mobile application.	Full: Google offers various levels of reporting and statistics to users and business owners. Note: Not necessarily tied to the mobile application.

6. Use Case Diagrams

A. User Options
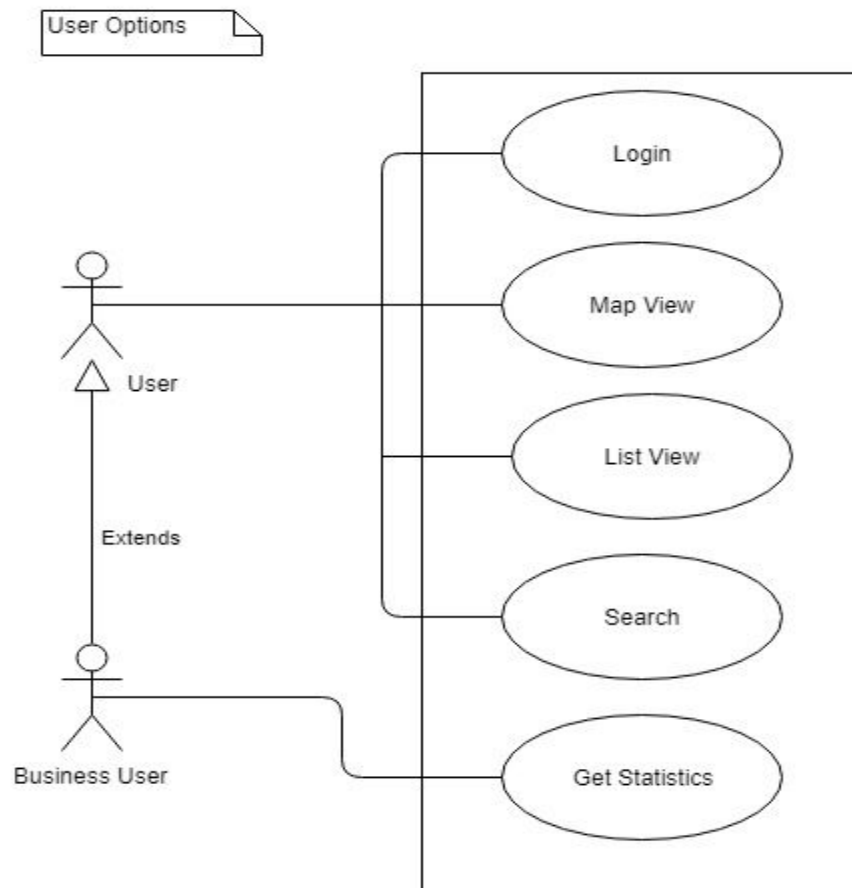
Users will have the choice between viewing business data in list form and viewing each business on a map. Additionally, they will be able to login to their accounts (if they have an account) and search through the locations. Furthermore, business users will also be able to request statistics for their business.

B. Create Account
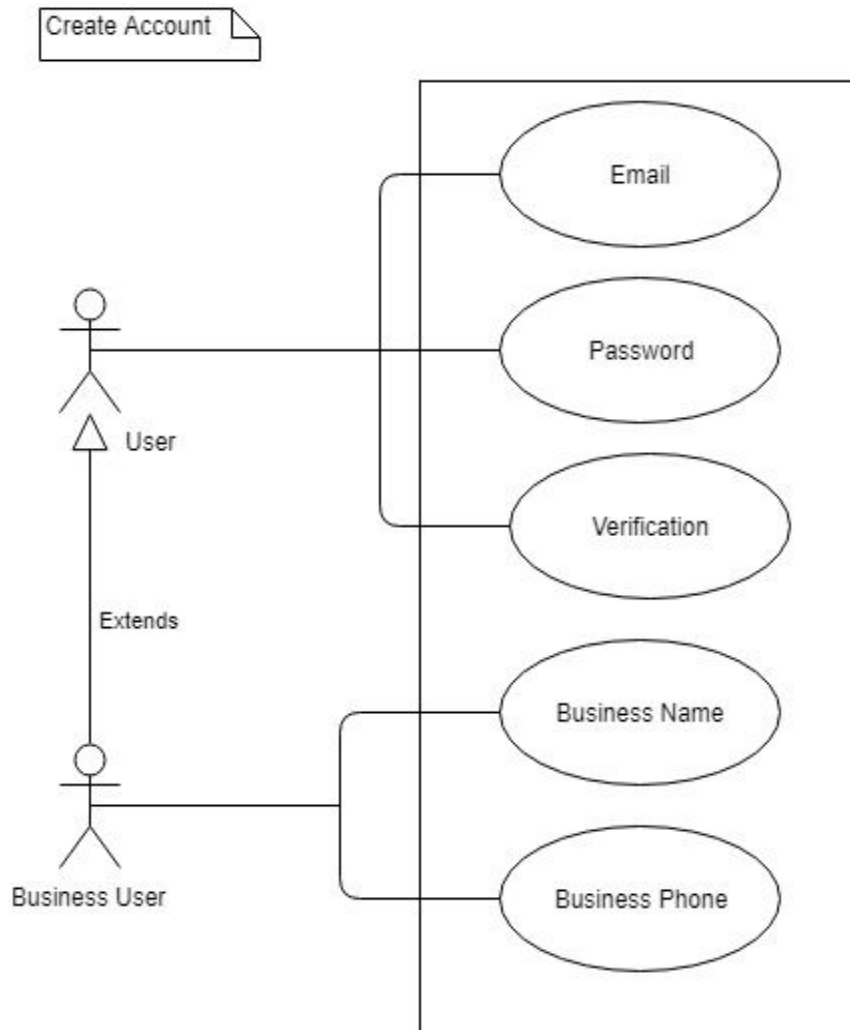
All users will be able to create an account with Krowded. Account creation will require inputting an email and password for the user, after which the system will generate a verification email that the user must follow to confirm their account. Additionally, business users will be able to provide their business name and phone number in order to claim a business and become a business user.

C. Account Verification
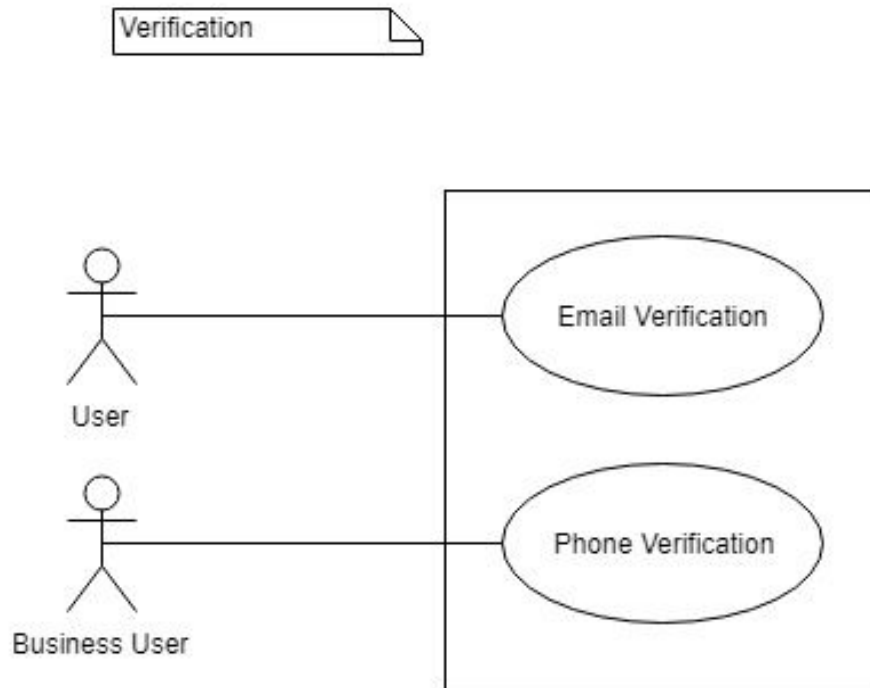
Non-business users may verify their possession of a provided email address through a system-generated user email. Business users may verify their ownership or management of their claimed business through a phone verification. This phone verification consists of a member of Krowded staff calling the business number listed in public directories and confirming that the respondent created a Krowded account.

D. Feedback Provision
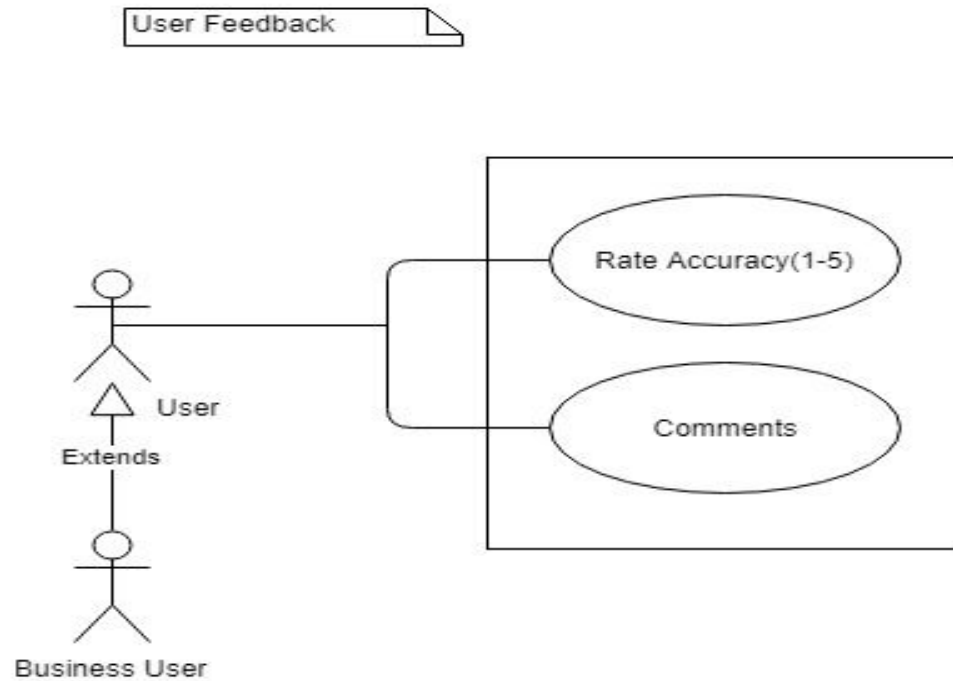
All users will be able to provide feedback on data provided by Krowded. This primarily consists of rating the accuracy of provided information on a scale of 1 to 5 via a notification sent after the user leaves the establishments. Users may also submit commentary on the Krowded system. Business users are not treated any differently than ordinary users in this regard.

E. Account Management

Edit User Account

Username

Password

Email

User

Picture

Age
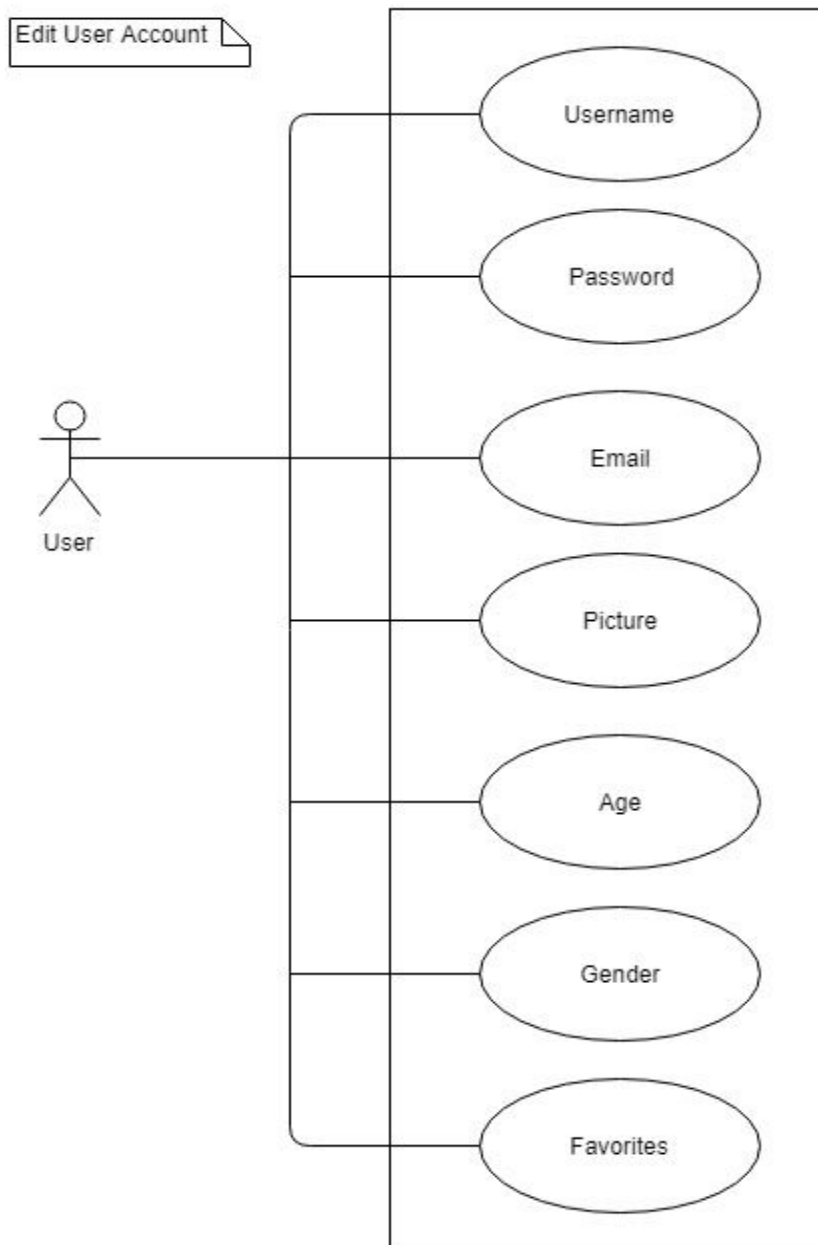
Gender

Favorites

Users will be able to edit the information previously provided for their account. This information consists of the user's username, password, account email address, profile picture, age, gender and favorites. Favorites are primarily concerned with favorite types of puting locations, and are used for determining preferences.

F. Business Page Management
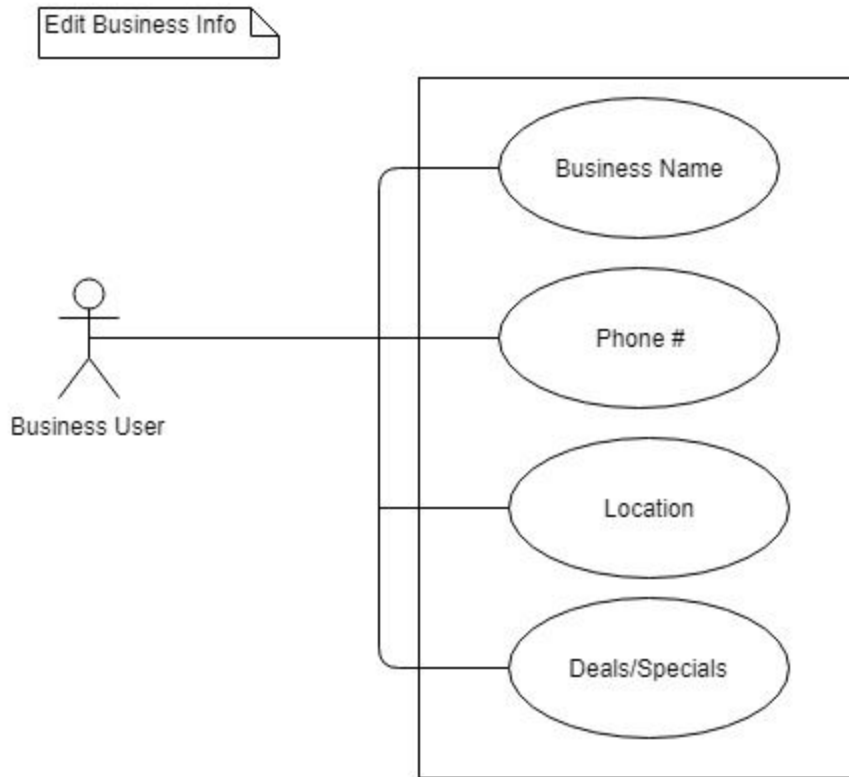
Business users, in addition to being able to edit their profiles, will be able to edit their business information page, which is available to all nearby users. The changeable information includes the business' name, phone number, location and any available deals or specials provided.

G. Email Report Request and Generation
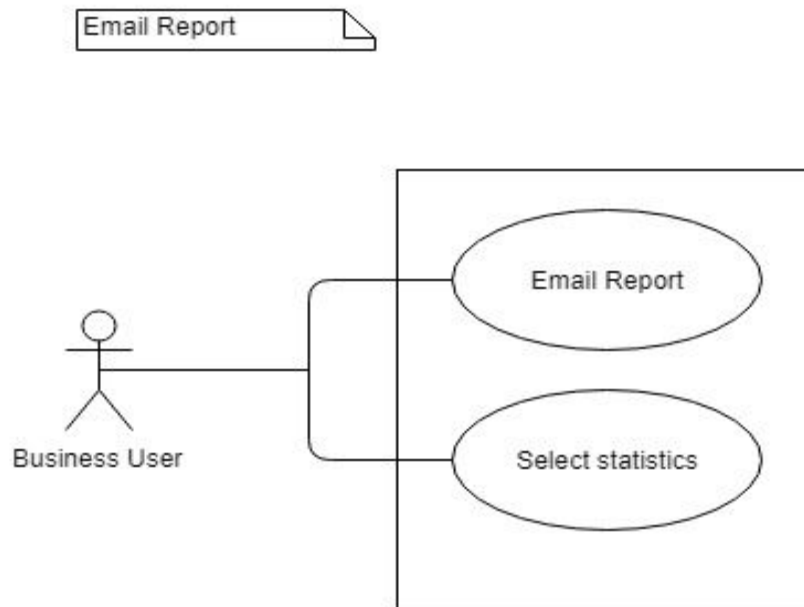
A business user requests an email report and may select statistics to view. This information is emailed to the user for their perusal.

7. Class Diagram
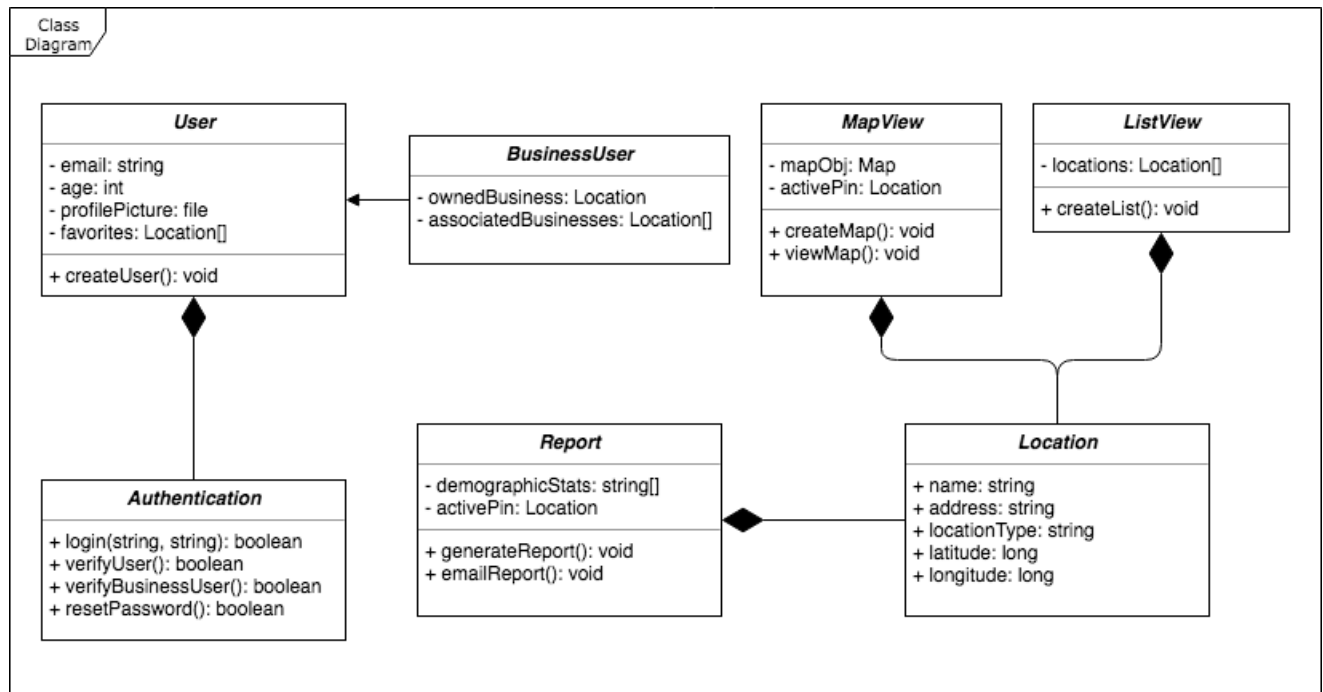
The overall mobile application has a user class, that includes a subclass for a business user. The business user can also edit a particular owned business, or businesses. The user class associates with the Authentication class for the process of authenticating accounts. There is also a location class which associates with two classes, ListView and MapView, to display the locations on the screen in either map form or list form respectively. The location class also associates with the report class, so a user can create reports based on a particular location.

8. Activity Diagrams

A. Location Viewing and Account Login
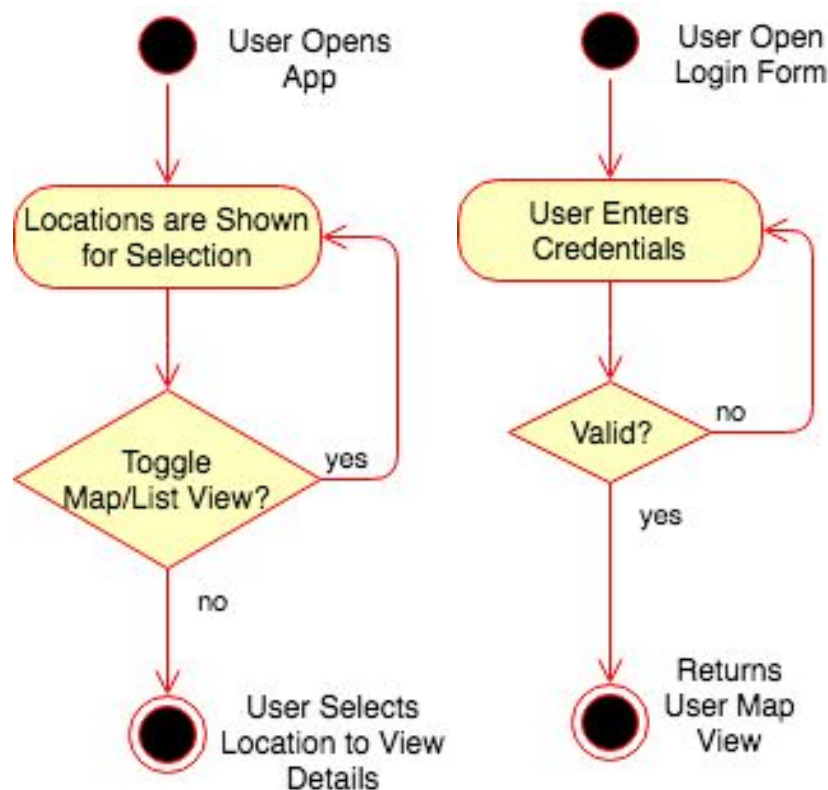
When first using the app, the app will display nearby locations in either the list view or map view and the user will be able to toggle between the two views. After toggling the views, nearby locations will be shown again in the new view. Once clicking on a location, the details for that particular location will be shown.

One optional feature is the user account system where the user will open the login prompt after clicking the account button. After entering in a username and password, the app will check to see if it is a valid account, if not, the app will return to the login page, if so, the user will return to the map view.

B. Create and Verify an Account
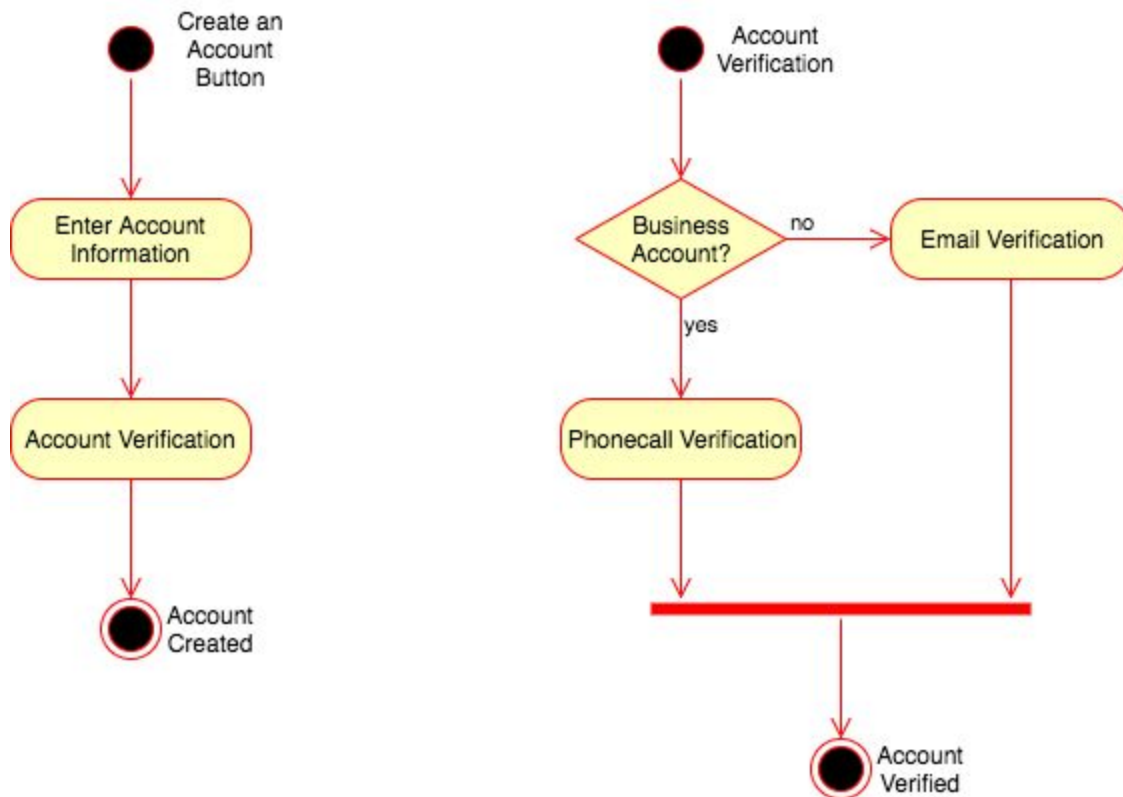
To create an account, a user will click the account button and click create account and then enter their information. The account is then verified and the app creates the account by adding the particular details to the database.

To verify an account, a app checks to see if it is a business account based on the information entered by the user, if so an phone verification will be sent where the user will have to answer the phone and enter a code displayed on screen and the account will be verified, if not an an email verification will be sent and the account verified after the user clicks a link in the email. The account verification status will be noted by a checkmark in the database.

C. User Feedback
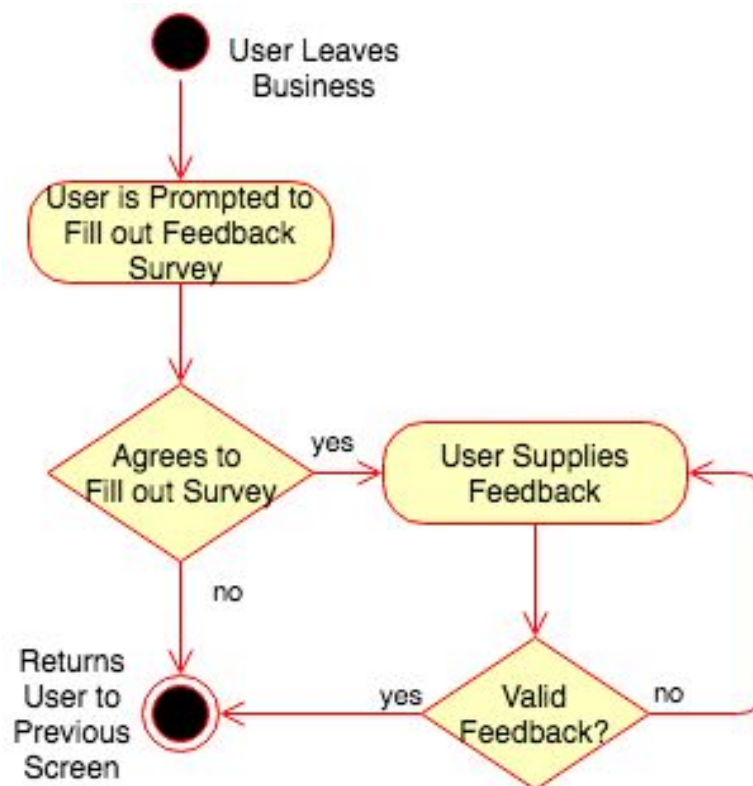
To leave user feedback, once exiting a location the app will prompt the user for a small survey when after the user agrees and provides feedback, the app will then check to see if it is valid. If not then the app will return to feedback screen, If so then the app will return to the previous screen.

D. Edit User Profile and Edit Business Information
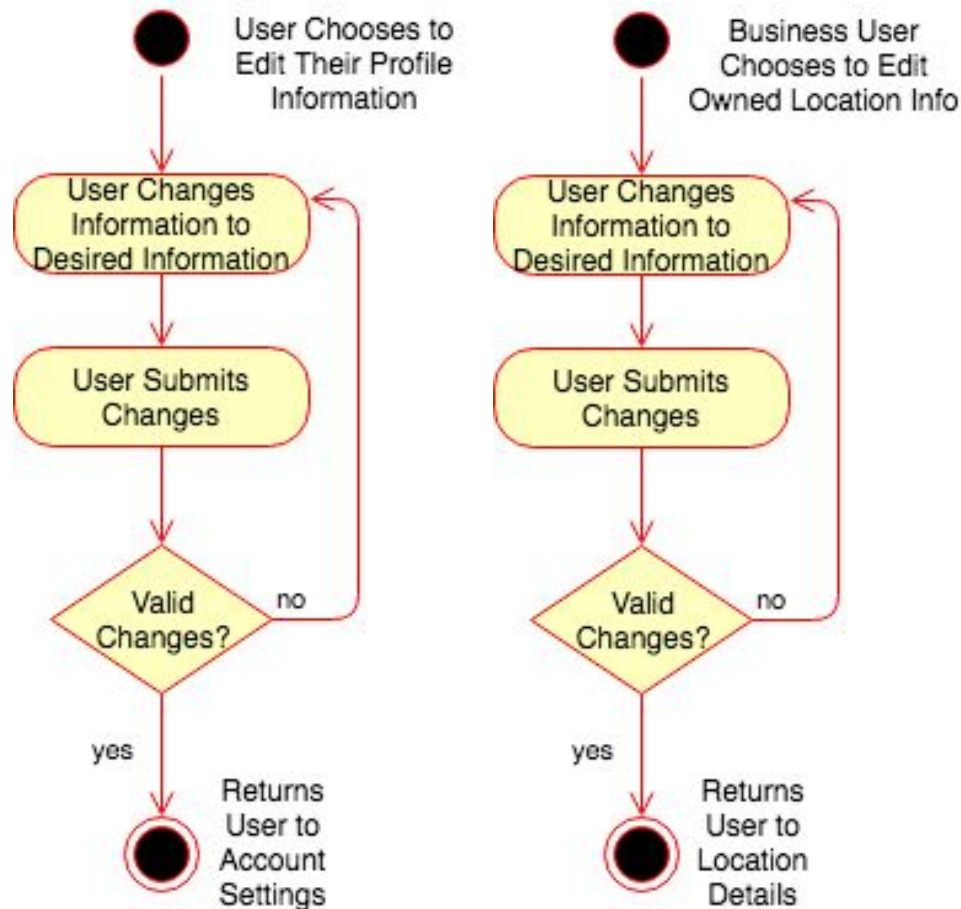
To edit the user profile, a user will click on the account button, and after changing and submitting the desired information, the app will check to see if the changes are valid. If so then the app will return to the account page with the newly updated information, if not the app will return to the account page with the invalid changed highlighted.

To edit business information, a user will click on the account button, and after selecting the desired location to edit and editing the information, the app will check to see if the changes are valid. If so then the app will return to the location page with the newly updated information, if not the app will return to the location page with the invalid changed highlighted.

E. Email Report

To have a report emailed to the user, the user will first navigate to the statistics page of the location. If a business user, the user will select the information to be emailed confirm their email address. If valid and successful the app will return to the location details page, if not, the app will also return to the location details page with the selected information remaining selected.