November 3, 2015

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Contents of Requirements

Change History

Date	Name	Summary
9/7/2015	Fenda Truong	Initial writeup
9/11/2015	Jessica Covington	Four Activity Diagrams added
9/13/2015	Lindsey Sexton	Four Activity Diagrams added
9/15/2015	Fenda Truong	Three Activity Diagrams added
9/21/2015	Fenda Truong	Non-Functional Requirements added
9/21/2015	Fenda Truong	Functional Requirements added
9/21/2015	Anna Marthinsen	Use case diagram updated
9/21/2015	Anna Marthinsen	Three Activity Diagrams and Class Diagram added
9/21/2015	Anna Marthinsen	Functional Requirements added
9/21/2015	Lindsey Sexton	Introduction added
9/21/2015	Jessica Covington	Add to the Project Description
9/21/2015	Jessica Covington	Activity Diagram description added
9/21/2015	Jessica Covington	Key Definitions added
9/29/2015	Lindsey Sexton	Formatting, Goals updated
9/30/2015	Anna Marthinsen	Functional Requirements Rewritten
10/1/2015	Anna Marthinsen	Formatting/Grammar
10/1/2015	Fenda Truong	Nonfunctional Requirements updated
10/1/2015	Anna Marthinsen	Expand on Activity Diagrams
10/27/2015	Anna Marthinsen	Added Project Changes

10/27/2015	Anna Marthinsen	Added Priority for Functional Requirements tables
10/28/2015	Anna Marthinsen	Updated Use Case Diagram and Description
10/28/2015	Anna Marthinsen	Formatted Headings for Design Diagrams
10/28/2015	Anna Marthinsen	Updated Table of Contents
10/28/2015	Anna Marthinsen	Added Class Diagrams
11/01/2015	Fenda Truong	Added four Sequence Diagrams
11/02/2015	Fenda Truong	Added four Sequence Diagram descriptions
11/01/2015	Anna Marthinsen	Updated Entity Framework Diagram
11/01/2015	Anna Marthinsen	Added Three Sequence Diagrams
11/01/2015	Anna Marthinsen	Update Project Changes
11/01/2015	Anna Marthinsen	Added Entity Relationship diagram description
11/01/2015	Anna Marthinsen	Add App Class diagram description
11/01/2015	Anna Marthinsen	Updated Web Class diagram description
11/01/2015	Anna Marthinsen	Added Sequence Diagram descriptions
11/01/2015	Jessica Covington	Added four Sequence Diagrams
11/01/2015	Jessica Covington	Added four Sequence Diagrams descriptions
11/02/2015	Lindsey Sexton	Added four Sequence Diagrams
11/02/2015	Lindsey Sexton	Added four Sequence Diagram descriptions

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1. Introduction

1.1 Motivation/Purpose

The motivation for doing this project is to learn how to use the Android Studio environment and new APIs in order to develop a practical application. By using this software, the Promo*Pass* team hopes to gain as much experience as possible, which will be advantageous in other areas of computer science. The team also hopes to improve collaboration and cooperation in order to develop a functioning, viable product.

The purpose of the PromoPass project is to develop software that will allow small businesses to pass information onto interested Consumers. Businesses need an efficient way to share information with their customers. Currently, businesses use flyers, billboards, and sandwich boards on sidewalks outside of their stores to advertise to passersby. This form of advertising limits stores to one design that is a hassle to update and redesign, and would also be viewed for a limited amount of time. With PromoPass, businesses will get dynamic advertising for a one time fee as well as the ability to reach their customers directly through their mobile devices. PromoPass offers a convenient way for Consumers to receive and store promotional information all in one place.

The purpose of this document is to provide details and information to aid the developers of the Promo*Pass* project. It contains UML diagrams, functional and nonfunctional requirements, and program features that will provide a more complete vision of the future of the project.

1.2 Scope

Promo*Pass* will be focusing on small businesses, such as those on the Strip on University Boulevard. This project will use the Gimbal Device's Bluetooth capabilities to send Notifications (Ads) to various Consumers that pass by registered Providers. The main purpose of the Promo*Pass* app is to allow Providers to create Ads and to display those Ads to Consumers who are nearby. These are attainable goals for the project this semester, as well as allowing Consumers to manage preferences and allowing Providers to manage their Ads.

1.3 Goals

Team Goals:

1. To work as a team to develop a functioning, viable product
2. To have a proof of concept for the users

App Functionality Goals:

Stages	Features
Stage 1	Providers create Ads. Consumers view Ads.
Stage 2	Consumers manage preferences. Providers manage Ads.
Stage 3	List of Providers regardless of location. Ad history for Providers.
Stage 4	Profit tracking for Providers. Multiple Gimbal Devices per Provider account. Portability for Consumers.

The primary goal for the semester is to work together to complete stages 1 and 2 and attempt stage 3 if time permits.

In order to have a functioning, viable product, the Providers must be able to create and manage Ads, and the Consumers must be able to view Ads and manage their preferences. Also the project will hopefully allow Consumers to view Providers' Ads regardless of their location and allow Providers to view their Ad histories. The app produced through the completion of these stages will serve as proof of concept for Promo*Pass* users.

Stage 4 does not seem to be in the scope of the time frame for this semester. The future goals include allowing Providers to track how certain Ads correspond to profit variations and allowing Providers to register multiple Gimbal Devices for one account (e.g., if a Provider owns multiple businesses). The current plan is to store Consumer information locally on the Consumer's device without requiring them to log in to the app. Another future feature would be to provide portability for customers through the use of login accounts, but this is also outside the scope of the semester project, and the implementation and planning for these future goals are not mentioned in this document.

1.4 Potential Risks

1. The biggest risk to this project is being unable to understand and manipulate the Gimbal API. In response, the project requires plenty of time to test the Gimbal Device.
2. Similarly the Android environment may present technical problems, and it also has a learning curve. Education on Android also requires invested time.
3. The integration and utilization of different programs, languages, and databases may prove difficult and take a considerable amount of time.
4. Other classes and work pose a risk of running out of time, so time management is key to completing the project.
5. A low risk is that one of the team members decides to drop out of college. Since this is the senior year for all team members, no risk management besides creating a good team environment is necessary.

1.5 Key Definitions

1. **Gimbal Device:** A low-cost, low-energy Bluetooth beacon that can send secure transmissions up to a 50-meter radius
2. **Providers:** Owners of small businesses on the Strip on University Boulevard
3. **Consumers:** Visitors and locals looking for new, fun activities
4. **Notifications:** An Android notification sent to the Consumer
5. **Ads:** Promotional pages of information created and sent by Providers and viewed by Consumers
6. **Ad Template:** A variety of pre-formatted templates, which the Provider will populate with their own promotional information. The format of the templates will be created by the developers of Promo*Pass*
7. **Web-Based Interface:** A web-based interface from which Providers will populate their Ads
8. **Mobile Application:** The application from which the Consumer receives the Ads and views them
9. **Bluetooth Low Energy:** an innovation in Bluetooth communication. This type of signal transmits at 300 pulses a second rather than constantly, significantly reducing the consumed battery power of a mobile device.

2. Project Description

The Promo*Pass* system is split into two component parts: the Mobile Application, which displays the advertisements and events to the Consumers via a Notification to the user's smart device, and the web-based interface that allows the Providers to populate an Ad Template with their promotional information. These components act in tandem to create an environment where Providers can achieve a low cost method of sending out information about their business and Consumers are able to stay up-to-date about events and deals going on in their surrounding area.

2.1 Web-based Interface

The purpose of the Web-Based Interface is to give the Providers and easy and clear way of creating their Ads. Providers would navigate to this web page and either sign up or login. If they are new to Promo*Pass*, they will need to create an account and register their Gimbal Device; otherwise, they will just login. Once they have logged in, Providers can then create a new Ad, modify an Ad, or view their Ad history.

2.1.1 Create Ad

Once Providers have logged into their account, they will have the option to select an Ad Template and then populate that template with their data.

2.1.2 Modify Ad

After Providers have logged in, they will have the option to modify their current Ad. During this process, Providers can choose to change the Ad Template or Ad information.

2.1.3 View Ad History

Providers can see all the Ads they have ever created. The Ad history consists of archived Ads. Archived Ads are created whenever the Provider creates a new Ad, archiving the old one in the process.

2.2 Mobile Application

The main purpose of the Mobile Application will be to notify Consumers that they are near a gimbal-infused business by sending them a Notification. The Consumers can click on the Notification if they wish to see the particular Ad, or they can swipe and clear the Notification from their screen if they do not wish to view it at that moment in time. If

the Consumers choose to view the Notification, they will be taken to a list of all nearby Providers. Once they have selected the Ad for which they want to see, they will have the option to dismiss the Ad, Save Ad, Favorite Provider, Block Provider, or exit.

2.2.1 Nearby Providers

Nearby Providers is a listing of all Providers of whom the user is in range. This is the basis of how the app works: if Consumers are within range, then the app will send them an Ad.

2.2.2 Save Ad

Save Ad is the ability to store an Ad to view later. It enables Consumers to view the Ad even after the Provider creates a new one.

Once in the Ad, Consumers have the option to save an Ad for later viewing, such as when they are no longer near that particular Provider.

2.2.3 Favorite/Block Providers

This function gives the ability to organize how the Providers show up within the Notifications. This enables the Consumers to view Providers they like the most first and completely ignore those they dislike.

Once in the Ad, the Consumers will have the option to Favorite or Block that Provider. Favoriting a Provider ensures that that particular Provider will appear higher up in the nearby Provider listing. Blocking a Provider will keep that particular Provider from appearing in the Nearby List until such a time as the Consumers unblock the Provider.

2.3 Gimbal Integration

When Providers register on the Promo*Pass* website, the website will request that they buy a Gimbal beacon and register its Gimbal ID with the Promo*Pass* account. The Gimbal ID is required to use the Promo*Pass* system. Once they turn on the beacon, the beacon will emit the Gimbal ID through a Bluetooth Low Energy signal. The Promo*Pass* app on the Consumers' mobile device will interpret this signal and notify Consumers of the Provider in their area via a single Notification. The app will use the Gimbal ID from the signal to get and display Provider information from the Promo*Pass* database. How the app receives a signal can be programmed using the Gimbal API.

2.4 Project Changes

1. The Report a Problem functionality is available not only to consumers but also to providers.
2. A Provider can have more than one business but must have at least one business, which is submitted and verified at registration.
3. The List All Providers and the List Nearby Providers classes will list the businesses sorted by priority (favorites) then by the date they were last viewed by the Consumer. These classes also have a filtering option to look up by business name or type.
4. The List All Providers class looks up only the providers that have sent ads to the Consumer's device rather than all providers within a certain radius. This functionality may be implemented in the future, but it is not in the scope of this semester.
5. The Complaints class was removed because the PromoPass team deemed it unnecessary to the functionality of Report a Problem. Instead, the information will be simply stored in an email.
6. The Consumer preferences, specifically the Preferences and ReceivedAd entities, will be stored on a database on the server side of to Promo*Pass* system in order to reduce storage on the Consumer's mobile device and to make implementation easier for the login of Consumers, which provides portability of Consumer's preferences.
7. The password authentication for Login and Register will be handled by a third party password management software called Userapp.

3. Functional Requirements

3.1 Android App

The following tables display the functional requirements for the Consumer side of the Promo*Pass* system. The View Ad section has a high priority because without the requirement the app would lack usability. The Manage Preferences section has a medium priority because without the requirement the app would lack ease of use. The List All Providers section has a low priority because it is not a part of the basic functions, but it would improve the Consumer experience.

3.1.1 View Ad

Requirement	Description	Priority
View Notification	The Consumer can view Provider information in a single Notification.	High
List Nearby Providers	The Consumer can view a list of the nearby Providers.	High
View Ad	The Consumer can view a Provider's current Ad.	High
Clear Ad	The Consumer can dismiss an Ad.	High

3.1.2 Manage Preferences

Requirement	Description	Priority
Filter Provider/Ad	The Consumer can search by Provider name or business type.	Medium
Favorite Provider	The Consumer can choose to prioritize certain Providers, sorting the list of Providers by priority and then alphabetically.	Medium
Block Provider	The Consumer can choose to never see a Provider again.	Medium
Save Ad	The Consumer can save an Ad to view at any time, even if the Ad is no longer current.	Medium
List Saved Ads	The Consumer can view and filter a list of the saved Ads.	Medium
List Favorite Providers	The Consumer can view and filter a list of the prioritized Providers.	Medium

List Blocked Providers	The Consumer can view and filter a list of the blocked Providers.	Medium
Unfavorite	The Consumer can remove a Provider from the prioritized list.	Medium
Unblock	The Consumer can remove a Provider from the blocked list.	Medium
Report a Problem	The Consumer can report a problem to the Promo*Pass* team.	Medium

3.1.3 List All Providers

Requirement	Description	Priority
List All Providers	The Consumer can view and filter a list of all Providers within a certain radius, not necessarily nearby.	Low

3.2 Web Application

The following tables display the functional requirements for the Provider side of the Promo*Pass* system. The Create Ad section has a high priority because without the requirement the app would lack usability. The Modify Ad section has a medium priority because without the requirement the app would lack ease of use. The View Ad History section has a low priority because it is not a part of the basic functions, but it would improve the Provider experience.

3.2.1 Create Ad

Requirement	Description	Priority
Register	The Provider sets up an account with an associated Gimbal ID.	High
Login	The Provider can login to registered account.	High
Create Ad	The Provider can create a tailored advertisement.	High

3.2.2 Modify Ad

Requirement	Description	Priority

Modify Ad	The Provider can make changes to the current Ad.	Medium
Choose Template	The Provider can choose Ad Templates for creating and modifying Ads.	Medium
Edit Profile	The Provider can modify the account information and preferences.	Medium

3.2.3 View Ad History

Requirement	**Description**	**Priority**
View Ad History	The Provider can view previously created Ads.	Low

4. Nonfunctional Requirements

4.1 Android App

4.1.1 Software Requirements

Requirement	Description	Priority
Bluetooth API	The system needs to use the Bluetooth API for Notifications.	High
Gimbal API	The system must use the Gimbal API to update the app depending on the current proximity to the Gimbal Device. This relies on the Bluetooth API.	High
Storing and Retrieving Data	The system must be able to take the Consumer's preferences and save them to a local SQLite database on the phone.	Medium
	The Android app must be able to receive information from the database of the server/web application.	High

4.1.2 General Requirements

Requirement	Description	Priority
Availability	The system needs to be able to work on Android SDK 4.4 (Jelly Bean) at the minimum to target the maximum amount of users while using recent API features	Medium
Response Time	The system needs to send new Notifications to Consumers once they have reached a Provider location quickly--in under 15 seconds.	Low
Extensibility	The system must be able to be built with extensible features in mind, to make way for further changes in the future.	High
Performance	The system should not cause a noticeable drain on battery life.	Low

4.2 Web Application

4.2.1 Software Requirements

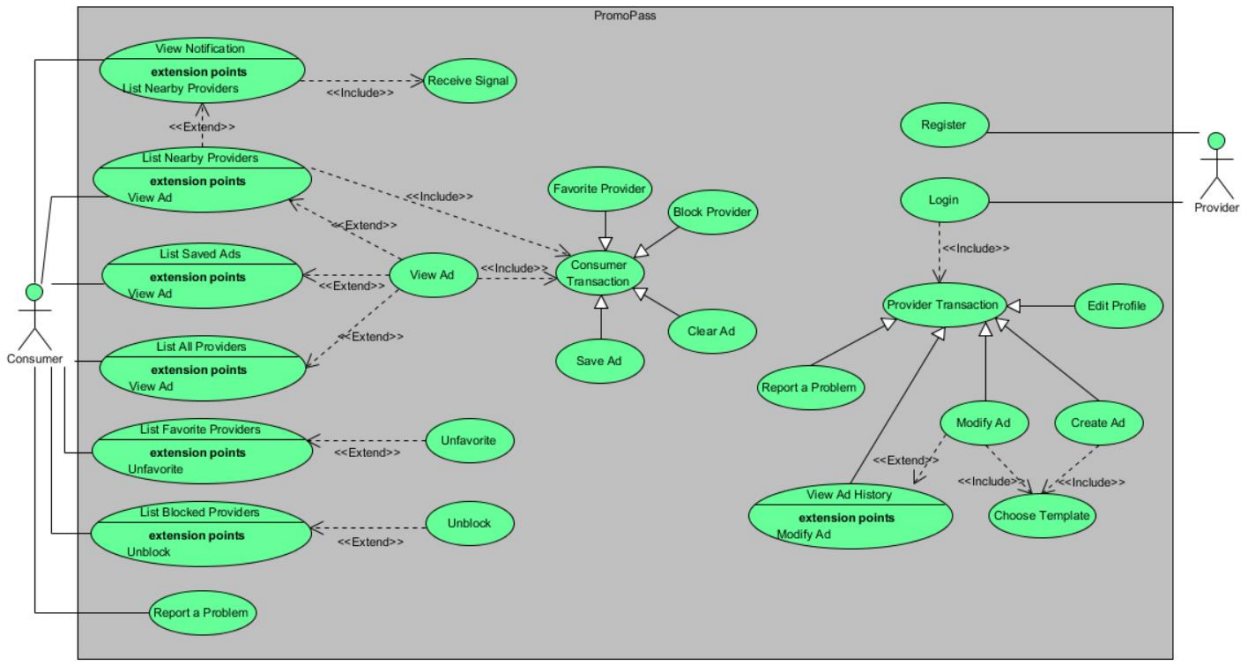
Requirement	Description	Priority
Server	There will be a Linux server that will host all web application services.	High
Storing Data	The system must have a MySQL database hosted on the web application's server to store information such as Ads and Provider information that can be made available to the Android app.	High
	Database information must be able to be retrieved from the Android App on request.	High
Security	The system must make use of a secure login system using OpenID Connect that will be associated with Provider logins.	Medium

4.2.2 General Requirements

Requirement	Description	Priority
Security	The system must be secure to protect Provider profile and Ad information.	Medium
User Friendliness	It must be easy for the Providers to update their profile and Ad information.	Medium
User Friendliness	The web application must be responsive (viewable on a mobile device)	Low

5. Requirements Diagrams

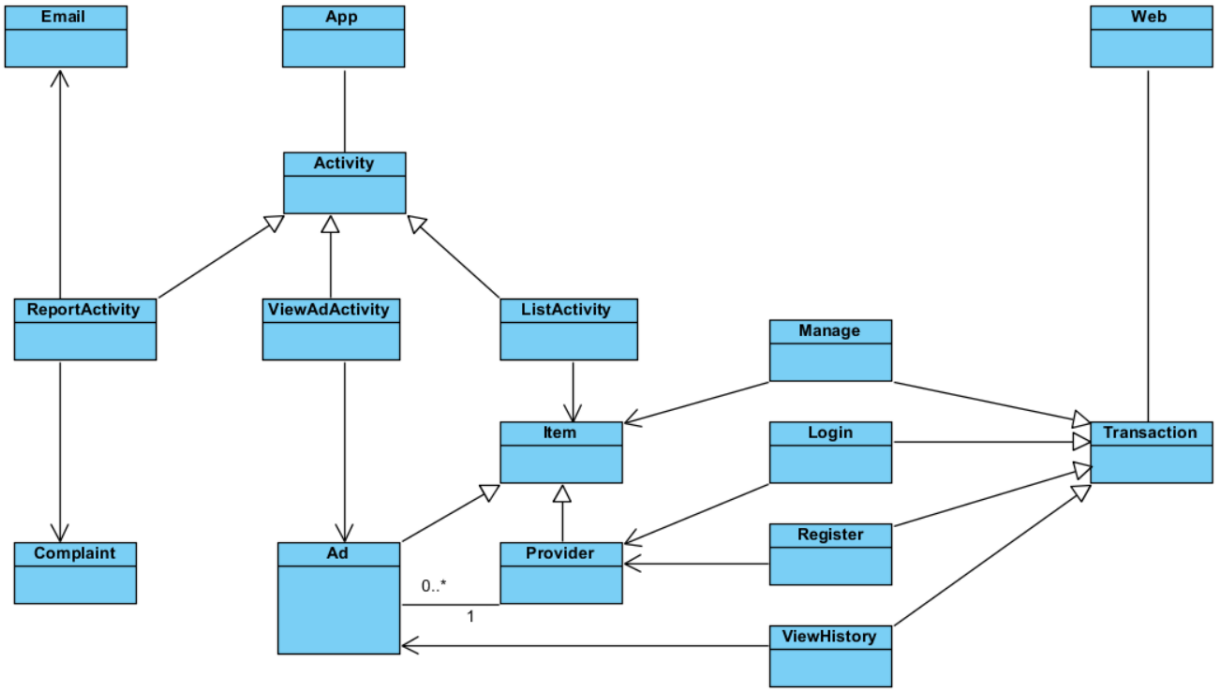
5.1 Use Case Diagrams



The diagram displays the use cases for the Provider and Consumer. The Provider will Register; then, in order to access any other use case functionality, the Provider must Login. The Provider can then choose to Edit Profile, Create Ad, Modify Ad, View Ad History, or Report a Problem. The Create Ad and Modify Ad use cases both include Choose Template. The Provider can navigate through these use cases through a navigation bar.

The Consumer's device will Receive Signal, and then the Consumer can choose to View Notification. On start, the app opens to List Nearby Providers. Then they can choose to View Ad, List Saved Ads, List All Providers, List Favorite Providers, List Blocked Providers, or Report a Problem. View Ad can also be accessed from List Saved Ads and List All Providers. Using List Favorite Providers, the Consumer can Unfavorite a Provider, and using List Blocked Providers, the Consumer can Unblock a Provider. Both View Ad and List Nearby Providers allow the Consumer to Favorite Provider, Block Provider, Save Ad, or Clear Ad. The Consumer can transition between use cases through a menu.

5.2 High-Level Class Diagram



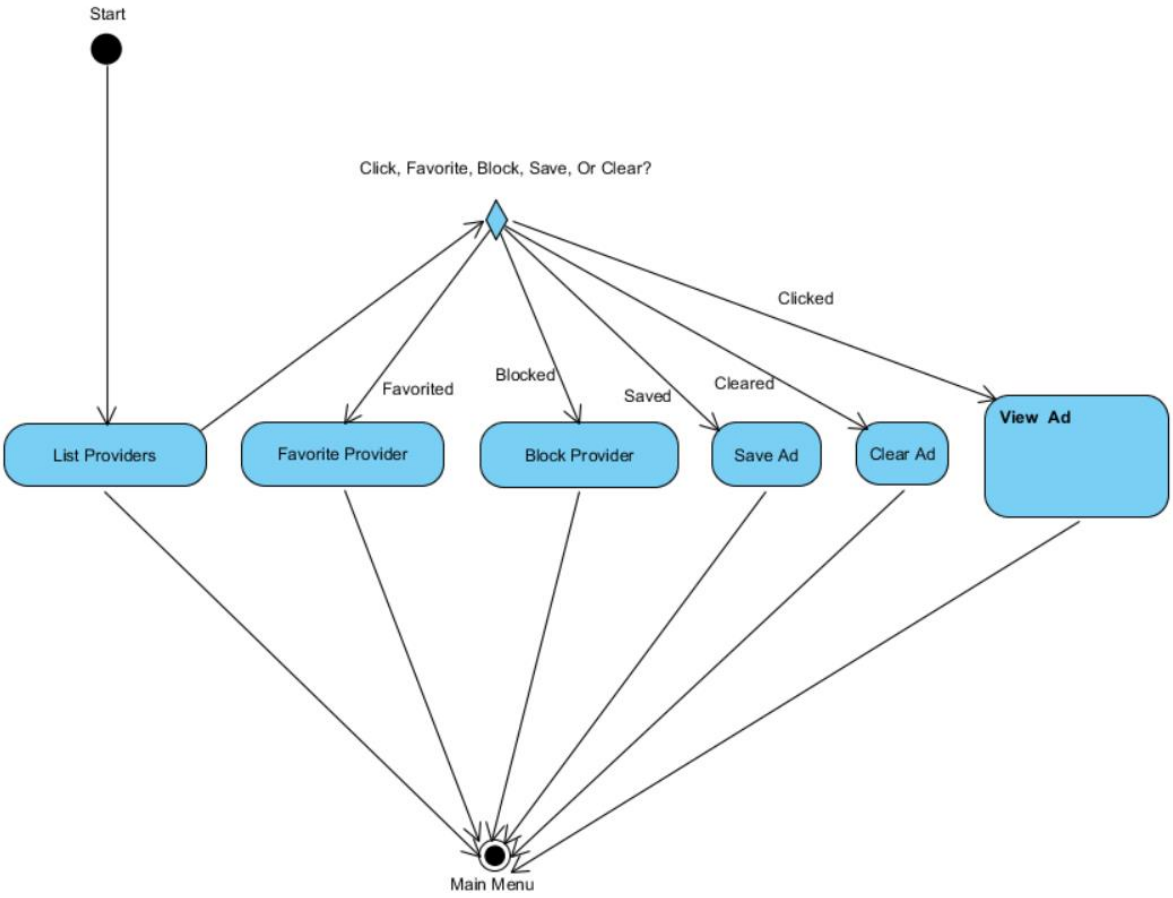
The class diagrams displays two main interfaces: the web and the app.

The Providers will use the web interface to make any transactions such as managing Ads or their profile, registering, logging in, or viewing the history of previously created Ads.

The Consumers will use the app interface to list both Ads and Providers, view Ads, and report a complaint. They will also be able to send complaints that will be emailed to the Promo*Pass* team about any bugs or errors they encounter.

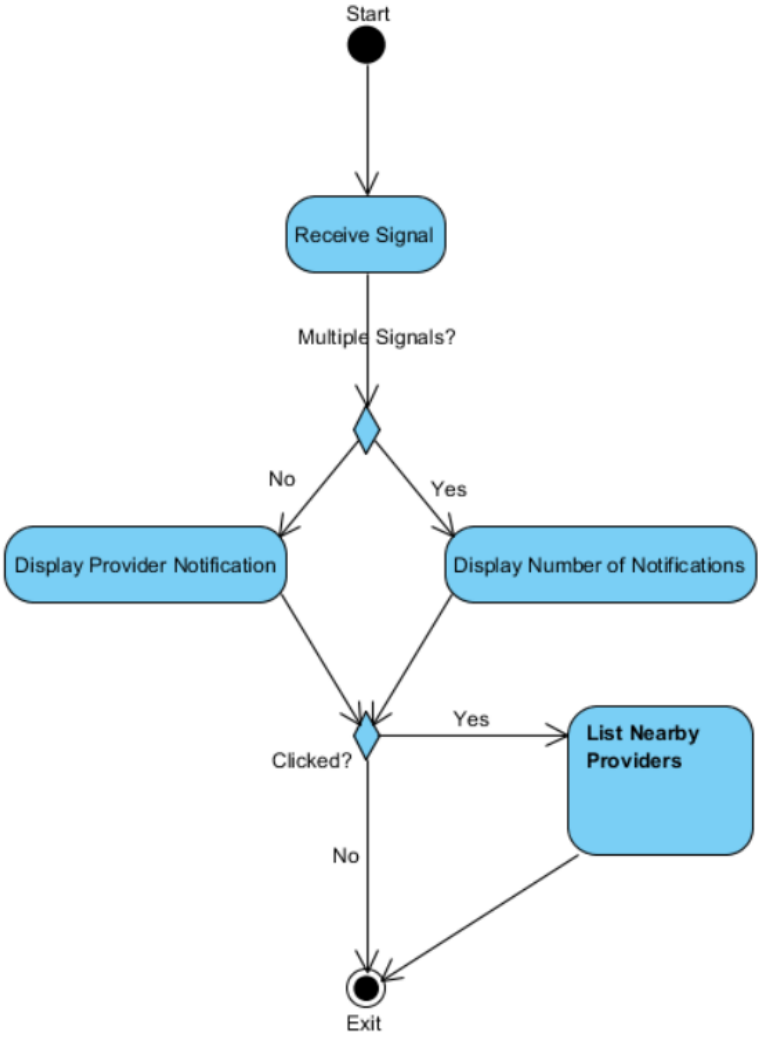
5.3 Activity Diagrams

1. List Nearby Providers



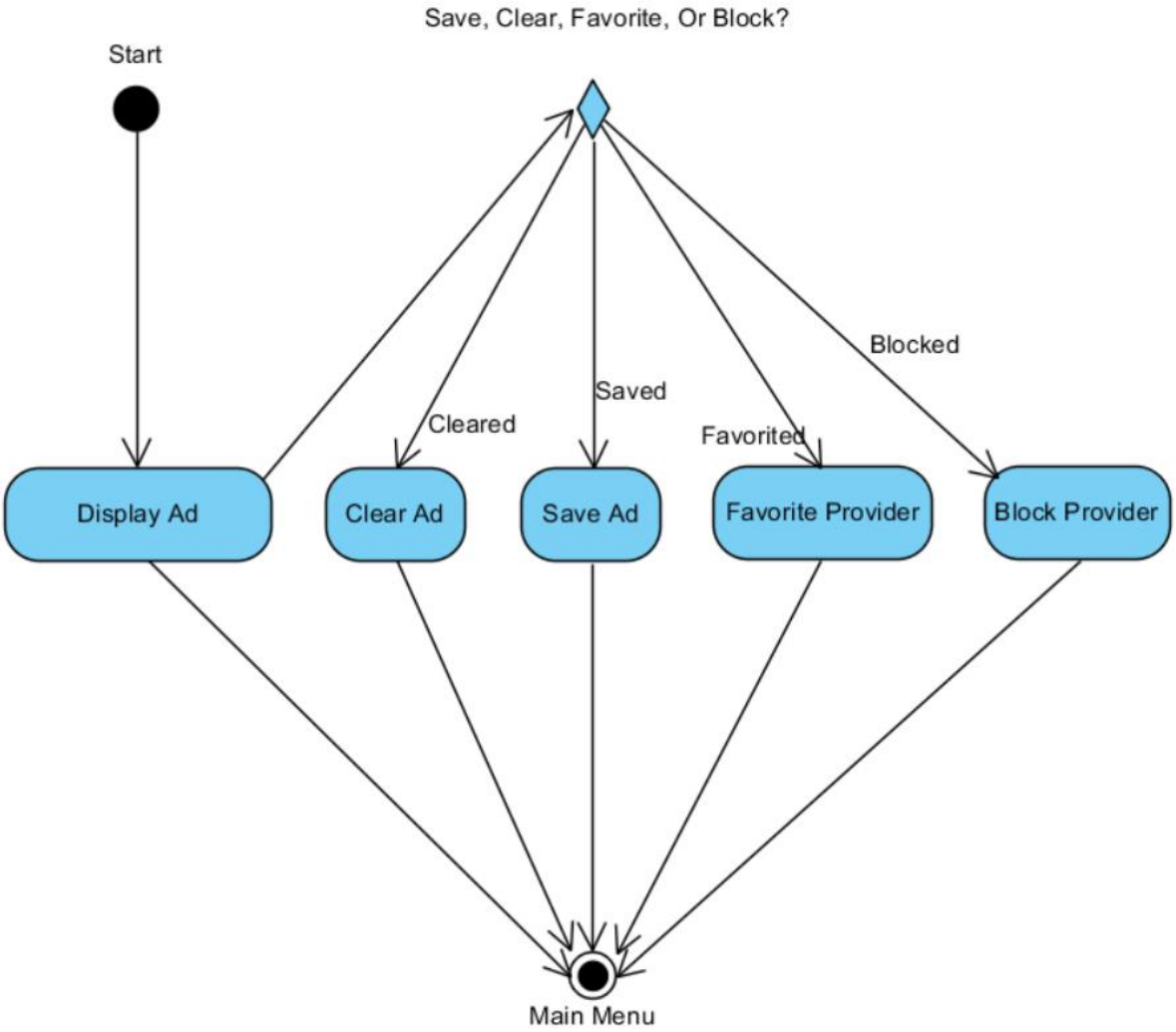
This diagram gets the Provider information such as the name and type of business and displays that information in a listed format. From this screen, the Consumer has the choice to favorite or block the Provider, save or clear the Ad, view the Ad, or simply exit the app. In order to give the most convenience to the Consumer, these functions have been provided both when Providers are listed and when an Ad is viewed.

2. View Notifications



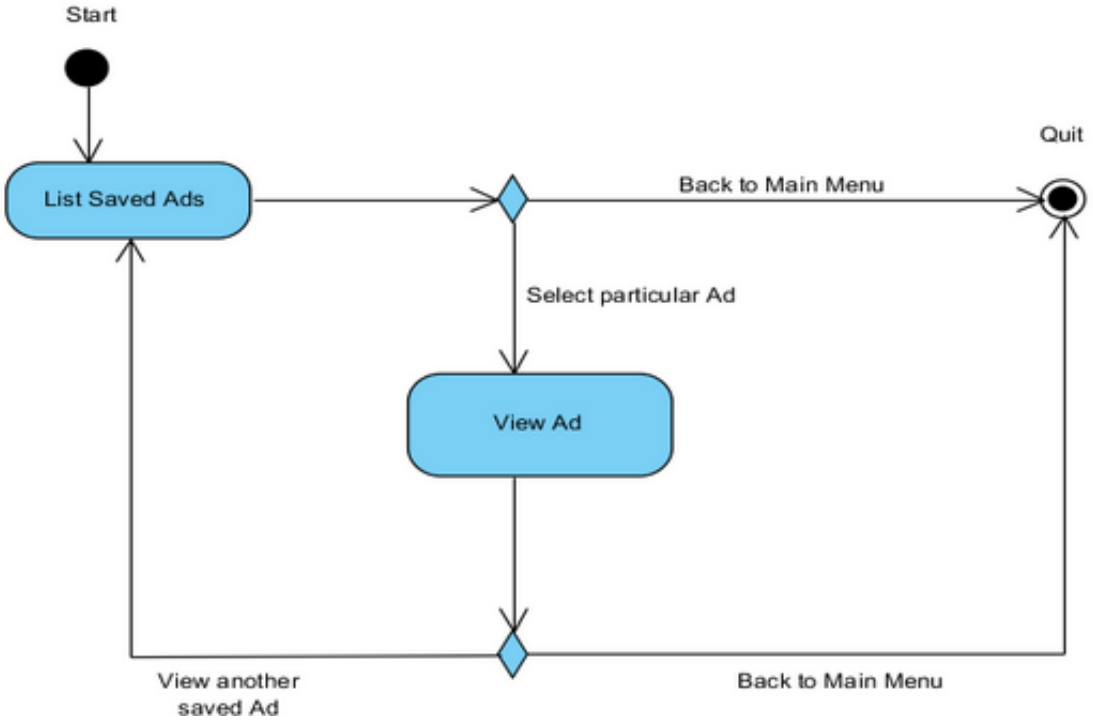
The View Notifications activity receives the Gimbal Bluetooth signal and interprets the Gimbal ID which is registered with a Provider. If the Consumer has not already received any signals, the Provider information associated with the current signal will be displayed in a Notification on the Consumer's phone. If the Consumer has received one or more signals, the Notification will display the number of Providers. The Consumer may choose to open the app to the List Nearby Providers activity or dismiss the Notification and handle the Ads later. If the current Ad for a Provider has already been viewed, saved, or dismissed, it will not appear again.

3. View Ad



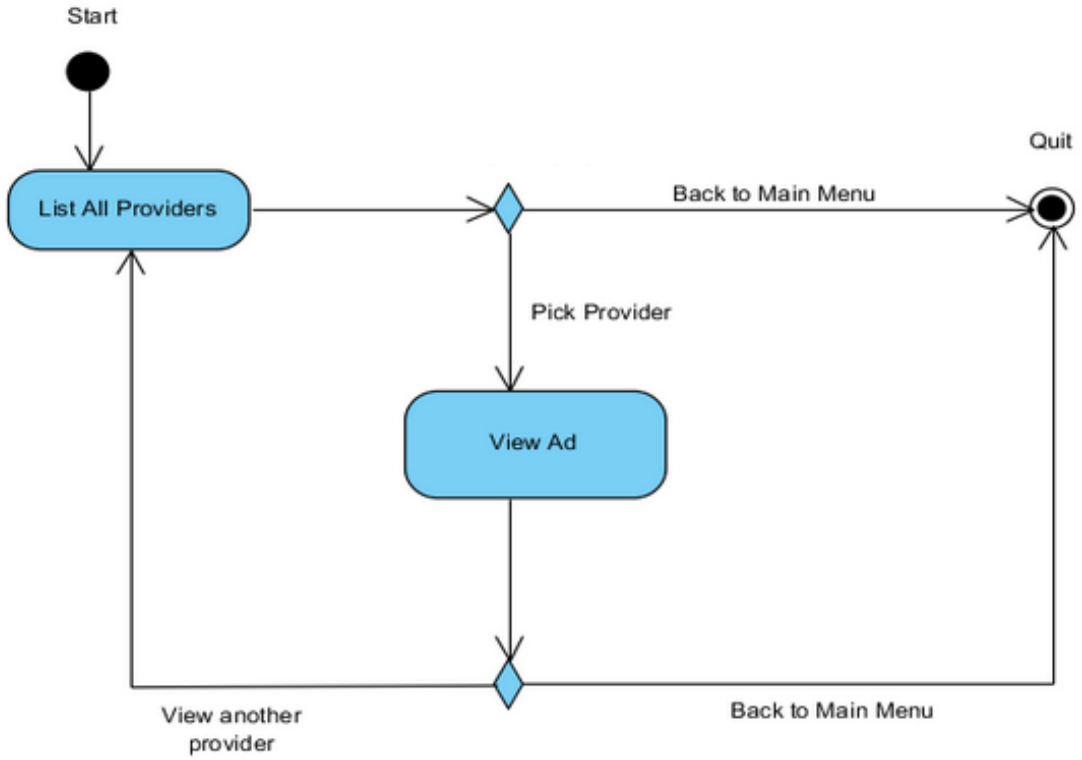
The View Ad activity gets the Ad information associated with the Provider previously chosen and displays it on the screen. The Consumer can favorite or block the Provider, clear or save the Ad, or simply exit to the main menu. In order to give the most convenience to the Consumer, these functions have been provided both when Providers are listed and when an Ad is viewed.

4. List Saved Ads



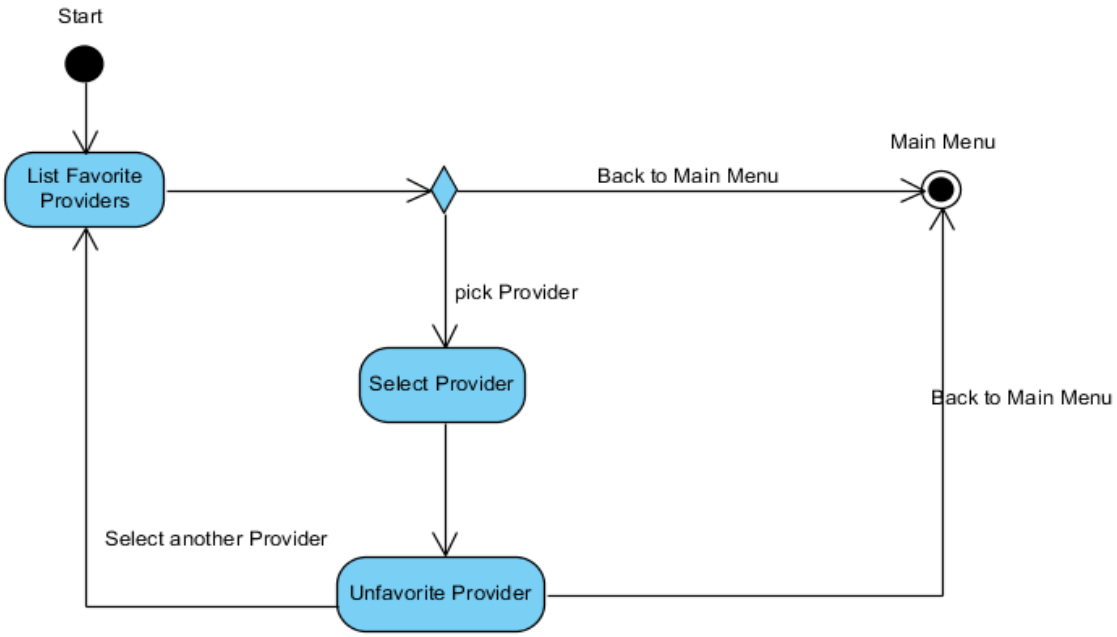
In this diagram one can see how Consumers will be able to list their saved Ads; at this point they have the option to filter/sort the saved Ads by Provider name or business type. From the start menu, they will select List Saved Ads. From there, they have the choice to view a particular Ad or exit back to the main menu. If they decide to view an Ad, they will be taken to that Ad. For a detailed description of what happens when they view the Ad, go to the View Ad activity diagram. After they are done viewing the Ad, they have the choice to view another Ad or exit back to main menu.

5. List All Providers



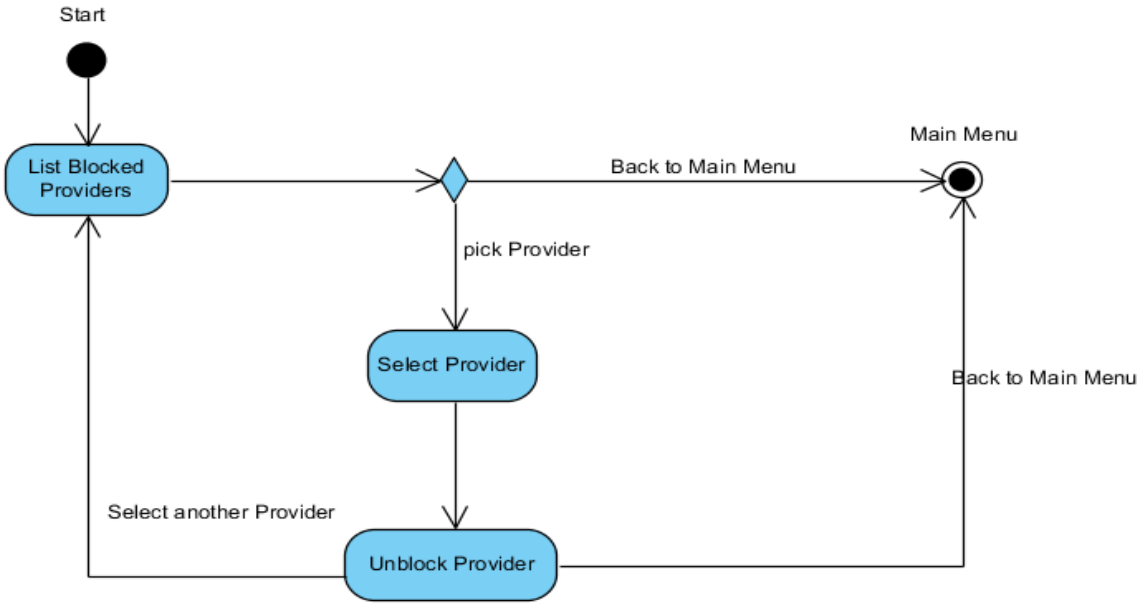
In this diagram one can see how a user of Promo*Pass* will be able to list all Providers; at this point the user has the options to filter/sort the Providers by Provider name or business type. From the start menu the user will select List All Providers. From there they have the choice to view a particular Provider or exit back to the main menu. If they decide to view a Provider, they will be taken to that Provider's Ad. For a detailed description of what happens when they view the Ad, go to the View Ad activity diagram. After they are done viewing the Ad, they have the choice to view another Provider or exit back to main menu.

6. List Favorite Providers



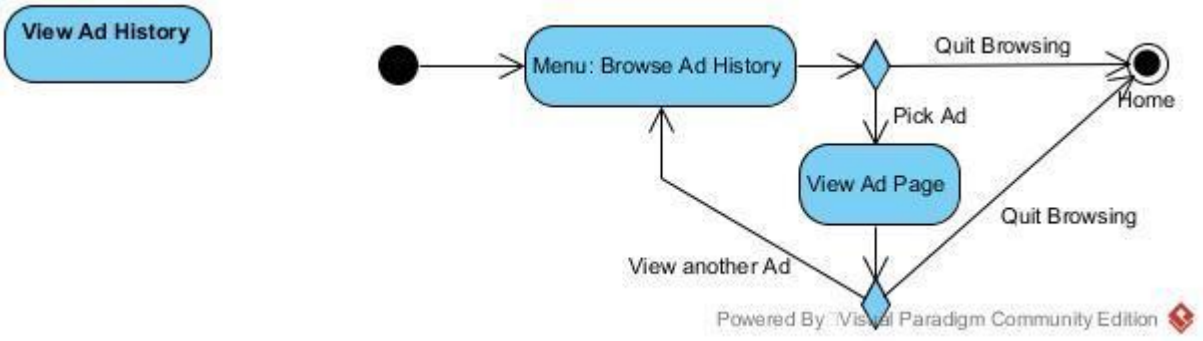
In this diagram one can see how Consumers will be able to list their favorite Providers; at this point they have the option to filter/sort the Providers by Provider name or business type. From the start menu, they will select List Favorite Providers. From there, they have the choice to pick a particular favorited Provider or exit back to the main menu. If they decide to pick a Provider, they will unfavorite that Provider. They will then either go back to the list of favorites or exit back to main menu.

7. List Blocked Providers



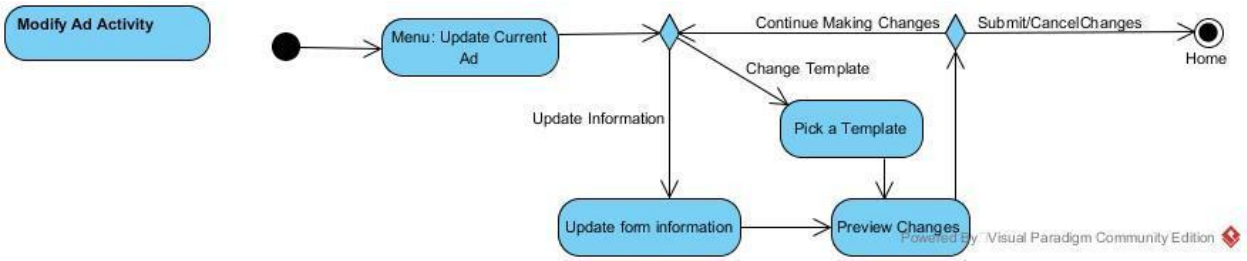
In this diagram one can see how Consumers will be able to list their blocked Providers; at this point they have the option to filter/sort the Providers by Provider name or business type. From the start menu, they will select List Block Providers. From there, they have the choice to pick a particular blocked Provider or exit back to the main menu. If they decide to pick a Provider, they will un-block that Provider. They will then either go back to the blocked list or exit back to main menu.

8. View Ad History



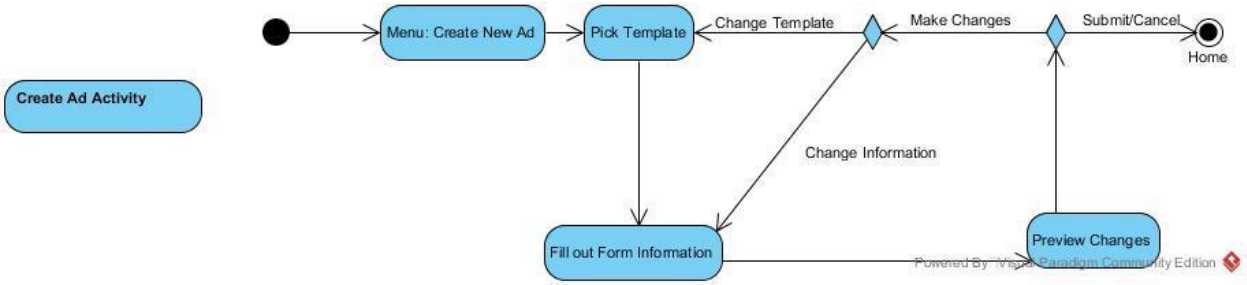
Providers will be able to view their Ad history on the web application by clicking on the “Browse Ad History” item on the menu. Ads will be listed in descending order from latest to earliest Ads.

9. Modify Ad



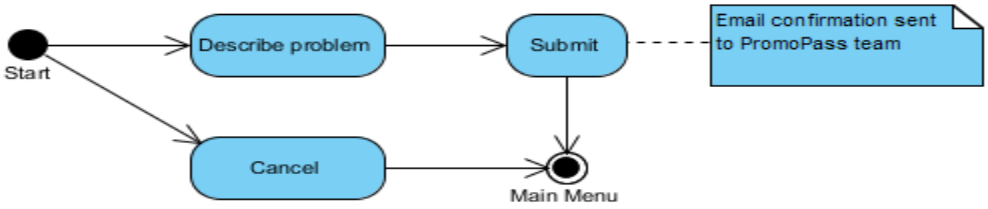
Providers will be able to modify Ads on the web application by clicking on the "Update Current Ad" item on the menu. From there, they can change the template and information on the Ad.

10. Create Ad



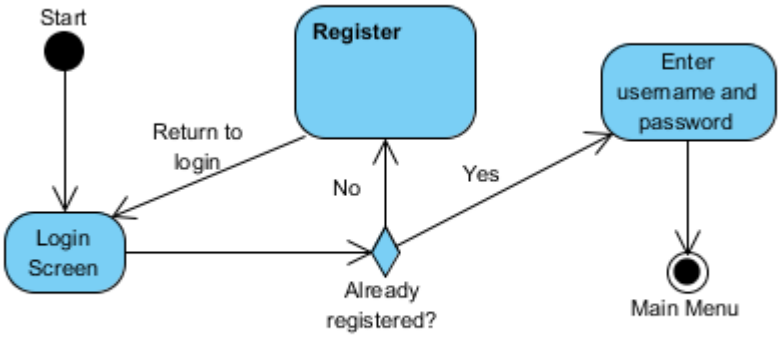
Providers will be able to create new Ads on the web application by clicking on the "Create Ad" item on the menu. From there, they have the option of picking a template and entering Ad information on the web form for submission.

11. Report a Problem



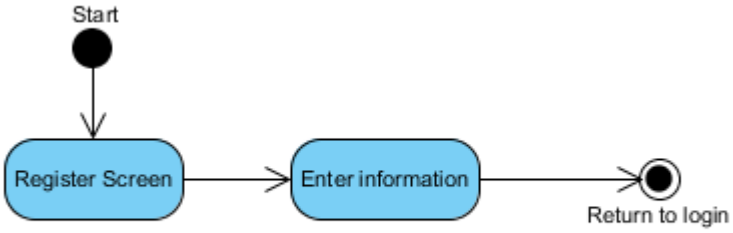
Consumers and Providers will be able to report any issues they may experience. If the user selects "Report a Problem," this will take them to a new screen. The user can describe the problem experienced and click submit, which will send an email confirmation to the Promo*Pass* team about the report and take the user back to the previous menu. The user can also select "Cancel" in order to return to the previous menu.

12. Login



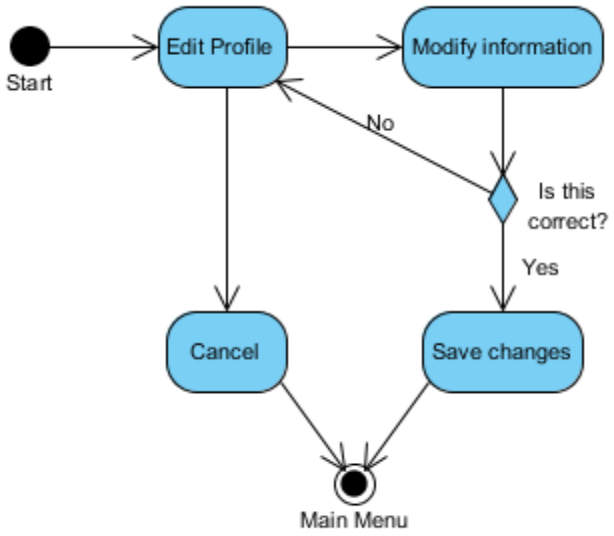
Providers are required to login in order to use the web app. When Providers go to the login screen, they can Register if they have not done so already. If the Providers have already registered, they can enter a username and password, which then takes them to the main menu.

13. Register



A Provider must Register in order to use the web app. This includes the Gimbal Device ID and other information about the Provider's business. Once the Provider has entered and submitted the information, they will be returned to the login page.

14. Edit Profile

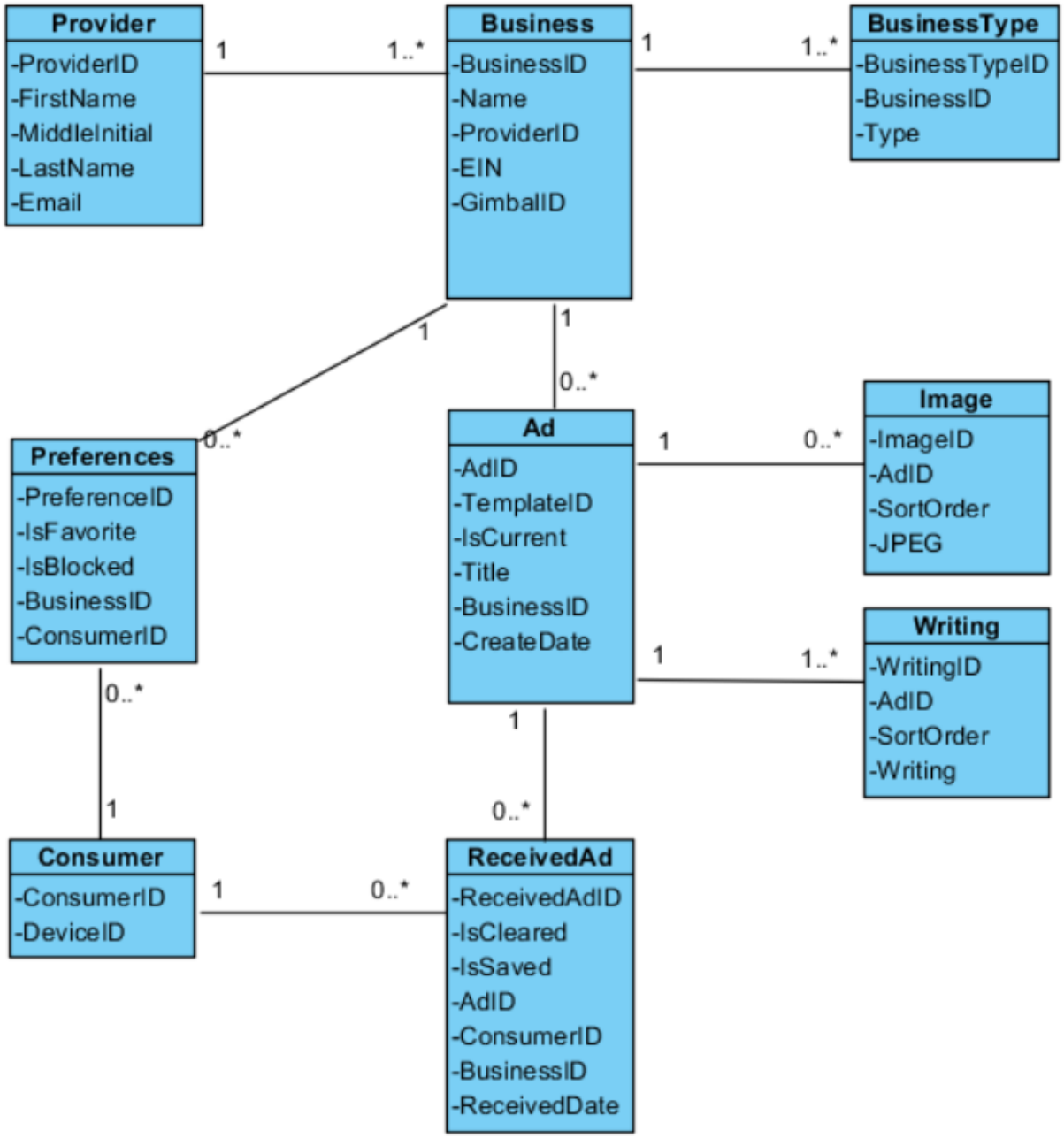


If Providers wish to change profile information, they can select “Edit Profile,” which takes them to a new screen. The Providers can then modify information and, if the information is correct, choose to save changes. This takes them back to the main menu. If the Providers wish to leave the page, they can select “Cancel” and return to the main menu.

6. Design Diagrams

6.1 Detailed Class Diagrams

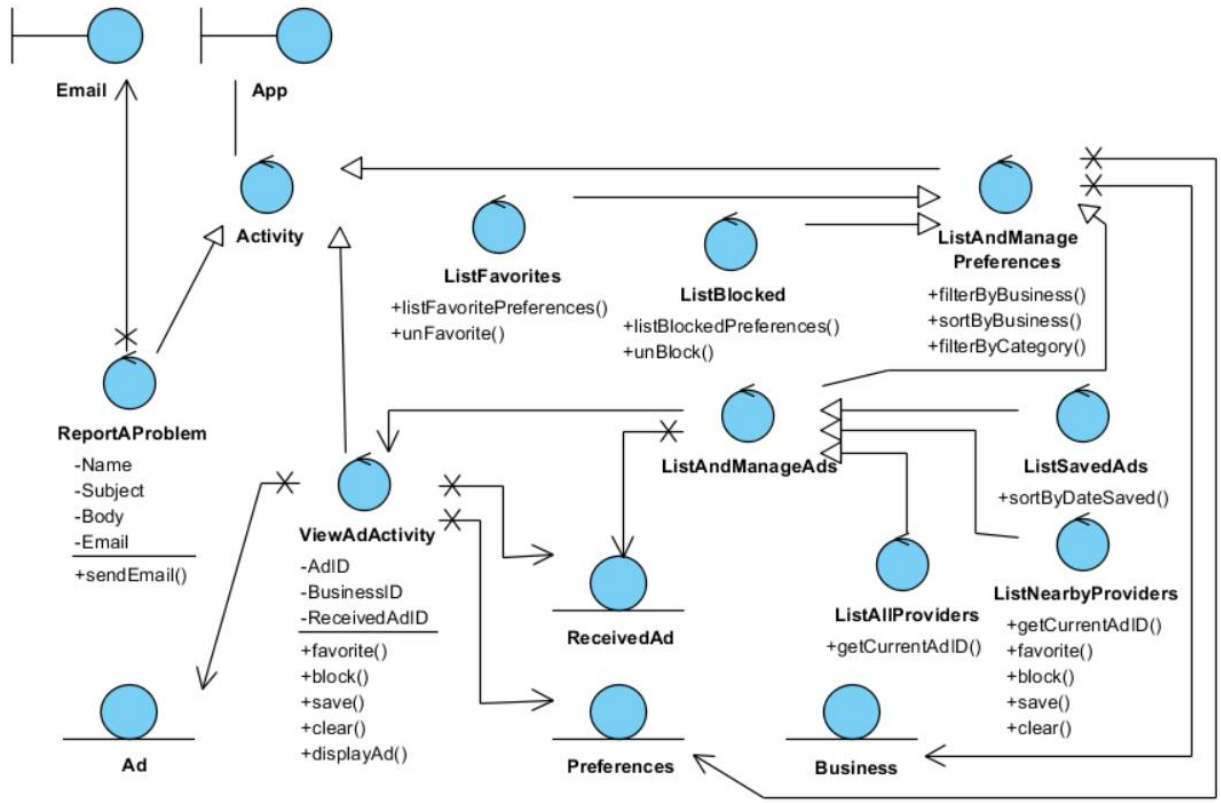
6.1.1 Entity Relationship Diagram



The entity relationship diagram displayed above represents the Promo*Pass* database architecture. Each Provider will have a unique ID tied to the first name, middle initial, and last name as well as an email address, which will be used as the Provider's username for the Promo*Pass* system. Each Provider can have one to many businesses, but the Provider must have at least one business, submitted and verified upon account registration. As well as a unique ID, the business has its name, the ProviderID for the Provider that owns the business, the employer identification number (EIN) that is used to verify that a business is real and legal, and the Gimbal ID that is used to receive a signal from the Gimbal device purchased by the Provider. Each business can have only one Gimbal ID, and the EIN does not have to be unique but the Gimbal ID does. A business can have one to many business types that identify the category of the business, such as restaurant, bar, etc. Businesses can have zero to many Ads, which holds the template ID, the title, the business it is associated with, and the create date. It also uses IsCurrent to see which Ad is the current Ad. Each Ad has zero to many images and one to many writing. An image is optional, but a writing is mandatory to give information to the Consumer. Both have sort orders to determine what order the images or writings appear. All of the above is stored and maintained by the Provider.

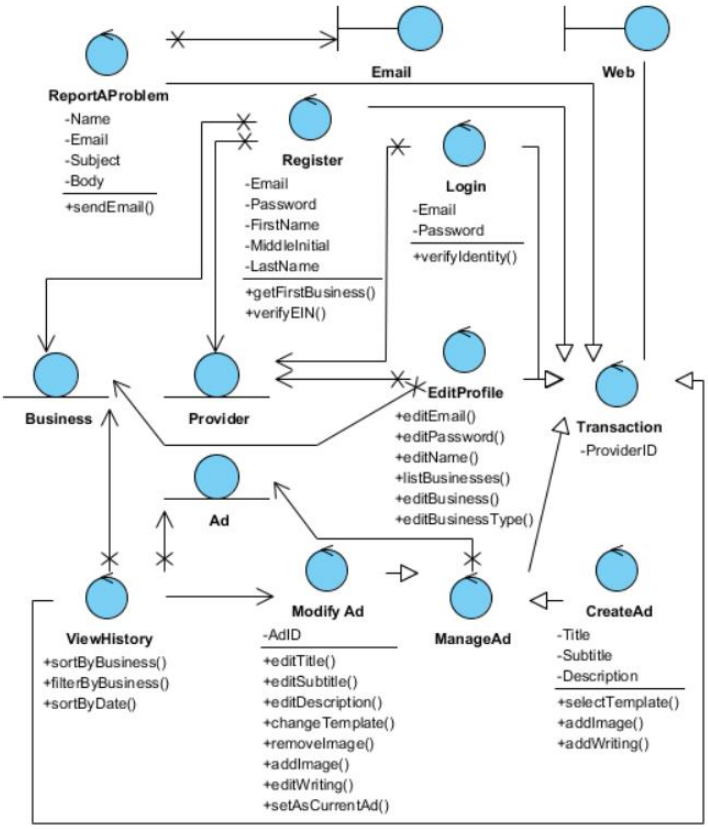
The Consumer maintains his or her preferences. A Consumer is currently identified by the Device ID associated with a mobile phone. If the Consumer is using a mobile device that is not a phone, a unique identifier will be generated and stored in an installation file on the Consumer's device. This installation file is referenced when trying to identify a Consumer. The Consumer has zero to many received Ads, and an Ad created by a business can be received by zero to many Consumers. The Received Ad entity stores the Consumer's preferences on the Ad, whether it is cleared or saved, the Consumer ID of the Consumer that received the Ad, the business ID of the business that created the Ad, and the received date of the Ad. The Received Ad is uniquely identified by the ReceivedAdID. The Consumer has zero to many preferences, and a business can be favorited or blocked by zero to many Consumers. The Preference entity stores the Consumer ID and business ID, as well as an indication of whether a business is favorited or blocked.

6.1.2 App Class Diagram



The Android app will have multiple activities. The View Ad activity will access the Ad entity to display the Ad and the Received Ad and Preferences entities to save or clear an Ad or favorite or block a business. The List Favorites and List Blocked activities access the Business entity to display its information and the Preferences entity to unfavorite or unblock a business. List Nearby Providers, List All Providers, and List Saved Ads also manage preferences similar to List Favorites and List Blocked activities except they allow Consumers to favorite or block instead of unfavorite or unblock. They also manage Received Ad entities. List Nearby Providers allows a Consumer to save or clear an Ad; List Saved Ads lists all the Received Ads that have been saved, and it can clear a saved Ad; and List All Providers list all businesses whose Ad has been received by the Consumer. All three of these activities can access the View Ad activity to view an Ad. The Report a Problem activity is simply a form that submits an email detailing a concern about the Promo*Pass* app.

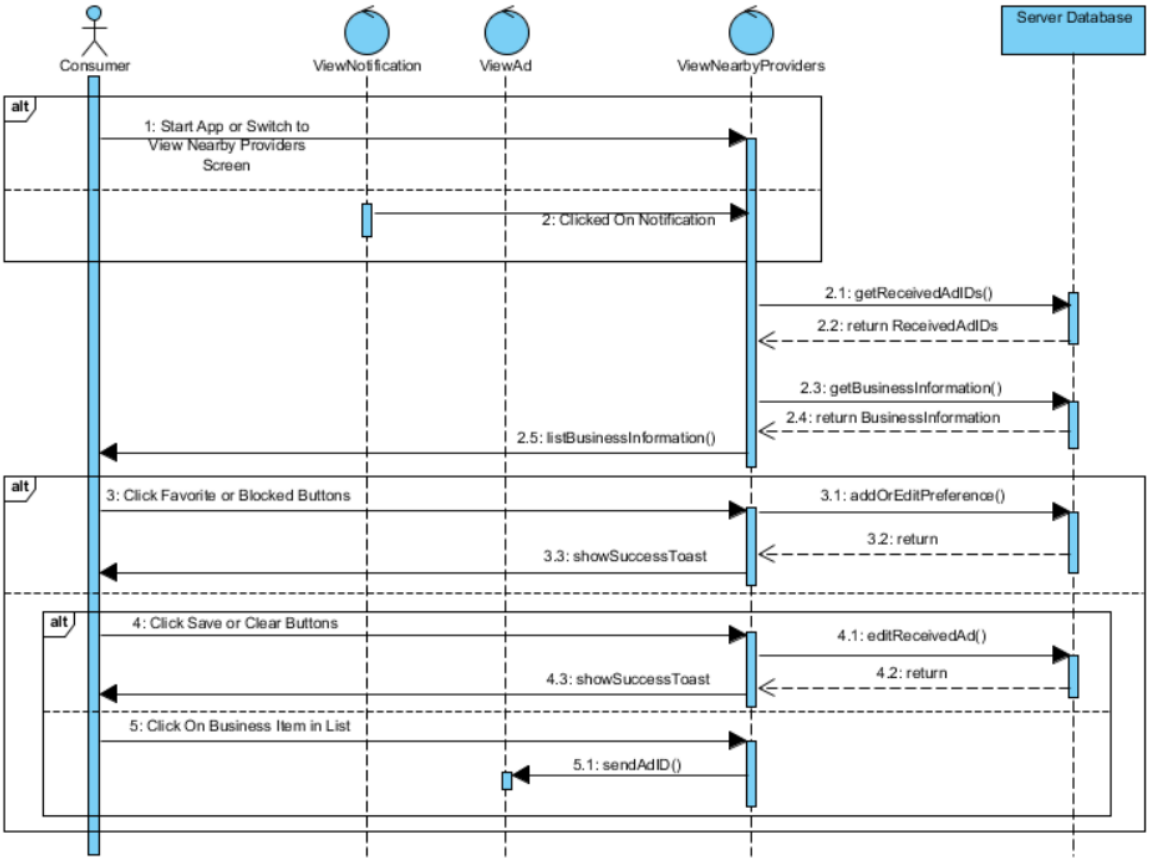
6.1.3 Web Class Diagram



All transactions on the Android application keep up with the current Provider's ID. Starting from the Register page, Providers can sign up for an account that is tied to an email and a password. The password will be saved with Userapp, a third party password management software. A Provider must also submit and verify a legal business at registration. The information will be stored in the Provider and Business entities. For the Login page, the Provider will have to be authenticated by his or her login email and a password through Userapp. It will also retrieve the Provider ID from the Provider entity using the Provider's email address. Every Transaction on the site is verified and saved to the database by the ProviderID. Using Edit Profile, Providers can make changes to their own profile as well as view and make changes to their businesses. These modifications are updated in the Provider and Business entities. The Create Ad activity creates an Ad entity and replaces the current one. The Modify Ad accesses the current Ad and stores any modifications made. Modify Ad can also modify old Ads if it is accessed through View Ad History. The View Ad History activity accesses the Business and Ad entities to display all Ads created by business. The Provider can then choose to modify an old Ad. Additionally, Report a Problem email form links will be available for Providers to report problems that occur on the site.

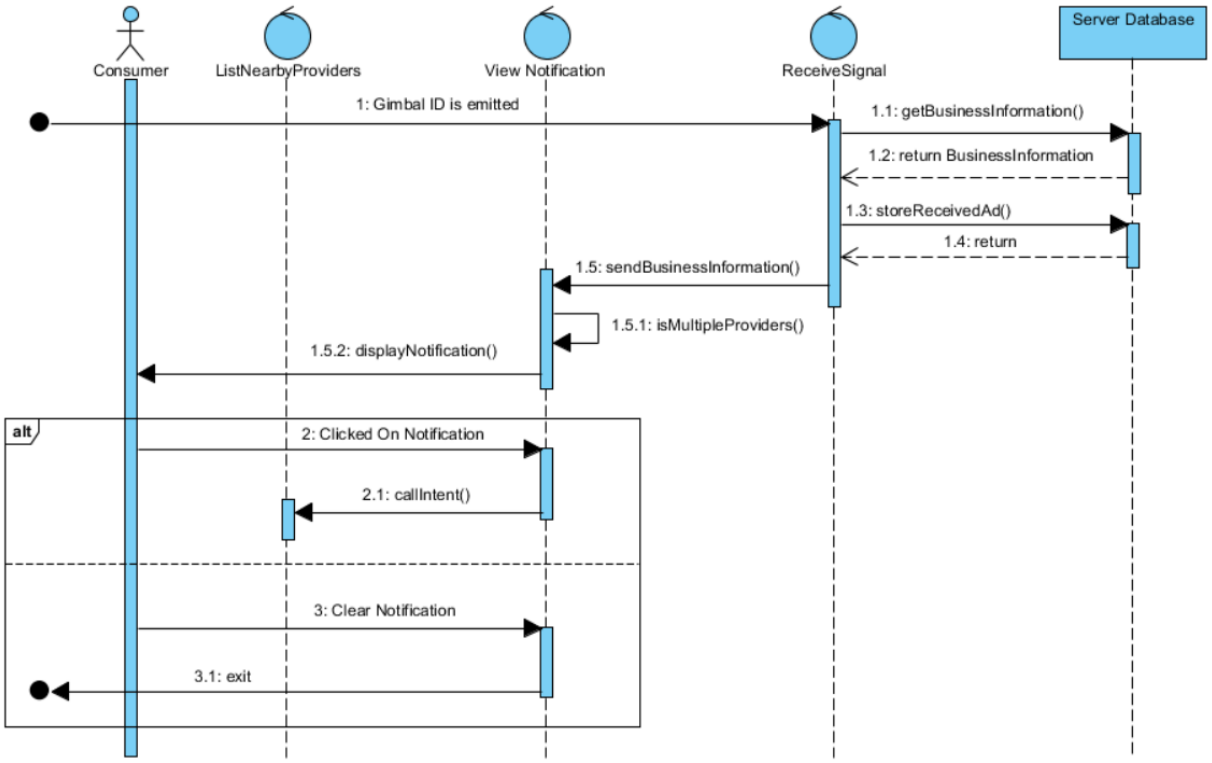
6.2 Sequence Diagrams

1. List Nearby Providers



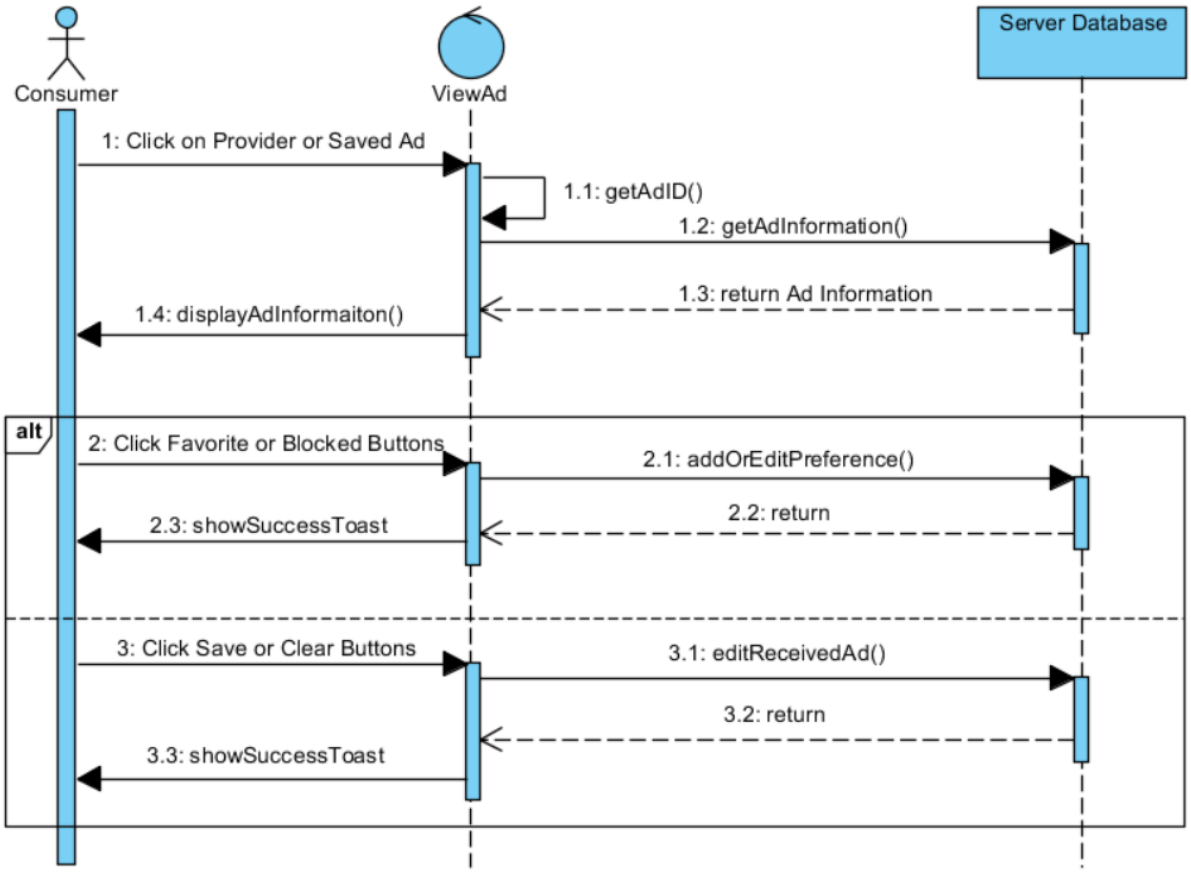
The List Nearby Providers activity begins by the Consumer starting the app, choosing the List Nearby Providers option, or clicking on a notification. The activity gets the Received Ads that are not cleared or saved, gets the business information associated through a business ID stored with the Received Ad, and displays the business names along with business types in a list format. If the Consumer clicks on a favorite or block buttons, the activity will add or edit a Preference entity to show that the Consumer has favorited or blocked a business. If the Consumer clicks on the save or clear buttons, the activity will edit the Received Ad entity to show that the Consumer saved or cleared the Ad. Cleared and saved Ads will not be shown in List Nearby Providers again. If a Consumer clicks on a business item in the list, the activity opens the View Ad activity and sends it the Ad ID for that business.

2. View Notifications



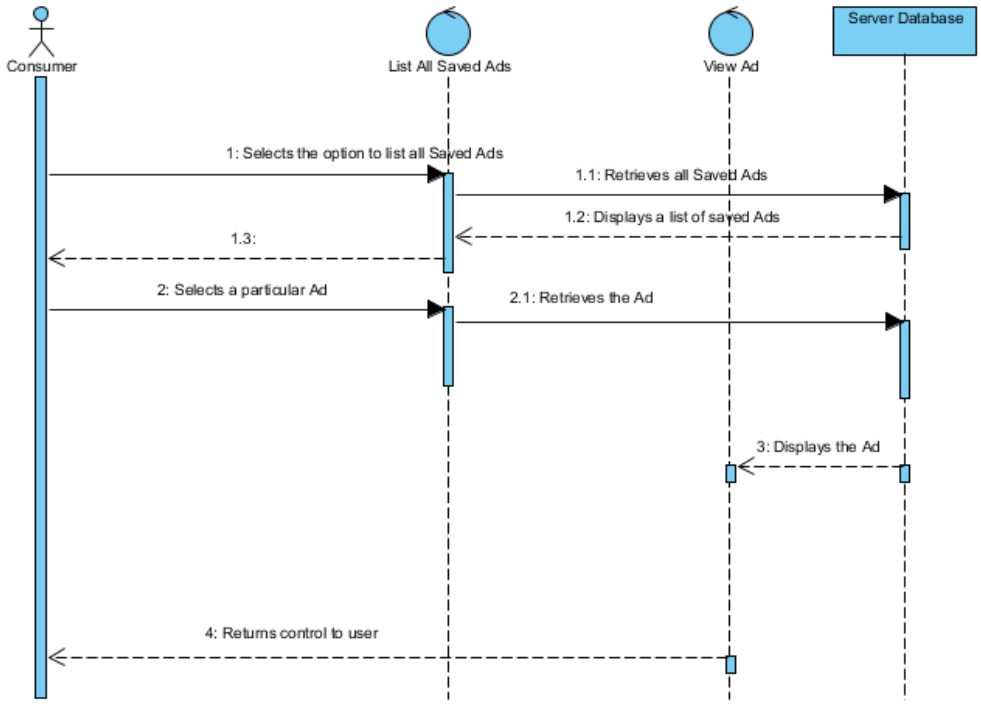
The Receive Signal class uses Gimbal API to receive the Gimbal ID emitted from a Gimbal beacon device. The Gimbal ID is the same factory ID that was stored for the Provider when a business is created. After receiving the Gimbal ID, the class will get the business and the current Ad information and store a Received Ad record in the database. The Receive Signal class then send the business information to the View Notification class, which displays it in a way that depends on the number of ads that have been received so far. The View Notification class then displays or updates the notification. If the Consumer clicks on the notification, the class will open the List Nearby Providers activity. If the Consumer clears the notification, the system will simply exit, but it is still listening for Gimbal IDs in the background.

3. View Ad



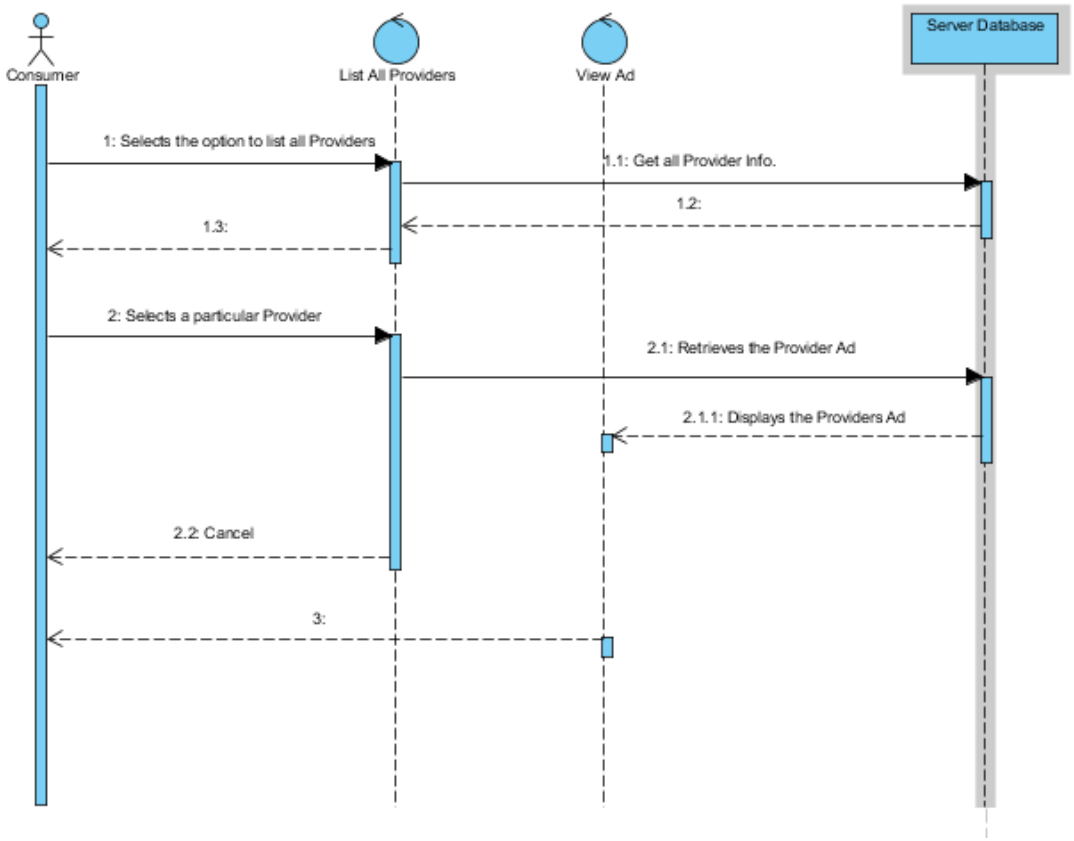
The View Ad activity is opened when a Consumer clicks on a business or a saved Ad. The activity uses the sent Ad ID to get the Ad information from the Ad entity on the server database. The activity then displays to Ad information. The Consumer can click on the favorite or block buttons, and the activity will add or edit a Preference entity to show that the Consumer favorited or blocked a business. The Consumer can also click on the save or clear buttons, and the activity will edit the Received Ad entity to show that the Consumer saved or cleared an Ad.

4. List Saved Ads



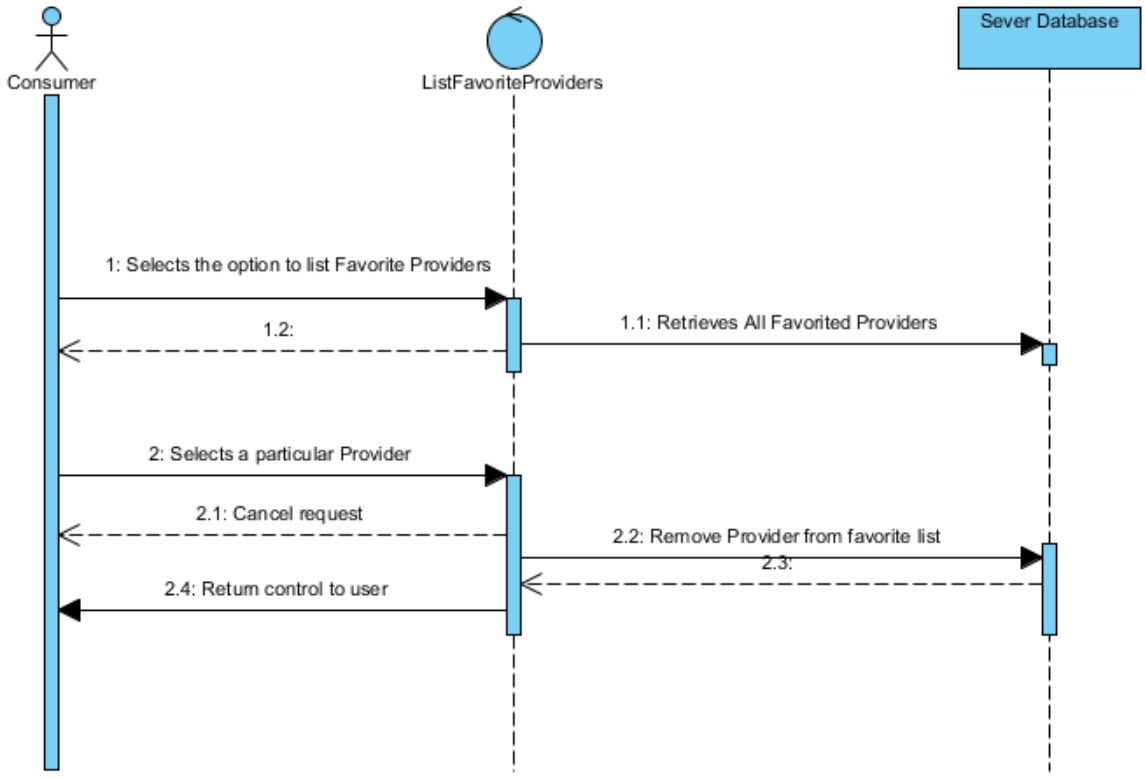
The List All Saved Ads activity is opened when Consumers click on List All Saved Ads icon. The activity then access the database server and retrieves a list of all the Saved Ads. This list is then displayed to the Consumers. They have the option to select a saved Ad to view or to exit the activity. If the Consumers decide to view an Ad, the system then opens View Ad activity.

5. List All Providers



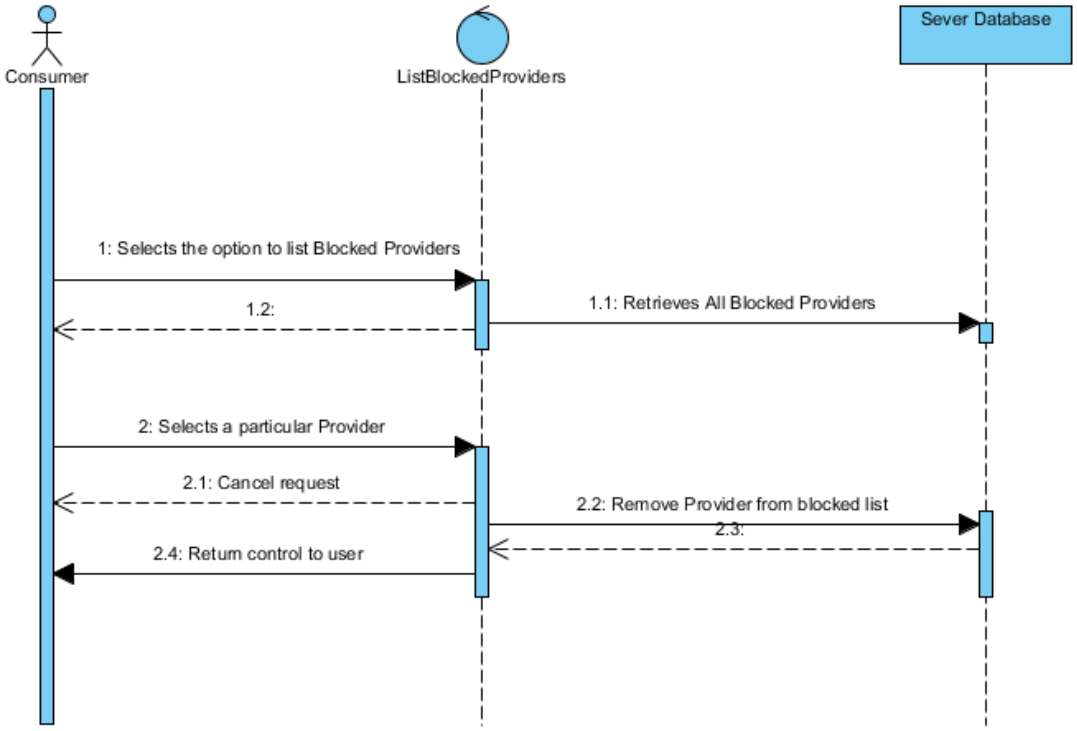
The List All Providers activity is opened when Consumers click on List All Providers icon. The activity then access the database server and retrieves a list of all the Providers in the system. This list is then displayed to the Consumers. They have the option to select a particular Provider and view the current Ad or to exit the activity. If the Consumers decide to view an Ad, the system then opens View Ad activity.

6. List Favorite Providers



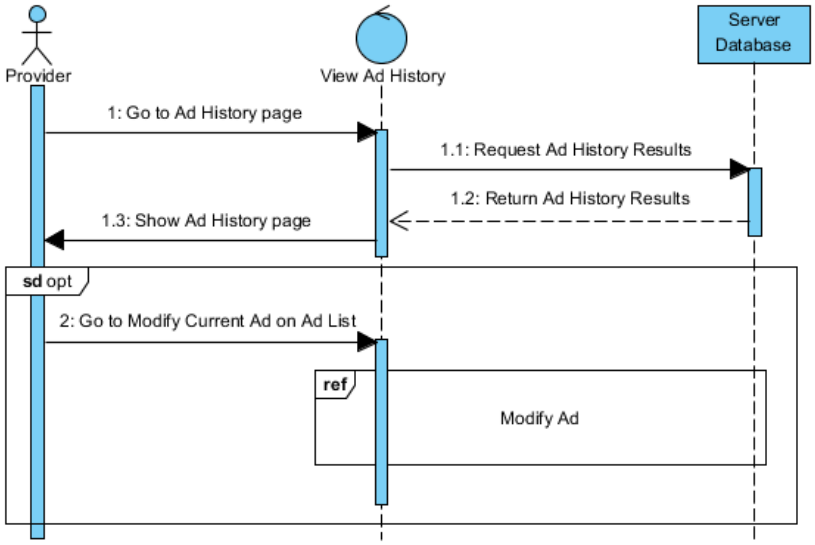
The List Favorite Providers activity is opened when Consumers click on List Favorite Providers icon. The activity then access the database server and retrieves a list of all the Providers the Consumers have favorited. This list is then displayed to the Consumers. They have the option to select particular Providers and remove them from the favorite list or to exit the activity. If the Consumers decide to remove them from the favorites list, the system will access the database and delete those particular Providers from the favorites list.

7. List Blocked Providers



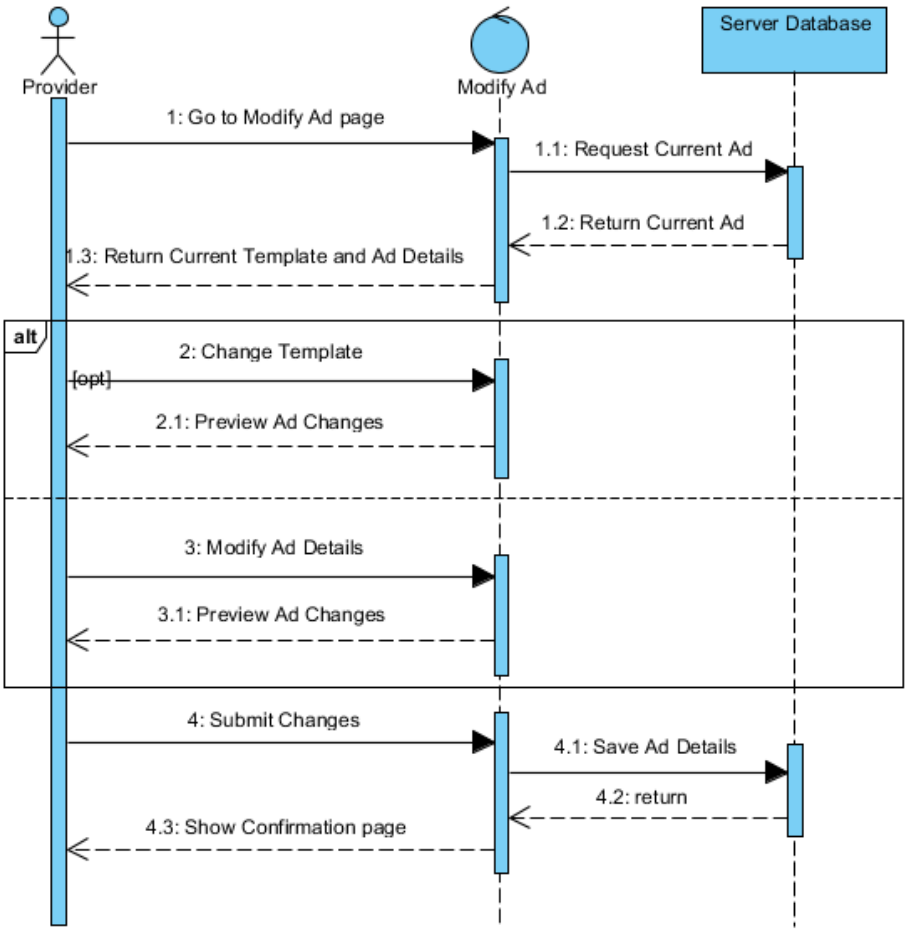
The List Blocked Providers activity is opened when Consumers click on List Blocked Providers icon. The activity then access the database server and retrieves a list of all the Providers the Consumers have blocked. This list is then displayed to the Consumers. They have the option to select particular Providers and remove them from the block list or to exit the activity. If the Consumers decide to remove them from the blocked list, the system will access the database and delete those particular Providers from the blocked list.

8. View Ad History



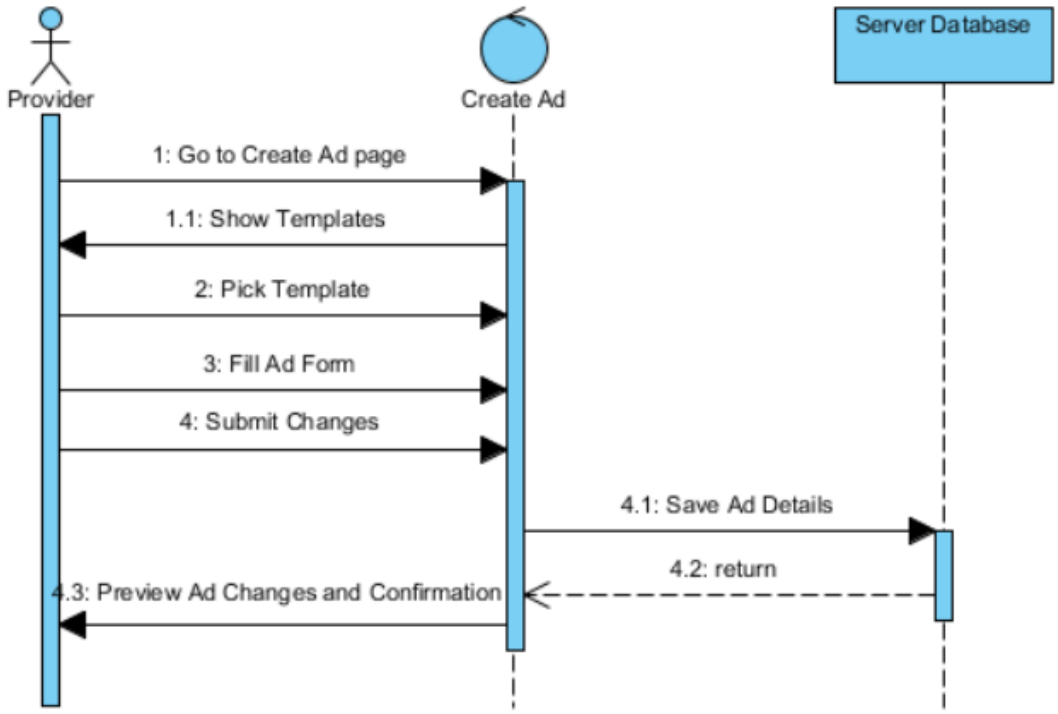
Once the Provider goes to the Ad History page, the website will make a request to the Server Database to return a list of all of the Provider's Ads. The Ads will then be displayed on the Ad History page, sorted in order of their creation date. The most recent Ad, or the current Ad, will be the first Ad on the list. The most current Ad will be linked to the Modify Ad page that the Provider can use to Modify the current Ad. Since previous Ads have been archived, Providers will not be able to modify their previous Ads.

9. Modify Ad



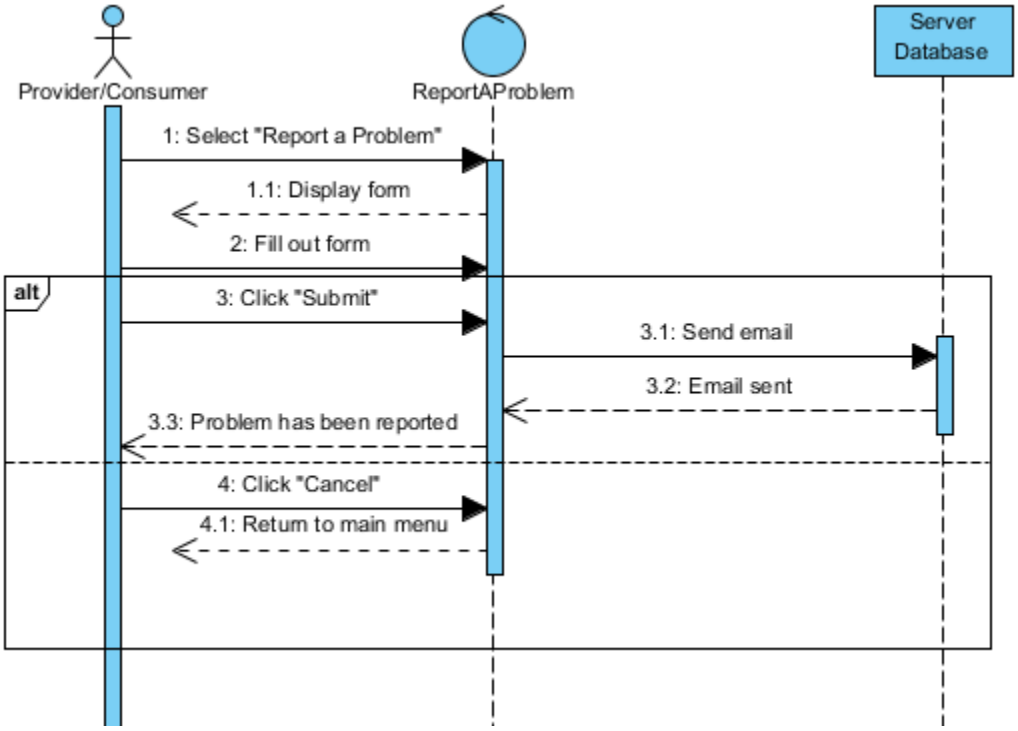
The Modify Ad page will return the Provider's current Ad from the Server Database. Once on the Modify Ad page, Providers have the option of either updating their Ad's Template or any of the Ad details (or both). The website will show the Provider's Ad changes while they modify the Ad. Once they submit, the Ad details will get sent to the Server Database and the Provider will be shown a confirmation message about the Ad changes.

10. Create Ad



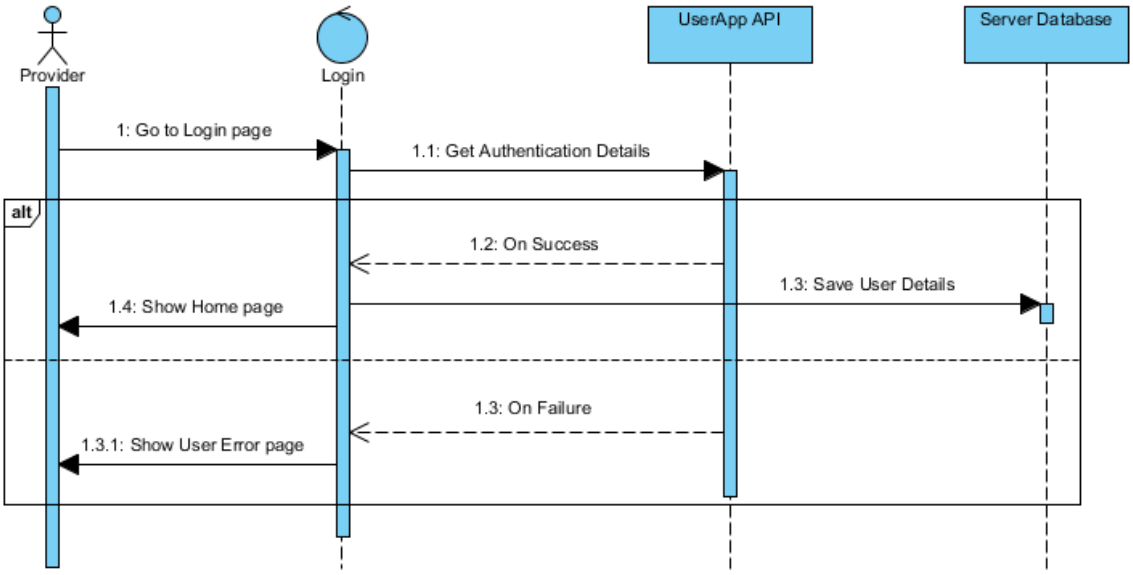
The Create Ad page allows the Provider to create a new Ad. On this page, the Provider will choose the Ad's Template and fill in all of the Ad form details (such as the Ad's Title and Writing description). After submission, all of the submitted Ad details will get sent to the database. If the Provider has never made an Ad before, the Ad will become the Provider's current Ad. If the Provider has made other Ads, the latest past Ad will be archived and the submitted Ad will become the Current Ad. On the return page after submission, Providers will be redirected to a page where they can preview their current Ad.

11. Report a Problem



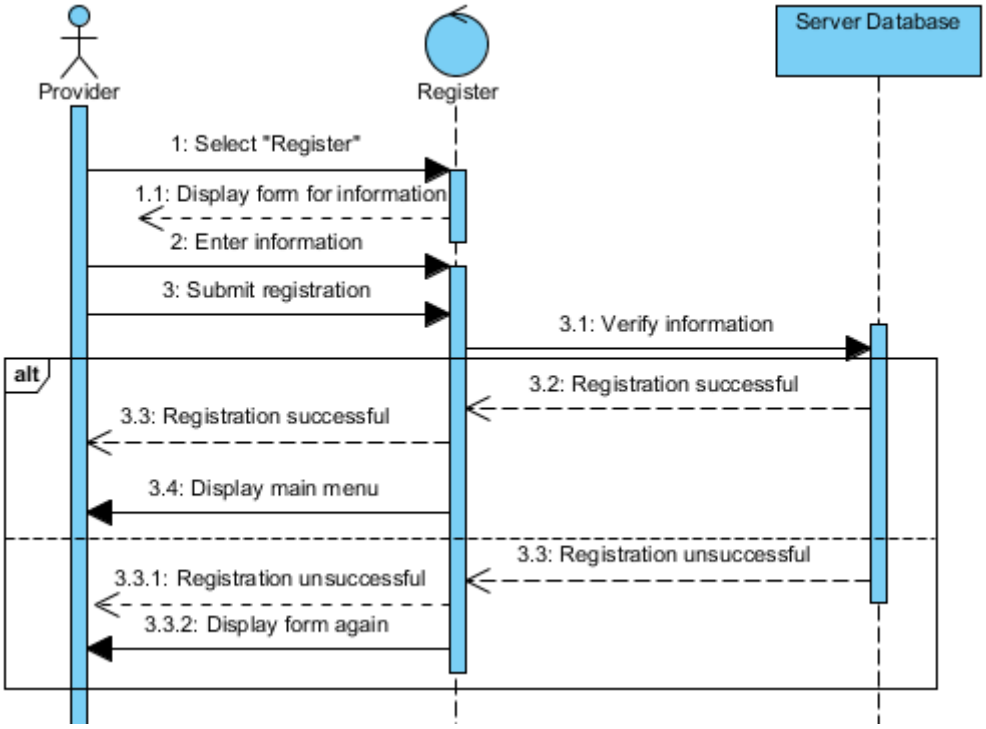
The user (can be a Provider or Consumer) selects the option “Report a Problem.” The user is directed to a form, which they can fill out to explain the problem they experienced. Once the user has filled out the form, they can select “Submit” in order to submit the form, which will send an email to Promo*Pass.* A message is displayed telling the user that his or her problem has been reported. The user also has the option to select “Cancel” and return to the previous menu.

12. Login



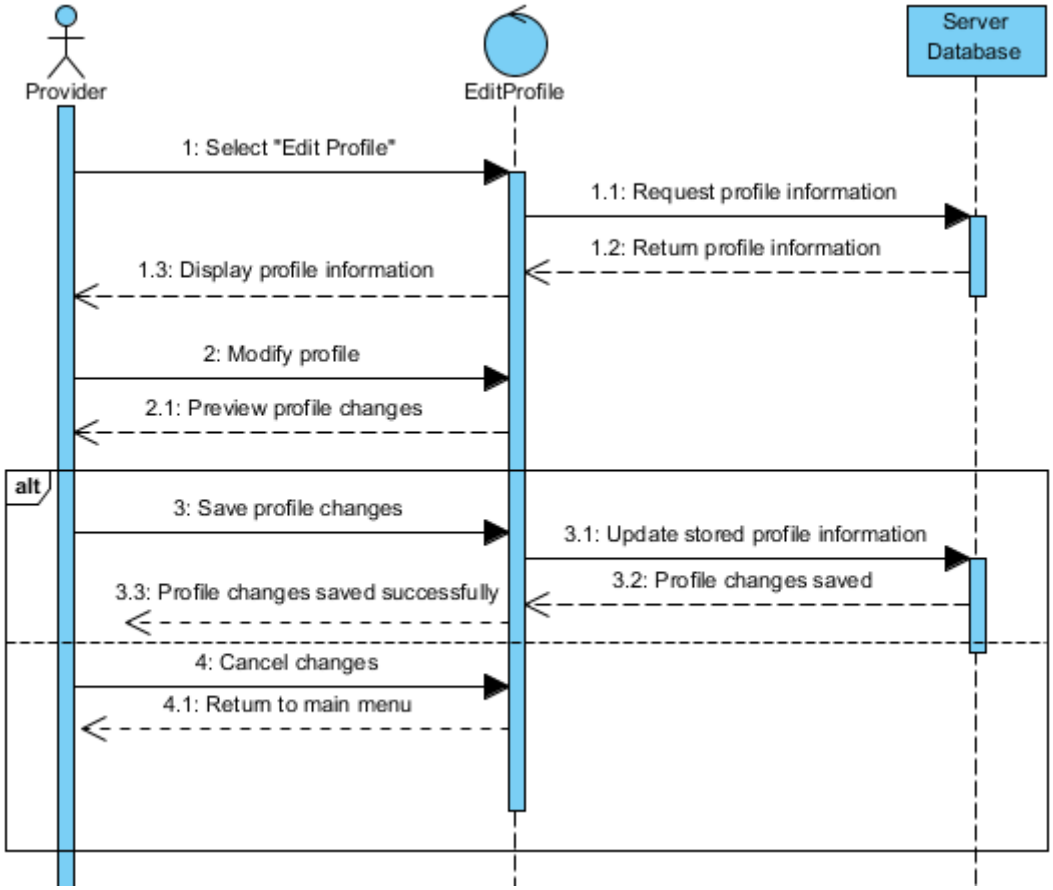
The Providers will have to enter their login details (their email and password) on the Login page. This information is sent to UserApp, which will handle all the authentication on the website. If the login is successful, UserApp will hand back a user token to the website, including such details such as the user's unique id, which can then be saved to the server database to later be associated with the Provider's Ads, Business details, and preferences. If the login is a failure, meaning that the Provider has entered the incorrect password, email, or hasn't been registered, the website will show the Provider an error page corresponding to the specific error.

13. Register



If Providers have not yet registered for an account, they must do so before they can Login. The Providers select “Register” and are directed to a form they must fill out with their account information. Once the form is filled out, the Providers can submit the form. The information entered must be verified. If the information verification is successful, the Providers are allowed to login. If the information verification is unsuccessful, a message is displayed telling the Providers that their registration was unsuccessful. The Providers must correctly enter their information into the form and try again.

14. Edit Profile



If Providers wishes to change their account information, they can select “Edit Profile.” The Provider’s information is retrieved from the Server Database and displayed in an editable form. The Providers can then modify their profile information and preview changes. The Providers can then choose to save changes to their profile, and the modified profile information will be stored in the Server Database. After the information is stored successfully, a message will be displayed telling the Providers that their changes have been saved successfully. The Providers can also choose to cancel changes to their profile, in which case none of the profile information will be updated, and the Providers will be directed back to the previous menu.