Socialize GPS Application

Team 02
Dylan Kehres & Michael Schott

Customer Requirements

Objective:

Create a software application that integrates GPS navigation with social media aspects that promotes usage through gamification.

Functions :

- Navigation
- Map Viewing
- Finding locations
- View Points of Interest (Gamification Aspect)
- Leave Feedback at Points of Interest
- Edit Account Settings
- Receive Help
- Show Location History of User
- Allow User to Save Places They Like Most
- View Leaderboards (Gamification Aspect)
- Add/Remove Friends
- Allow Friendly Competition
- Show User's Gamer Score (Gamification Aspect)
- Show User's Achievements (Gamification Aspect)
- View Friends' Scores/Achievements (Gamification Aspect)

Supporting Systems of the Software:

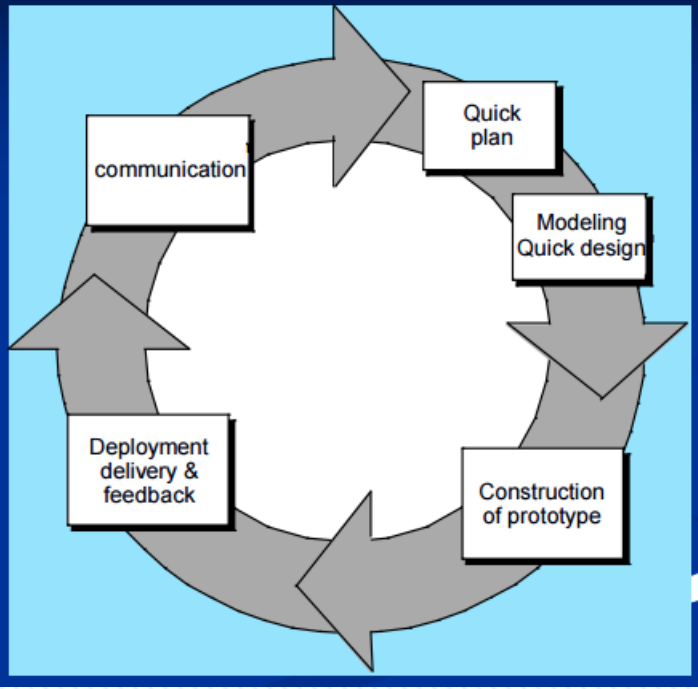
The software application should be supported on mobile operating systems, beginning with iOS and Android and, should funds permit, other mobile operating systems as well. There is no need for this application to be integrated with PC operating systems such as Windows. The application should have internet capabilities and must have access to the User's location in order to operate. It is to be written in JavaScript.

System Constraints:

1. The application will need internet connectivity to run smoothly. This will cause certain regions to be inaccessible to certain players depending on their mobile carrier due to the varying coverages of each phone company. For example, one Point of Interest may be accessible to Users using Verizon or Sprint as their mobile providers but inaccessible to AT&T users. This could create the potential for an unfair game.
2. The Mobile Device must has a GPS unit.
3. The Software System should take between 112-124 man months to complete.
4. The budget for the development of the system is $1,000,000.

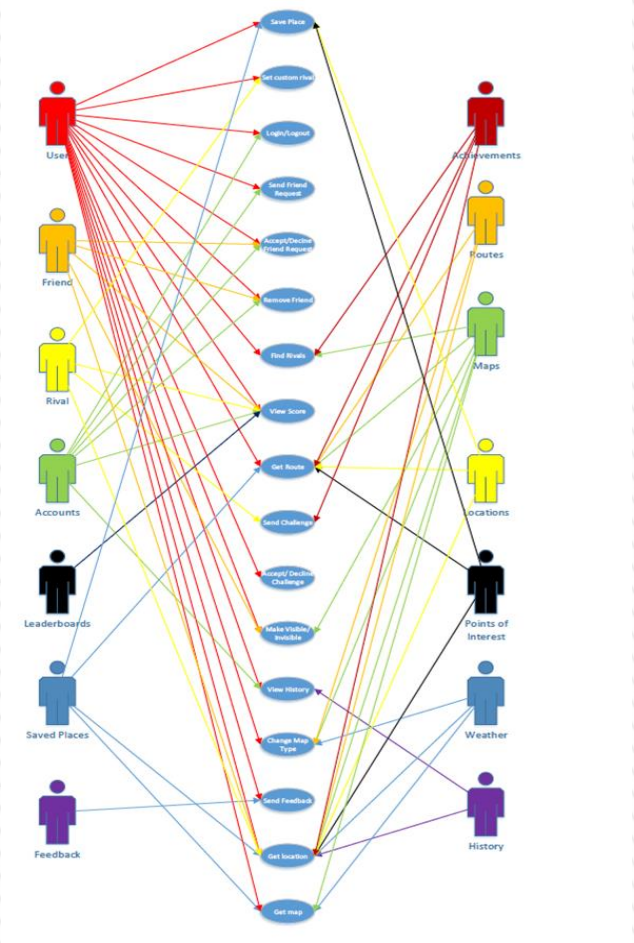
Software Engineering Process Model

Evolutionary Process Flow: A Prototyping Model

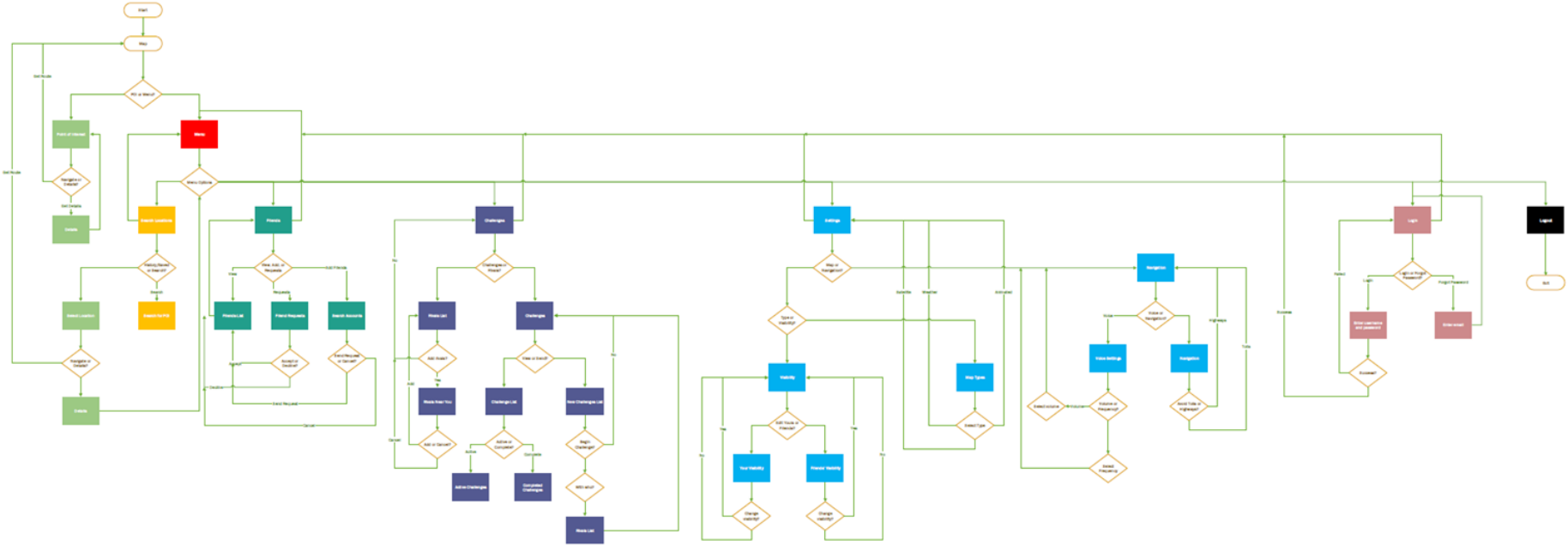


- Our software is blending social media and GPS navigation with a gaming aspect; therefore it is critical that the User is enjoying the product.
- Users will be able to provide us with important feedback on aspects of our application such as the GUI; which is critical as our application must be user friendly.
- Users will also be able to let us know what features need to be added in future updates of the application that will enhance the User's experience.

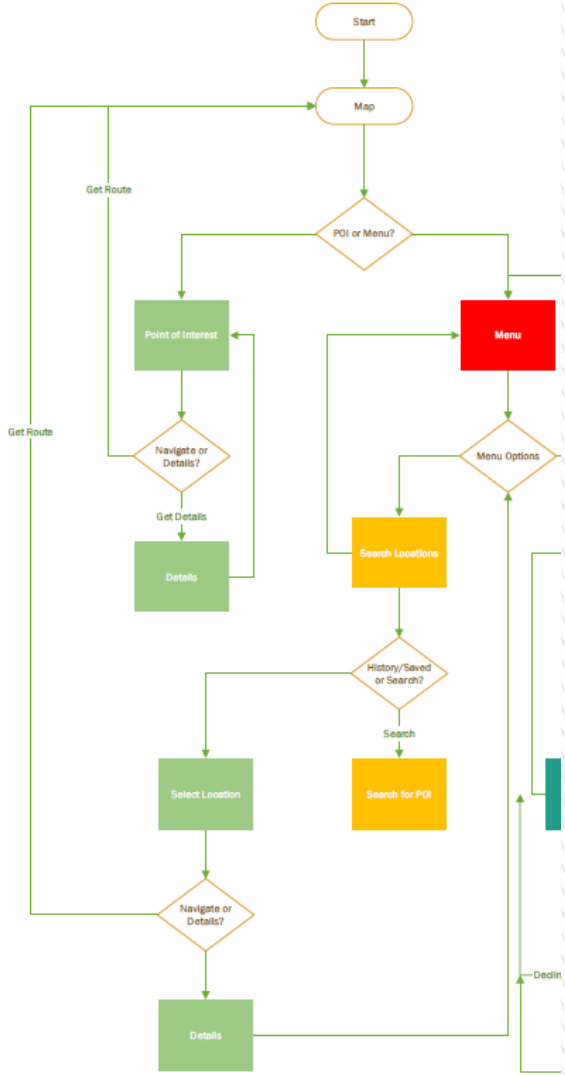
Use Case Diagram



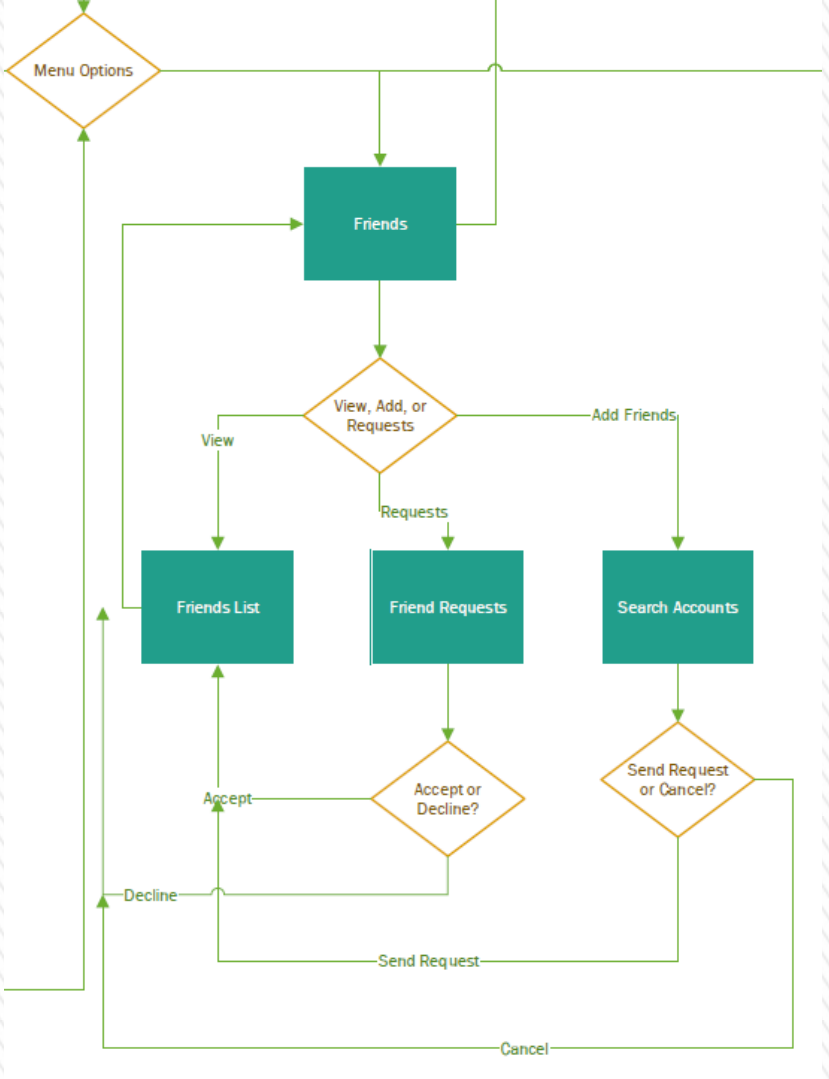
Activity Diagram



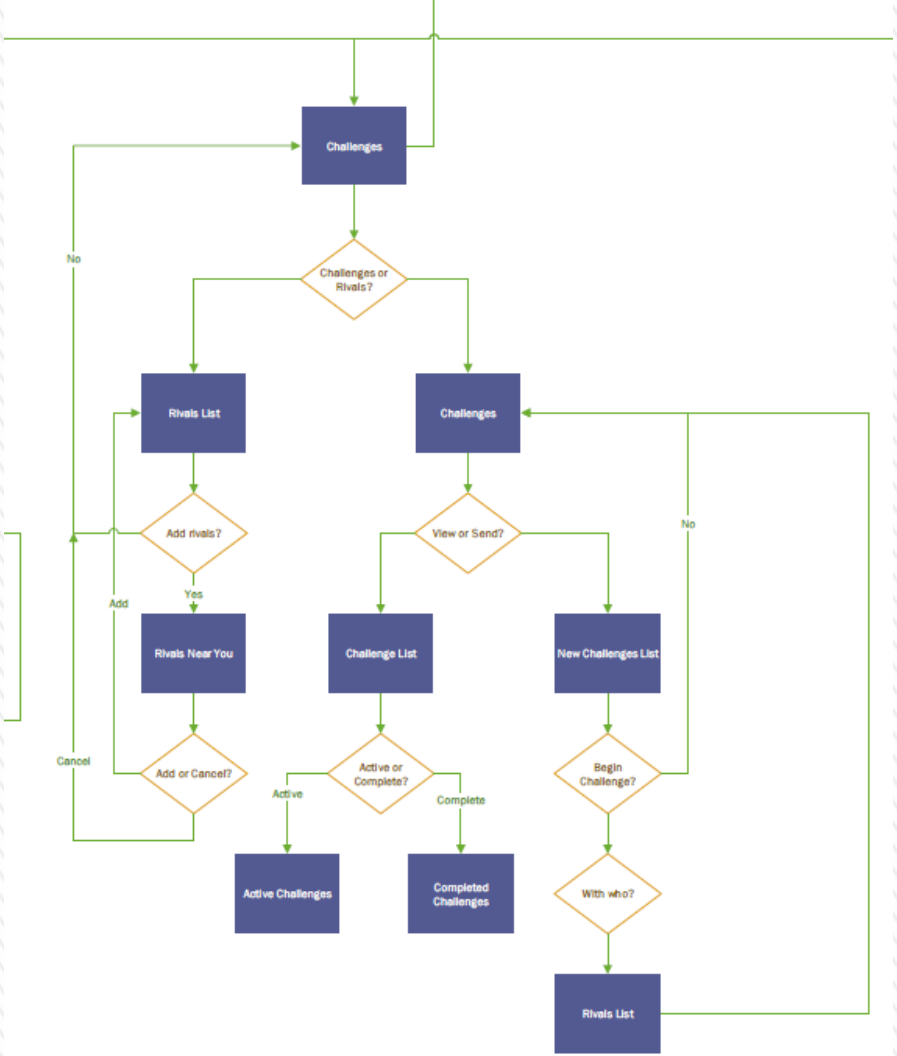
Activity Diagram Part 1



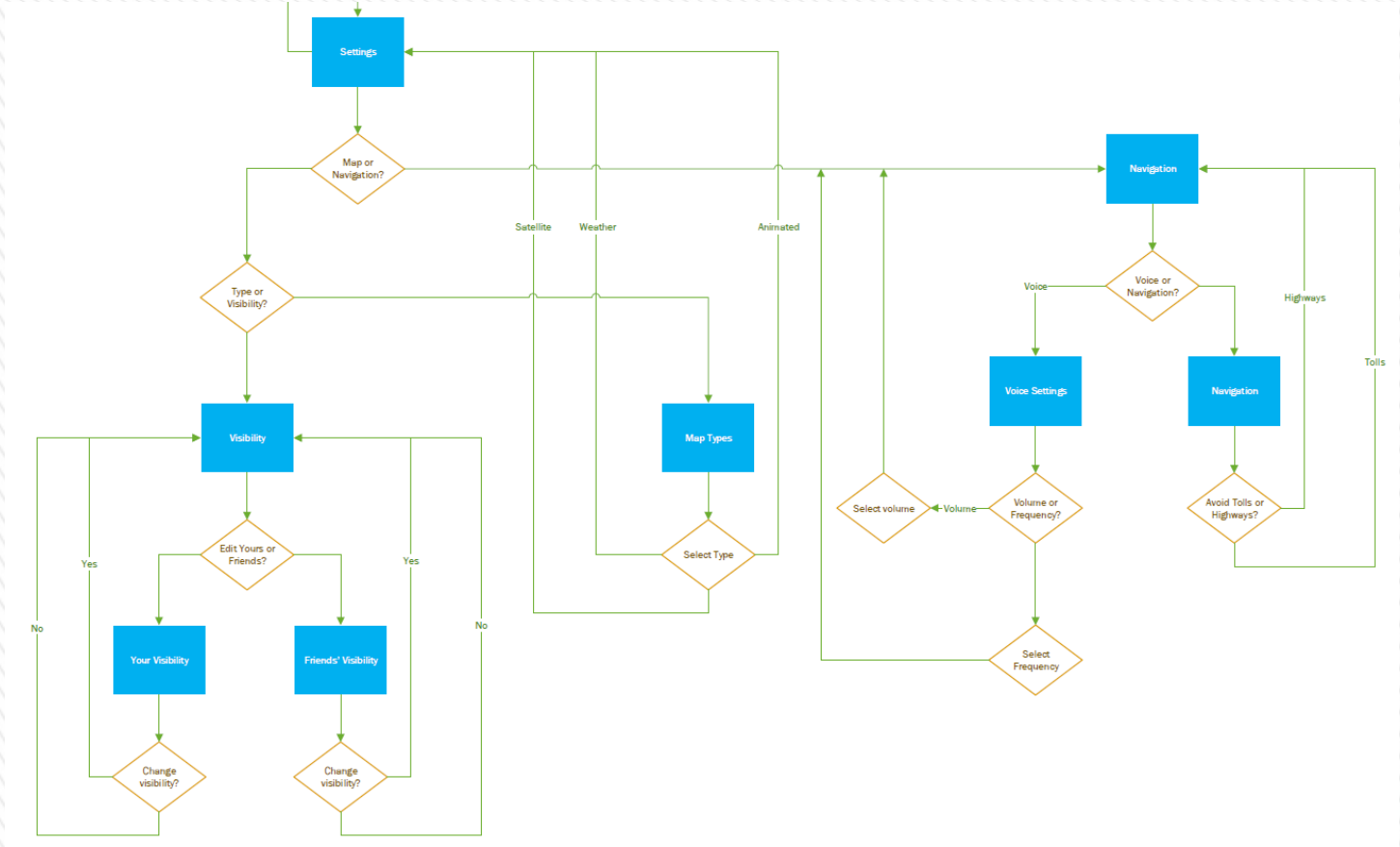
Activity Diagram Part 2



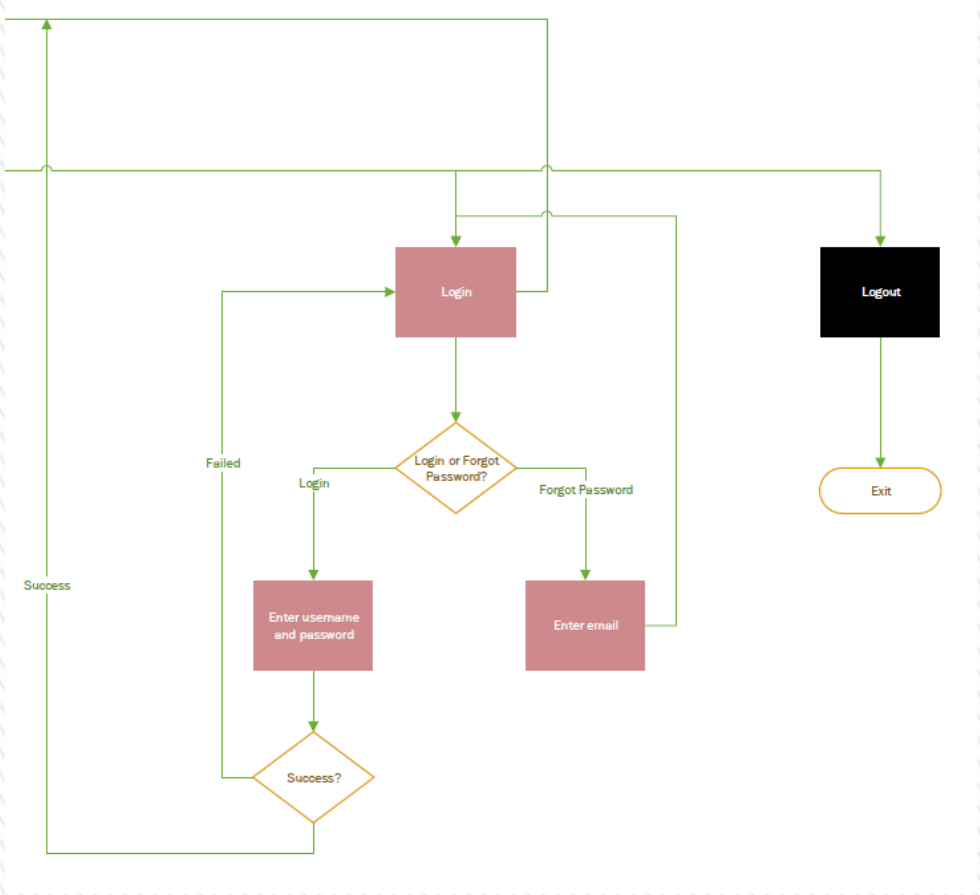
Activity Diagram Part 3



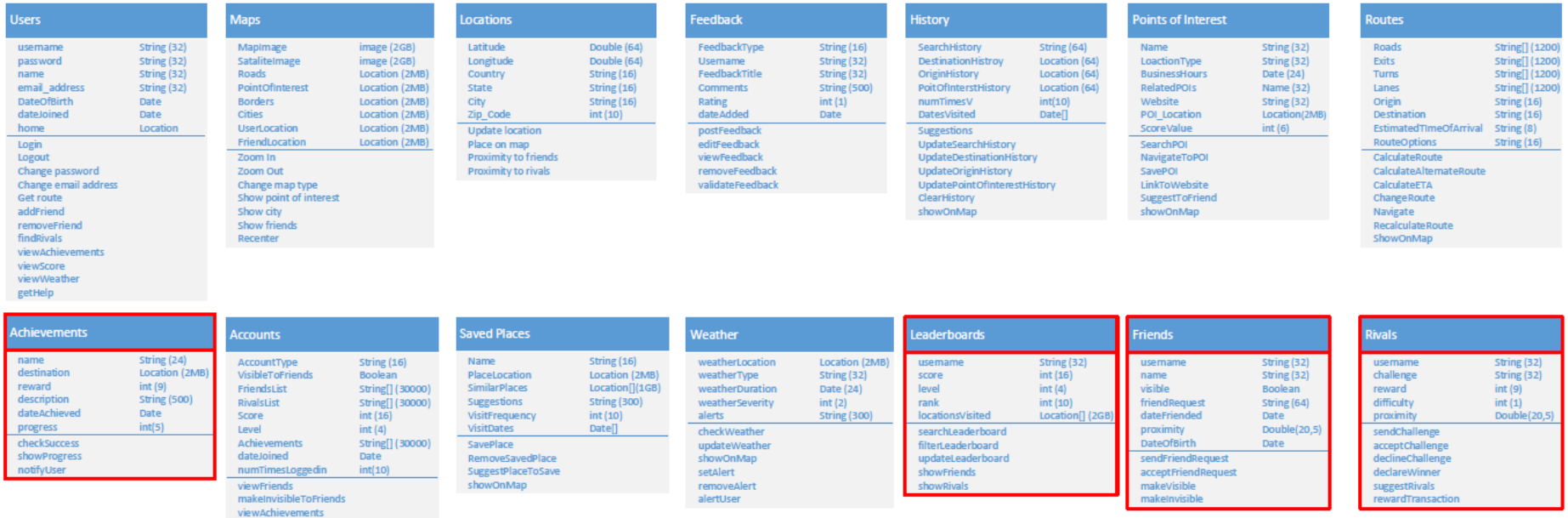
Activity Diagram Part 4



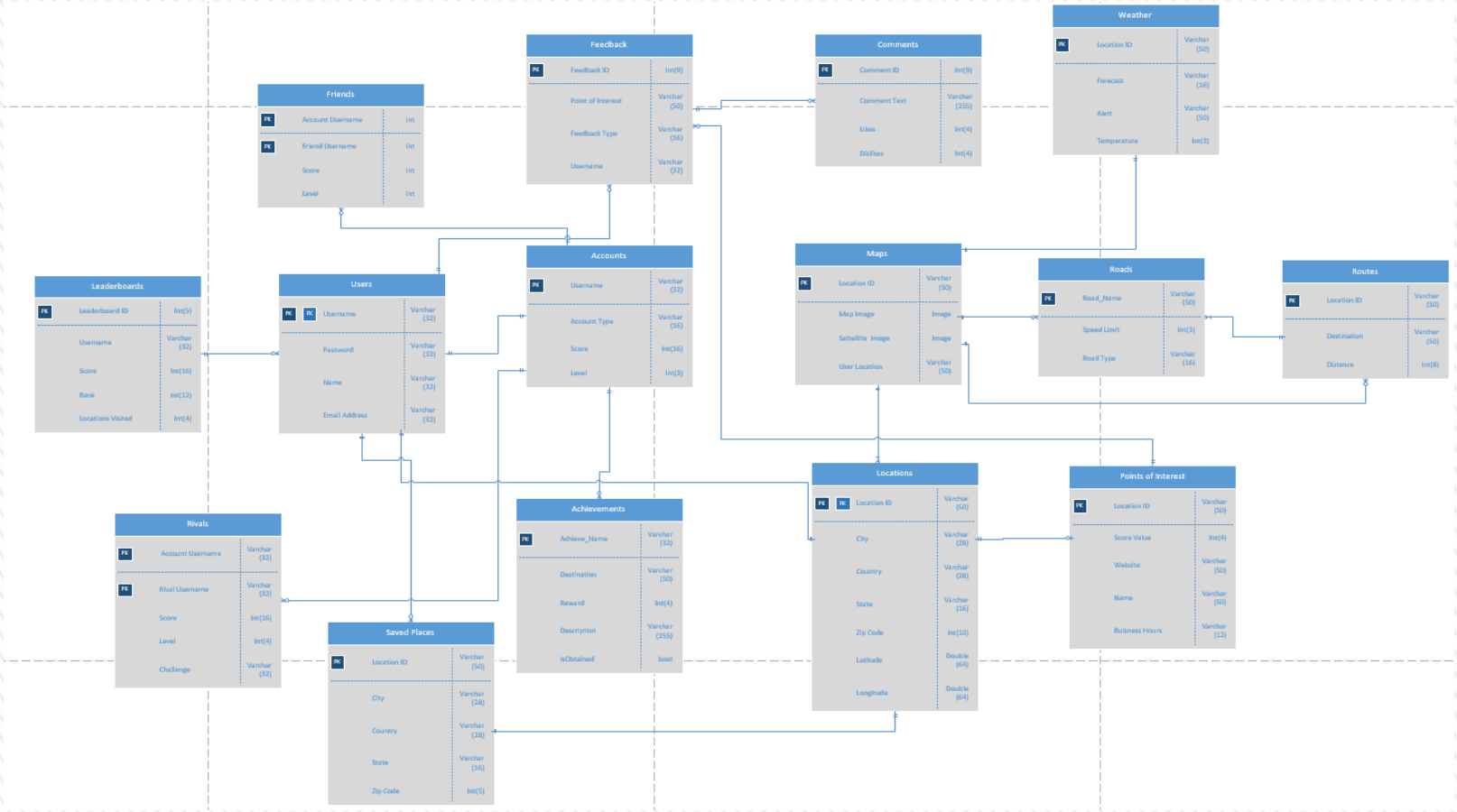
Activity Diagram Part 5



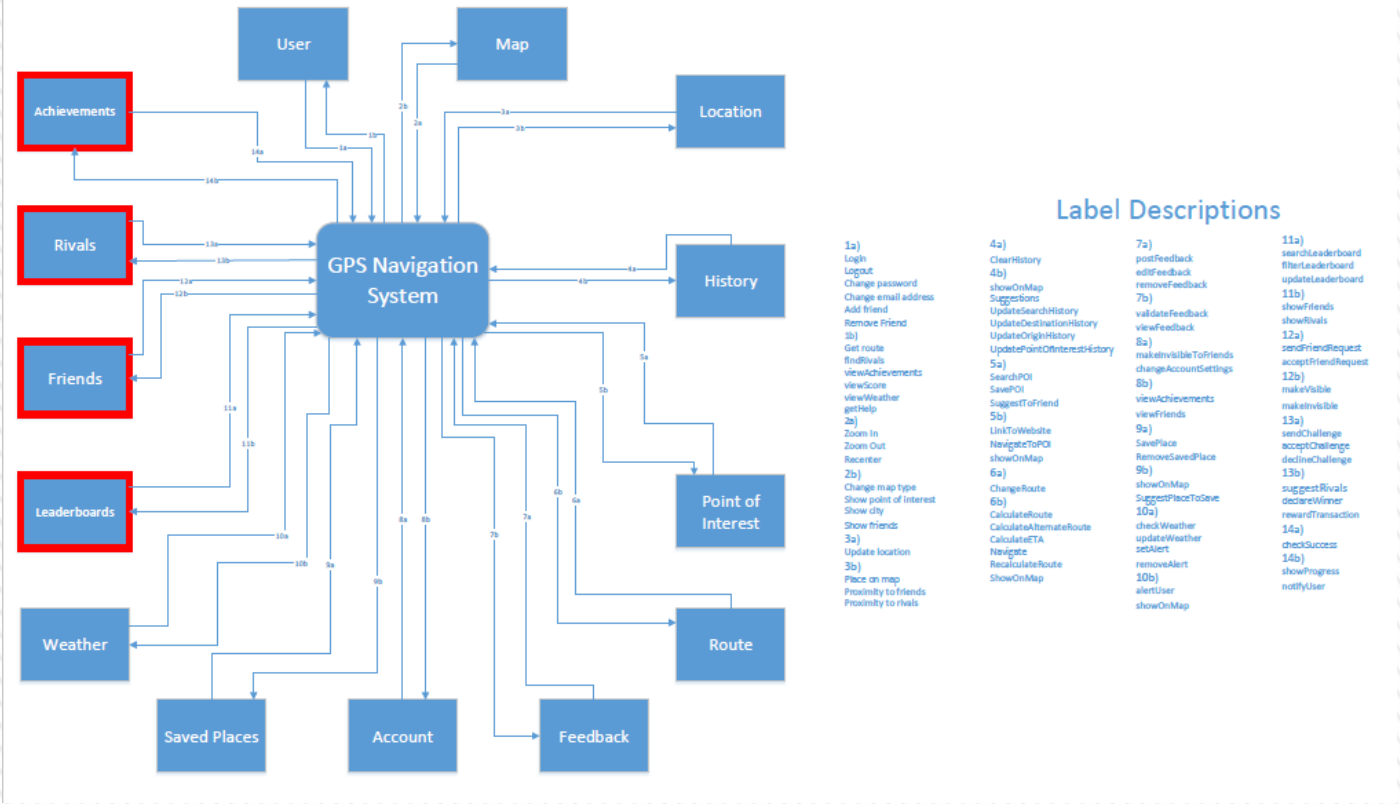
Class Object Diagram



Optional ERD



Context Dataflow Diagram



Context DFD Label Descriptions

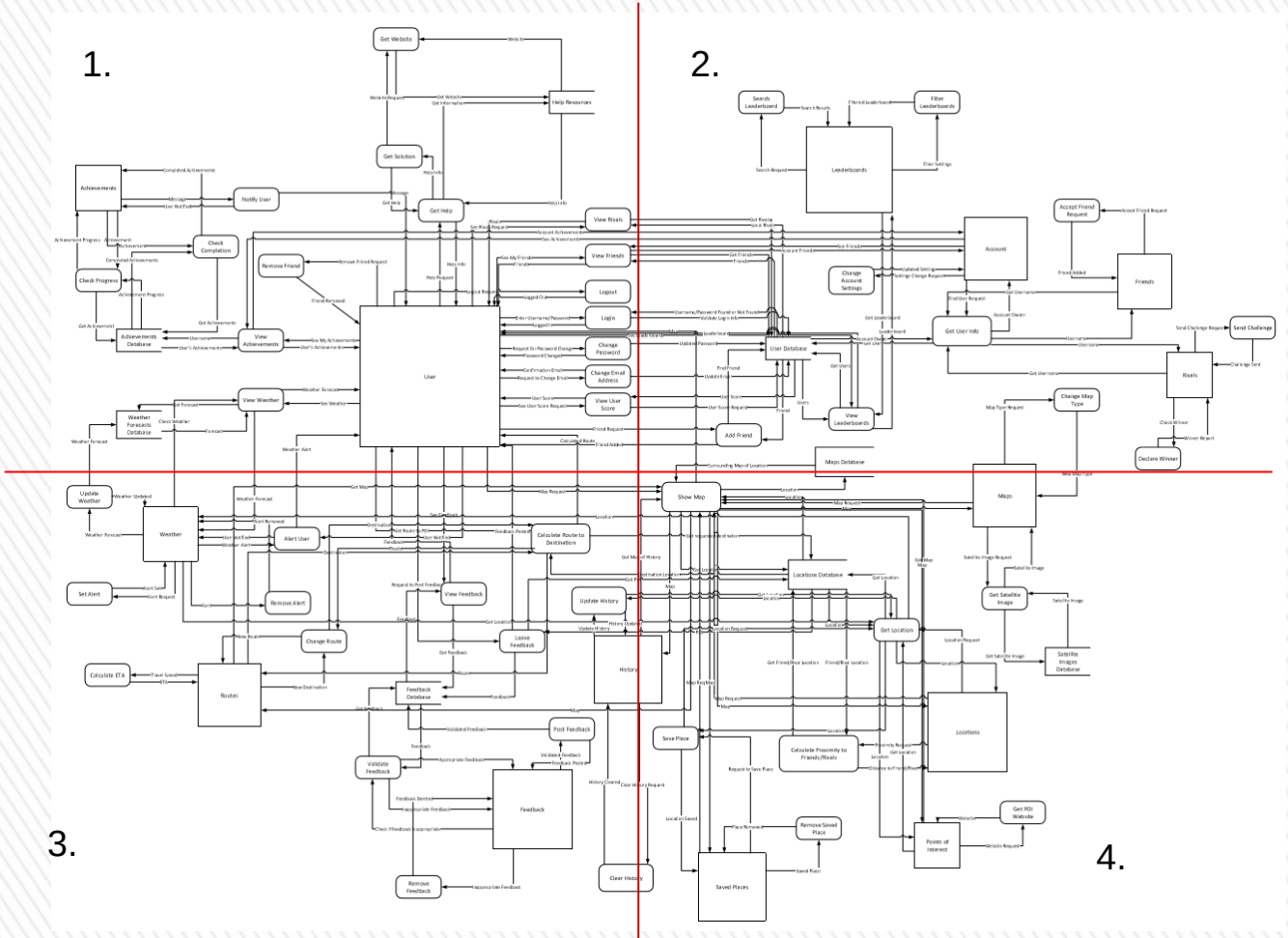
1a)
Login
Logout
Change password
Change email address
Add friend
Remove Friend
1b)
Get route
findRivals
viewAchievements
viewScore
viewWeather
getHelp
2a)
Zoom In
Zoom Out
Recenter
2b)
Change map type
Show point of interest
Show city
Show friends
3a)
Update location
3b)
Place on map
Proximity to friends
Proximity to rivals

4a)
ClearHistory
4b)
showOnMap
Suggestions
UpdateSearchHistory
UpdateDestinationHistory
UpdateOriginHistory
UpdatePointOfInterestHistory
5a)
SearchPOI
SavePOI
SuggestToFriend
5b)
LinkToWebsite
NavigateToPOI
showOnMap
6a)
ChangeRoute
6b)
CalculateRoute
CalculateAlternateRoute
CalculateETA
Navigate
RecalculateRoute
ShowOnMap

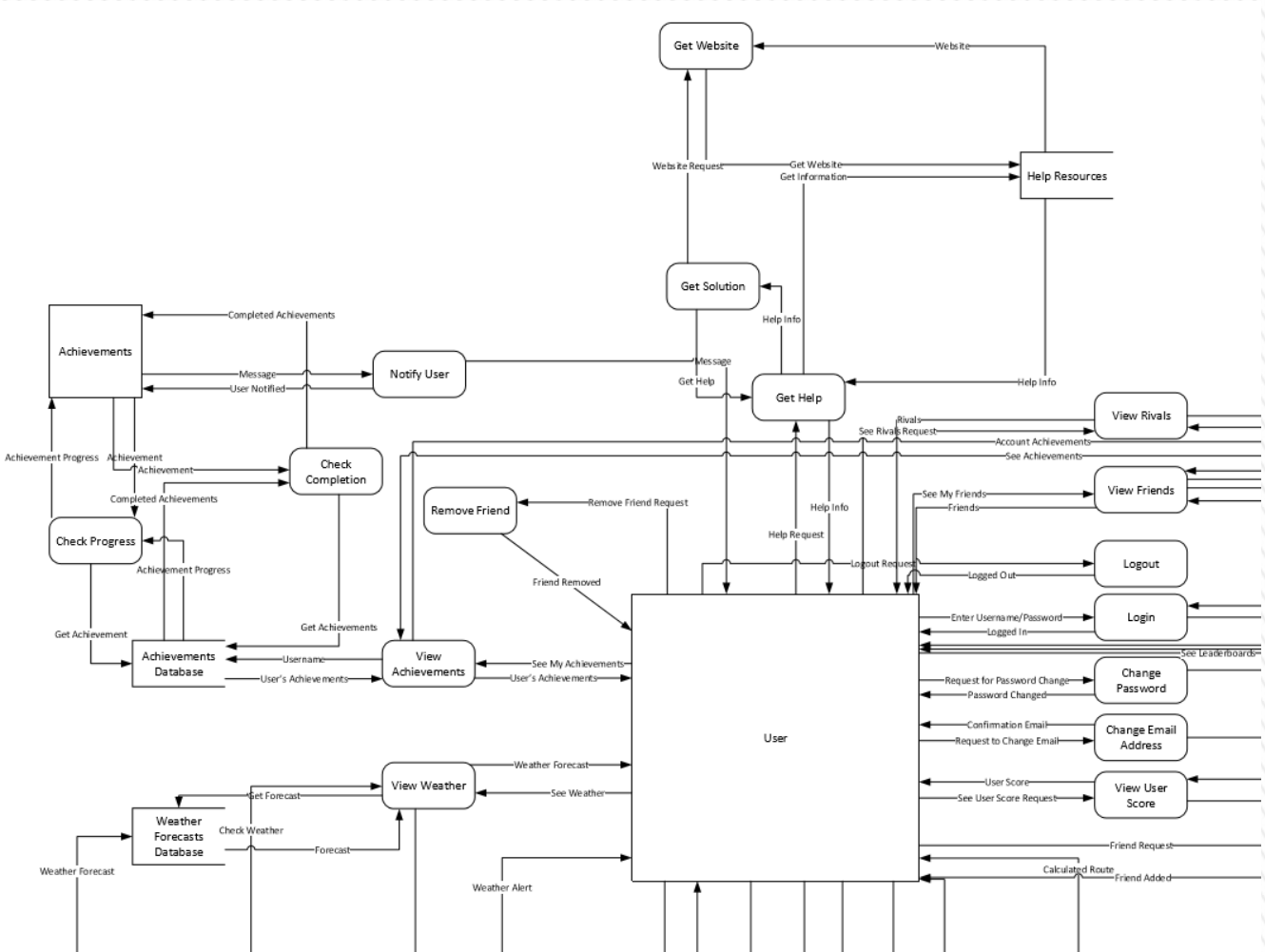
7a)
postFeedback
editFeedback
removeFeedback
7b)
validateFeedback
viewFeedback
8a)
makeInvisibleToFriends
changeAccountSettings
8b)
viewAchievements
viewFriends
9a)
SavePlace
RemoveSavedPlace
9b)
showOnMap
SuggestPlaceToSave
10a)
checkWeather
updateWeather
setAlert
removeAlert
10b)
alertUser
showOnMap

11a)
searchLeaderboard
filterLeaderboard
updateLeaderboard
11b)
showFriends
showRivals
12a)
sendFriendRequest
acceptFriendRequest
12b)
makeVisible
makeInvisible
13a)
sendChallenge
acceptChallenge
declineChallenge
13b)
suggestRivals
declareWinner
rewardTransaction
14a)
checkSuccess
14b)
showProgress
notifyUser

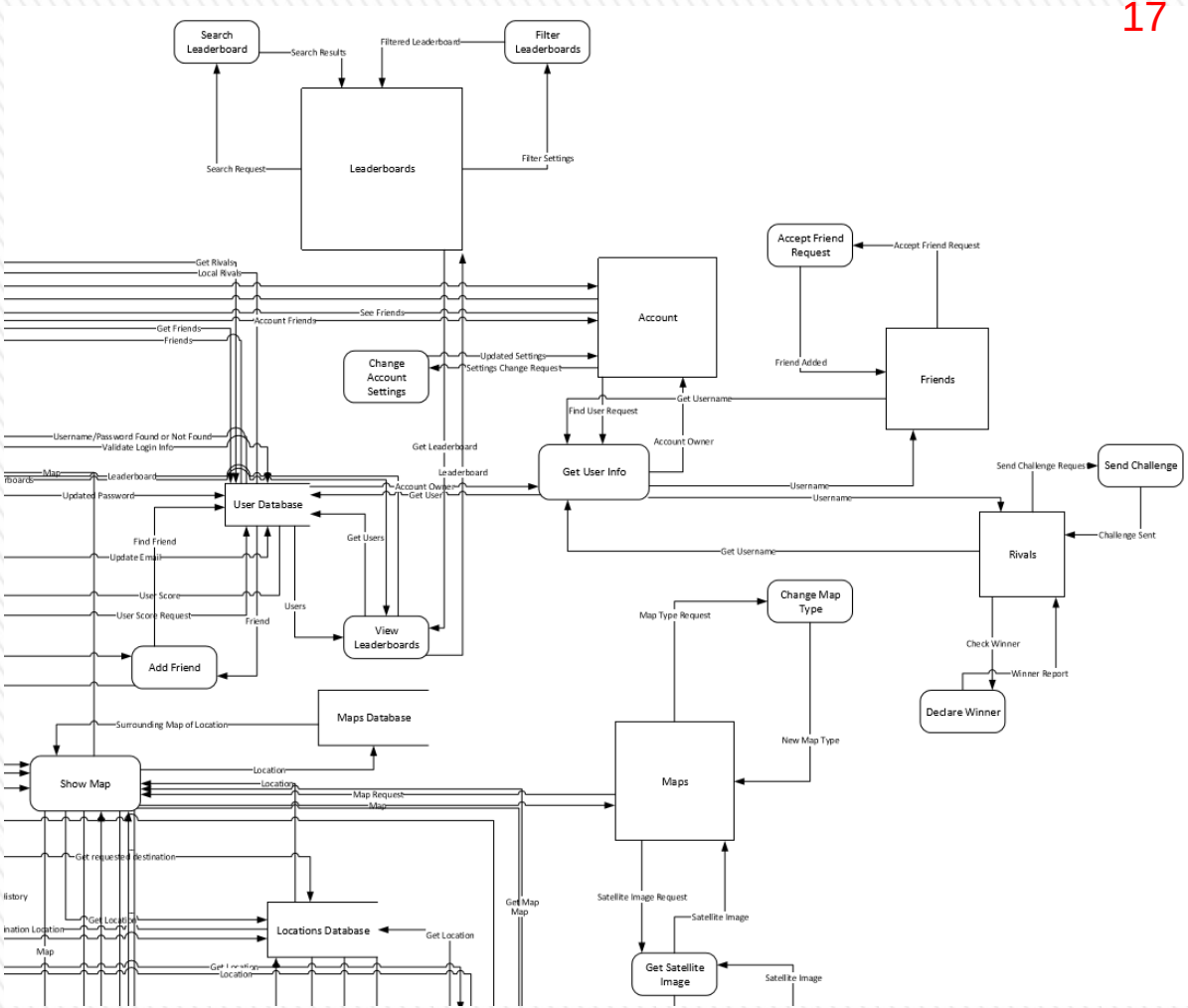
Level-0 Data Flow Diagram



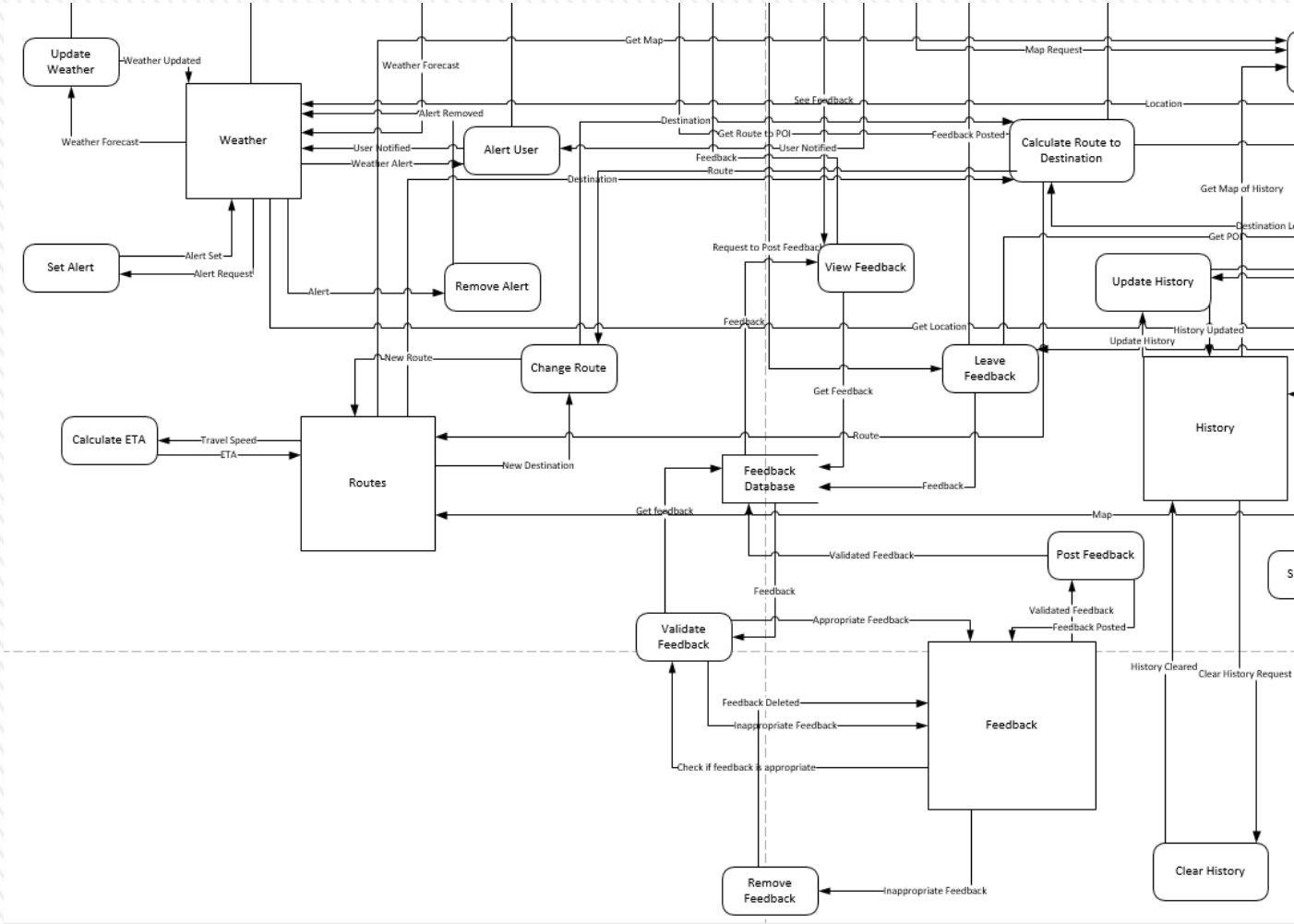
Level-0 DFD Section 1



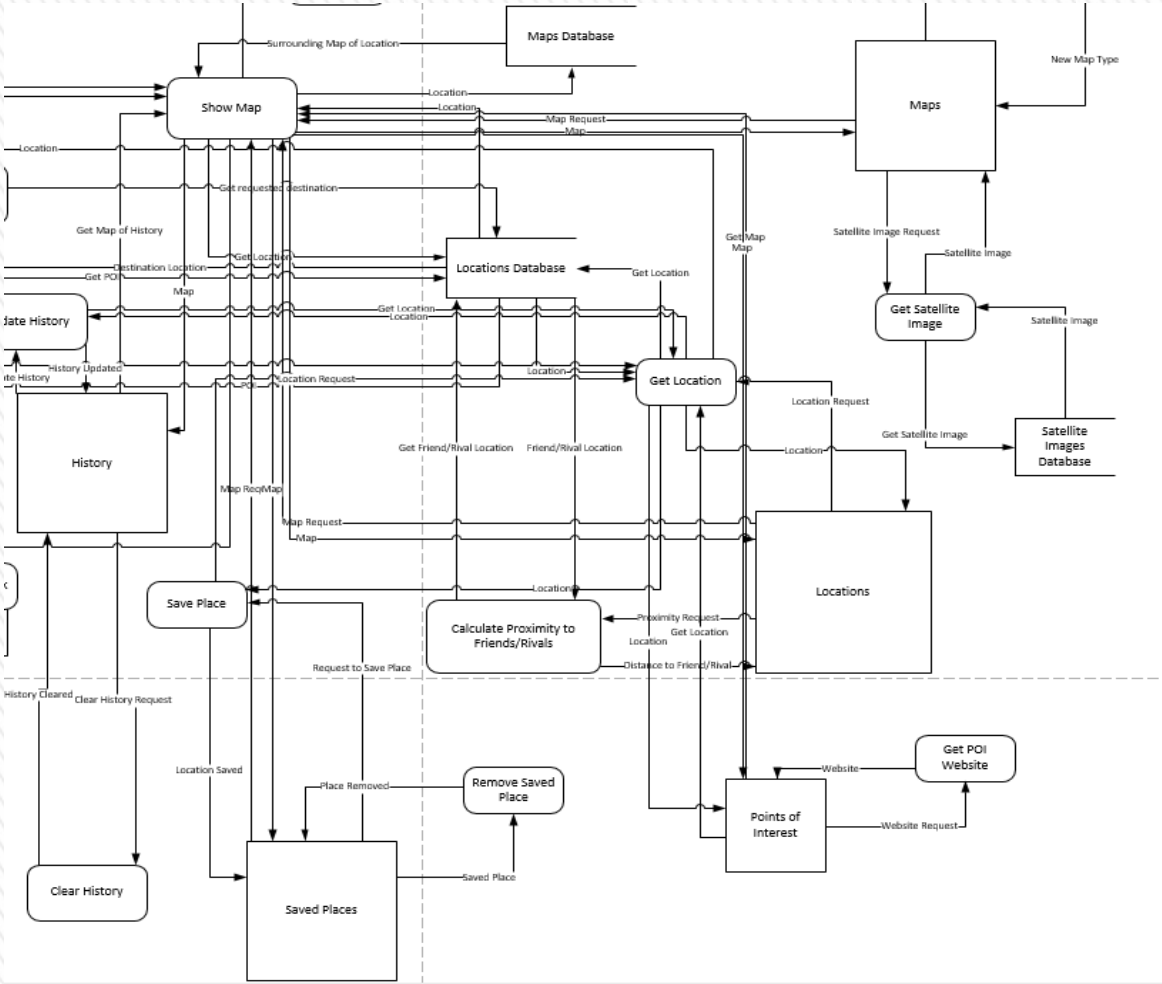
Level-0 DFD Section 2



Level-0 DFD Section 3



Level-0 DFD Section 4



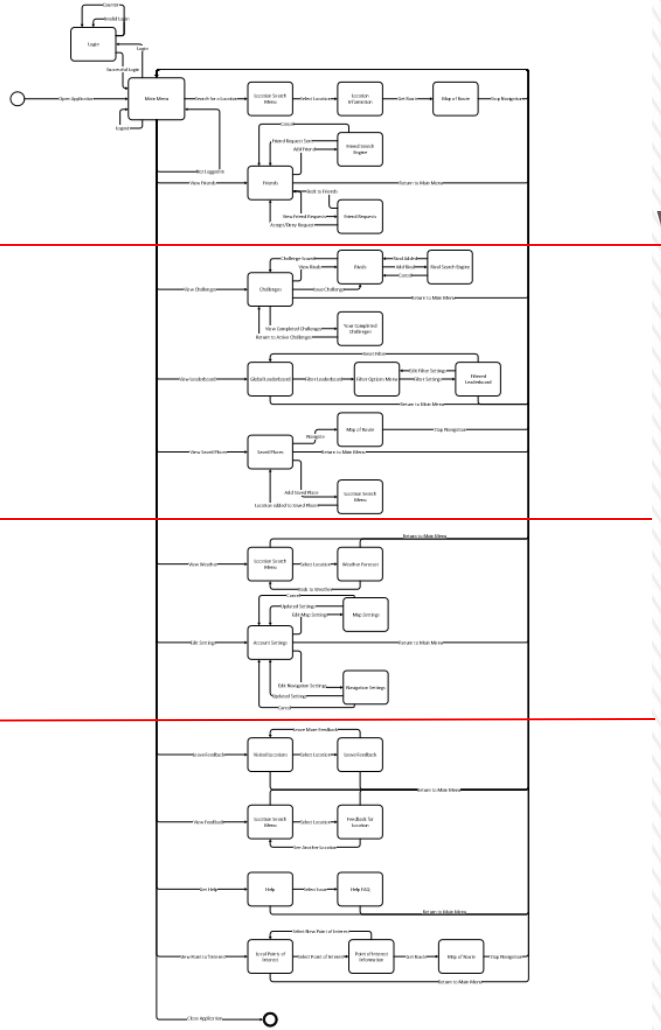
State Transition Diagram

1.

2.

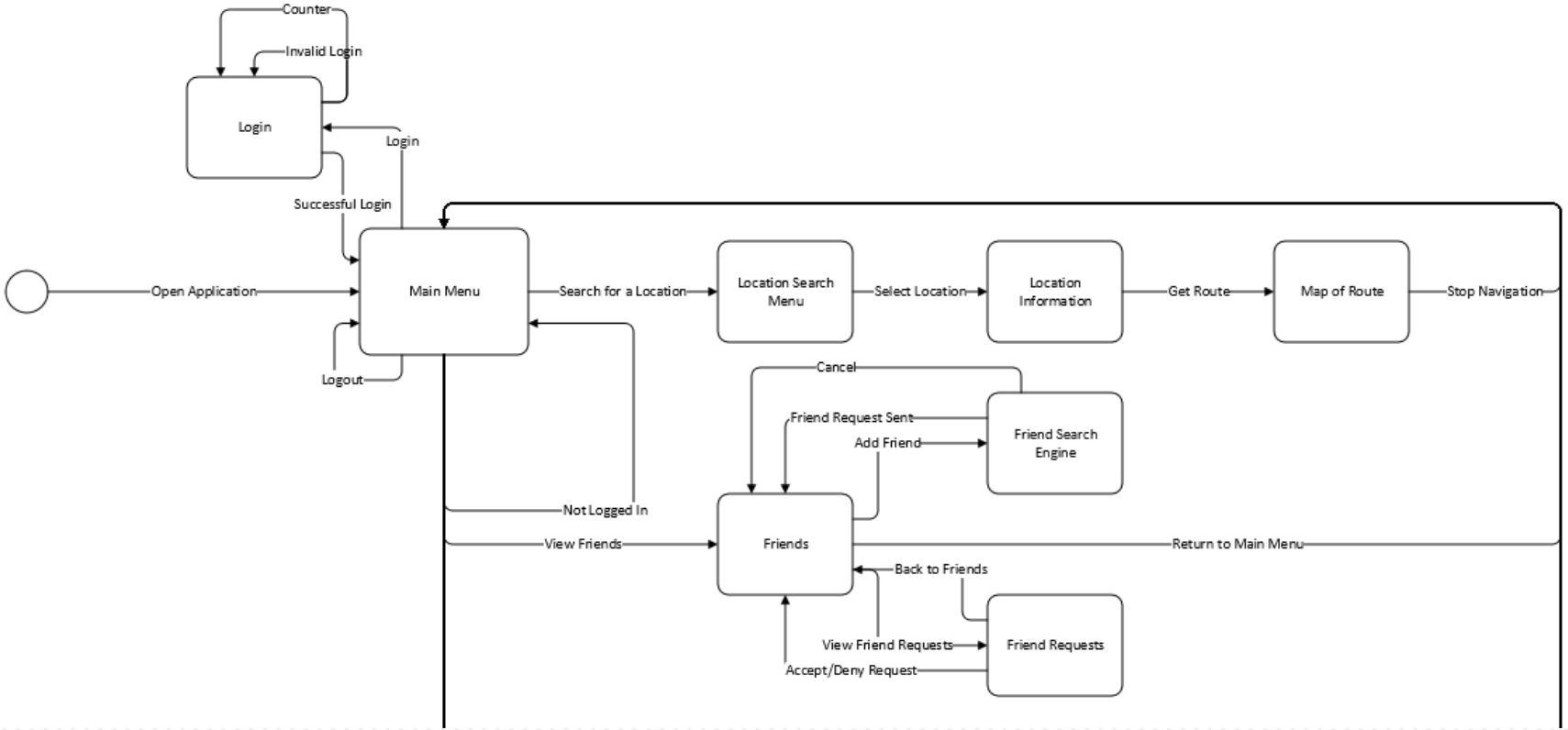
3.

4.

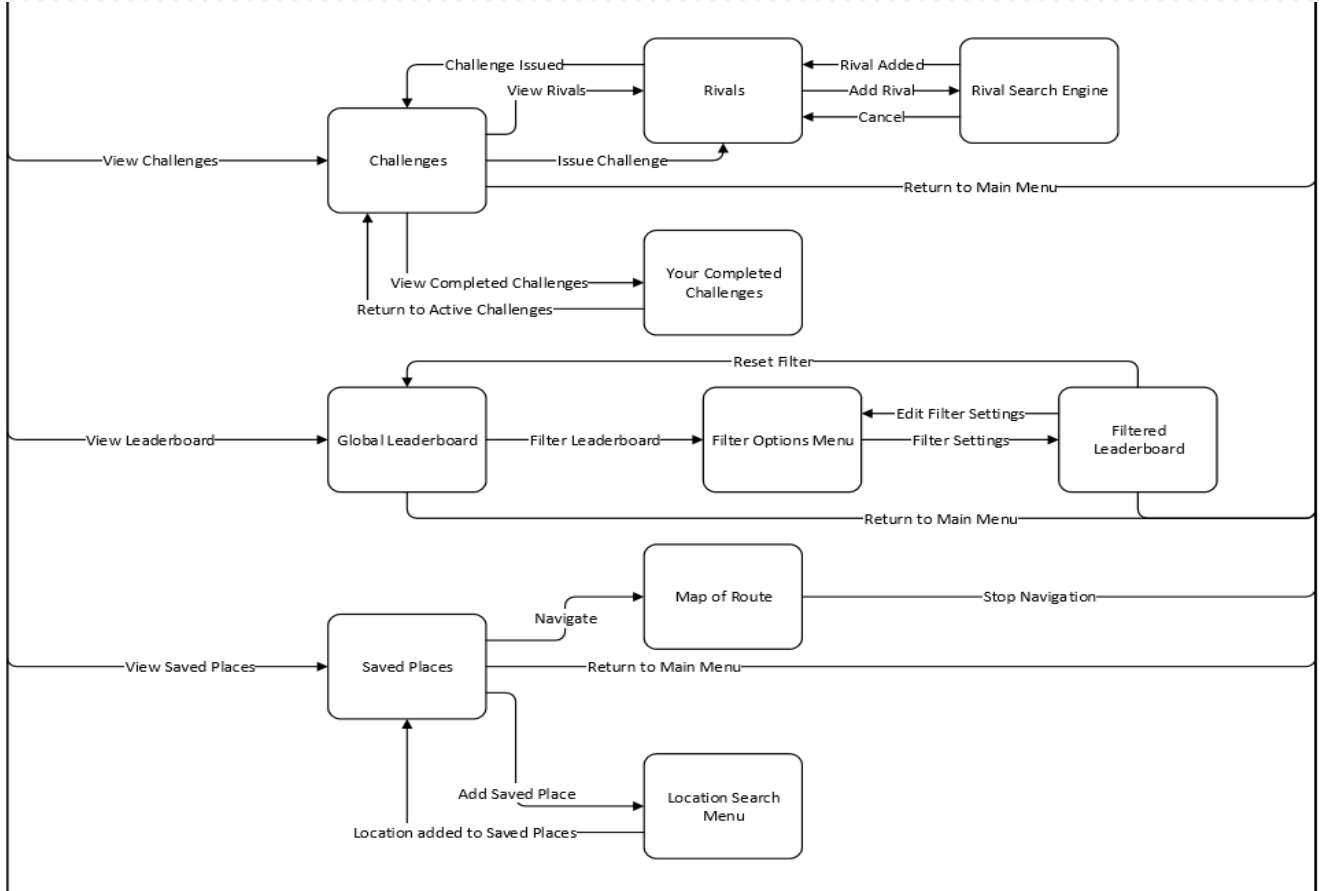


We decided to allow users to access the navigation system without having to log in. In doing so it allows the user to not have their location displayed to their friends and/or rivals that are also using the app; without the user having to change their account settings each time they would like to use the GPS feature in an incognito mode.

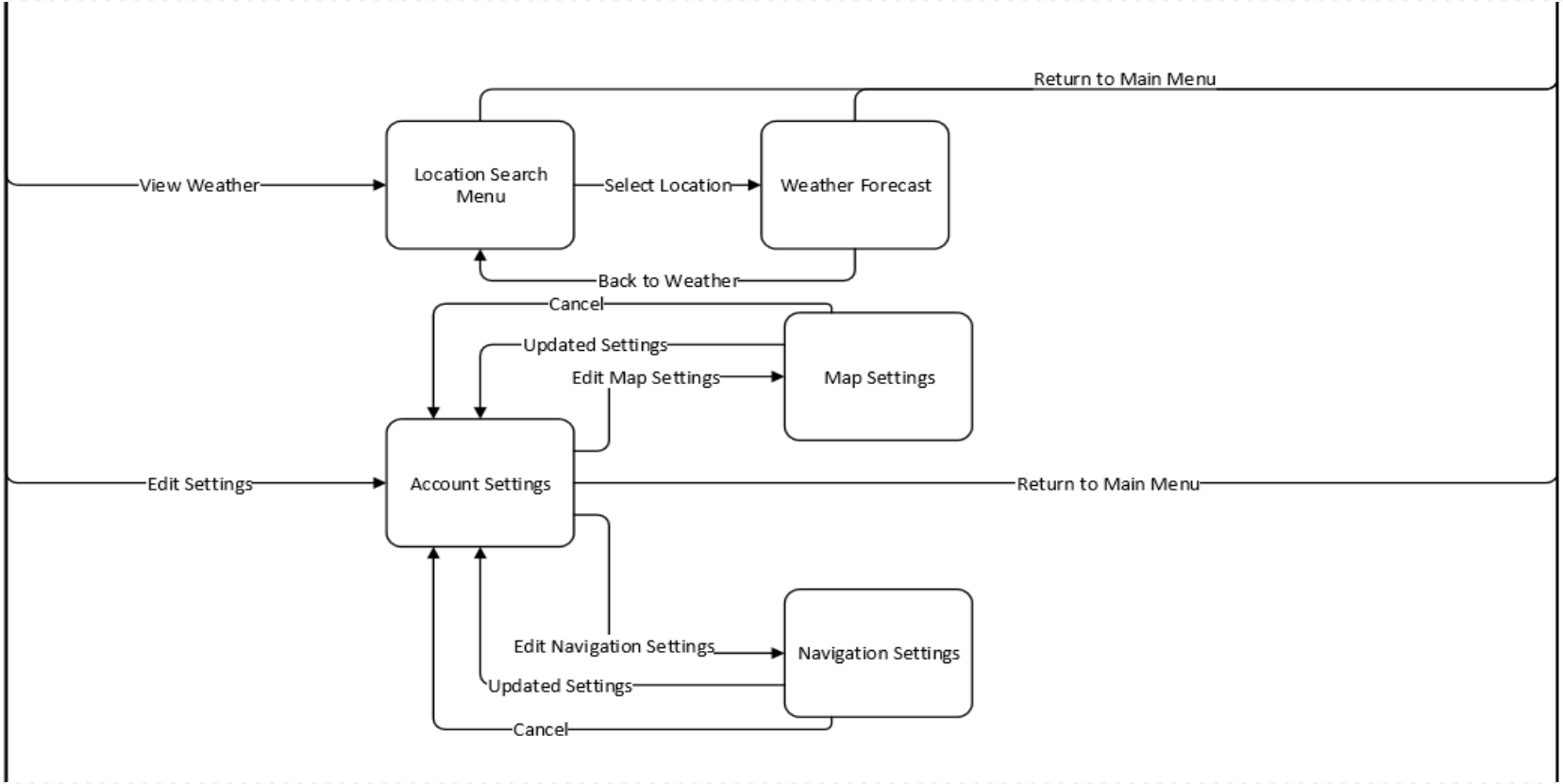
STD (Section 1)



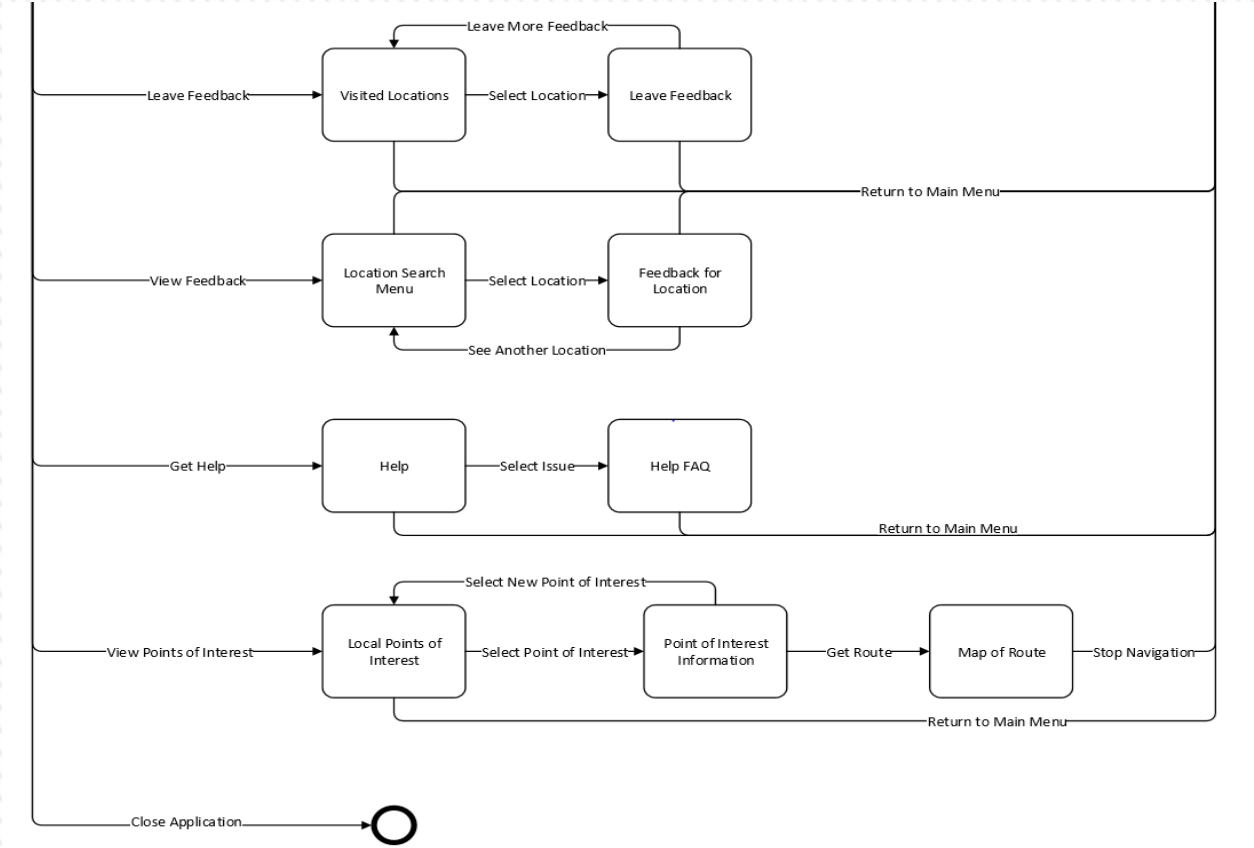
STD (Section 2)



STD (Section 3)



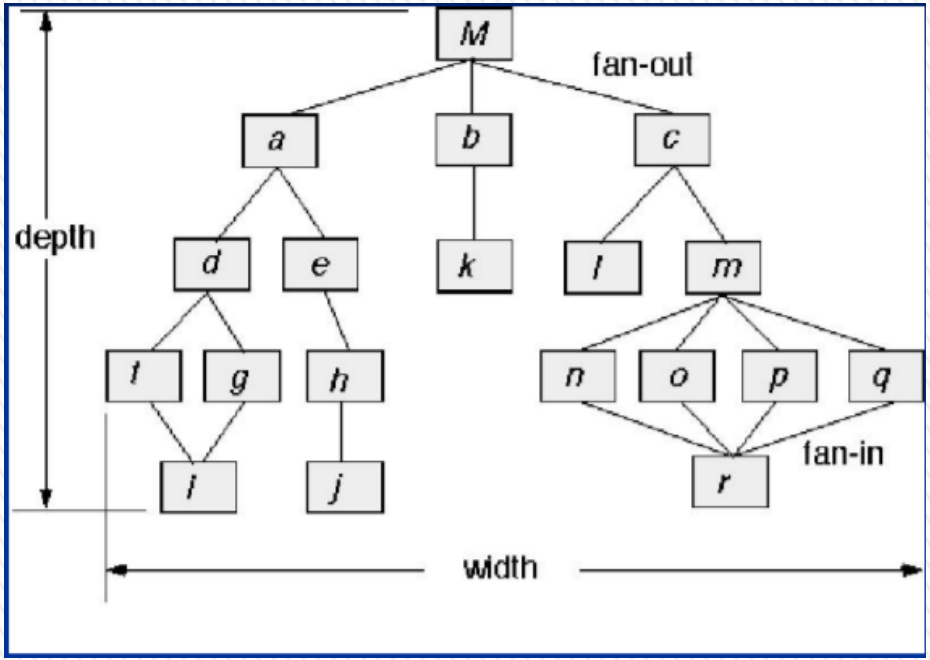
STD (Section 4)



Software Architectural Model

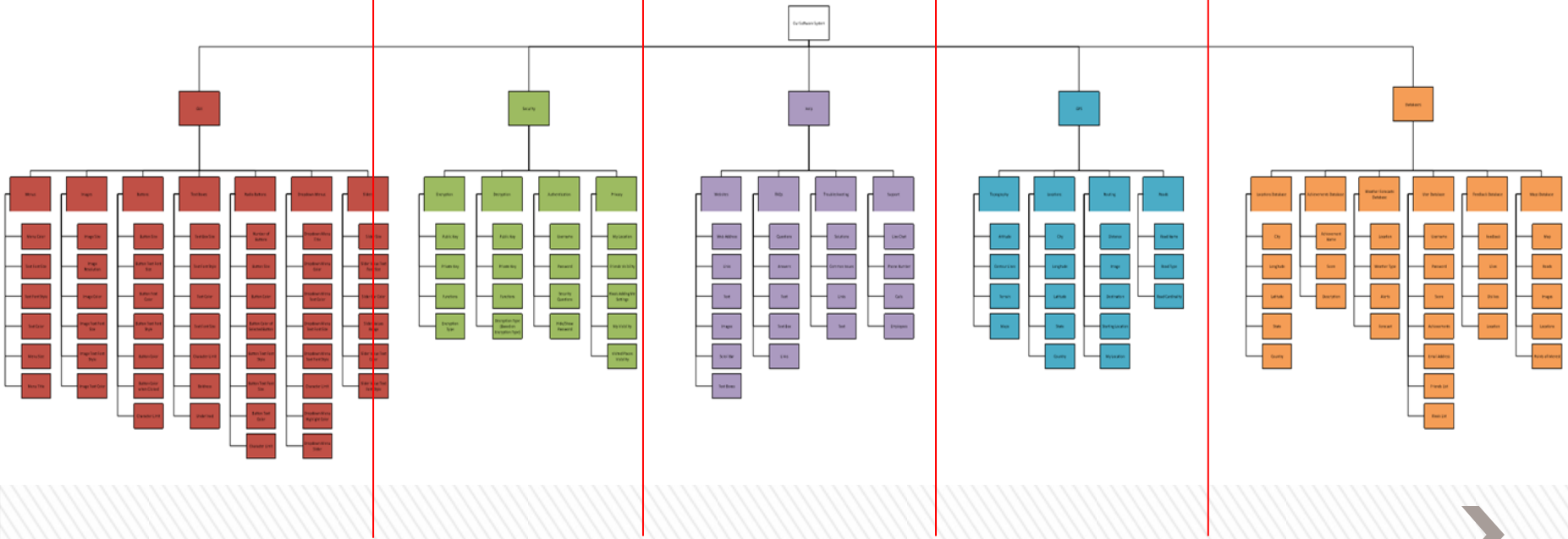
Call and Return Model

- User inputs address to obtain route which is then passed into a subfunction.
- User searches for locations or friends in a data base, and that data is then handled by sub functions.



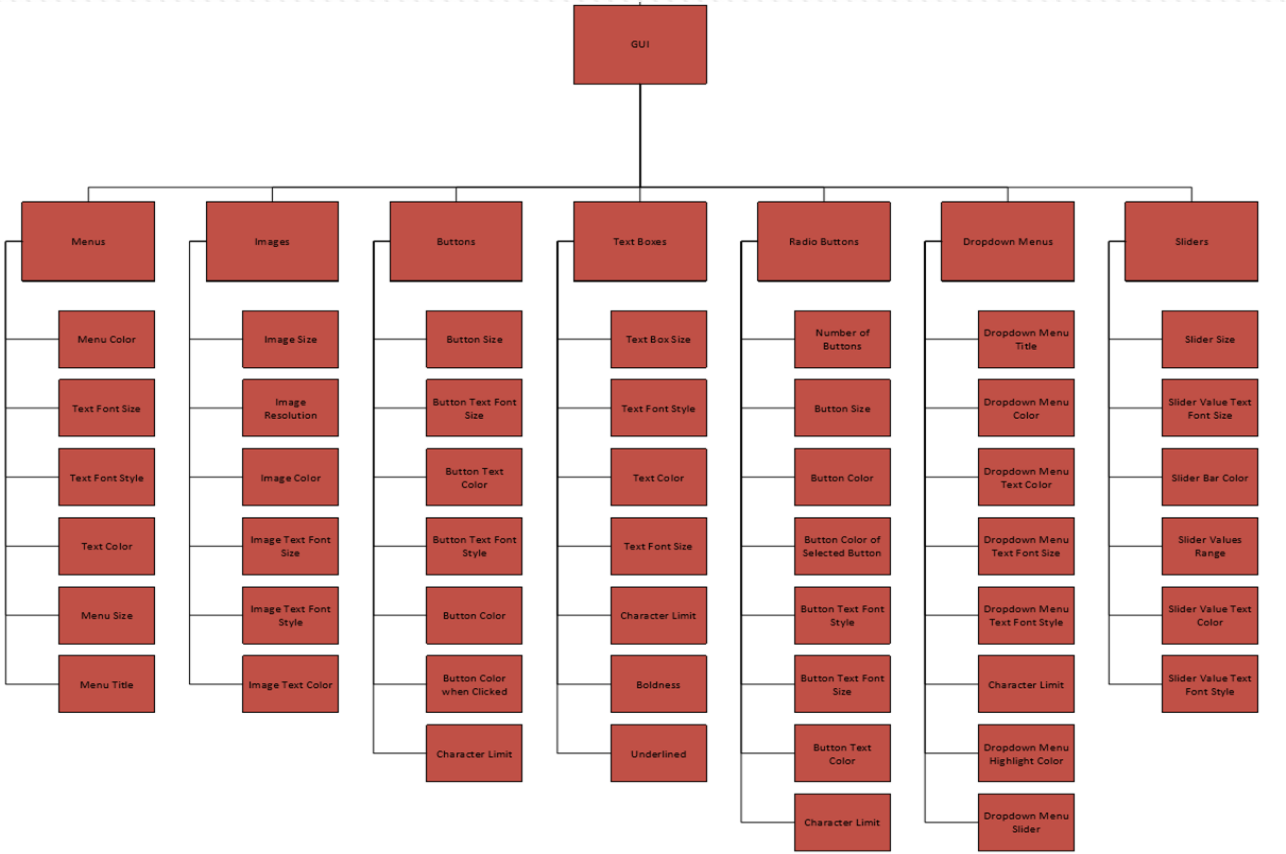
Hierarchical Model (System Architecture)

1. 2. 3. 4. 5.

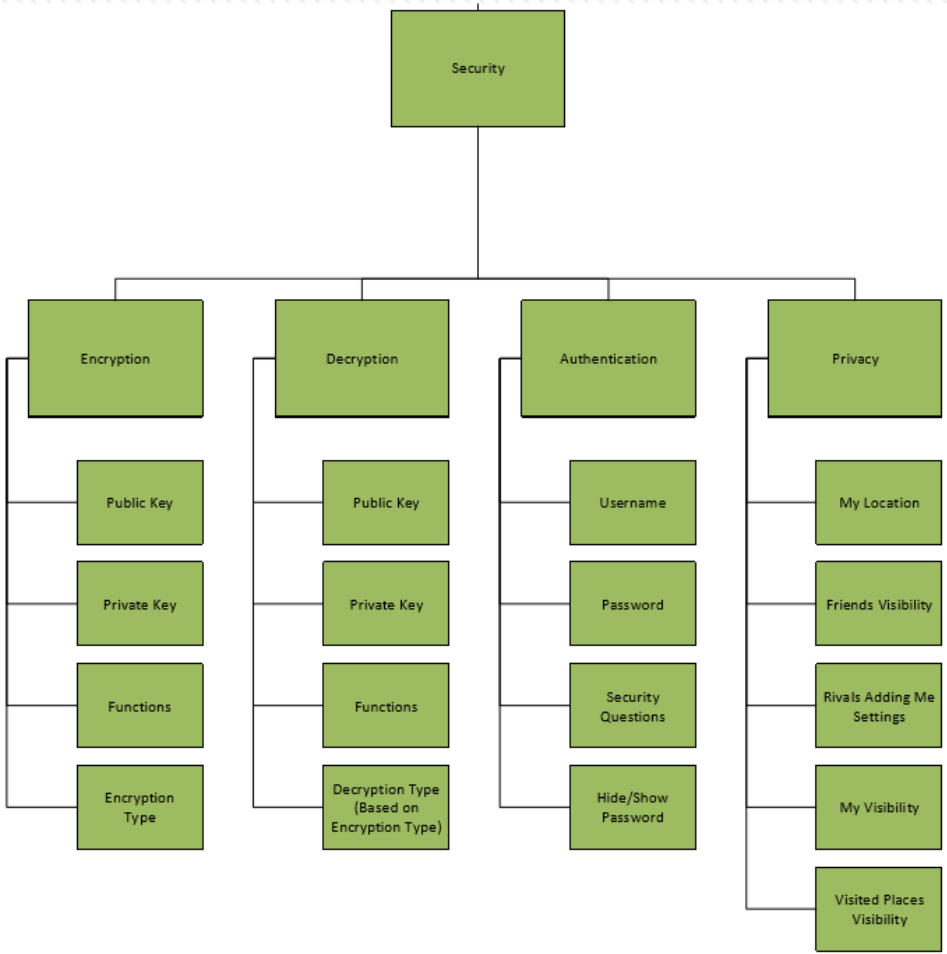


Contains the software system's subsystems, the subsystems' components, and then finally details for each component of the subsystems.

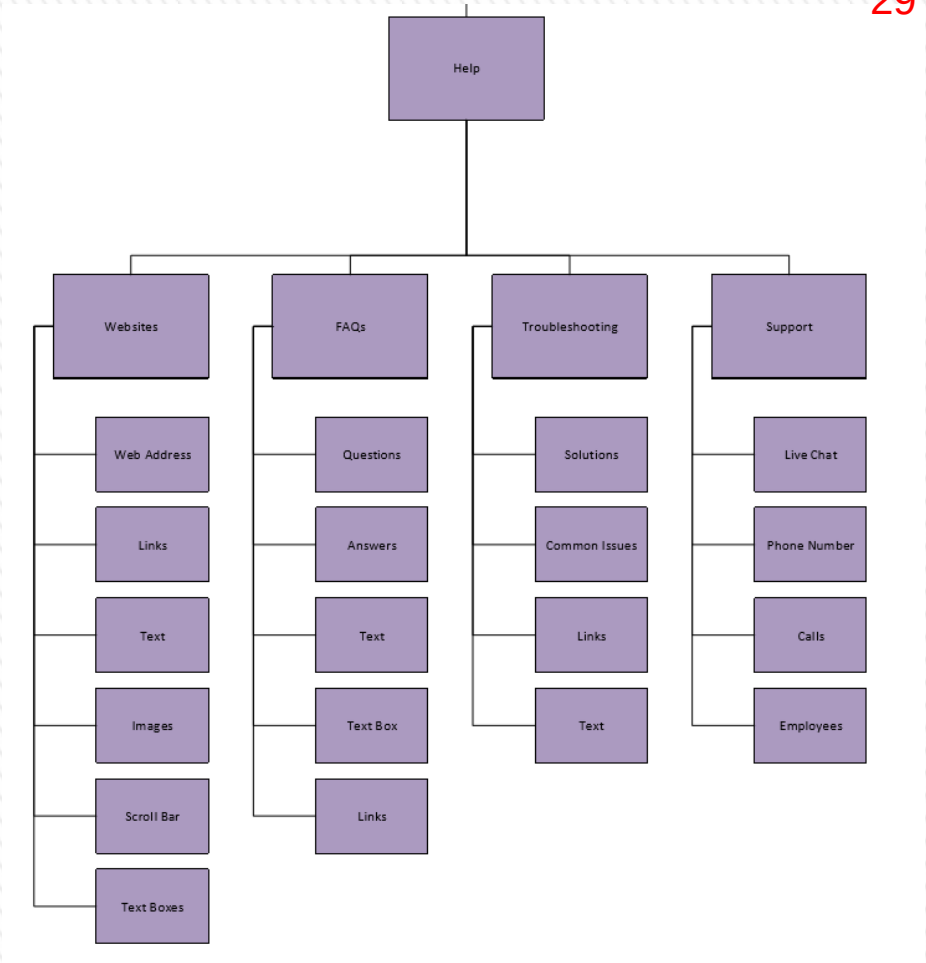
GUI Subsystem (1)



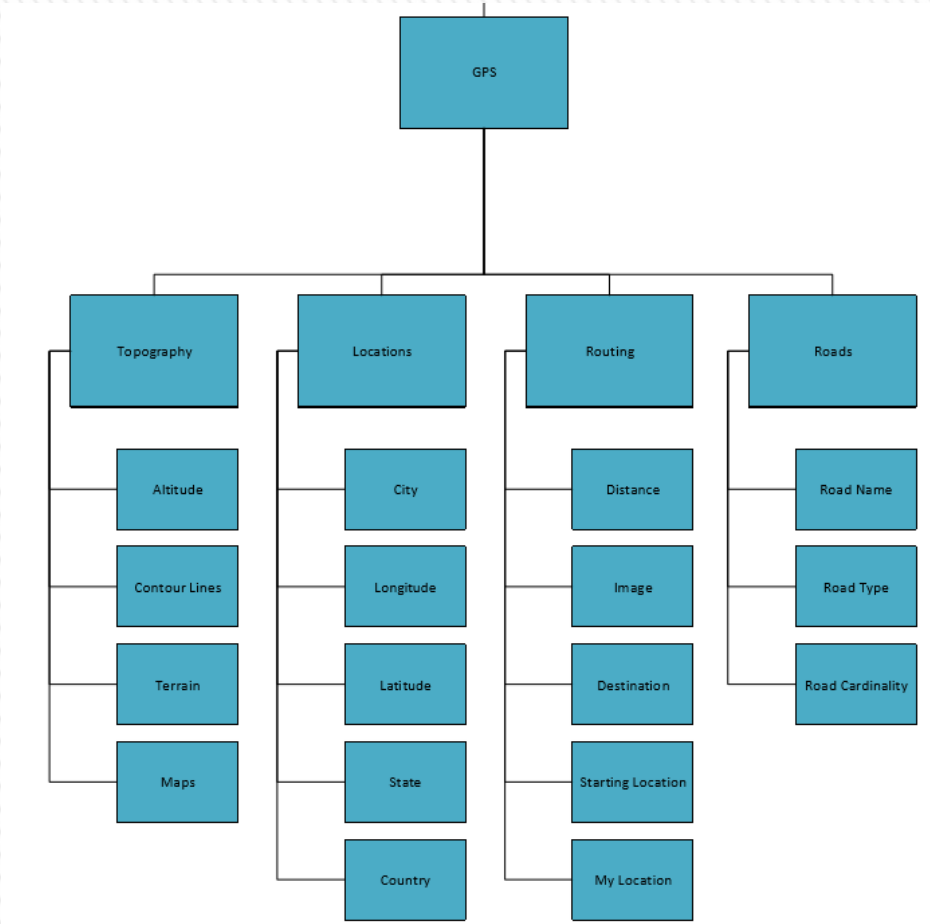
Security Subsystem (2)



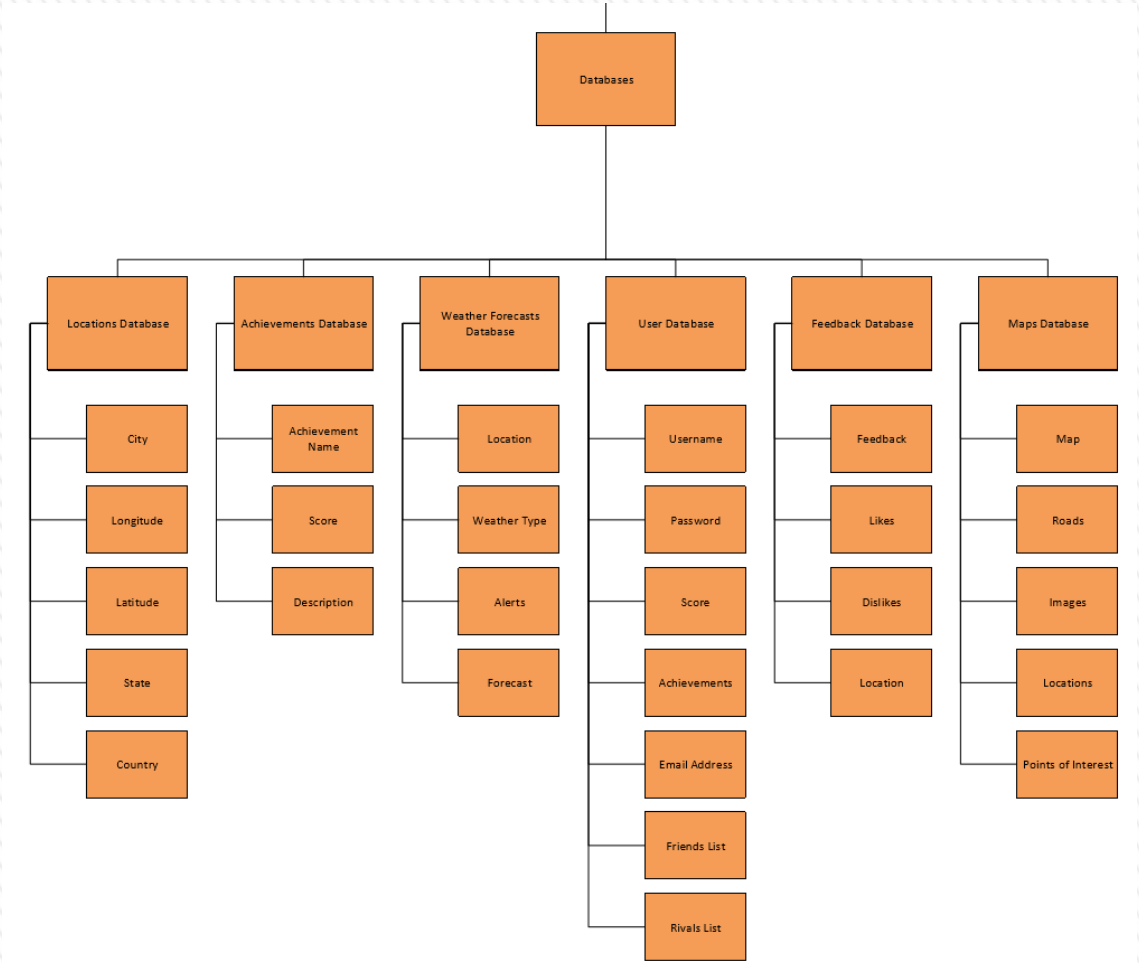
Help Subsystem (3)



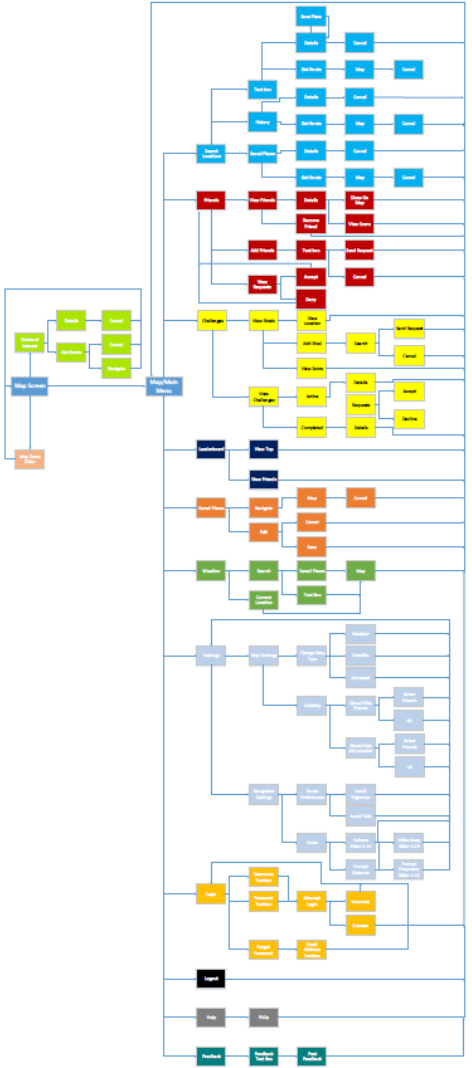
GPS Subsystem (4)



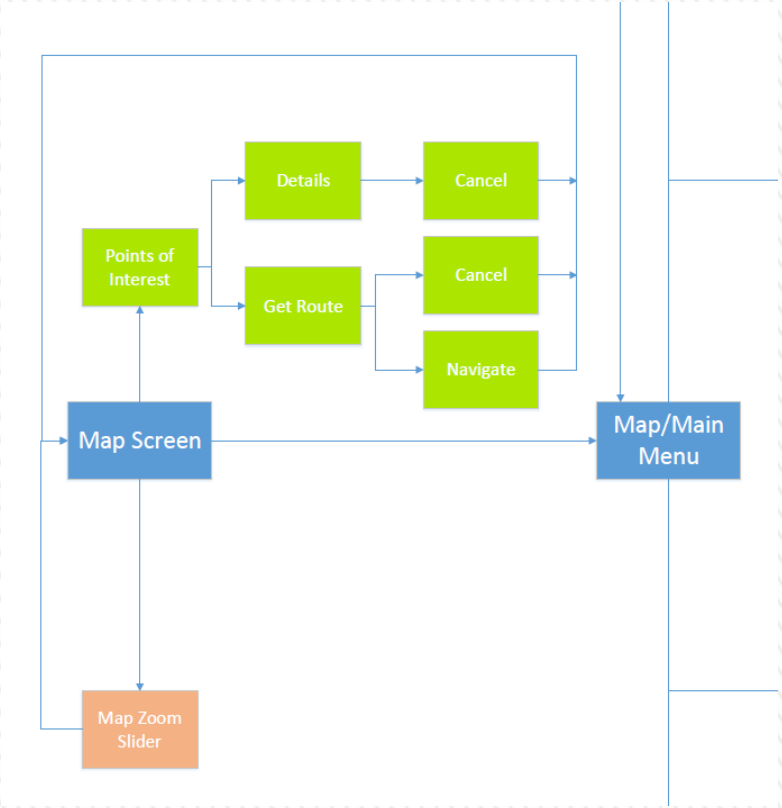
Databases Subsystem (5)



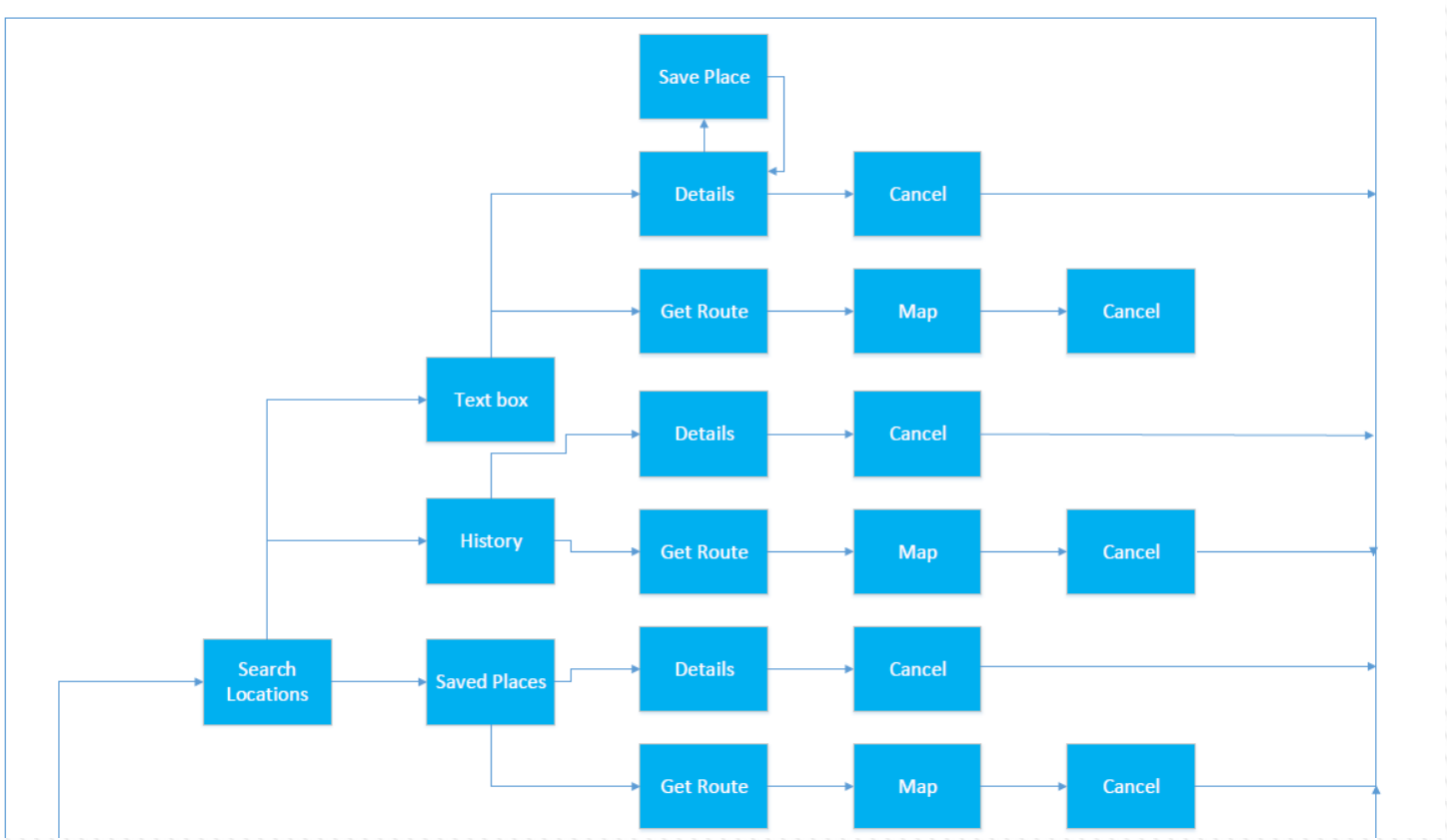
GUI Functional View



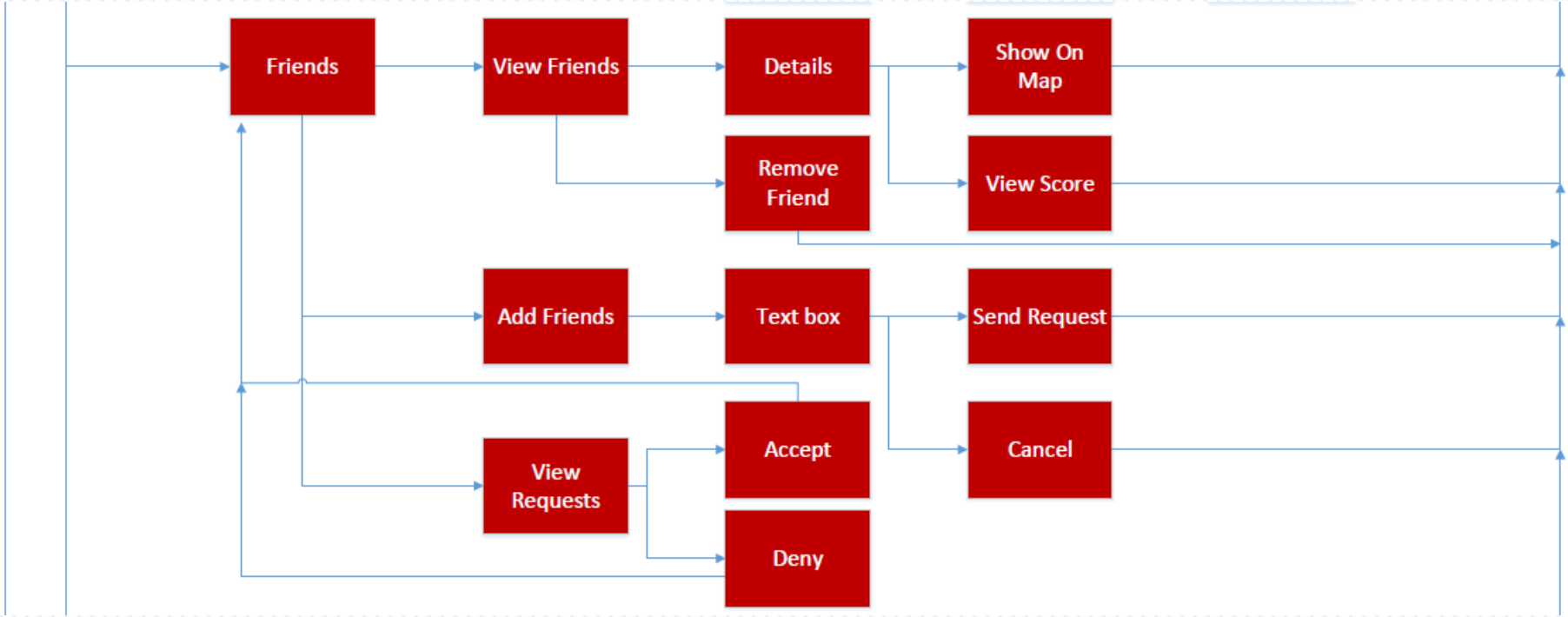
GUI Functional View Part 1



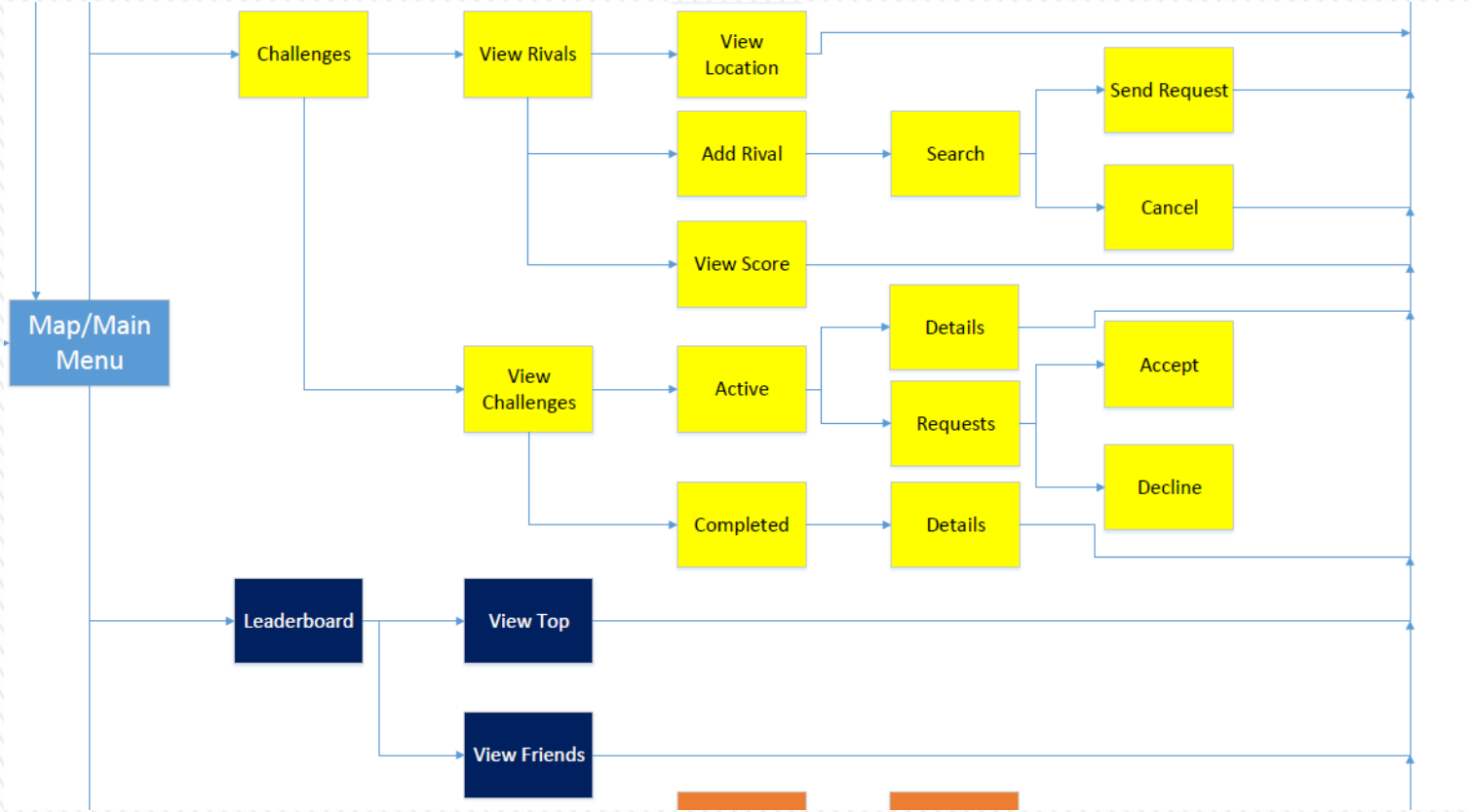
GUI Functional View Part 2



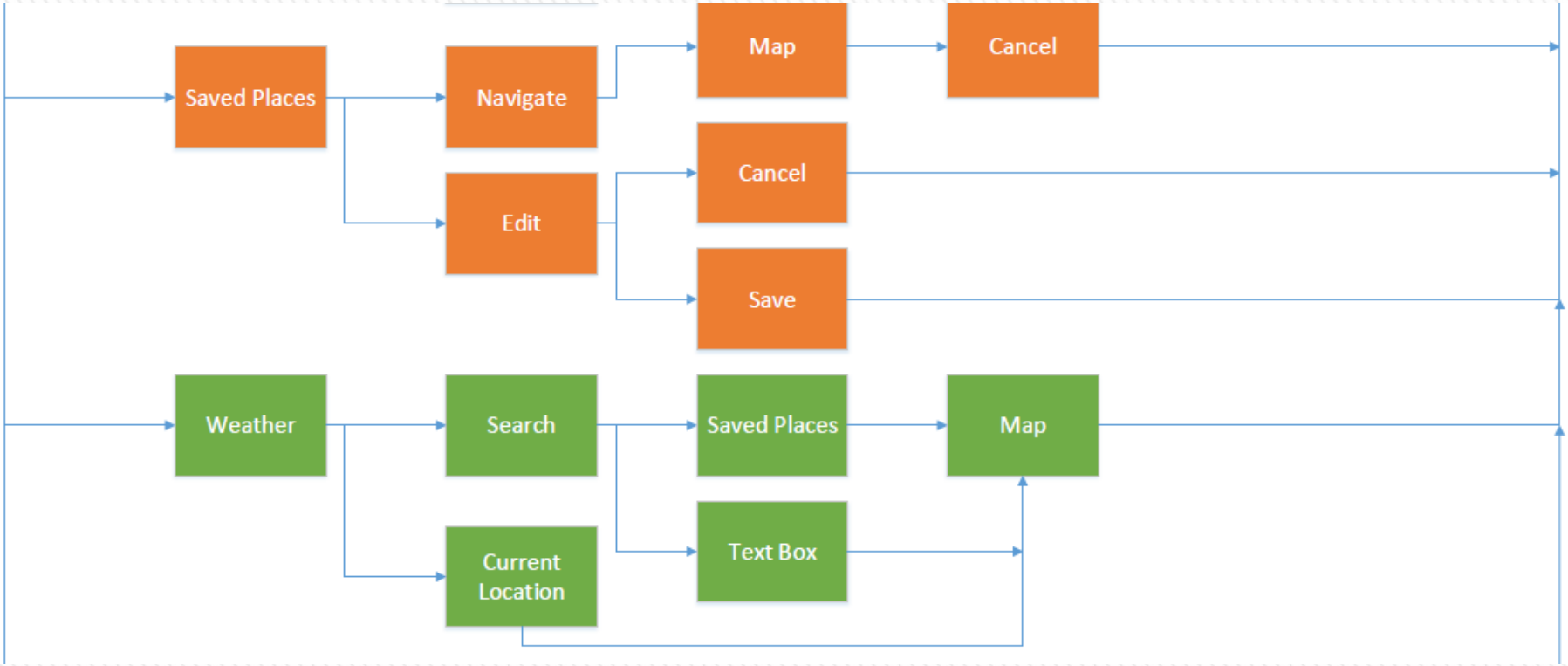
GUI Functional View Part 3



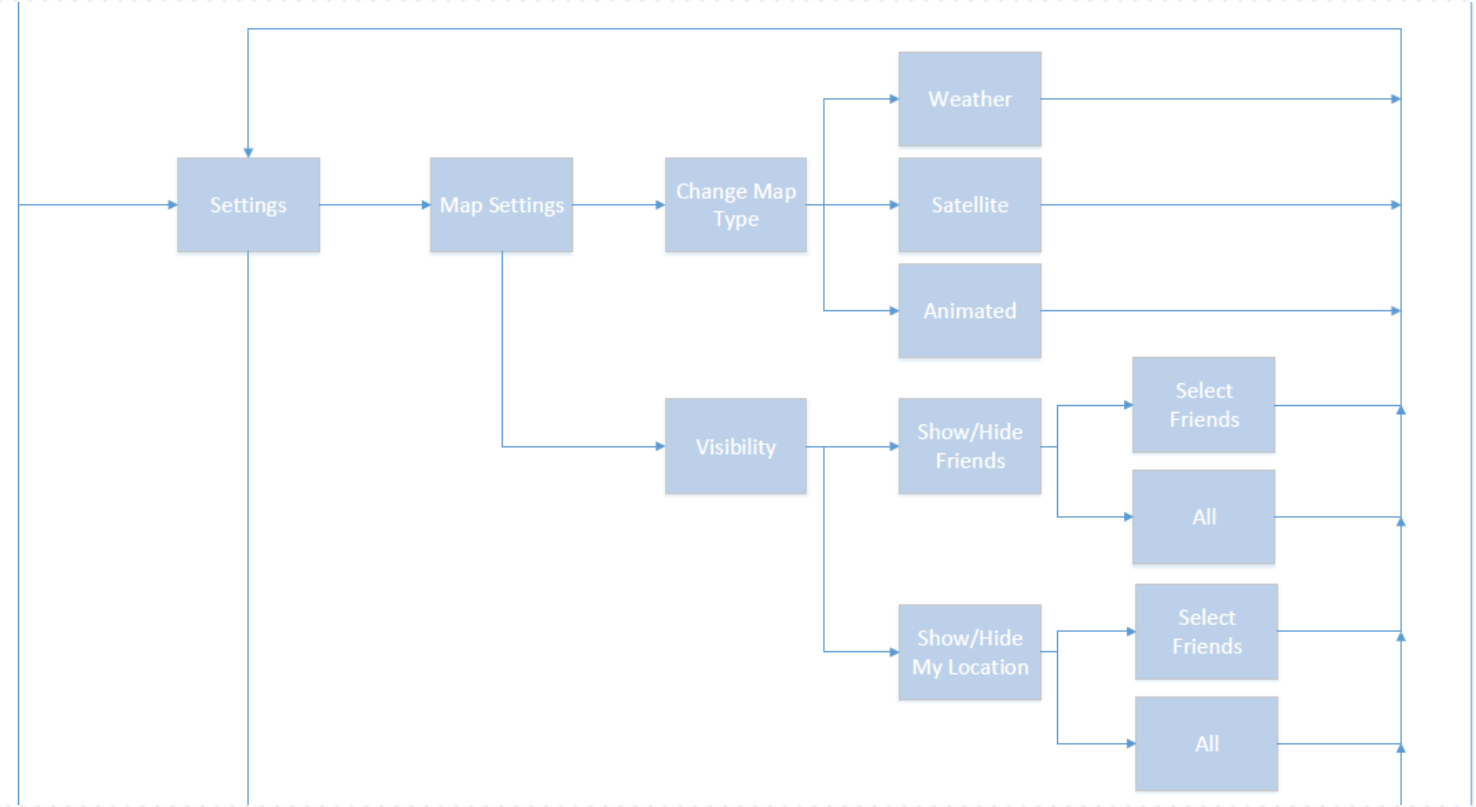
GUI Functional View Part 4



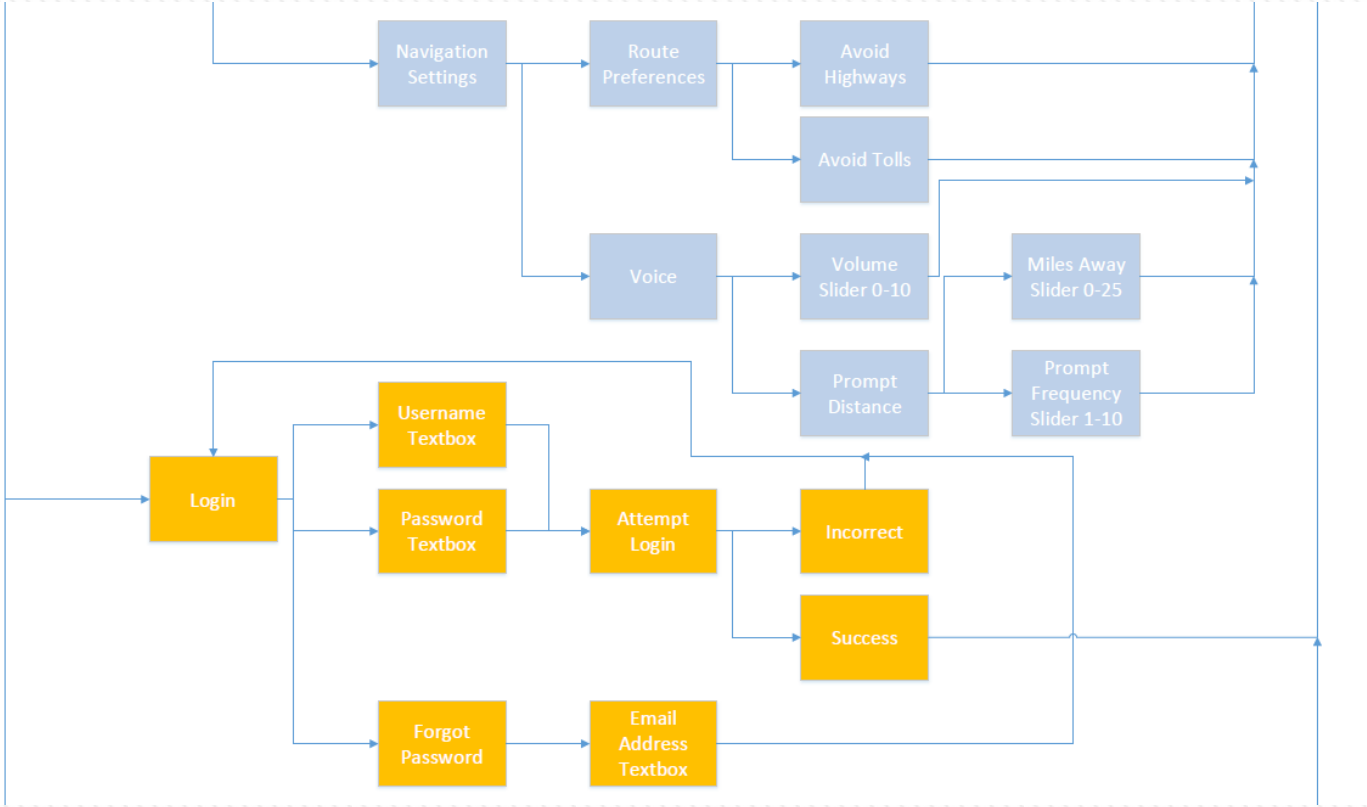
GUI Functional View Part 5



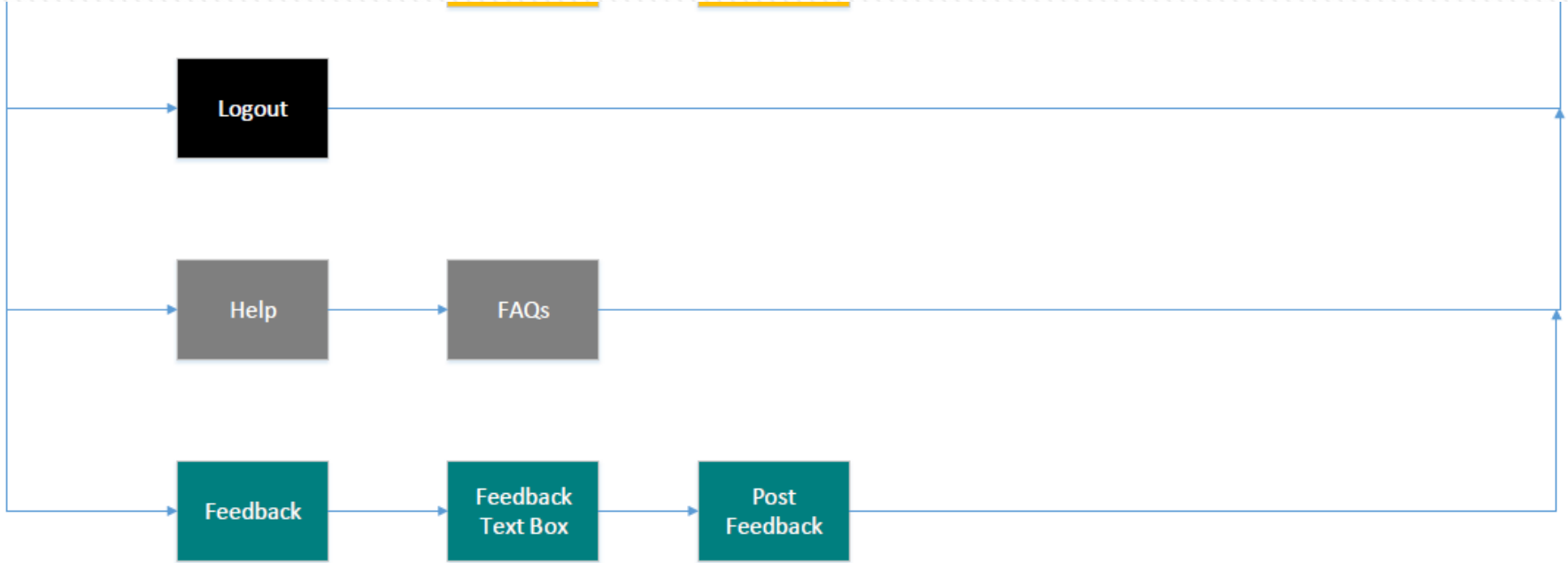
GUI Functional View Part 6



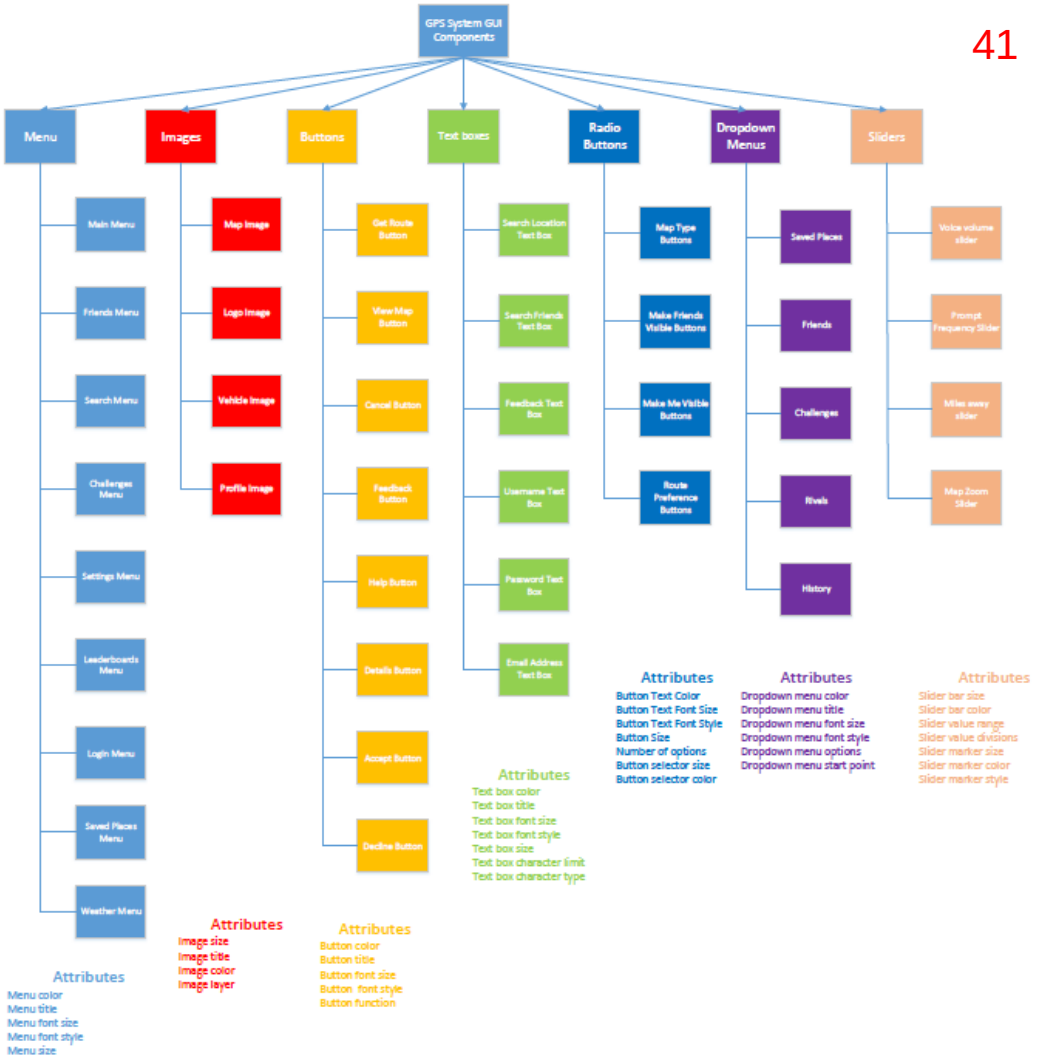
GUI Functional View Part 7



GUI Functional View Part 8

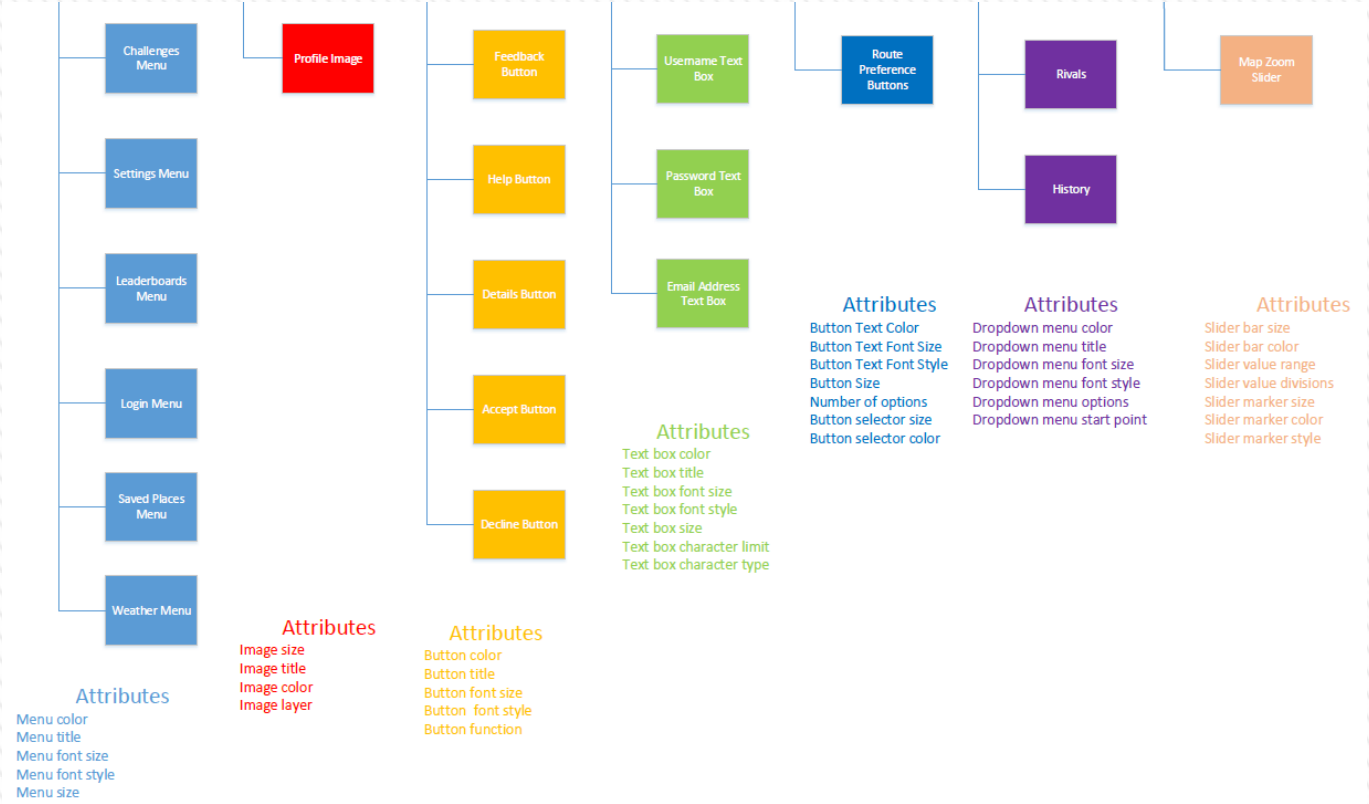


GUI Component View



GUI Component View Part 1

GUI Component View Part 2



FP-Based Estimation

Information Domain Value	Optimal	Most Likely	Pessimistic Estimation	Estimated Count	Weight	FP-Count
Number of inputs	45	60	75	60	4	240
Number of outputs	35	50	80	50	8	400
Number of inquiries	10	15	25	15	3	45
Number of files	8	12	18	12	6	72
Number of external interfaces	4	6	8	6	8	48
Total						805

FP- Based Estimation

Number of Function Points: 805
Average productivity: 6.5 FP/month
Burdened Labor Rate: $8000/month

The project will take 124 man months and cost $992,000 to produce.

LOC-Based Estimation

Function System	Estimated LOC
User Interface	5,000
Route Calculation	35,000
Location Calculation	20,000
Database Management	10,000
Gamification	10,000
Total Estimate	70,000

Lines of code: 70,000

Average productivity: 620 LOC/month

Burdened Labor Rate: $8000/month

The project will take 113 man months and cost $904,000 to produce.

Thank You!

Are there any questions?

Team 02
Dylan Kehres & Michael Schott