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# Travel Advisor Project Report

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# I Project Description

## 1 Project Overview

Travel Advisor is a mobile application that provides users satisfaction when traveling nation park, this application aims to become the fully functional travel guide application. It included a schedule of different parks, ratings, weather notification, history, and photo gallery, and it has a navigation system that helps you to find the direction you are looking for. The application makes you never get lost in the national parks, and there is an emergency call button that could send your location to the rescue team when there is an emergency case happening.

## 2 The Purpose of the Project

### 2a The User Business or Background of the Project Effort

Our application is designed for the business investors and park owners to advertise the park and keeps the park safe. The idea would be for visitors in national parks, especially the first time visitors to know information about the park, or something they can use as a guide in their journey. By using this application, users can improve their experience in the park, so they will be more likely to come back again or recommend the park to others. Also, it would be useful for people who are interested in coming to the park, by using this application it will attract them to come.

Since we are making this application as a mobile application, our primary user will be smartphone owners who are traveling in the park or have the potential to do so. Users will be able to use this application to obtain information anywhere at any time as long as they have access to a smartphone.

The biggest challenges in travel are travel planning and orienting yourself in a place, and this application will solve both of the problems for the user. So, the effort of this project will go towards creating a great user experience by keeping it simple and easy, but nonetheless, providing authoritative and comprehensive information. We want the national park visitors to have a safe and relaxing journey in the park, but in the meantime they don't miss the beautiful scenery and fun activities.

Solving those problems would help the visitors to enjoy their time of travel. On the other hand, it would prevent risks from happening by providing the user information in the area including weather, vegetation, animals, etc. Also, it would ensure the user gets help in timely matters if they are endangered.

### 2b Goals of the Project

The goal of this project is to increase the overall quality of the user's journey in national parks. As said before, making travel planning and orienting itself in the national park earlier so that people are more likely to choose national park as the destination of their vacation. The visitors should see the effect immediately after using our product, and the park should see an increase in visitor volume in 6 months.

### 2c Measurement

Since seasons and time of the year can have a huge impact on the visitor volume, the idea of measuring if the park's visitor volume has increased after using our product would be comparing the visitor volume in the same season or same time of the year with one using our product and another don't.

To measure if the the overall quality of the user's journey has been increased, there could be some surveys sent out anonymously through the application. There could also be some kind of place where people can rate the application or leave comments about the application.

## 3 The Scope of the Work

The production statificity all visitors require during their traveling in National Park. When visitors travel across the National park, most of them are self-driving tours, and amateur hikers. There are a whole bunch of common sense of safe traveling they should know, and it costs a lot for tutoring every visitor, they may only visit once National park for their entire life. Well, this mobile application will be able to handle all complicated situations while you are traveling.

### 3a The Current Situation

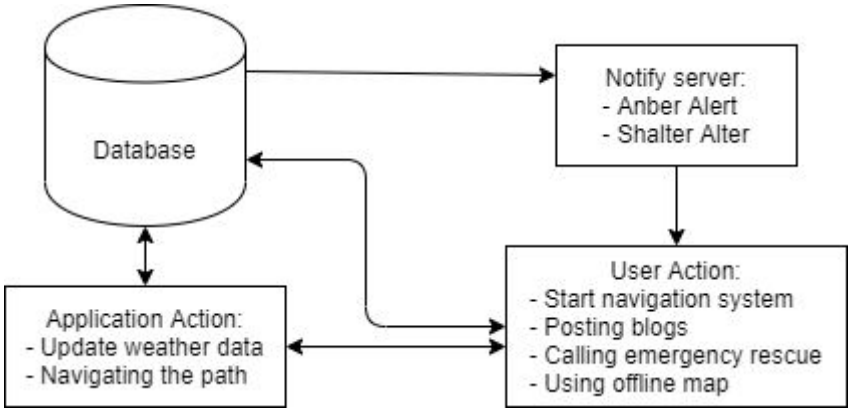
The main design of this application is to help clients have a better experience while they are using this application. This application would not be so useful for common daily use. But it turns out to be very useful when clients use it in Nation Park. This application gives all what clients need, if there is no signal, this application provides an offline road map. Anything emergency happens, the application has all contact and rescue methods.

### 3b The Context of the Work

Travel Advisor application including the online GPS navigation system, and offline road map, and database related species living in National park, also weather advisor is constantly updating the weather data and precaution for future days, beside that, clients can share their experience, new founds, photos and suggestions on the build-in web community. Any unexpected or emergency happened, the application provides instruction and 24 hours dial-service support. Well Travel Advisor is aiming to do certain things , it is not a general app that is used for common travel and daily use.

The Navigation System is a very basic road map with all necessary areas in national parks. Clients could use other navigation systems to lead their road, but the main part of this navigation system also includes trail maps, campground and service area. This function would be very useful for all travelers. Scenic Spots Guide requires a database that contains a large number of species which inhabit its lands, it requires connection to a server so that clients could access the data of species. Weather advisor does not just display general weather information, it has a lot of details that could be used for certain studies. Emergency rescue is using the minimum resource to get connected rescue teams and display what users should do now and the closest service area. This part of information should build-in this application, because we can not guarantee that wifi or cell phone signals cover all areas. This part of function is compulsive because the main idea of this application is satisfying users while traveling to certain areas.

The requirement efforts are modifiable, both databases on the server or application itself should all be modifiable. For the navigation system, it also could be used on emergency rescue, since we can not guarantee the signal will be stable, so the deviation should be within 100 meter.




**3c Work Partitioning**

## Business Event List

| Event Name | Formatting | Input and Output |
|---|---|---|
| 1. Analysing weather data | Local weather station and general area weather station readings in | Analysing and combining both general area weather data and local weather data. Because some species' activities are based on weather and time. |

| | | |
|---|---|---|
| 2. Navigation system | Input could be the final destination or incidentally location that users want passing by. Output is direction and good view spot or species around the road. | Planning the way to the final destination, and showing all view spots and species haunt spots. |
| 3. Upload photos and stories to Photo Gallery | Server connection and user standard input, may need album permission | Users can share their great photos and scenic advise on Photo Gallery |

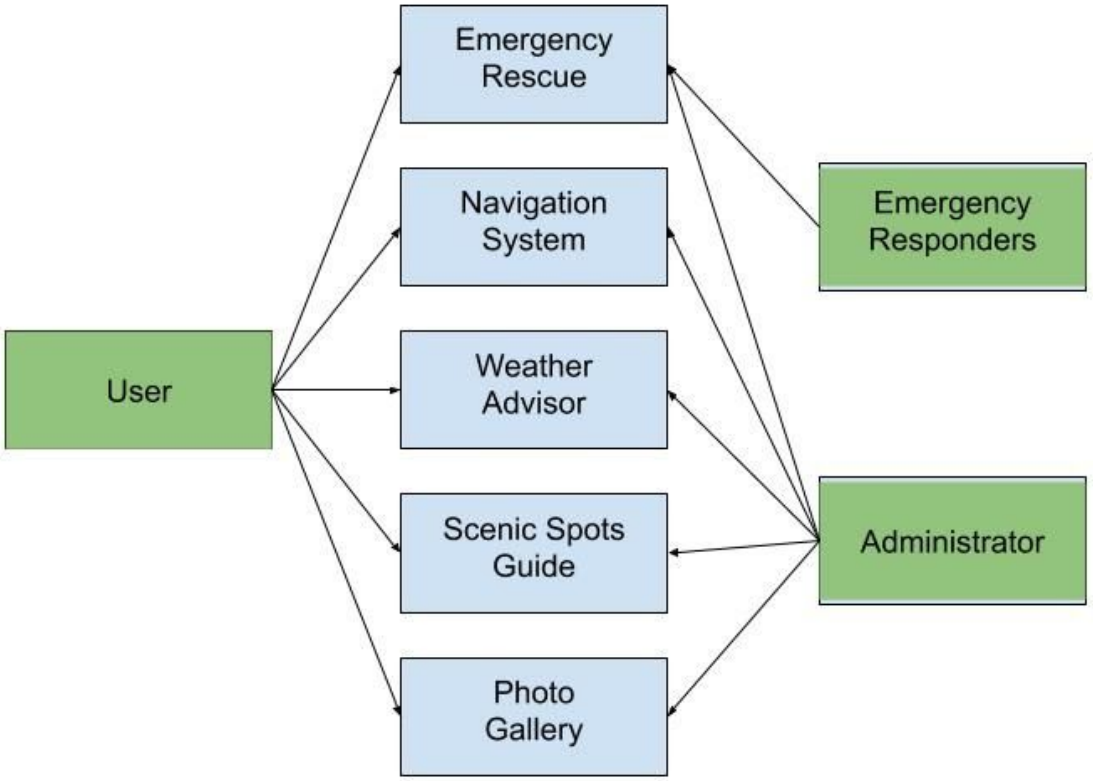
### 3d Competing Products

Travel Advisor application is not like a general travel advice application, Travel Advisor is aiming to target certain users and do certain things. First of all, not all applications have 24 hours dial-service support. Any unexpected or emergency happens, the application provides instructions and connects with the rescue team immediately. Secondly, not all applications are gathering local weather data and analysing general area weather data, since some species are very rare and strict on weather and time, this would be very helpful if users want to observe certain species.

## 4 The Scope of the Product

This product is to be used by both workers and visitors of the National Parks system: this includes the visitor, the admin and emergency services if necessary. All parties will have access to the navigation system, scenic spots guide, weather advisory, photo gallery, and emergency rescue system. This product is meant to augment visitor's experiences in the national park system by offering users the ability to navigate the parks via their smartphone; this navigation will highlight scenic spots and a photo gallery of notable spots. To promote safety, the user will be identified of any inclement weather and offer the ability to call for emergency rescue if necessary. The admin will have access to all facets of the system and emergency services will have access to the rescue system.

**4a Scenario Diagram(s)**




**4b Product Scenario List**

| Number | Scenario | Actor Involved |
|---|---|---|
| 1 | User selecting spot for navigation | User |
| 2 | User checking weather reports for the day | User |
| 3 | User checking the photo gallery for a specified area | User |
| 4 | Admin updating photo gallery with new user submitted photos | Admin |
| 5 | User using emergency rescue feature; pings emergency services | User |
| 6 | Emergency services finding a user's location after emergency rescue signal is sent out | Emergency Services |

### 4c Individual Product Scenarios

Upon opening the application, the user (whether a visitor, administrator or emergency services) will be connected to the server via a secure connection. At this point a visitor would have many options; suppose the visitor elects to check the photo album to see where they would like to visit first. Once a location is determined, the user would open the interactive map and click on the location that they would like to visit. This would activate the navigation system, showing the visitor a route to their intended destination along with any scenic destinations along the way. The visitor would then have the ability to check the weather advisor to ensure that conditions would be ideal for the planned visit. After arriving at the destination, suppose the visitor gets lost, injured or stuck in extreme weather; this would send a notification to emergency services that a rescue is required. The emergency services would open the application and select emergency rescue; this would show the last known location of the distress signal and spring into action.

## 5 Stakeholders

### 5a The Client

The clients are for business investors and park owners. The business investors want tourists to have a better tourist experience, and the park owner may want their parks to have better safety.

### 5b The Customer

The tourists and park managers have to install the app and get a better tourist experience and management. The clients would update the newest announcements and tourists will get the newest information of the parks. Also, they would be required to maintain and update monthly.

### 5c Hands-On Users of the Product

The hand on users are going to be tourists and parks managers. The primary users will be tourists, and they would be able to use this application to help them to get useful information with their park visit. When they have the application installed and they would allow them to get the information of the park they are visiting.

### 5d Maintenance Users and Service Technicians

The application will be posted on the app store, so users can install it by themselves. The application will be maintained monthly and if there are any bugs that appear have been reported by the user will fix it as soon as possible.

### 5e Other Stakeholders

The other stakeholder that would benefit those developing relative groups and shops in the parks which will increase their business performance.

Quality Assurance: The product will be a success depending on the user experience ratings and feedback. For our application, we have a big amount of users which also are our application's tester. They will see any of the problems that the application would have missed or mistakes. We also have a professional tester team and they will receive those feedback from the user. They will have a good understanding of the software on test cases, and be able to confirm that reported by the users was exciting. Then, they can communicate with the software developing teams to fix the problems.

Technology experts: Technology experts will be responsible to provide customers with the best technology that they have. They have to understand what the customers demand and what the developers need to build, and in order to supply them with the most efficient way.

Software Developer: Software Developers will be in charge of the software architecture. All the application functionalities are depending on the software developers, they have to work on all the UI, back-end, and maintain of the software.

Legal: A legal representation of the company is going to be required to ensure all the data safety for all customers. The legal must obey all the fundamental ethical rules, and regulatory boundaries. They also have to protect data and in order to prevent any of those mishaps information privacy.

### 5f User Participation

The user would be expected to share the data with the development group, which will help them to analy which feature that the users use the most. The user would be allowed to write their feedback directly in the application.

### 5g Priorities Assigned to Users

The priorities will be set by the level of the user (people who use the application more frequently). The Users would be responsible to give feedback and report bugs that occur, and the development team could be taking care of the issues as soon as possible.

# 6 Mandated Constraints

## 6aSolution Constraints

Description: The product shall have offline map

Rationale: Using map for some place without signal

Fit criterion: Not like the interactive map, an offline map should exceltly as a physical map, with high resolution, shall not be able to interact but be able to zoom in and out.

Description: The product shall have 24 hours emergency dial-service

Rationale: There are many accidents happened in mountain or somewhere far from city, and this application will send rescue signal to the outside rescue team by using all radio frequency, include satellite and personal intercom channel

Fit criterion: 24 hours immediately response

Description: The product shall be able to be installed on a smartphone device.

Rationale: The product is to be marketed to travelers, hikers and mountain climbers. Smartphones are easy to carry and interactive.

Fit criterion: The product shall be able to use low power mode. When a user is trying to use an emergency rescue function, this product needs to make sure the remaining battery is able to constantly send rescue signal for over 30 minutes, and there shall be no external power source.

## 6b Implementation Environment of the Current System

First of all the physical environment is a general modern smartphone, this application can be used both in the city and outside of the city area. Secondly, there are at least two servers. The main server contains the species database that needs to be inquired from an interactive map from a user device. The main server and backup server both are taking immediate response to the emergency request with the user's last location. There should also be customer service, response and repair of the bugs and issues that customers provide to the debug center. For communication systems, it will use general mobile community strategies such as wifi, signal and GPS.

After this application connect internet, if user location has update or user have not update their location for a while, For security reasons application will automatically upload user last location to server, if the user is missing, the rescue team could track by user last location.

### 6c Partner or Collaborative Applications

The Scenic Spots Guide outputs the user interesting species and scenic, this part will require developer import data from national park research database or library and upload data to the main server. So that when a user is inactive with a map, specie and scenic will be sent to the user device.

There is another function that needs to collaborate with the national park security system and rescue team. The Emergency Rescue function will immediately contact the rescue team and upload a report to the security system.

### 6d Off-the-Shelf Software

In order to implement this software, a framework that allows for dual platform (ios/android) should be used in development.

### 6e Anticipated Workplace Environment

The primary users would be using it outside, we have displays that are visible in sunlight. And we have to make sure that the users can access the network to make the product working properly.

### 6f Schedule Constraints

There are no schedule constraints for this product, but the product should take about 6 months to compete. The majority of the work of the product is going to be the back-end of the application.

### 6g Budget Constraints

The budget constraint would be around 50K, and most of the budget will speed on the software development parts. Server maintenance routine, customer service.

## 7 Naming Conventions and Definitions

### 7a Definitions of Key Terms

Navigation System: The application comes with a navigation system containing a map of each location, seven days weather forecasts, sunset/sunrise times, facilities available at the park and links to trail maps, campground maps and more.

Weather Advisor: The system will display the forecasted weather in the map with different areas in the park, like fog in the north of the park, or rain in the south of the park.

Photo Gallery: It is not just a photo gallery but more like a web community where pros and fans can share their photos and stories pertaining to the park with one another. This feature helps to find others interested in the park and develop a network between users.

Emergency Rescue: The emergency rescue feature would consist of a very minimal UI with a button. When the button is pressed, the devices' current GPS coordinates are recorded and immediately relayed to rescue teams. There is a high likelihood the device could run out of battery so this must be instantaneous.

Scenic Spots Guide: The scenic spots guide is a map that has a list of scenic spots and animals which are contained within the selected park. Users can select each of the scenic spots or animals to acquire more information about them.

### 7b UML and Other Notation Used in This Document

Any UML or Notation will be explained in more detail later in the report.

### 7c Data Dictionary for Any Included Models

Under the interactive map there is statistical analysis system, this particular system gathers weather data and species activities including: activity time, sleeping time, suckling period and favorite food, etc. The statistical and analysis system finds out the weather and time in relation to species. This helps both visitors and researchers observe any species within the national park.

Species databases are grouped by their type i.e. fish, birds and mammals; this could be divided even further into subsets like Mammal ->Carnivore/Herbivore.

Scenic spots are grouped by the amount of time needed to be spent there( >30 mins, 30 mins - 1hr, >1hr). When users are using the navigation system to their final destination, scenic spots will also display around route, grouped by time, so that user could make a little detour, but viewing a great scenic spot.

## 8 Relevant Facts and Assumptions

### 8a Facts

The factual information would be gathered from each national park. It would be the number of people viewed the information or rating and number of comments of the specific park. The data would be obtained daily or monthly depending on the volume.

This app will always be useful for national parks. This app would not only bring them more visitors but also help keep the visitors happy and safe.

This app is only for national parks and the visitors traveling in the park use only. It would require the application installed on a smartphone.

Any misuse from the users might lead to some mishaps for this app, please keep in touch with the customer so we can prevent it from happening or timely solve the problem.

People can learn the knowledge from this app including vegetation, animals or even the park itself.

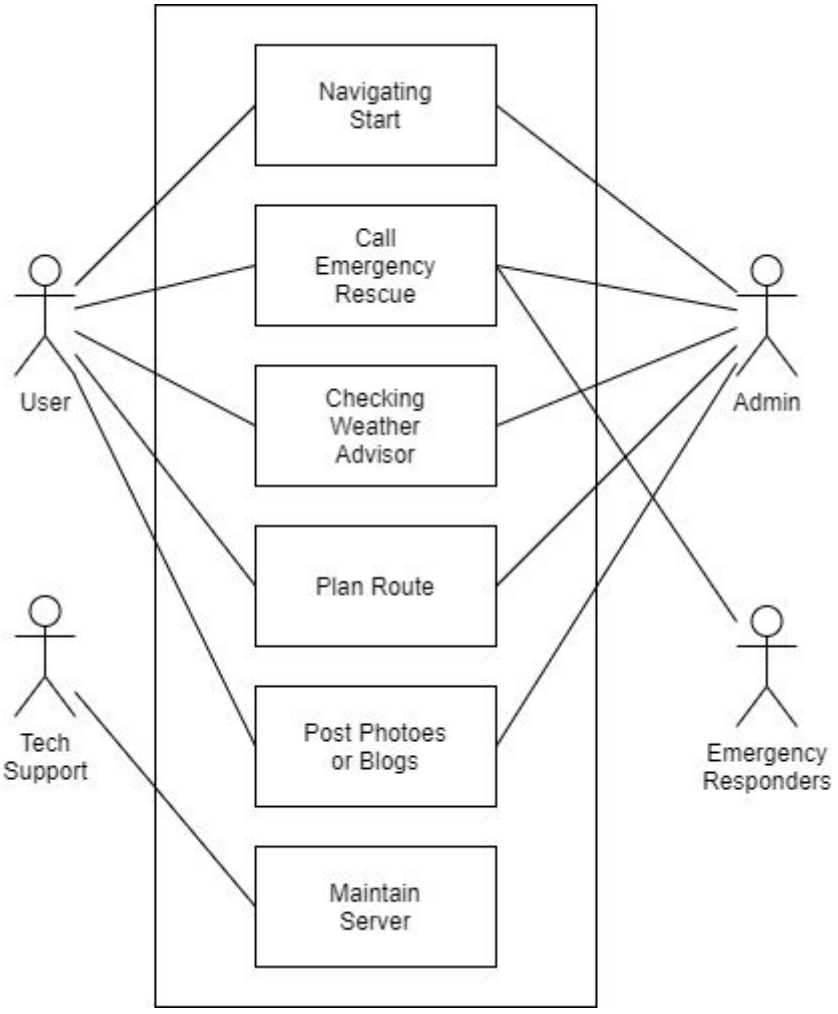
**8b Assumptions**

We are assuming the visitors who are using this app have basic knowledge of using a smartphone and can read English. Also, we assume all the national parks operate within the same guidelines. The adjustment could be made upon the request of the customers.

# II Requirements

## 9 Product Use Cases

### 9a Use Case Diagrams




### 9b Product Use Case List

| ID | Name | Description |
|---|---|---|
| 1 | Start Navigating | After user plans a route, the navigating system with guide the user to the requested location pass |
| 2 | Call Emergency Rescue | When user requests any emergency situation, a button press will contact emergency services immediately with location |

| | | |
|---|---|---|
| 3 | Checking Weather Advisor | By selecting a species, the weather advisor will advise for the best time and place to aid with user observation |
| 4 | Plan Route | After a user selects their destination, highlight the scenic spots around the route |
| 5 | Post Photos or Blogs | To help build a national park web community with sharing favorite moments. |
| 6 | Maintain Server | Regular server maintenance, updating new species and species data. Ensuring emergency rescue always remains functional |

**9c Individual Project Use Case**

Use case ID: 1 Name: Start Navigating
Pre-conditions: require GPS turned on, route is planned, destination selected
Post-conditions: GPS remains turned on
Initiated by: Any user who capable access this application
Triggering Event: Pressing the start navigation button
Additional Actors: No

Sequence of Events:

1. Once the system receives a destination from the user, navigating will provide several routes for the user to select.
    a. If the user does not pick any routes, the default route is the fastest path
    b. Users can pick one of the routes from the system: including the safest route, which could take a longer time; the most scenic route will pass by scenic spots, or the fastest route.
2. After the route is selected, the system will constantly update the user's current location on the map, and notifications will be displayed about the route.

Alternatives: An offline map will be used for Navigation
Exceptions: N/A

Use case ID: 2 Name: Call Emergency Rescue
Pre-conditions: The device is capable of sending an emergency message in weak signal or satellite signal
Post-conditions: GPS turned on to help rescue team locate user location
Initiated by: Any user who has access this application

Triggering Event: Pressing the Emergency Rescue button
Additional Actors: Rescue team

Sequence of Events:

1. When user request a emergency rescue, the rescue team will be contacted immediately
2. The app continues running, listening instructions from rescue team , then wait for rescuer to locate a user

Alternatives: N/A
Exceptions: If the call fails, the system repeats until the call is successful.

Use case ID: 3 Name: Checking Weather Advisor
Pre-conditions: Weather data is up to date
Post-conditions: Advise the best day to make species observation
Initiated by: Any user who capable access this application
Triggering Event: Pressing the Weather Advisor Rescue button
Additional Actors: No

Sequence of Events:

1. First by entering the species
    a. Systems will combine the recent weather data and species recent activity, this will determine a place and time that users can find the species.
    b. If the users want to have nice good weather, it will display the time span for a best possible views

Alternatives: N/A
Exceptions: For the species that do not exist in a national park, the system will provide general weather advice.

Use case ID: 4 Name: Plan Route
Pre-conditions: User selected their final destination
Post-conditions: requires GPS stay on after location was accepted
Initiated by: Any user who capable access this application
Triggering Event: Pressing the navigation button, this triggers the navigation system
Additional Actors: No

Sequence of Events:

1. System will prompt user to enter their destination
    a. Highlight the scenic spots around the route to allow user to alter their route

Alternatives: User can also plan their route on the provided offline map
Exceptions: Destination does not exist

| |
|---|
| Use case ID: 5 Name: Post Photos or Blogs<br>Pre-conditions: Stable internet connection<br>Post-conditions: User can post, edit, upload and comment on their blog<br>Initiated by: Blog owner<br>Triggering Event: Pressing the Photo Gallery button<br>Additional Actors: No |
| Sequence of Events:<br>1. System will display all users' public blogs<br>a. the system provide the ability like and comment under each blog<br>2. The user can post a good photo of scenic spots or their favorite |
| Alternatives: N/A<br>Exceptions: N/A |

| |
|---|
| Use case ID: 6 Name: Maintain Server<br>Pre-conditions: Remote server<br>Post-conditions: Server can communicate with hosts<br>Initiated by: Server owner<br>Triggering Event: Daily server diagnose<br>Additional Actors: Tech Support |
| Sequence of Events:<br>1. Tech support should run diagnose for server daily<br>2. Also needs to making sure the backup server also in a good condition |
| Alternatives: N/A<br>Exceptions: N/A |

## 10 Functional Requirements

| NAME - ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| FUNC - 1 | The Emergency Rescue connection should sent as fast as possible | Close all unnecessary resource, only making sure that Emergency Rescue is working functional | Require clear audio and clear image to be sent, but also require low energy use. | FUNC - 1 |
| FUNC - 2 | Plan route not only consider the shortest path but also caring the | Using the shortest path algorithm should do. | Test if the route is shortest and all selected scenic spots are passed | FUNC - 2 |

| | | | | |
|---|---|---|---|---|
| | user travel experience | | | |
| FUNC - 3 | Weather advisor is helping user to explore the better view of scenic spots or species activity | If certain species like wet environments and shadow sides, combine the nation park terrain data or weather data. Then display the place or time | It can be tested by given random species, the system should return a place or time that meets the user requirement. Or return the specie does not exist in this national park | FUNC - 3 |

## 11 Data Requirements

| NAME - ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| DATA - 1 | Saving species data that users are interested in. | Users may want to go back to their previous species data. | Generating a huge user search history, and check if all data is saved | DATA - 1 |
| DATA - 2 | User blogs should save permanently on server unless user explicit delete their blog | A health and energetic web community should not control their freedom of speech. So nothing will be deleted without informing the user. | Generating numbers of different types of blogs, check if all blogs exist. | DATA - 2 |

## 12 Performance Requirements

### 12a Speed and Latency Requirements

| Name-ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| SLR-1 | The emergency | The environment must | When the user | SLR-1 |

| | | | | |
|---|---|---|---|---|
| | call service algorithm must be instant. | be fast, the user will only use this service when an emergency happens and those emergencies require immediate help. | presses the call button, the location of the user needs is sent to the rescue team within 1 second. Otherwise, the test fails. | |
| SLR-2 | The application's route generation algorithm must be fast | A user will not want to wait for a route to load forever, so it must be done in a reasonable time. | The routes must be generated within 2 seconds. Otherwise, the test fails. | SLR-2 |
| SLR-3 | The overall speed for loading and running the app must be done in 1 second. | The user should require the least loading time possible | The app must finish loading and be running in 1 second. | SLR-3 |

**12b Precision or Accuracy Requirements**

| Name-ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| PAR-1 | The location of the user must be as precise as possible. The error range must be kept within 5 meters. | The location is used for search and rescue people who are in danger. The more precise the locations are, the more it can help both the user and the rescue team. | This can be tested using unit tests. | SLR-1 |
| PAR-2 | All generated routes must be correct and easy to read and follow. | The user must be able to read and follow GPS instructions. Since some of the users will be using the GPS feature while driving, the instructions must be succinct and clear, so it will not distract them. | This will be tested using feedback from users during product usage. | PAR-2 |

### 12c Capacity Requirements

| Name-ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| CR-1 | The backend servers should be able to handle 10,000 users connecting all concurrently | This application is meant to serve all the visitors in national parks, so the backend must be able to connect a large number of users. | It can be tested by simulating multiple users and those users can make requests at the same time. | CR-1 |

## 13 Dependability Requirements

### 13a Reliability Requirements

| Name-ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| RR-1 | The application shall not fail more than once per day. | If the application fails often, users could be put in danger. | Unit tests and automation tests can be used to prevent users from prone to failures. | RR-1 |
| RR-2 | No data shall be lost or damaged in the event of a failure. | Users should be able to reconnect to the server to resync the data. | Unit tests will be able to ensure data will not get lost during program crashes. | RR-2 |

### 13b Availability Requirements

| Name-ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| AR-1 | The application shall be available during all hours of the day. | Travel Advisor contains features a user can use during the closing time of the park. I.e. photo gallery, weather advisory and park | Unit tests and automation tests can be used to ensure the application is available at all | AR-1 |

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|---|---|---|---|---|
| | | information, etc. | times. | |
| AR-2 | The application shall have 99% uptime. | Application crashes should only happen occasionally. Since crashes will affect the user experience of using the app. | Automation and unit tests will ensure that almost all crashes are mitigated. | AR-2 |

**13c Robustness or Fault-Tolerance Requirements**

| Name-ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| RFTR-1 | When the application fails/crashes,na corresponding error messageis sent with instructions to restart the application. | Restart instruction becomes super useful when the application crashes. Especially the users of this application might not have a lot of knowledge in this aspect. | Unit tests can be used to ensure the proper error messages are displayed upon failures. | RFTR-1 |

**13d Safety-Critical Requirements**

| Name-ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| SCR-1 | The application shall not cause any damage to the user's devices. | If the application caused damage to the user's devices. It will cause the owner additional charges to repair the device, and no user will want that to happen. | Unit tests can be used to ensure the app is not taking up too much CPU. | SCR-1 |
| SCR-2 | The application will not ask for users' personal information besides email when creating an | Travel Advisor does not need to know any personal information of the user to be a helpful application. The email is used for creating | Developers must be careful when handling users' personal data. And all data must be stored in | SCR-2 |

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|---|---|---|---|---|
| | account. The username for each account can be “faked” names. | accounts so users can save information. But the user doesn’t have to have an account to have access to the app. | a safe space. | |

## 14 Maintainability and Supportability Requirements

### 14a Maintenance Requirements

| Name-ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| MR-1 | Maintenance will be available through the help section, email or phone. | Maintenance teams will have permission to access each user’s data in order to provide needed help. | All maintenance requests should be handled by the maintenance teams in a reasonable time. | MR-1 |
| MR-2 | Any maintenance which could affect normal usage of the application, the maintenance must be done at midnight. | Midnight will have the lowest user volume, so those types of maintenance should be done at midnight to minimize the effect on the user; unless the maintenance requires immediate maintenance. | Maintenances could be performed at any time of the day, so maintenance teams need to be flexible in order to provide the help users needed. | MR-2 |

### 14b Supportability Requirements

| Name-ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| SR-1 | The help section of the application will be the main source of support. | The help section will be provided to the user, and users can submit any help there. | Support should be given 24/7.<br><br>During work hours requests should be instant, for all after-hours requests the | SR-1 |

| | | | | |
|---|---|---|---|---|
| | | | system will have automated responses.<br><br>The help section is for small issues that can be fixed on the spot. | |
| SR-2 | Users have the option to send emails to the developers. | This is for bigger issues, and the maintenance teams will handle case by case. | Bigger issues that require a longer time to fix would be requested through email.<br><br>Users can expect responses for the requesting emails within 3 business days. | SR-2 |

**14c Adaptability Requirements**

| Name-ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| ADR-1 | The application must be compatible with all Android phones and iPhones. | Travel Advisor is a mobile application that runs on Android phones and iPhones. It would be able to support both operating systems. | The application needs to be tested on different mobile devices that use the Android or IOS operating system. | ADR-1 |

**14d Scalability or Extensibility Requirements**

| Name-ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| SER-1 | The application shall be capable | Travel Advisor will be able to handle 10,000 requests at the same | Testing and Updates will always be taking | SER-1 |

| | | | | |
|---|---|---|---|---|
| | of processing 10,000 users. | time in order to serve 10,000 users. | place to ensure all user requests are processed properly. | |

### 14e Longevity Requirements

| Name-ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| LR-1 | As long as national parks in the United States are open for public, the application will continue on. | Travel Advisor shall be available to the user as long as the national parks are open for visitors. | Travel Advisor might be adapting as times in order to keep information relevant. | LR-1 |

## 15 Security Requirements

### 15a Access Requirements

| **NAME - ID** | **Description** | **Rationale** | **Fit Criterion** | **Acceptance Tests** |
|---|---|---|---|---|
| ACRE - 1 | Only certain user will need access requirements to be able to change information about the parks and remove employees in the parks | Managers of the parks will have the these right, but it is also depending on the parks discretion. | Users will only have access to read the information that provides by the parks | ACRE - 1 |

### 15b Integrity Requirements

| **NAME - ID** | **Description** | **Rationale** | **Fit Criterion** | **Acceptance Tests** |
|---|---|---|---|---|
| INRE - 1 | The systems that | The security of | Users will only | INRE - 1 |

| | | | | |
|---|---|---|---|---|
| | are utilized in order to build the services for the parks shall all be built with security in mind in order to protect all of the user information. | parks and users' information should be a priority. The security team would be responsible for ensuring that information is safe. | have access to their profiles and basic table and customer functionalities that would allow them to use the normal tasks. park Managers and will handle the rest. | |
| INRE - 2 | There would be no third party users only the clients and the developing team that would have access. | The application will not share any data with other third parties. | All of this would be disclosed on the user agreements and terms and conditions. | INRE - 2 |

**15c Privacy Requirements**

| **NAME - ID** | **Description** | **Rationale** | **Fit Criterion** | **Acceptance Tests** |
|---|---|---|---|---|
| PRRE - 1 | The application will only use the data that the users agree to share | User agreements would be the first thing that the users agree to use the application | Any data use should be ask the user's permission | PRRE - 1 |
| PRRE - 2 | The application will also notify all users if there are any changes to the privacy policy | A notification would allow us to notify the users that any change of the privacy policy | Privacy is a priority of all users and we have to notify users if any change | PRRE - 2 |

### 15d Audit Requirements

| NAME - ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| AURE - 1 | Audits will be done monthly | Upon request each user can request a different frequent audits | These audits are performed monthly by the test team. | AURE - 1 |

### 15e Immunity Requirements

| NAME - ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| IMRE - 1 | The servers that would run the application must be built and protected with high-grade security systems. | All the server are hosted in most of the time | Servers are hosted from companies that guarantee 95% up-time | IMRE - 1 |

## 16 Usability and Humanity Requirements

### 16a Ease of Use Requirements

| NAME - ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| EAUS - 1 | The application should be usable within the training. | The application should help the visitor use their time efficiency | All operation should be simple and directly | EAUS - 1 |

### 16b Personalization and Internationalization Requirements

| NAME - ID | Description | Rationale | Fit Criterion | Acceptance |
|---|---|---|---|---|

| | | | | **Tests** |
|---|---|---|---|---|
| PEIN - 1 | The application should have multiple language for user to chose | Multiple language system would help user that may not understand English | The application should have as least three language(English, Spanish, Chinese) for the user to chose | PEIN - 1 |

### 16c Learning Requirements

| **NAME - ID** | **Description** | **Rationale** | **Fit Criterion** | **Acceptance Tests** |
|---|---|---|---|---|
| LERE - 1 | Users need to learn how to mark the attractions and communicate with other users in the application | Time would be provided an experience for how to use the application | All users should be able to mark down the attractions that they like and share information (picture of attractions, experience) with other users | LERE - 1 |

### 16d Understandability and Politeness Requirements

| **NAME - ID** | **Description** | **Rationale** | **Fit Criterion** | **Acceptance Tests** |
|---|---|---|---|---|
| UPRE - 1 | The application should have a language filter in the communication system for the users | The communication system would automatically block the swear words | The communication system of the application should not have any verbal violence | UPRE - 1 |

### 16e Accessibility Requirements

| NAME - ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| ACRE - 1 | The application should be usable by anyone | The application software is free in the app store | Anyone could download the application | ACRE - 1 |

### 16f User Documentation Requirements

| NAME - ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| USDO - 1 | the user documents would ask feedback of the user, and the use time of the users | The users will provide feedback to the development term, and analyzed the collected data to improve the application | Users would provide the best feedback and agree with the data analyze | USDO - 1 |

### 16g Training Requirements

| NAME - ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| TRRE - 1 | Learn how to use a smartphone or similar device efficiently | Guiding would be provided by the application | User should be able to use all the feature in the application | TRRE - 1 |

## 17 Look and Feel Requirements

### 17a Appearance Requirements

| NAME - ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| APRE - 1 | The product must be able to handle different layout, since the application has different features(sub system) | The different layout would help the different feature more clear and efficient | The application would had a clear UI and fit in the feature | APRE - 1 |

### 17b Style Requirements

| NAME - ID | Description | Rationale | Fit Criterion | Acceptance Tests |
|---|---|---|---|---|
| STRE - 1 | The product must have a simple and clean look. | A simple and clean UI will help the users more comfortable while using the application | The UI of the application should be simple but innovative | STRE - 1 |

## 18 Operational and Environmental Requirements

### 18a Expected Physical Environment

The product shall be used by a visitor in various types of weather conditions. The product shall be usable if a mobile device is available.

The product shall  enter an offline mode when cellular service is unavailable.

### 18b Requirements for Interfacing with Adjacent Systems

The product shall work on both the Android or IOS operating systems.

The product shall be available in the app store for free download.

The product shall allow for user registration with email verification.

The product shall not allow multiple accounts per email.

The product shall require unique usernames.

The product shall be able to update weather information while cellular data is available.

The product shall be accessible by at least 3 different types of users (visitor, admin and emergency services).

### 18c Productization Requirements

The product shall be a free application for download via the app store.

Application upgrades shall be available for download immediately after release.

The product shall be able to be downloaded by a user with minimal experience in the app store.

The product shall not be downloaded if the required disk space is not available.

### 18d Release Requirements

The application store will provide upgrades for free download.

The application will respond to any found bugs in a timely manner.

User profiles will be accessible on any release.

## 19 Cultural and Political Requirements

### 19a Cultural Requirements

The product shall offer text in the top 4 languages in the United States (English, Spanish, Chinese and French).

The product shall not collect any data pertaining to gender or race.

### 19b Political Requirements

The product should comply with all terms of service required by both the IOS and Android application stores.

The product shall make all functionality available to the Administrator.

The product shall allow access to visitor location to Emergency service.

## 20 Legal Requirements

### 20a Compliance Requirements

Personal information shall be implemented so as to comply with the Data Protection Act.

The product shall offer emergency service visitor information in the event of an emergency.

The product shall comply with all terms or service required by both the Android and IOS application stores.

The product shall only use licensed map information for the Navigation System.

### 20b Standards Requirements

The product shall comply with state and federal laws at all times.

The product shall comply with IOS standards.

The product shall comply with Android standards.

**Acceptance Tests: List ID# and/or names here . . .**

## 21 Requirements Acceptance Tests

### 21a Requirements – Test Correspondence Summary

| **Test** | **Requirements** | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | |
| **Test 1** | | | | | | | | | | | | | | | | | | | |
| **Test 2** | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Test 3** | | | | | | | | | | | | | | | | | | | |
| **Test 4** | | | | | | | | | | | | | | | | | | | |
| **Test 5** | | | | | | | | | | | | | | | | | | | |
| **Test 6** | | | | | | | | | | | | | | | | | | | |
| **Test 7** | | | | | | | | | | | | | | | | | | | |
| **Test 8** | | | | | | | | | | | | | | | | | | | |
| **Test 9** | | | | | | | | | | | | | | | | | | | |
| **Test 10** | | | | | | | | | | | | | | | | | | | |
| **Test 11** | | | | | | | | | | | | | | | | | | | |
| **Test 12** | | | | | | | | | | | | | | | | | | | |
| **Test 13** | | | | | | | | | | | | | | | | | | | |
| **Test 14** | | | | | | | | | | | | | | | | | | | |
| **Test 15** | | | | | | | | | | | | | | | | | | | |

### 21b Acceptance Test Descriptions

?

## III Design

### 22 Design Goals

The overall design should be considered concise and obvious, and using clear and simple icons to prompt user behavior, such as an arrow, three dots icon, three line menu icon etc. The user needs to be able to glance at the interface and immediately know what to do without second guessing. Travel Advisor is an outdoor assistance application, many of its features are based on user location, the system requires accurate location, and good communication with the server.

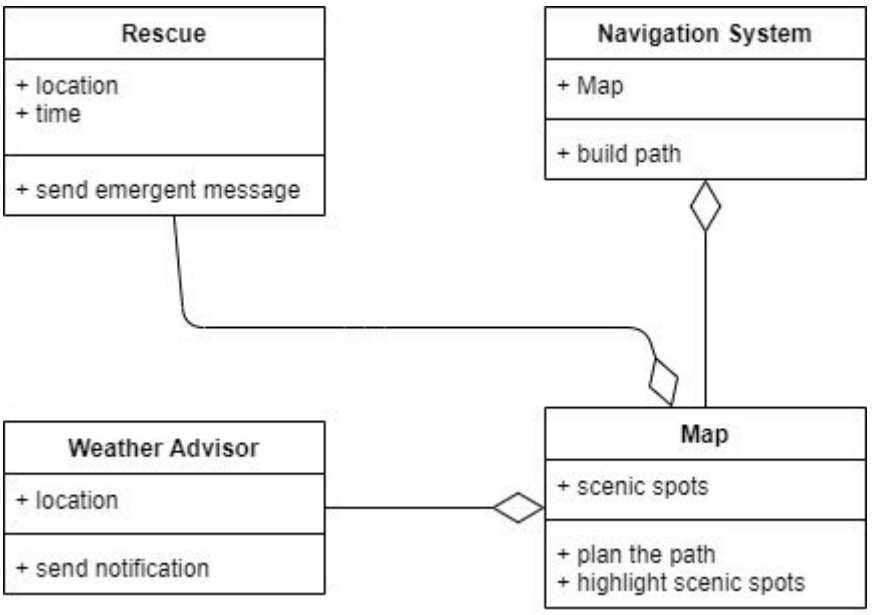
Since a user interface is the bridge connecting human command to backend programs, it is also the point of human-computer interaction and communication on a device, webpage, or app. Travel Advisor is an application that does not care too much about device computer power or high resolution. Text needs to be conservative and large enough with the ability to  adjust font size and background color schemes.

### 23 Current System Design

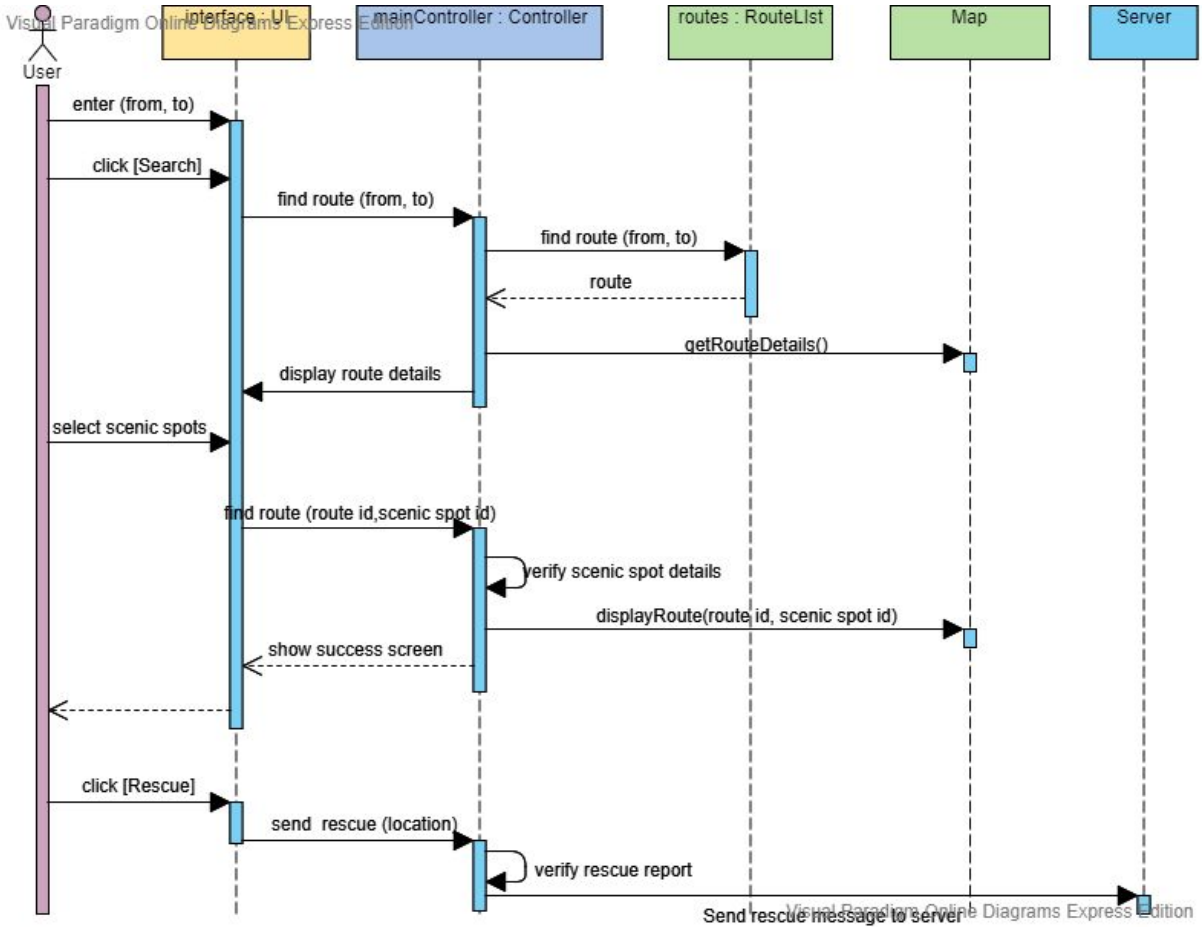
Traveling to a beautiful national park without preparing would be a nightmare. After the journey and realizing many missing scenic spots would be so regretful. Even though people prepared before the journey, the travel opinion that was written by different hands could be completely different. When you are preparing, everything starts coming into your mind such as booking hotels, weather, scenic spots. The design of Travel Advisor is used to avoid this kind of situation, this application gathers all advice from all over the place, the weather notification is always up to date, all scenic spots are highlighted on the map.

# 24 Proposed System Design

## 24a Initial System Analysis and Class Identification



### 24b Dynamic Modelling of Use-Cases




### 24c Proposed System Architecture

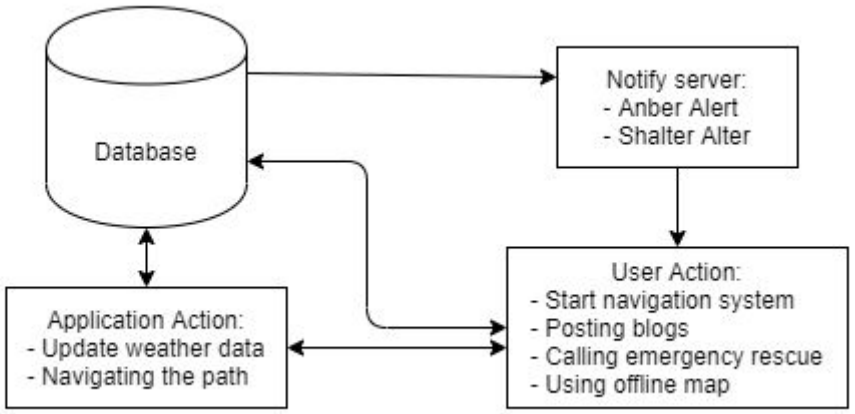
For the front end, we are considering using Flutter, Flutter is a framework that allows development in both Android and Apple. And providing great user preferences.
For the back end, we will be choosing Java and MySQL to do the most of programming, since Java and MySQL is very commonly used and there are many resources online that developers can look up.

### 24d Initial Subsystem Decomposition

Navigation System: Adapting google map library, combing with scenic spots from our database. The scenic spots are initially updated by local famous scenic spots, and more scenic spots can be added by users.
Weather Advisor: Getting data from the server, but at the backend server needs to gather local weather data and analyse these data to users.
Emergency Rescue: Immediately send rescue message to server, once when server receives message then spread to park ranger, and rescue team.

## 25 Additional Design Considerations

### 25a Hardware / Software Mapping




### 25b Persistent Data Management

All the data of the part will be communicating with the SQL database. In the event of a failure, the application will store the data off the database to keep Tasks up to date. The database will also store all users, manager and rescue teams information.

### 25c Access Control and Security

The Application will require a good security system. we have to handle the server host firewall and router's security. For the access control, only the managers could allow access to the database, and the rescue team could read the database inorder to get the needed information. Also, a user verification class should be added into the scheme in order to handle the authentication process.

### 25d Global Software Control

The application would handle different ways in different situations. Managers could update park information to the application, and customers can request the parks' information from the database.

When the customers send a request to the database, the server which was the controller will send the data to the views(customers).Also, the rescue

team will use the same method as the customers, but the rescue team could see the customer's data which is the higher level access.

### 25e Boundary Conditions

The server database will keep all the parks and users' information in the database. On fail shutdown, the state of the system should automatically be saved. When the application detects the system in a fail shutdown situation, it will save all the data and log to the local disk, when the system comes back, it will update the data to the server and send the error report to the server.

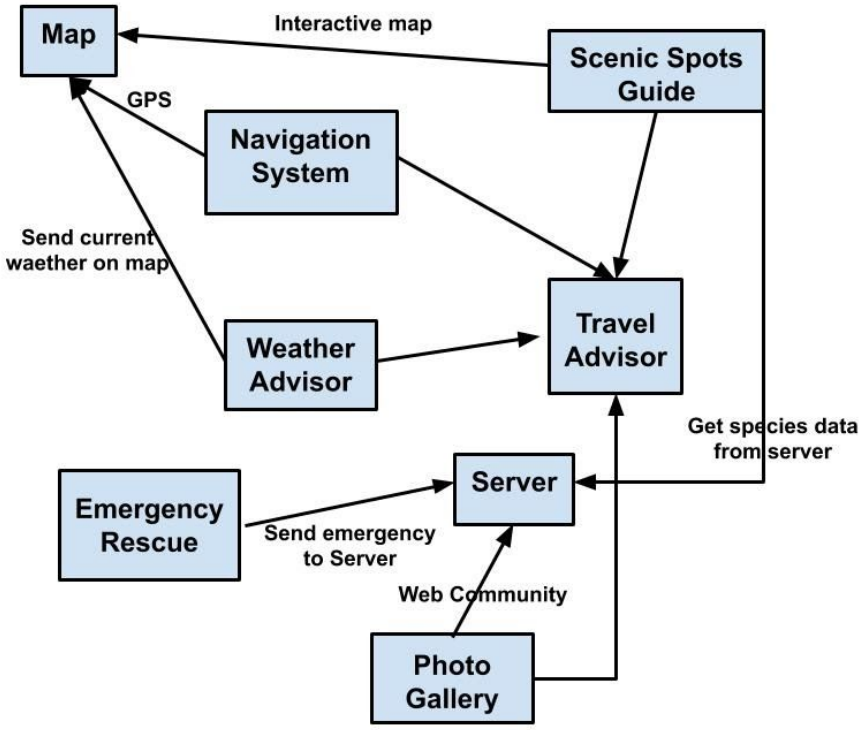
### 25f User Interface


The application UI has to be clean and simple, since most of the users would use the application outdoors. Color of the UI has to be bright, so the user is able to see the UI cleanly.

### 25g Application of Design Patterns

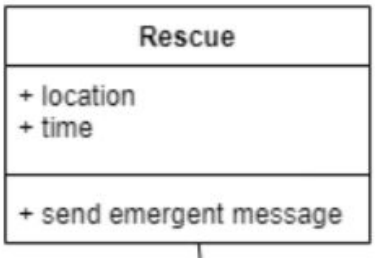
The Application would use the MVC(Model Viewer Controller) design pattern, and MVC the observer pattern will be used, as each time the frontend tasks are updated, data is sent to the subscribed managers to see how each waiter is doing.

## 26 Final System Design

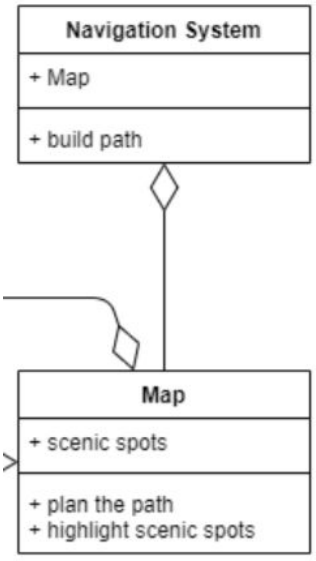


# 27 Object Design

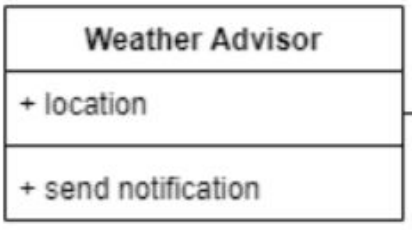
## 27a Rescue




## 27b Navigation system and map




## 27c Weather Advisor



# IV Project Issues

## 28 Open Issues

Nowadays, the internet has become an integral part of our life. As most applications, Travel Advisor is an application dependent on the internet. Therefore, one of the biggest issues Travel Advisor may face is data security. Also, another issue would be competition against other similar applications. Nowadays more and more people use software, there is also a growing demand for software. With the high demand there is going to be competition, and there is nothing we can do to prevent it. However, the Travel Advisor team will be prepared when that happens, and we will be working on producing more features to better serve our customer.

## 29 Off-the-Shelf Solutions

### 29a Ready-Made Products

As of right now, there's no need to use any ready-made products. However, this might change in the future, especially when Travel Advisor is in development. One thing we think might help would be some kind of GPS products which may help us to keep the error range as minimal as possible.

### 29b Reusable Components

Reusable components are welcomed for this product. However, for those who do reuse components of their own work or someone else's work, please refer to the work they are reusing, and properly cite their work.

### 29c Products That Can Be Copied

Unfortunately, our current design of this product does not prevent others from re-using our project. However, if someone wishes to reuse this project, they should definitely get consent from the team.

## 30 New Problems

### 30a Effects on the Current Environment

This new system would require the rescue team to pay close attention to it, so when the user's current coordinate is sent to the rescue team they can act on it on time.

Also, Travel Advisor is a mobile application,  it totally depends on the mobile device. If the device ran out of battery while users were using this application. It might result in serious consequences. For instance, if the user were in danger and was about to use the emergency rescue feature but their phone just ran out of

battery. Therefore, the rescue team should not only pay attention on the application but also make inspection tours around the park regularly.

### 30b Effects on the Installed Systems

This product is installed on smartphones, and will take some space in capacity as well as the CPU.

There might be future updates after this product is developed. This will request users update the product on their own device. Failure to update might result in bad performance of the product or the product may not work at all.

### 30c Potential User Problems

Users who lack knowledge on using smartphones might find this product really confusing and not useful at all. We encourage users who are not familiar with smartphones to learn the basic knowledge of how to use a smartphone before using this product. Also for those who are really familiar with the specific national park, they might find this product is unnecessary.

### 30d Limitations in the Anticipated Implementation Environment That May Inhibit the New Product

like all other mobile applications, this product would require installed on a compatible smartphone, and the smartphone needs to be charged.

### 30e Follow-Up Problems

For users with disabilities, this product would need to be done differently in order to serve those users better. For instance, those who have vision problems will need the ability to adjust font size or zoom in on certain areas and those who are color blind or color impairment will require different UI design.

## 31 Migration to the New Product

Not apply to this product.

## 32 Risks

One risk the user might encounter is possibly exposing personal information. However, our product minimized this by only asking users to provide an email, and we encourage users to not provide any other personal information while using this application.

Another risk would be application crashes while using it. This could result in serious consequences. Especially when users use the navigation feature as well as the emergency rescue feature. That's why in the requirement we state that this application shouldn't crash more than once a day.

## 33 Costs

12+ weeks of development (part-time) - $75 per hour / 10 hours per week = $9,000

Functional/Unit Testing - 10 hours = $1,000

6 product use cases = $600

41 Defined Requirements from # 10 - 17 = $4,100

6+ UI models created for mobile = $1,200

6 for IOS

6 for Android

3 different user types = $600

Continuous maintenance = $600

First release total = $17,100

## 34 Waiting Room

Offer animal species list

Sorted by some criteria (species, size, seasonality)

Sort species into parks

Add species encounter option to navigation system

Radio-box animal types and develop a route around selected animals

## 35 Ideas for Solutions

Generate animal database in SQL format

Possible fields: population, seasonality, location(s)

## 36 Project Retrospective

In retrospect, the development of Travel Advisor was greatly aided by weekly scrum meetings. With one hour a week, we were able to follow each step of the development process to craft a fully fledged product. When requirements were first drafted, the project had an entirely different look than it does currently. We found that the modular development had to be changed as the original design did not make sense from a practical standpoint. Some features also had to be pushed back from the original release, such as the species database. This changed the entire program design, as it was originally intended to be integrated into the navigation system as well as a standalone feature. Overall, one of the key features this project taught our group members was fluidity. Workflow was completely changed due to the COVID quarantine; our group went from in-person meetings to ZOOM video chats, and all deadlines had to be changed. It was a learning experience for all involved.