
**by**

[redacted]

[redacted] **Nicole Nagatoshi**[redacted]

**ITM 353**

**Professor** [redacted]

**Spring 2020**

# Table of Contents

# Introduction

## Executive Summary

The following is a proposal for the app-based service, Venture. Venture strives to enable campers with the freedom to explore the great outdoors without the hassle of setting up campsites or transporting bulking items through our convenient rental and set-up service. Our mission is to encourage the community to reap the proven benefits of spending time outdoors, while also providing valuable tools and education to empower the community to assist in the conservation efforts necessary to preserve our precious natural resources. We prioritize the safety of our clients, environmental conscientiousness, and sensitivity to the cultural resources throughout the regions we service.

Venture will initially be based out of Yosemite National Park, California. The Venture app will allow campers to conveniently schedule rental, set-up, and breakdown services. Our independent contractors will be notified when open jobs become available from which they will be able to choose on a first come, first served basis. As the business grows, there is potential to expand our business to service other parks in the National Park Service across the US, state parks, as well as Canada.

Venture intends to build a win-win partnership with the National Park Service. Federal law mandates that the NPS conduct a costly survey of all the archaeological sites and cultural resources within the park every few years. As part of the training process, all contractors will be professionally trained to conduct this surveying by our archaeological partners. Twice a year, contractors will be given a paid day to explore and survey the park. To assist in this process, the Venture app will feature a “scavenger hunt” game, geo-mapping, which will encourage campers to take photos of a given list of items in exchange for points and rewards. The photos will

provide geo-location data for contractors to better map and track the locations of landmarks, endangered species, invasive species, etc. This service and all the data that comes with it not only helps resolve the conservation and environmental issues facing each national park.

## Mission Statement

Venture seeks to aid in the battle against constervantional and environmental issues that are faced by the National Parks across the nation. Our synergetic technology will assist in healing ecosystems in America, and eventually the world, through an engaging and educational exploration game that rewards you with tangible incentives to spend time enjoying the environment that you helped to restore. As an app, Venture will empower the community, both locally and abroad, with the tools required to make a long lasting impact on restoration related efforts. As a mindset, Venture will bring the people together as a competitive yet environmentally moral body to leave the planet better for the generations to come.

# Project Proposal

## Systems Request

The project sponsor for Venture will be the primary point of contact for our project. Our key project sponsor will be the Hawaii Exemplary State Foundation, whose head has personally stated that he would support us. This sponsorship will provide our service supportive funding for the construction of the restoration related portion of our software system (detection / pinging capability and interactive map) and an intensive two week (ar)Ranger (Our independent contractors) training and will provide backing to help ensure a partnership with NPS. The reason for prompting this project is to address the problem of invasive species throughout the national

parks and eventually the globe. Additionally, in accordance with federal laws, each park must have their land surveyed every year, which generates the large costs associated in hiring an archeologist to perform such services. Our company's business seeks to provide this service for free in return for operating capacity on their grounds. Our system will provide archeology and invasive species services along with camping set up and break down.

Users and NPS will benefit from our project's tangible and intangible value. An average of $50,000 is spent on an archeologist per year, and by utilizing Venture who can execute land surveys cost efficiently, they will save time, money, and the energy required in the hiring process. The precise location of invasive species throughout the park is also highly valuable as it directly combats their most pressing issue. Intangible value comes in the form of peace of mind and simplicity that replaces a once tedious and laborious action for both our users and NPS when we provide our services, as well as the added morale and community strengthening that occurs through Venture. Special issues to consider would be incentives similar to Pokemon Go (augmented reality) so people using our service can help us identify where invasive species are located. This will later be explained in the Geo Mapping section. Expansion plans will also be considered.

## Nonfunctional Requirements

Venture has a lot of features that make up the system, but some issues investors may ask about are the Nonfunctional requirements. The operational, performance, security, legal implications and cultural and political influence, will all be considered while the system is being produced.

The operational requirements are, for the most part, straightforward. The portability of the system is not an issue because it is an app on users phone, which any user can use on IOS or Android. Portability for employees of Venture will also be a nonissue because they will be

using the same app, with different admin access to certain elements based on their specific job. The technical environment of the system, we would like to put things out in two sections, because our system is both environmentally and camping focused, we plan to put the storefront and the rest of the application out, separately. System integration, because the system will have an environmental focus and a camping focus, we are going to put them out separately. The storefront will be established in the app first in order to have profit for our workers and other future features for the application. Afterwards we would like to release the rest of the application, because the rest of the application is environmentally focused, we plan on getting funded from other environmental industries. The maintainability of the system is something that might be a process. Once users have downloaded the app, there may be some issues that were not thought about while the system was being developed. Inorder to combat this, the system will have different versions and updates to fix any bugs or making the app more user friendly based off any reviews we get.

With a system like Venture, there may be a lot of performance issues, however with having versions and updates to the system, our developers will be able to constantly update the systems capability. The speed, availability and reliability is going to be an issue when the app is first open to the public. This is due to GPS and cellular interference that the park may cause by having tall trees and mountains. One way Venture plans to fix this issue is by letting users have a hotspot while staying at the park, for long term, Venture should consider talking to cellular providers to partner with them in making more GPS friendly areas in the parks. If this does not work, Venture will put out an update to the GPS system to make it so that the system uses the phone's internal GPS to track app users.

Venture, being a GPS based system, security will be questioned a lot. One of the security issues is about who has access and control of the system. Venture will have an application for an admin (one admin group per park). Once completed their job is to grant certain control to certain user accounts, this access will be custom to employees depending on

their job. Also Venture will work on constantly updating this system to prevent hacking and to make this system safer. The admins job will also be virus control, because they have full reains on the system, they will look for things that look out of place or bugs that should not be there. In the case of a virus or worm, the admin should catch and report it for the Venture tech team to terminate. Because the admin has access to sensitive information, they have to understand system value, meaning not to abuse their position and give access to people who shouldn't have access or sell information. Lastly, encryption will be handled by the Venture tech team to make sure the security is kept up, and authentication will be handled by the admin to anyone coming in.

While users are exploring and/or camping at a national park, there has to be a lot of legal implications that need to be addressed. Such as laws and government regulations, while expanding to different national parks, there will be different laws and regulations which need to be followed. In the system, after expansion to other parks, the app will know which park the users are in. Depending on that, there will be different terms and services when users are planning on renting equipment or camping at the park in general. With those different terms and services, any users, including users from out of state or international, will have to agree to the terms and services. If users violate the terms and services they are held responsible because they agreed to the term and services.

With any app or system, there has to be thought of how anyone will be able to use it. Thus with cultural and political influence, there will be language preferences for the app. Depending on the circumstances, surrounding user downloads, depending on what region the app store is from, will automatically have the system in that region's more dominant language. However, users are also able to change their language preferences in the settings of the app, or when they are first registering for an account. For centralized and local control, Venture will be a local control, everything the user will need for the app, on the app.

With the nonfunctional requirements thought out and implemented into the system, Venture will be able to be user friendly while having benefit to the national parks.

# Feasibility Analysis

No business venture can succeed unless it is feasible for the world and market that it seeks to enter into and influence. For this reason it was deemed necessary to collect as much information, from as many professionals in relevant fields, as possible to determine whether Venture stands a chance in the real world and how we would go about bringing such a project to life. The Venture team conducted many interviews with professionals associated with the National Parks, Software Engineering and Systems Development as well as Leaders and Investors in the start up company industry. If an interview was recorded and transcribed it will also be laid out in greater detail in the interviews section of this report. To preface a collection of useful data points it was integral to first lay out the framework of our business concept and how it provides value to its potential users.

Our biggest “competitor” for lack of a better word, in the understanding that Venture is built on the foundation of a moral and environmentally conscious mission, is a software system titled iNaturalist. iNaturalist is a self declared “citizen science project and online social network of naturalists, citizen scientists, and biologists built on the concept of mapping and sharing observations of biodiversity across the globe.” We needed an app that takes the science a step further through gamification. Venture gamifies sophisticated research grade plant identification with an interactive map that simultaneously hosts other value markers that you can interact with, enjoy and learn from. The Venture system can be compared with iNaturalist in the same way duolingo is compared to rosetta stone. To add further value, Venture adds a camping set up and break down service, like a duolingo that sets up a trip to your new language’s country of origin in

a few clicks. What's the point of learning a language if you never go out and use it. Venture will execute its mission by providing this previously mentioned interactive map of user generated value location markers that will shed light on the invasive species proliferation in victimized landscapes, as well as many other markers to enhance and optimize your National park experience, while simultaneously offering camping setup and breakdown services to settle down with after a long day of adventure. The data accumulated through this map will provide immense value to the Park and secure a partnership with them.

With an adequate framework laid out, our team first extracted information from those directly associated with the National Parks in order to determine what it would take to secure a partnership with the federal agency. Kenneth Kaneshiro, head of the Hawaii Conservation Alliance, a confederation of 25 different conservational and environmentally related agencies, was first interviewed about the biggest problems facing the National Parks today and what our software system would require to produce enough value to secure a partnership with those same parks. With an understanding of what our system set out to do he stated that this was “God’s timing” in that he just secured half a million in funding for his new foundation, the Hawaii Exemplary State Foundation, focused on wholesome approaches to battling conservational issues locally and abroad. With the acknowledgement that Venture’s mission aligns perfectly with his own foundations, he went on to say that he would be willing to help fund our system and business if we took it seriously and got it off the ground post graduation from the University. The exact details of this interview can be viewed in the interviews and feedback section of the report. This interview alone was groundbreaking for the feasibility of Venture.

The next interview was conducted with Professor James Baymen, an archaeologist, at the University of Hawaii, who seasonally works for the National Park Service to conduct their cultural and environmental archeology services. Through this interview it was discovered that there is a law imposed by the Federal Government to inventory all the archaeological sites on their land. Venture’s interactive map will provide this service for free as an additional means to

secure a partnership with the parks. Our system does this via its validated ping system by producing a scientific grade overlay of the entire park throughout each year as its countless users explore, map, and validate the various sites within the park. Baymen has worked with the National Parks nearly all his life and understands their mode of operation with great detail. He has stated that, “the National Park Service will outsource their need to meet archaeological regulations” and that they would likely partner with us if we offered such a service for free, in combination with the invasive species assistance, in exchange for the ability to operate our setup and breakdown service in their parks. The data points accumulated from just these two interviews indicates a strong likelihood of successful partnership assuming completion of our system.

Moreover, the third interview with Scott Rupel, a former park ranger was focused primarily around the obstacles to entry and legalities of working with the National Park Service. He focused on advising us of the procurement measures required to attain a partnership with the parks. It was also discovered that the current power dynamic of good and service providers is split between two multi-generational mega corporations that oversee everything from carpentry to food services at the national parks. In light of this we had to shift gears from a for profit business to a non-profit to avoid the obstacles required to hurdle over as a revenue generating entity. This shift was accommodated to easily as its funding for the restoration portion of our system will be more easily secured via environmental agencies whose goal is to support groups that use wholesome approaches to tackling the ecosystems biggest challenges. As a non-profit the camping services revenue stream would also only need to produce enough to be self sustaining.

Furthermore, a close spin off of this business model, the for profit version, was entered into the PACE Business Venture Competition and made it to the semi-finals. As a testament to the feasibility of the software centered business idea, three of a panel of five judges said that this endeavor was worth pursuing and investing in. This panel of judges even had an angel

investor that had previous experience in dealings with the National Parks Service named Clif Purkiser. The others on the judging panel included; Raj George (Mughal Ventures LLC Founder), Timothy Roy (COO of Turnover BnB), Doris Miocinovic (Owner of M2 Consulting), and Lisa Miller (Senior Consultant at BCR Business Consulting). Sounds bites from the in person feedback include, “I think the service provides a lot of value for its target audience”, “the market is large and growing, but relatively saturated”, “great idea”, and “Venture can be a significant player with the spectrum of services offered and scalable app platform.” Aside from these positive remarks, the progress made throughout the competition imbues Venture with a level of feasibility superior to that of the business models that did not make it as far in the competition.

Some additional individuals we sought to consult were Michael-Brian Ogawa and Gerald Lau, both acting as faculty specialists within the ICS Department at the University of Hawaii at Manoa. With a combination of degrees ranging from a bachelor’s in Mathematics and Business Management, to a master’s in the Computer Sciences, to a Doctorate in Curriculum Instruction, in addition to a background in military technology held between the two, Dr. Ogawa and Dr. Lau provided our team with insights regarding the potential costs of our business venture and the potential managerial and technological issues that may result in the process.

From our discussions with Dr. Ogawa and Dr. Lau we came to realization that many of the basic aspects of the Venture App, including the Package Storefront and Community Hub services could be produced in a relatively short period and maintained at a fairly low cost due to how commonplace and simplistic these systems are in the marketplace. With this in mind we were able to see that these aspects would not act as large of a burden on our startup and would allow us to focus ourselves in other areas that would require a much heavier investment. The area both men were specifically targeting in this regard was the collection of user data for the Geo-mapping and species tagging systems we would be offering. With the recent technology

environment, there is an increased scrutiny of privacy with matching legislation coming into existence across the globe. These discussions have indicated that our team will need to shift a large amount of our focus in addressing these laws, such as the European General Data Protection Regulation (GDPR), at the international, national, and local levels.

In addition, Dr. Ogawa and Dr. Lau also explored topics of partnerships and gamification. In terms of Gamification, a significant hurdle in keeping the competitive nature of the geo-mapping system running is to ensure that the response time between a user creating a ping or identifying an invasive species and the reward attached to those actions has to strike a balance; time will be needed to verify the information collected, but responses must also be provided to users in a short and predictable timeframe. This has forced us to consider different approaches to implementing this system whilst maintaining its precision, such as implementing a weekly, rather than instant, reward structure. It was also discovered that Dr. Lau himself is actually a member of the REI Co-Op, an industry retailer involved in outdoor recreation services. Such an organization, and others like them, would be prime opportunities to engage in mutual-beneficial relationships in addition to those we have already discussed, such as the National Park Service, due to overlapping end goals and target markets. Engaging in these partnerships would further ensure the feasibility of our venture and allow us to tie ourselves to a more expansive support network of non-profit and environmentally inclined organizations.

Despite overwhelming support for a project, no business endeavour or software system can be successful if people don't use it. Luckily far more than a million people visit Yosemite National Park, where we will launch Venture, every year. This results in a large potential demand due to the insane amount of foot traffic. Of course not all visitors are campers, but most are not from the nearby towns and cities and most want to have the best experience possible while they visit a new, unfamiliar and exciting place. The people who visit National Parks tend to be families and tourists coming from many miles away, often escaping their everyday lives to

find haven in the amenities and peace that nature provides. Yosemite National Park had 4,422,861 visitors last year, and this number has grown or remained steady every year without fail for the last two decades. (NPS, 2020) If even 1% of these visitors downloaded Venture to enhance their experience at the park, about 44,000 people would have taken their first steps into becoming avid Venture detectives and restoring the park's landscape. In terms of camping, It is quite burdensome to haul camping equipment on a plane, train or in your car for miles. Especially after you've either dug it out of your garage or spent top dollar purchasing the gear you may only use once or twice a year. Not to mention, when you get to a park that you've never been to, you don't want to waste precious time fumbling over setting up your campsite. Time that could instead be spent exploring with your family. There is a market for an easier way to carry out an ancient practice and the value offered will reveal itself to be quantified and measured directly. Assuming 1% of tent specific campers, 475,620 total, in a given year at Yosemite National Park are absorbed by Venture, you can see from the table below that we will be servicing over 45,000 people. For the reasons above it is fair to assume that the market for Venture users equates to fantastic feasibility for the project as a whole.

| **National Park Service Public Use Report** | |
|---|---|
| Date: | Yosemite Tent Campers |
| March 2020 | 4,120 |
| February 2020 | 4,009 |
| January 2020 | 2,383 |
| December 2019 | 4,018 |
| November 2019 | 14,666 |
| October 2019 | 43,415 |
| September 2019 | 105,165 |
| August 2019 | 116,330 |

| | |
|---|---|
| July 2019 | 93,530 |
| June 2019 | 36,110 |
| May 2019 | 31,507 |
| April 2019 | 20,367 |
| **Yearly Total:** | **475,620** |
| Absorption Estimate | 1% |
| **Users Serviced:** | **47,562** |
| Source: https://irma.nps.gov/STATS/SSRSReports/Park%20Specific%20Reports/Monthly%20Public%20Use?Park=YOSE | |

The technical features of the app that are later explained in this report would be camping package order capability, species detection capability, geo-mapping, and an employee chat. As for organization, we will analyze the different users of our system. The main stakeholders identified in our stakeholder analysis are the National Park Service, Hawaiian Exemplary Foundation, and the UHM Archaeology Department.

| | Benefits | Cost | Risk |
|---|---|---|---|
| National Park Service | High | Low | Low |
| Hawaiian Exemplary Foundation | High | High | Medium |
| UHM Archaeology Department | Medium | Low | Medium |

Our staffing plan is to first determine how many people are required by dividing the person per month over the time to complete in months. We want to match skill sets to required activities while motivating the team to meet our objectives to minimize conflicts. Other users in our stakeholder analysis also include the outsourcing of system and program developers and archeologist experts.

The target market for Venture is centered primarily around tourists, and inexperienced families who are getting their first taste of the outdoors, however, Venture will be available and market to people of every background. According to The 2019 North American Camping Report, the National Park Service of America received 318.2 million recreation visits and booked 13 million overnight stays in 2018 *(Cairn Consulting Group)*. Visitations to all national parks have exceeded 300 million recreation visits for four consecutive years, reflecting a potentially large and growing market pool.

As stated by the report, the breakdown of the generational divide between campers in 2018 was 41% Millennials, 36% Gen X, 18% Baby Boomers and 5% Mature *(Cairn Consulting Group)*. When analyzing new campers in 2018, over 56% were Millennials, followed by 25% belong to the Gen X generation. New campers have large potential as Venture's target market, as they are the least experienced with setting up their own tents or having the likelihood of owning their own equipment. This data suggests that Millennials and Gen Xers are the age demographic Venture should be looking to reach.

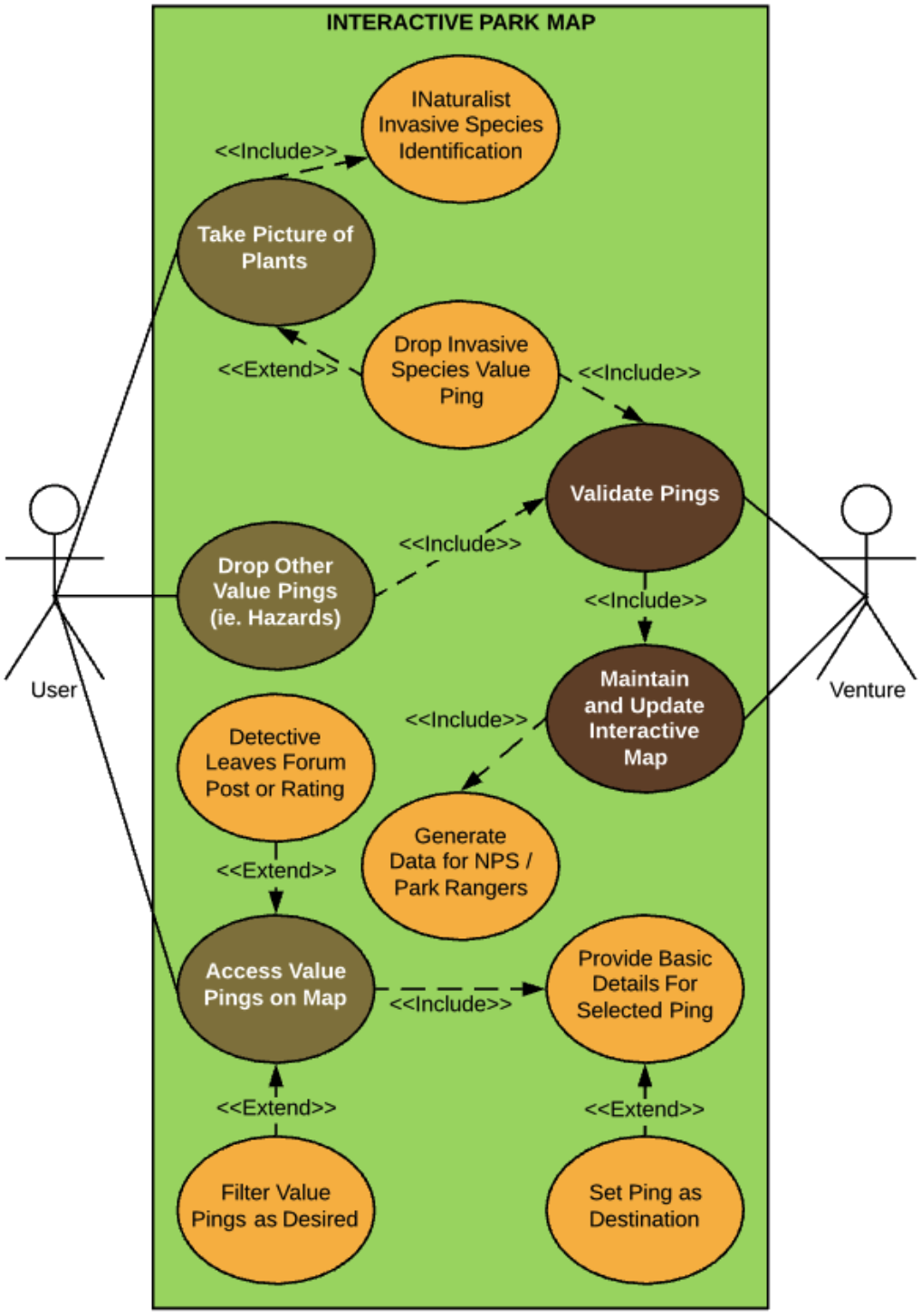
Another possible consumer group to market to would be families. The percentage of camping families with children has grown 17% over the past 5 years, showing a steady upward trend in camping as a family activity. 52% of camping families included children in 2018 *(Cairn Consulting Group).* Families are a market that has a large potential for our business, as families can rely on the convenience of packing less camping gear and having their tents set up for them.

# Features

## Geo-Mapping

Geo Mapping is a feature on the Venture app that will allow users to access everything the national park has to offer. Users will be able to see plants, animals, hiking trails, nearby hazards, and more. Users will also be able to take pictures of plants and other things to add onto the interactive map. This is to make the feature interactive and encourage the users to use the Venture app for more than just renting camping gear. There will be different levels and experience points that users can achieve when using this feature. Geo Mapping will also collect data about the endangered species of plants in the park which will be sent to the National Park Services and park rangers. This feature will only work when you are inside the park to protect the app from hackers and outside interferences.

Geo-Mapping Use Case




Geo Mapping Use Case Description

| **Use Case Name:** Geo Mapping Interface | **ID:** 2 | **Importance Level:** High |
|---|---|---|
| **Primary Actor:** User, iNaturalist, NPS, Government Tracker, Venture | **Use Case Type:** Detailed, Essential | |

**Stakeholders and Interests:**

- Users: Takes pictures of plants, animals, hazards, etc. to create pings on map
- iNaturalist: Identifies plants and provide information
- NPS: Collects data and statistics about the park from the Venture app
- Government Tracker: Provides information on the location of these pings

**Brief Description:** This use case shows how a user will use the Venture app to take pictures of plants, animals, hazards and more to create pings on the interactive map.

**Trigger:** Users will take pictures of plants, animals, hazards and more to create pings on the interactive map. iNaturalist will identify the plants and provide information on them. Pings will be on the map once they become validated by three or more other users creating the same ping as well. The location of these pings will be provided by a government tracker. Data and statistics will be generated to be sent to the National Park Services and the Venture app.
**Type:** Internal

**Relationships:**

- Association: Venture, iNaturalist
- Include: Data will be sent to safety about hazards, users will also be able to see their friends and campsite on the map
- Extend: Users will be able to know more information about the plants through iNaturalist, NPS will collect and handle the data about the plants

**Normal Flow of Events:**

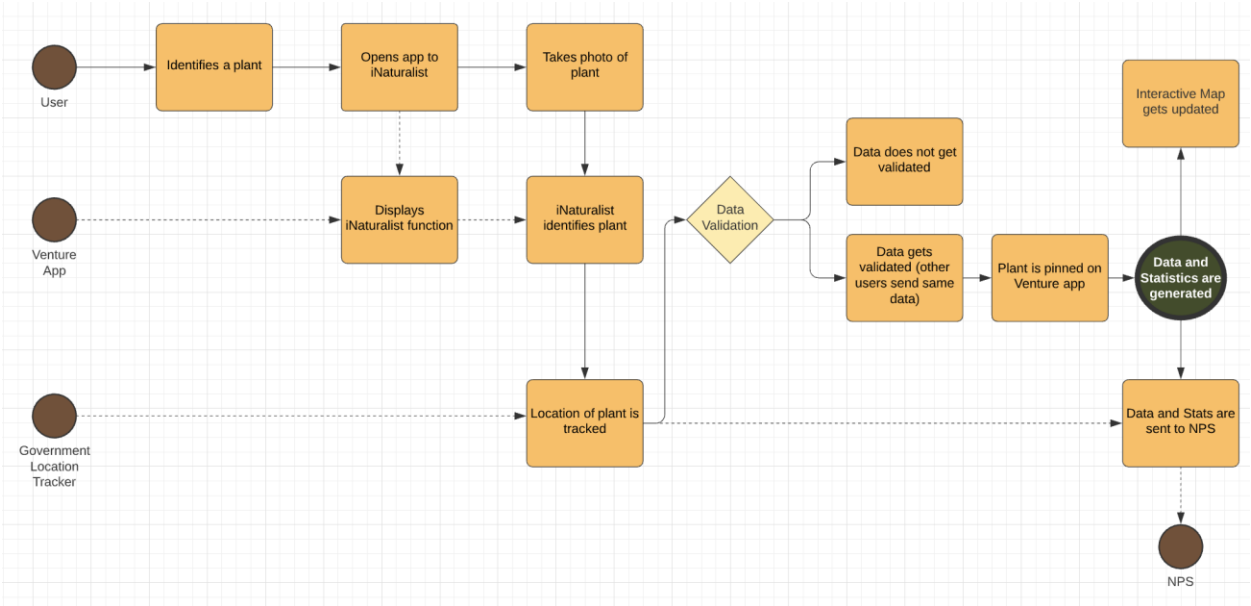
1. User takes a picture of plants, animals, hazards, etc.
    a. iNaturalist identifies plants
    b. Government Tracker locates the ping
2. Venture creates a value ping
3. Ping gets validated once other users take a picture of the same thing
4. Interactive Map is maintained and updated with the new ping

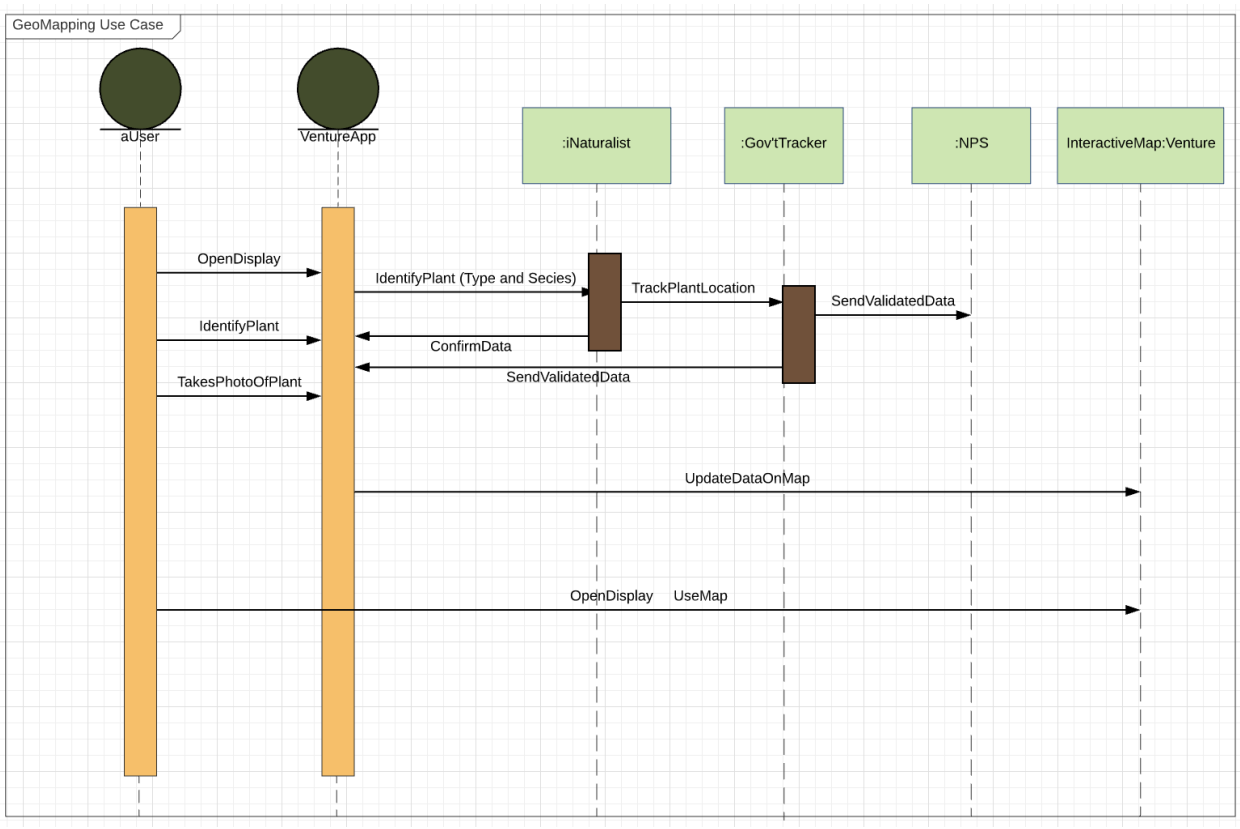
5. Data is generated for NPS and Park Rangers
6. Users can access the ping on the map
    a. Users can leave ratings or feedback on the ping
7. Users will be able to access filters for the ping and be provided basic information about the selected ping

**Alternative/Exceptional Flows:**

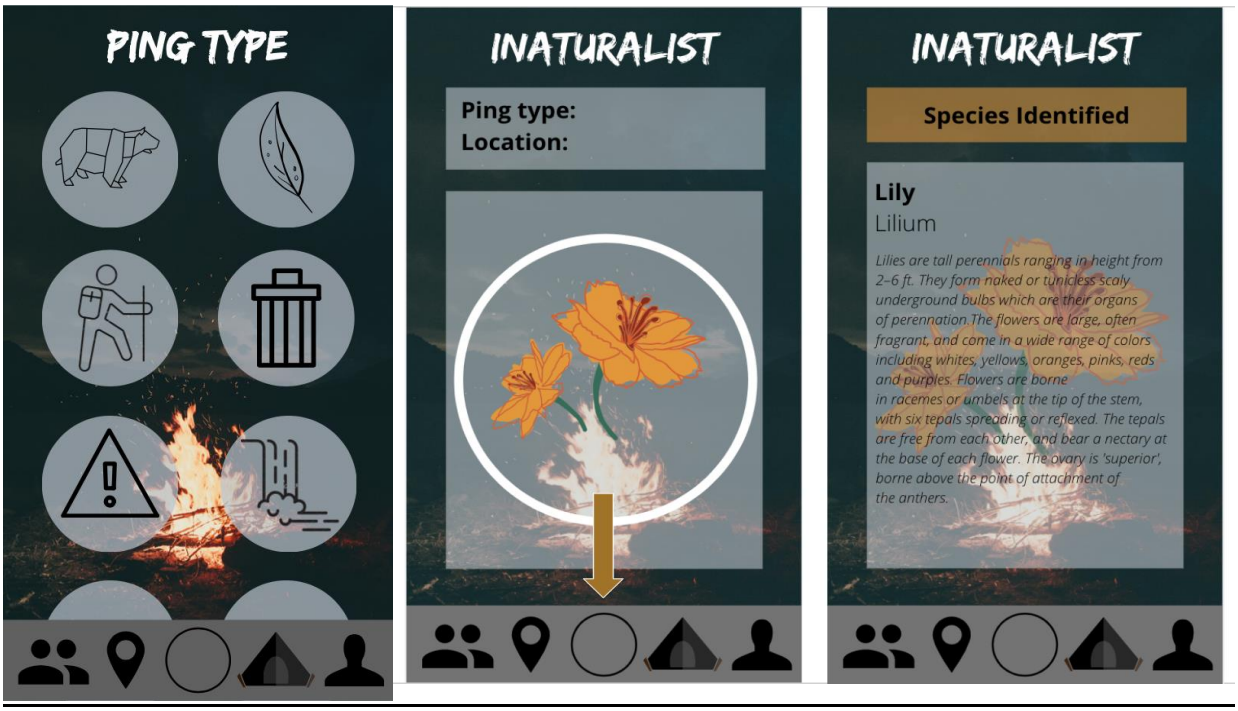
3a. If a user's ping does not have three or more other pings like it, it does not get validated

The use case for the Geo Mapping feature starts off with a user taking a picture of a plant. It sends a ping to the app which will be validated when three other users send the same thing. Once that happens, it gets updated on the interactive map. iNaturalist is an API that will identify the species of the plant and provide additional information. A government tracker will provide the location of the plant or ping. Data will be generated and sent to the National Park Services and park rangers. Users will also be able to access these pings and leave ratings and feedback for the plants, animals, and other resources.






The activity diagram for geo mapping is similar to the use case but it emphasizes the different sources that will be validating our pings and information. iNaturalist will be identifying the plants and a government location tracker will be identifying the location of those plants. The sequence diagram for geo mapping emphasizes the different sources that the validated data and pings will be sent to such as the National Park Services, Venture, the interactive map, and government tracker.

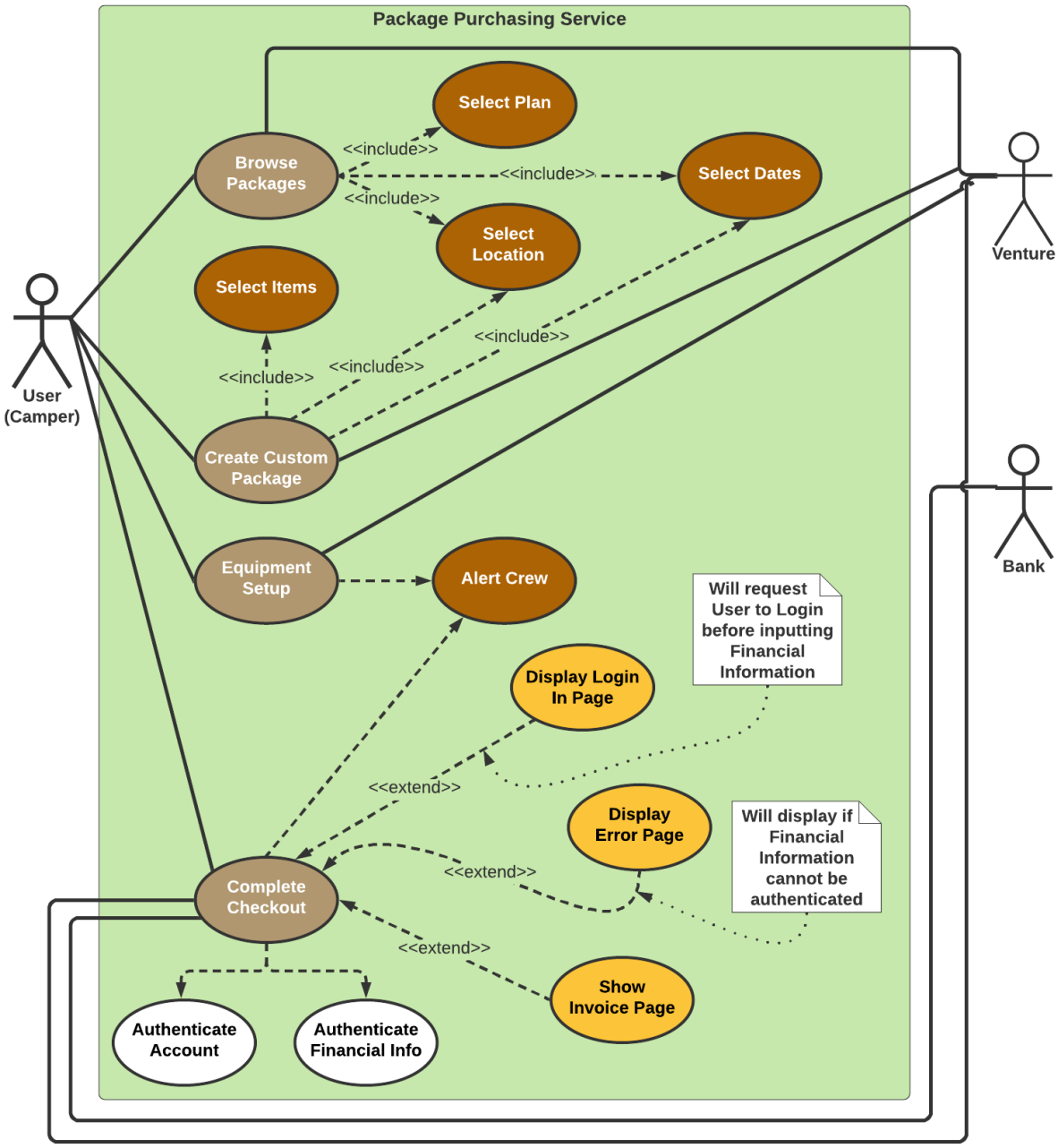




The three screenshots above are a preview of what the interface would look like for the geo mapping feature. The first one shows the interactive map with everything that the park has to offer and a notification screen for important messages and safety. It also has a screen for

users to ping plants they see while they are exploring the park. The second screenshot shows what the user would see when they want to access different validated pings. It is filtered into different categories such as animals, plants, hikes, waterfalls and more for easy access. The last screenshot is what the iNaturalist API will look like when users are taking a picture of a plant. As stated before, iNaturalist will identify the species and provide information on the plant.

## Package Storefront

To aid in pushing forward our core mission statement stated previously and to act as one of our primary methods of funding for pursuing these goals of environmentalism, the Venture app will include within it a basic Package Storefront in which Venture users will be able to purchase a variety of camping packages. As some of our target markets include such users as families, novice campers, or campers seeking more convenience, purchasing one of these camping packages will provide a user with all of the equipment and amenities needed for a camping trip(s) without the hassle of maintaining their own equipment or dealing in the set-up or break-down of a campsite. Our certified contractors also maintain a service for the set-up of personal equipment if requested. This service, we believe, will help grow a wider audience and attendance to campgrounds and help push our other primary service involved with the Geo-Mapping feature. More information detailing the set-up and break-down service itself will be further explored later.


Package Purchasing Service
Select Plan
Browse Packages
<<include>>
<<include>>
<<include>>
Select Dates
Select Location
Select Items
<<include>>
<<include>>
<<include>>
Create Custom Package
Equipment Setup
Alert Crew
Will request User to Login before inputting Financial Information
Display Login In Page
<<extend>>
Display Error Page
Will display if Financial Information cannot be authenticated
<<extend>>
Complete Checkout
<<extend>>
Show Invoice Page
Authenticate Account
Authenticate Financial Info
User (Camper)
Venture
Bank

| **Use Case Name:** Package Storefront | **ID:** 5 | **Importance Level:** High |
|---|---|---|
| **Primary Actor:** Camper (User) | **Use Case Type:** Essential | |

**Stakeholders and Interests:**

- **Camper (User):** *Browse, Customize, and Purchase Camping Packages*
- **CAMPP (Venture)**: *Display and Update Storefront; Alert Contractors on Purchases*
- **Bank**: *Ensure Authorized Transactions*

**Brief Description:** This use case describes how a user (the Camper) will use the Venture application to interact with and access the digital storefront and engage in the purchase of and complete the checkout of preset or customized camping packages.

**Trigger:** Camper (User) wants to go on a camping vacation or trip without having to purchase their own equipment and opens the Camping Package Storefront page from the Venture app's menu bar.
**Type:** External

**Relationships:**

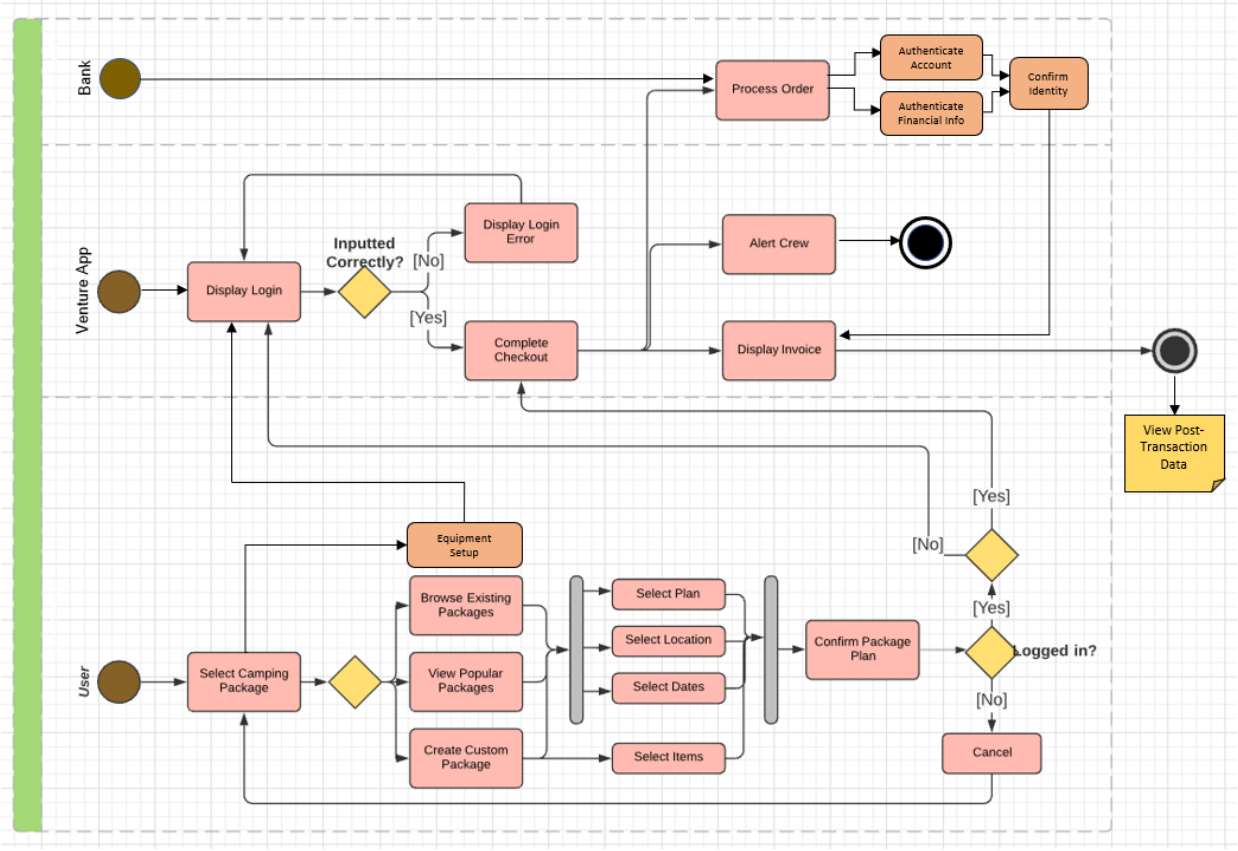
- **Association:** *User, CAMPP (Venture), Bank*
- **Include:** *Alert Contractors/Crew of Package Purchase; proceed to Set-up and Breakdown Use Case*
- **Extend:** *Selection options for package Plan, Date, Location, and Items; Display Login page prior to checkout; Display Invoice after checkout; Display Error and return user to Login if inputted information is incorrect.*

**Normal Flow of Events:**

1. User access Storefront from menu bar which will open the Storefront Screen.
2. User selects between Equipment Setup and Package Browser options.
3. User selects between camping package options.
    a. If user selects preset camping package, display package information screen.
    b. If user selects popular camping package filter, apply filter or redirect to new screen.
    c. If user selects custom camping package, redirect user to package creation screen.
4. User adds selected package to shopping cart.
5. User ends package browsing; proceeds to shopping cart interface.
6. User begins purchase procedure and proceeds to purchase selection checkout screen.
    a. If user is logged in, proceed to payment selection.
    b. If user is not logged in, request verification and display login page.
7. User ends checkout and confirms purchase.
    a. User inputs account/bank information.
8. CAMPP and Venture App processes completed checkout.
9. CAMPP and Venture App alerts contracted crew for Set-up and Breakdown services.
10. User proceeds to post-transaction invoice display.
11. User ends transaction process; User is redirected to Homepage.

**Alternative/Exceptional Flows:**

3a. User repeats step 3 for selecting package plan if filter is applied.
3b. User selects chosen Date and Location for package plan set-up and breakdown.
3c. User selects from itemized list of supplies and equipment. User proceeds back to Alt Step 3b after item selection.
4a. User may leave storefront interface or continue browsing after adding item to cart. Repeat from Step 1 or Step 3 respectively.
7a. User has transaction history, request if User would like to input same credentials, bypass Step 7 and proceed to Step 10 if accepted. Continue with Step 7 if declined.
7b. User inputs authorized account information from bank, proceeds to Step 10.
7c. User inputs unauthorized or incorrect account information from bank, repeat Step 7.




The Package Storefront will work similarly to other online storefronts and shopping cart APIs. The principal actor, a Camper or User of the Venture app, will begin using the Package Storefront when they wish to purchase an equipment package for a camping trip or vacation. To select a camping package, the user must first browse among existing and popular packages available within the storefront posted by the Venture organization itself (see Set-up/Breakdown Interface mockup). Selecting one of these packages will display the equipment provided, the package price, as well as the location and times the package can be used; these packages and the equipment provided may change depending on external factors, such as seasonality or environment. Users may also choose to create their own custom packages should they require more precision in equipment selection, or simply for our services to provide campsite set-up in situations where the user owns their own equipment. Selected packages are added to the user's personal shopping cart.

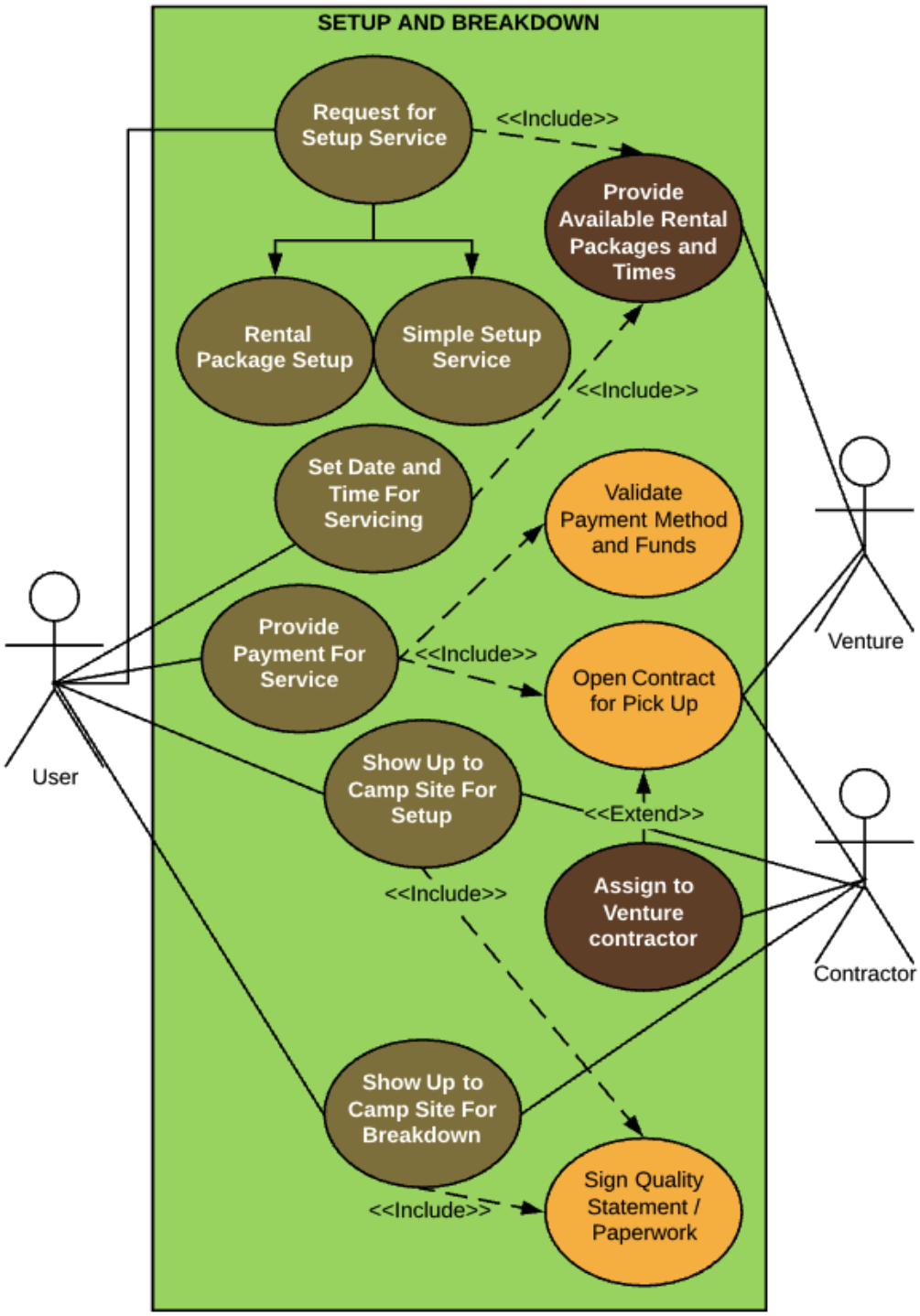
Once a package is selected and a user is ready for purchase, if a user is not logged in or has not created a Venture account, they will be asked to do so. This will be done using a simple username and password. Once the user has been confirmed via this traditional login system, the order will be processed. While an order is processed, financial information will be checked and confirmed through the user's chosen financial institution or banking service as well as sent as an alert to contractors and crew to prepare the package; information regarding contractor communication for package set-up and break-down is discussed later. Finally a user will be able to view their order's invoice and any necessary post-transactional data once the package purchase has been completed. Attached above is an example use case and activity diagram illustrating this process from package selection to transaction completion. Some additional options to note should be that users can skip the financial information request should they choose a payment method used previously and other sub-flows that can appear during the transaction process.

# Set-up & Breakdown

Venture offers set-up & breakdown camping service that allows our users to enjoy the ease of their visit. We strive to make camping as convenient as possible so that more people will spend time in nature. Our app takes the hassle out of camping and makes it possible for anyone, no matter what their experience is. On the day of your arrival, contractors will gather the gear you have selected and meet at the campsite at the selected appointment time to setup/breakdown within a 30-minute time frame. The Venture app will be used as a communication tool between management, contractors, and campers. This provides transparency between all involved parties. Our app has been customized for our users to use effortlessly while providing other features to benefit our users' camping trip(s).

By requesting a set-up & breakdown service, campers can choose between a rental package setup or a simple equipment setup service. The rental package option consists of predetermined bundles of camping equipment that our users will essentially be renting during their stay. This eliminates the hassle of traveling with personal camping equipment or buying hardware that may only be used once. Certified contractors that have been trained by James Bayman, a National Park Service Archaeologist. *(Appendix: Interviews)*, will be assigned to complete service orders for set-ups & breakdowns. If a user would like to use their own camping kits, the simple equipment setup service may be chosen where contractors will set-up & breakdown our users personal equipment.

Set-Up & Breakdown Use Case Diagram & Description



# Setup and Breakdown Use Case Description

| Use Case Name: Setup and Breakdown | ID: 1 | Importance Level: High |
|---|---|---|
| Primary Actor: Camper | Use Case Type: Detailed, Essential | |
| Stakeholders and Interests:<br>• Suppliers: equipment and inventory<br>• Marketing team: number of packages sold<br>• Interface developers: flow of process | | |
| Brief Description: This use case describes how the VENTURE's setup and breakdown service works from beginning to end. | | |
| Trigger: The camper requests for setup service.<br>Type: External | | |
| Relationships:<br>• Association: VENTURE, Contractor<br>• Include: available rental packages and times, open contract for pickup, signing quality statement/paperwork<br>• Extend: assign a VENTURE contractor to a contract | | |
| Normal Flow of Events:<br>1. Camper requests for setup service<br>2. Camper selects package<br>2a. Rental package setup<br>2b. Simple Setup Service<br>3. Camper sets date and time for servicing<br>4. Camper provides payment for service<br>5. VENTURE validates payment method and funds<br>6. VENTURE opens the contract<br>7. Contractor is assigned to contract<br>8. Camper and contractor show up to camp site for setup<br>8a. Sign quality statement/paperwork<br>9. Camper and contractor show up to camp site for breakdown<br>9a. Sign quality statement/paperwork | | |
| SubFlows: | | |
| Alternative/Exceptional Flows:<br>5a. If payment method does not go through, service is rejected, and camper must start from beginning. | | |

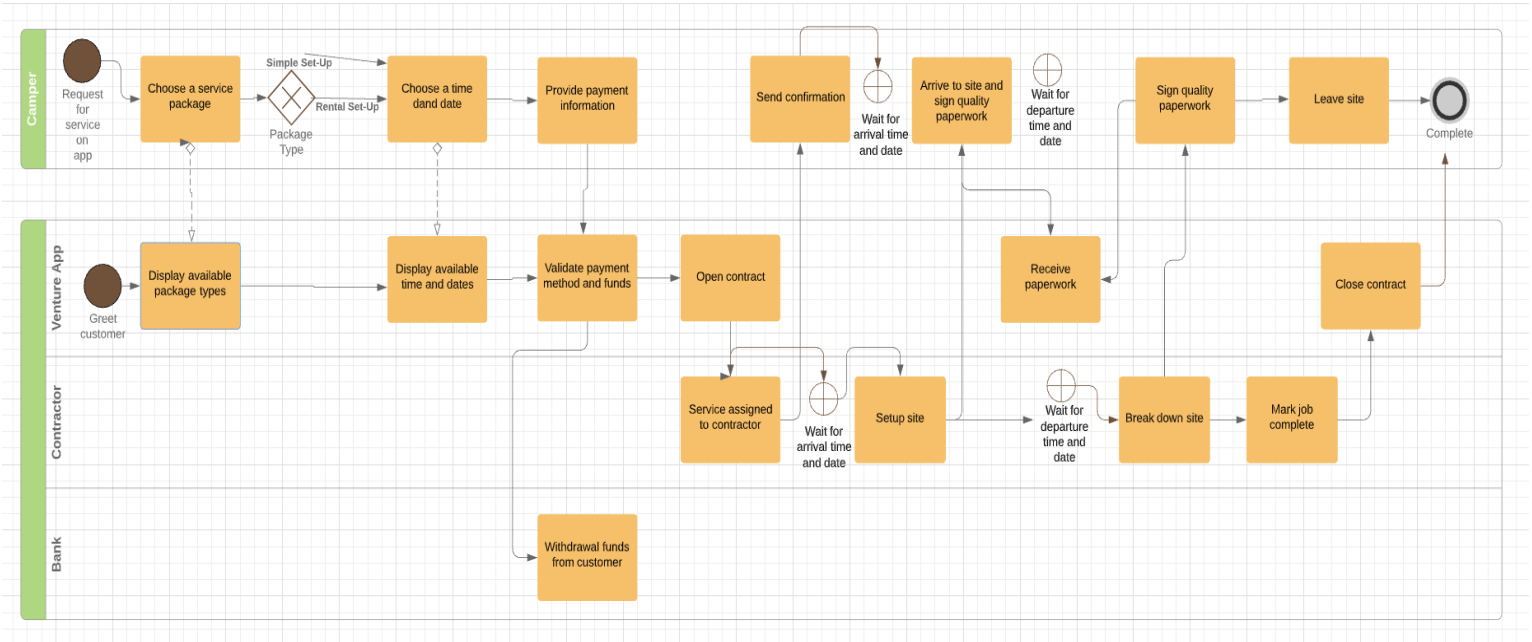
---

The set-up & breakdown function works similar to most e-commerce applications. The actors involved in the process would be our user(s), Venture, and the certified contractor(s). First the user must choose between the two categories of packages, a rental setup or a simple

equipment setup. All available rental packages and set-up & breakdown dates and time will be displayed *(see Interface).* Once a time and date is set by the user and a payment method is provided, Venture's system will validate the payment method and funds then open the service for pick up.

From there, a contractor can pick up the service order or it will be assigned to a contractor if not picked up. Once the user arrives at the campsite to begin their stay, the site would be set-up by the contractor and the quality statement and paperwork covering liability forms and damage insurance to cover legal issues that could possibly occur. These papers will also be signed again during the breakdown to ensure a complete, cyclic process.

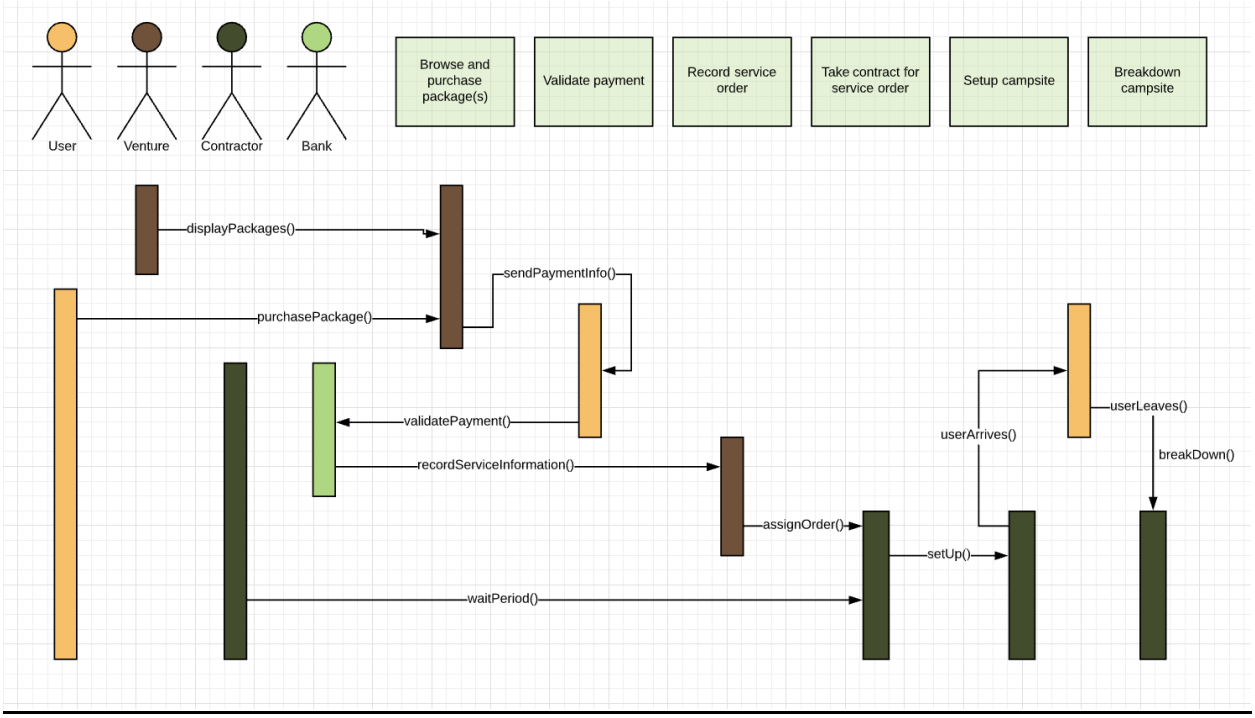
# Set-up & Breakdown Sequence Diagram




Attached is our BPMN activity diagram to illustrate Venture's workflow for set-up & breakdown service process beginning when the camper requests for a service and ending with them leaving our site and Venture closing the service contract. The camper, Venture app, contractor, and the bank are included in swim lanes as they are included in the activity workflows of Venture when this service is completed.

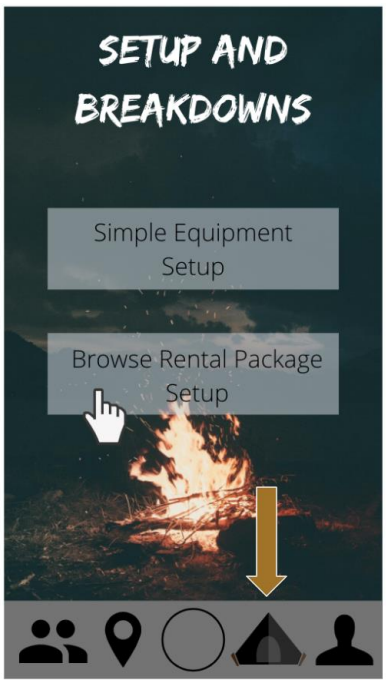
This diagram goes into more detail than the use case diagram shown above. It gives a definite step-by-step workflow of activities that can be used by each party involved. A representation of what needs to be done to progress in each process is shown such as sending service order confirmations, the wait times, and Venture actually receiving the paperwork.

# Set-Up & Breakdown Interaction Diagram

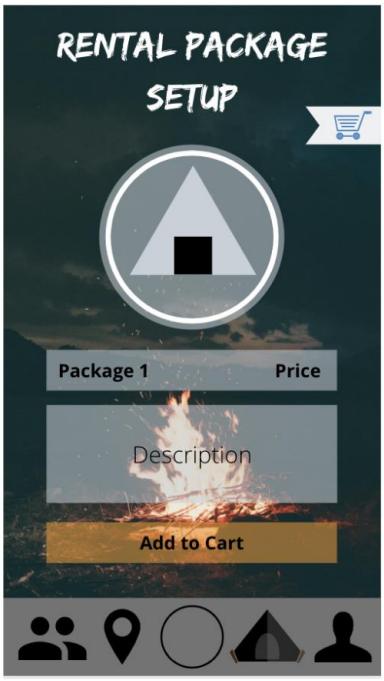


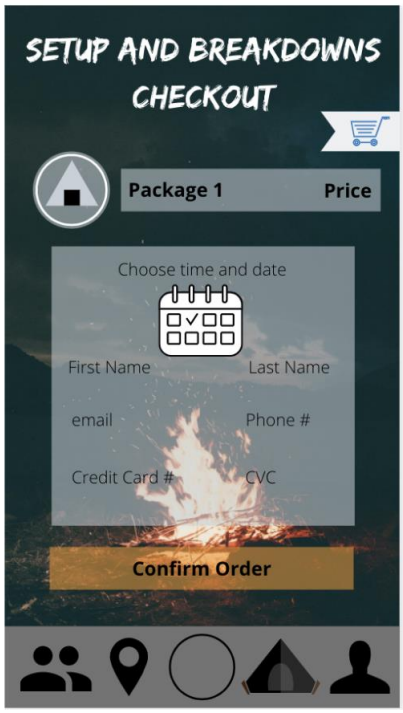

This diagram simplifies the BPMN activities while conveying the interactions between each step. With the same four actors as our BPMN diagram, the workflow steps are simplified into browse and purchase package(s), validate payment, record service order, take contract for service order, setup campsite, and breakdown campsite. The blocks are color coded, indicating which actor is involved in the interaction. The arrows signify the communications between each interaction to specify what exactly is happening, similar to the actions on our UML diagram.

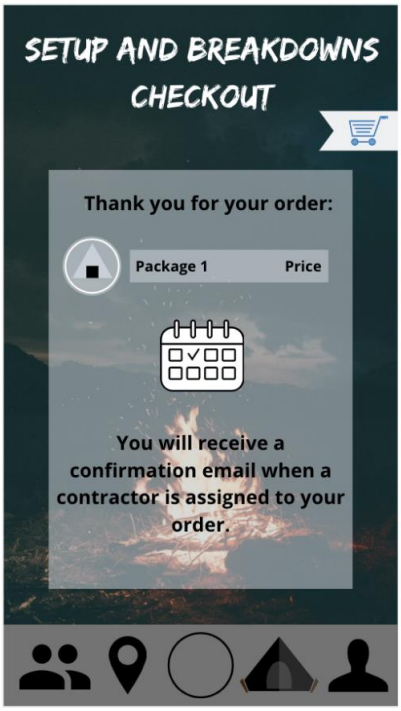
## Set-Up & Breakdown User Interfaces








_____The above illustrations are five mock-up interface screens for our app. It particularly mirrors our diagrams shown above as the service is triggered when the user requests for

service. This can be done by our user clicking the tent icon on our toolbar which redirects them to screen 1, giving the choice of simple equipment setup or to browse rental package setups. Available packages are displayed on screen 2, allowing the user to browse and purchase their desired package. Screen 3, similar to most e-commerce application UI, shows the user the description and price of packages.

Once our user has selected their package, a calendar is displayed with all available dates and times for set-up & breakdown. The user may then enter their contact and bank information so Venture can validate and process their payment method. After pressing “Confirm Order”, a message is shown with a summary of their order and a note saying “You will receive a confirmation email when a contractor is assigned to your order.” After this, most interactions are done face-to-face between the contractor and camper, thus a UI is no longer needed.

## Safety

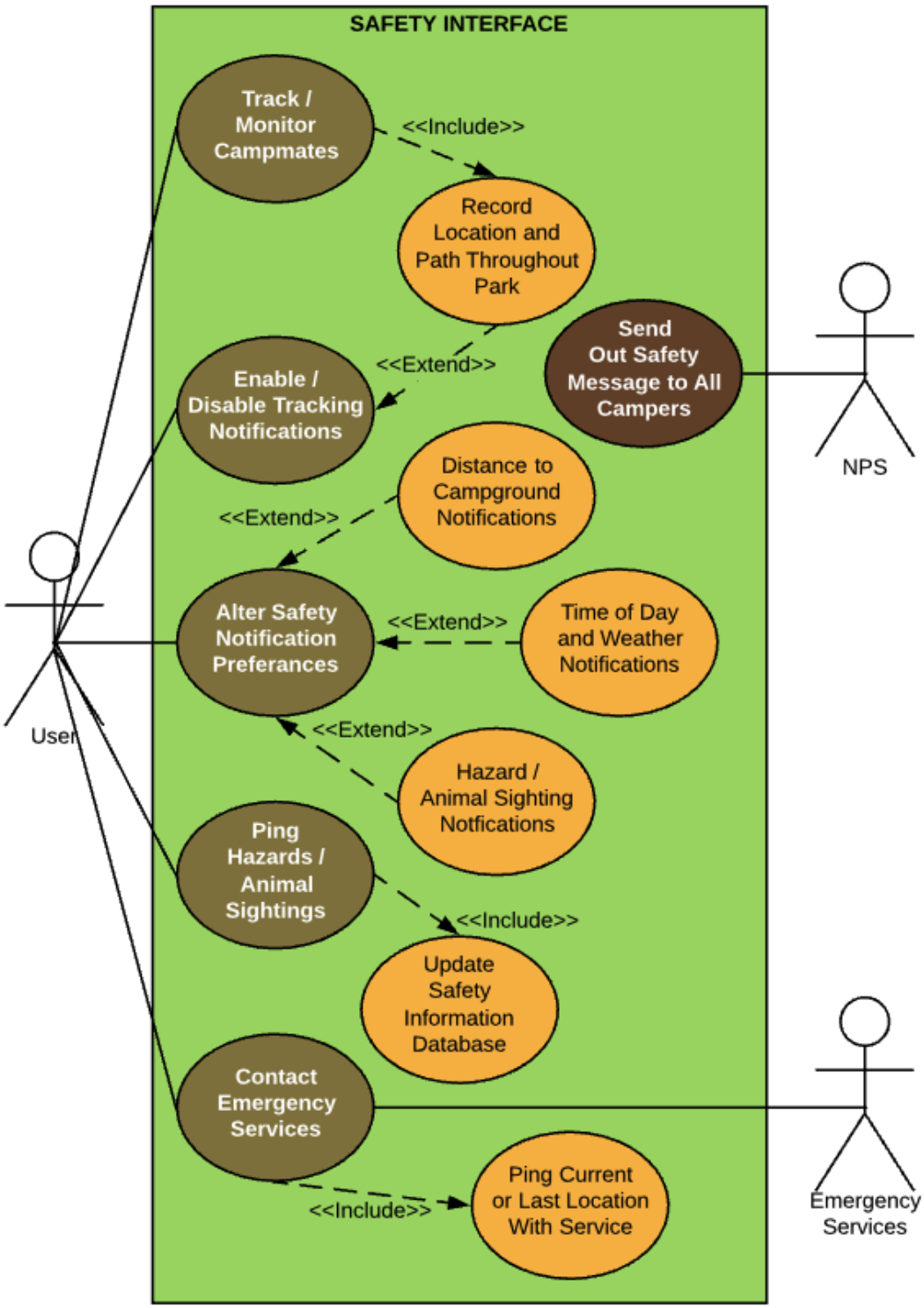
Having an app with GPS has a lot of benefits and drawbacks, for the safety interface it provides a great benefit for the community. One of them being able to have notifications for things nearby and being able to contact emergency services. With the safety interface, users are able to toggle which notification they would like to have on their feed.

They have two different types of notifications, Gernal Notifications and GPS based Notifications. General notification will include notification such as; when a campsite is ready, the weather, when the sun is rising or setting and any park wide emergencies. GPS based Notifications will include; if there is a campsite nearby, if there is a hiking trail nearby, hazards in their area (animal or otherwise). Users will also be able to ping hazards on the system with geo-mapping. This GPS signal goes through the safety system to be able to contact NPS and Emergency services.

Lastly users will also be able to contact emergency services. This gives the user the option to contact someone if they find a hazard that could be threatening them or others around

them, or if something happens to the user and they are stuck, lost or feel unsafe from another park visitor. This also ensures the user that they will be safe, if anything happens to them or the people around them, in the park.

Safety Interface Use Case



## Safety Interface Use Case Description

Users will have the option to toggle safety notifications and report hazards. From this, users are able to choose which notifications they would like, as well as making choices to report hazards around them. While doing this, they are able to report hazards, once reported the report will go to a database which holds information about all the hazards that are reported. Once three reports match in an area, a notification will be sent to emergency services which then, they will look at the hazard. After Emergency services view the hazard they will notify NPS and send out a notification to all Venture app users.

<table>
<tr><td>Use Case Name: Safety Interface</td><td>ID: 3</td><td>Importance Level: High</td></tr>
<tr><td>Primary Actor: Camper, NPS and Emergency Services</td><td colspan="2">Use Case Type: Detailed System</td></tr>
<tr><td colspan="3">Stakeholders and Interest:<br>· NPS: Sends out notification to users based off user input<br>· User: Users input information of potential hazards<br>· Emergency services: After three of same user sightings, will check out hazard</td></tr>
<tr><td colspan="3">Brief Description: Safety interface is used to check and ensure safety of campers who are staying or visiting the national parks.</td></tr>
<tr><td colspan="3">Trigger: Camper(s) ping hazards, after three of the same reported hazards, a notification will be sent to NPS and they will inform Emergency services, from there if hazard is there, Emergency services will remove or report hazard to NPS to send out notifications to campers that the hazard has been removed or if there is an active hazard at the site.<br>Type: Internal</td></tr>
<tr><td colspan="3">Relationships:<br>· Association: NPS, Emergency services<br>· Include: Live ping of active or moved hazard<br>· Extend: sends Emergency services to look/ take care/ warn about potential hazard</td></tr>
</table>

Normal Flow of Events:

1. User(s) use app to report hazard
2. Three or more users report the hazard
3. NPS is notified that three of the same hazards has been located in the same area by a user
4. NPS notifies Emergency services to look for potential hazard
5. Emergency Services are sent to site
6. Emergency services evaluates hazard
7. Emergency services report back to NPS on status
8. NPS sends notification to campers (respectively)

Subflows:

Alternative/Exceptional Flows:

6a. If Emergency services can remove hazard than it will be removed from site

6b. If Emergency services cannot remove hazard than report accordingly

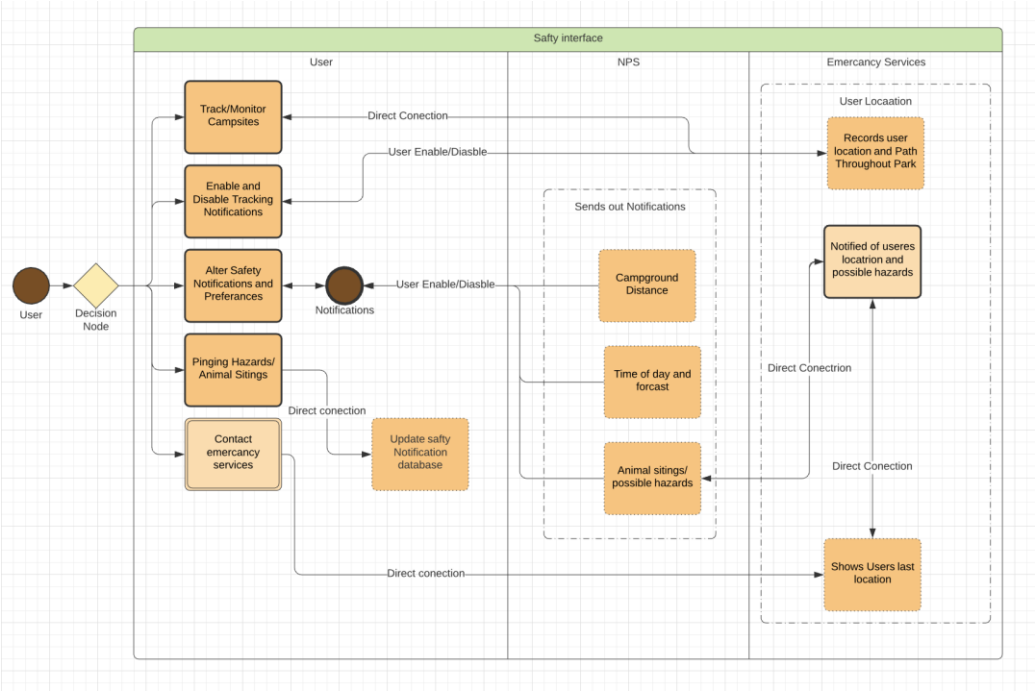
6c. If Emergency services cannot find hazard than report accordingly

8a. If hazard was removed, NPS will notify campers that the area is safe, and it has been removed

8b. If hazard could not be removed, NPS will notify campers about an active hazard and to stay away from that area

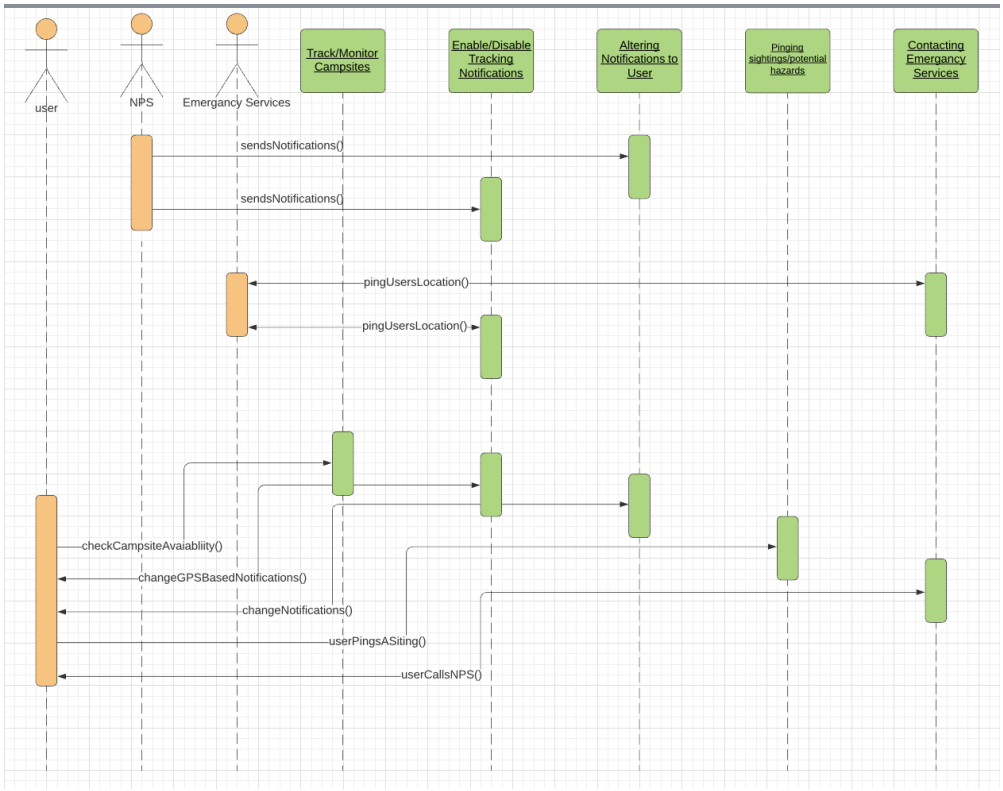
8c. If hazard was not found, NPS will remove ping from map and notify campers who reported hazard that It was investigated and not found by Emergency services

# Safety Interface Activity Diagram



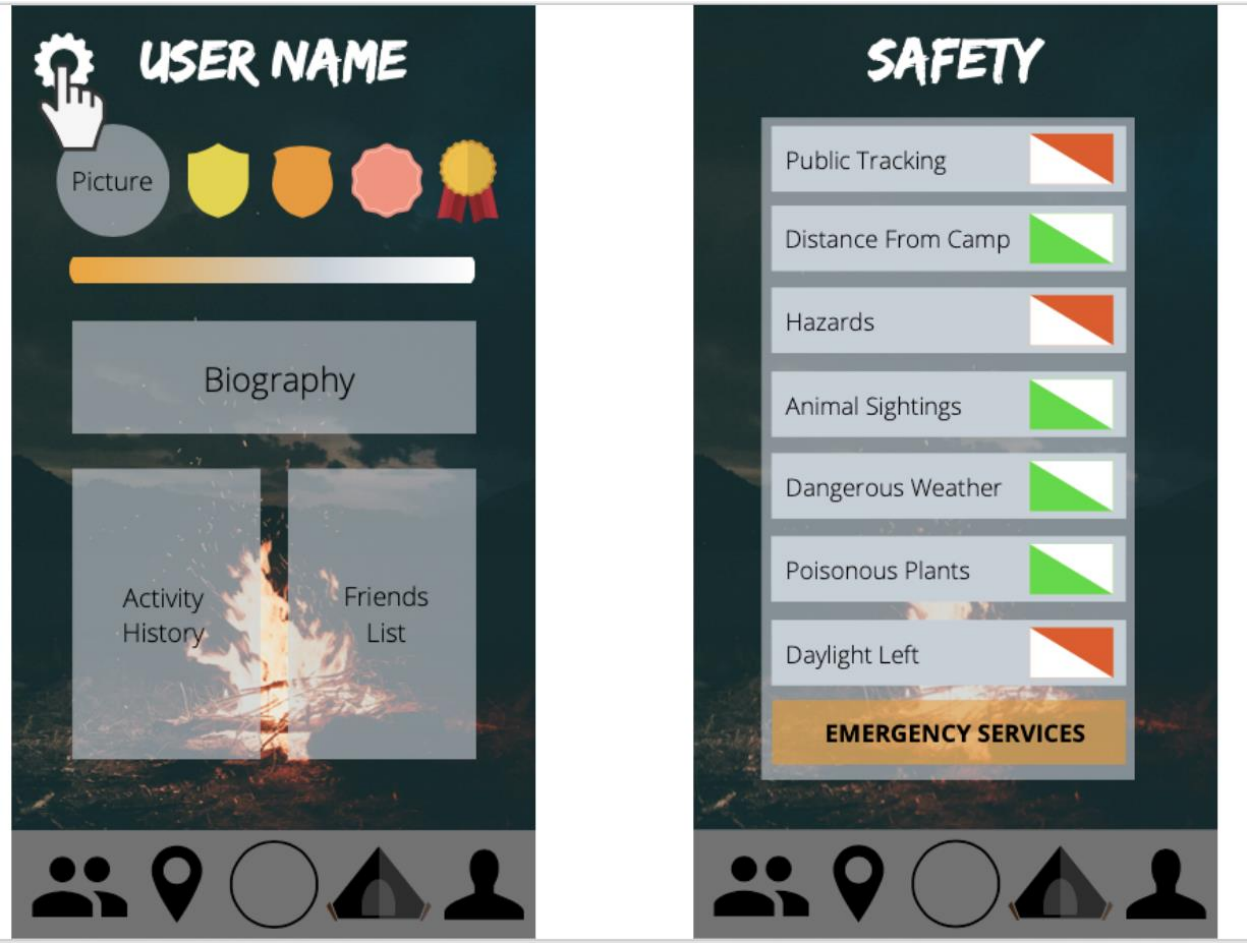

Users will be able to choose which they would like to do; track/monitor campsites, enable or disable tracking notifications, alter safety notifications, report a hazard or contact emergency services. Once a user has decided which option they would like to do, they will then be sent to either NPS or Emergency Services. NPS takes care of all  the notifications for Venture and Emergency Services handles user locations.

# Safety Interface Sequence Diagram




Depending on the user's choice they will be sent to either NPS or Emergency Services, respectively. From there, NPS and Emergency Services work together to identify hazards and notification to send out to Venture users. Once three of the same hazards are reported in a similar area,  Emergency Services are sent to look at the hazard. If the hazard can be removed, then they will contact NPS to send out a notification that  a hazard is/has been removed from an area. If a hazard can not be removed then NPS sends a notification that there is an active hazard in the area and visitors should not go there. If there is no hazard  then Emergency Services will tell NPS to send out a notification that there is no threat in the  area.

Safety Interface Mock-up




## Community Interface

The community interface, accessed via the bottom left icon on the user interface's static toolbar, will be the social glue that brings the different features available throughout the Venture app together. The most popular apps that we use today are social in orientation. By combining the best of socialization and gamification software, the Venture app seeks to empower its local communities with the tools to educate themselves and battle conservation and environmental issues in an engaging and enjoyable manner. As depicted in the various diagrams below, the community interface is composed of four parts to a whole. These four features imbue the user with the ability to find friends and communicate with them, create beneficial activity groups,

check in on the local value ping competition and stay up to date on all news revolving around the National Park. To achieve a wholesome understanding of how the community interface works it is necessary to undergo an in-depth analysis of each available feature.

To begin, the find and communicate with friends feature operates like most well known application's social components. Venture strives to mirror the face to face communication we see on a daily basis and take it a step further by pairing communication with safety through precise location tracking and ping destination sharing. When a user selects the community interface icon in the static toolbar, the find friends screen will launch, ready and waiting to scan venture codes or display your own. Just like Snapchat, Venture will allow you the option to either search for a friend via username or scan a unique Venture code in person with your device's camera or upload the code from a screenshot in your image files. We are certain that implementing a friends networking portal that models Snapchat, with over 210 million daily users, will prove to be extremely user friendly, familiar, and adoptable. (Moshin, 2020)

Furthermore, the find friends feature should also be equipped with the standard verification and friend recommendations for searched usernames. As a username is being input, Venture should display available options with each new letter and consider variables such as mutual friends and proximity to user location to exhibit optimally predicted candidates before the exact username is input. A simple mock up of the display for this feature can be found below alongside other important features. Once a friend is found, Venture will display whatever information that potential friend has enabled to broadcast publicly such as badges earned, parks visited, user biography and profile picture. To enter into communication with the other user a friend request must be accepted. Following request acceptance the new friend will appear and be available to communicate with on the friends messaging interface found one swipe to the right of the initial find friends launch screen.

Moreover, from the friends messaging portal a user can communicate with his or her friends and create activity groups. This interface also looks and acts similarly to the popular

Instagram and Snapchat communication portals. A user can tap directly on a specific friend to open a chat and communicate one on one. Accessing the details of a specific friend allows you to track their location, set them as a destination, send your current location, share news and send value ping destination recommendations. Tracking a friend's location or setting it as a destination will make them appear on the interactive map interface. Of course this ability is only possible if the user to be tracked has public tracking enabled or has sent you his or her own location directly.

Venture will also retain the ability to create activity groups of up to 20 people, to enhance the ability to communicate with multiple people at once, each of whose location can be tracked simultaneously aside from the multiendpointed communication vessel. This means that a family of five can explore the forests of a National Park with greater peace of mind knowing that if they lose track of one another they can set each other as a destination and regroup efficiently, all while maintaining unbroken communication. Enabling '*Parent Mode*' in a specific category of activity group designated as '*Family*' will also allow parents to receive notifications when their children enter the vicinity of pinged hazards. All members of an activity group who have the respective notifications enabled will receive an update every time a message is sent in an activity group chat. To make an activity group you must tap the plus sign displayed next to a friends chat preview bar on the friends messaging interface. Tapping will prompt a friend list with additional plus signs next to their names for you to select from and add to the group quickly and conveniently. Additional members can be added from within the activity group portal once a group between more than two users is forged. The option to display all public friends in an activity group on your interaction map will be available. You can also pick and choose individuals to track or make your location public for. Not all members of a group have to be friends with each other. One person in the group could have added all of his friends, none of whom know one another. For this reason, a roster of everyone within the activity group, their

names, and profiles will be available to view and send friend requests from within the group portal.

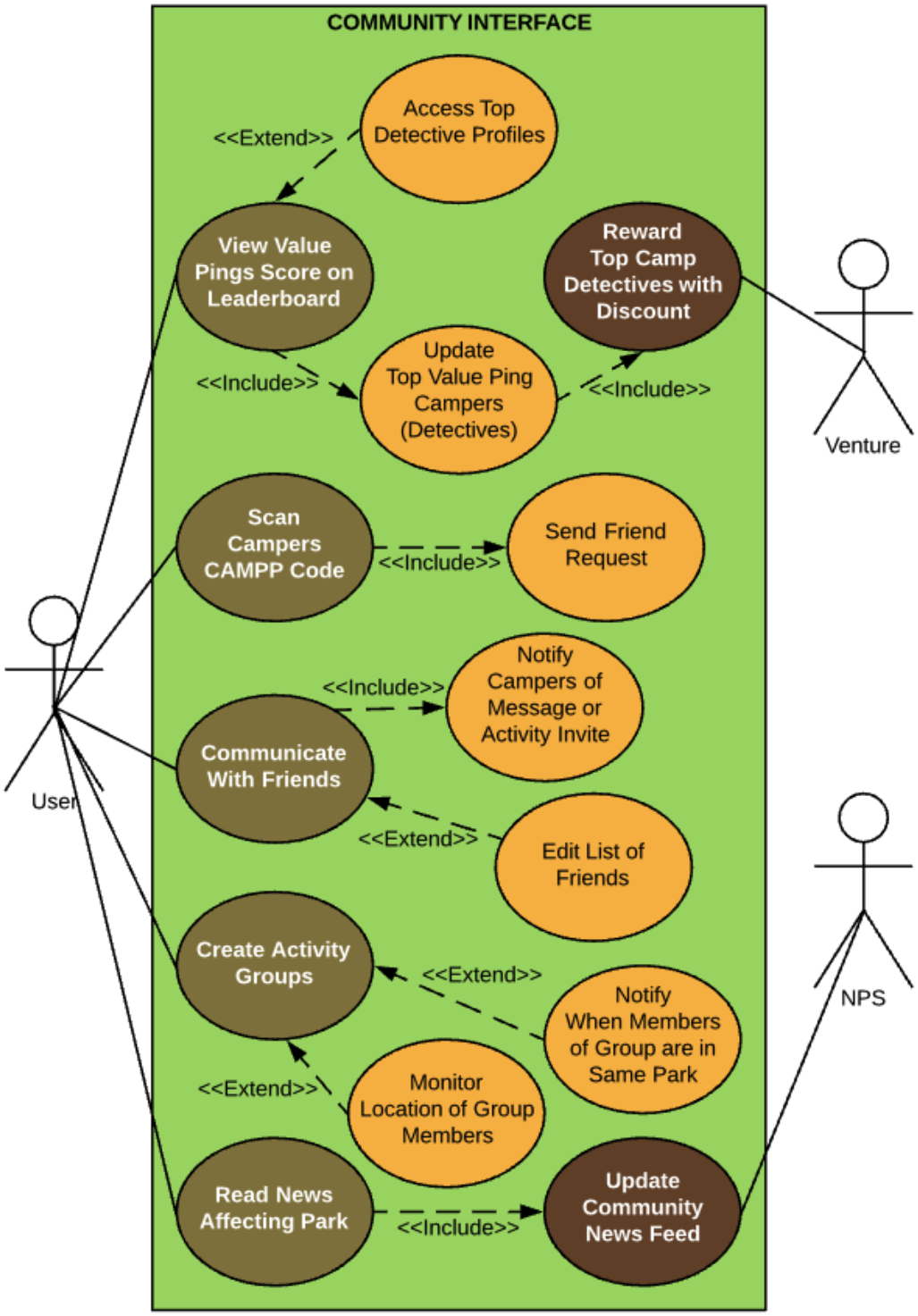
In light of this, the third pillar of the Venture Community Interface is the Value Ping Leaderboard. This leaderboard, accessed by swiping left from the find friends launch screen, will display the top fifty Venture detectives in the park that you are currently located or closest to. The leaderboard will possess options to filter top detectives by ping type and time frame. If you have a passion for fighting back against invasive species you may find it valuable to have access to the top invasive species ping detective at the park you reside in. From the leaderboard you can friend request detectives and hopefully enter into communication or activity groups with them to help you on your value ping specific missions. To incentivize that users continue to actively drop and validate value pings on the interactive map the top ten detectives each month will be rewarded with heavily discounted camping setup and breakdown services. Rewards will be granted on the first of the month, however, the leaderboard will be updated on a rolling basis. Your spot as number one can be stolen right before the first. Education tends to be dull and unattractive and educational games trapped in social isolation do not hold their allure for long. However, a socially engineered and competitive educational game that offers tangible rewards both for the user and planet is bound for success in today's world of interconnected online socialization of progressive morality and environmental conscientiousness. A sample mock up of the value ping leaderboard is displayed alongside the other community interface features below.

Last but not least, the fourth pillar of the community interface, the National Park News portal, will be the direct link between authorities at the park and its daily adventurists. Accessed from the find friends launch screen by swiping to the right twice, passing the friends messaging portal, users will have all available knowledge of the park at their fingertips. If a special event such as a whittling contest in the northern woods area off Yosemite is to take place, everyone will know. If an escaped convict has taken sanctuary in those same woods and park rangers

have yet to apprehend him, everyone will know. Knowledge is power and the information that the National Park Services deems relevant and important for explorers to know will help park goers to make educated decisions when park circumstances change. Venture users will also be able to send and share news articles to their friends and activity groups to help spread the word faster. The National Park Service will update this news feed as they deem necessary but is expected to be used quite regularly as a direct connection to its patrons no matter where on the park is too invaluable a resource and tool to be left unused. News articles will be rated on a need to know basis, where level 1 news is deemed absolutely critical, such as an active shooter at the park, and will notify all Venture users regardless of their notification settings.

Conclusively, the four pillars of Venture's community interface; the ability to find and communicate with friends, create activity groups, check in on your local competition and stay up to date with the most important circumstances and events at the park, work together with harmonious synergy to enhance the experience provided by Venture and the National Park as a whole. It is one of our top priorities to make a visit to the National Parks as rewarding and enriching as possible and this community interface makes leaps and bounds toward that goal. Socializing the gamification and education provided by Venture will bring people together in an effort to heal the planet one value ping at a time. A simplified diagram of the community interface can be analyzed in the use case below. Notice that Venture and the National Park Service stay relatively untangled in the interaction between users. This is to ensure a mindset of relative freedom and security in the exchanges between parties without overarching authority watching every message sent and location shared. Venture is for the people, and planet, and should be left un-micromanaged by large and impersonal entities that could detach the underlying human morality involved in the attempts by individuals, who can come together as teams, to restore the land around them.

Community Interface Use Case




Community Interface Use Case Description

To take the simplified use case above and delve further into a specified step by step of how a user would interact with this portion of the Venture system, a detailed use case description is presented below. This use case represents the most likely set of actions to take place the most often within the community interface with a few alternative options. There are other available use cases that could have been detailed however the one described below was deemed fundamental in exemplifying the purpose of this facet of the Venture system as a whole.

<table>
<tr><td colspan="2">Use Case Name: Community Interface (Ryan)</td><td>ID: 4</td><td>Importance Level: Medium</td></tr>
<tr><td colspan="2">Primary Actor: Camper</td><td colspan="2">Use Case Type: Detailed, Essential</td></tr>
<tr><td colspan="4">Stakeholders and Interests:<br>- Users: Find and Communicate with Friends<br>- NPS: News feed<br>- Venture: Leaderboard Rewards</td></tr>
<tr><td colspan="4">Brief Description: This use case describes how a user interacts with the community interface to find and communicate with friends, check in on his value ping competition and read park news.</td></tr>
<tr><td colspan="4">Trigger: User wants to find an experienced friend to adventure with and opens Community Interface from Venture app’s static toolbar.<br>Type: External</td></tr>
<tr><td colspan="4">Relationships:<br>- Association: Venture, NPS, Users<br>- Include: Rank value ping detectives and reward top ten, Notify users of chat updates, Update news feed with relevant articles.<br>- Extend: Create activity groups, Monitor location of group members, Notify users when group members are in the same park, Send friend requests, Edit list of friends.</td></tr>
<tr><td colspan="4">Normal Flow of Events:<br>1. User A accesses Community Interface from toolbar which opens the Find Friends screen.</td></tr>
</table>

2. User A swipes left, accessing Value Ping Leaderboard
3. User A selects overall first place Venture Detective (User B) in specific park
4. User A combs through badges, interests and parks visited on User B's profile
5. User A sends friend request
    a. User B accepts or declines
6. User A is notified of friend request acceptance
7. User A swipes right twice from leaderboard to get to Friends Messaging Interface
8. User A and User B communicate on chat interface and decide to create an activity group
9. User A invites user B to an activity
    a. User A accepts or declines
10. Both User A and B enable their group tracking setting so they can find each other if they get seperated.

**Alternative/Exceptional Flows:**

1a. User A searches a friend by his or her username, skipping to step 4 or 5.

1b. Scan unique Venture code given to him by a friend, skipping to step 4 or 5.

2a. User A Swipes right once to access Friends Messaging Interface, skipping to step 8 or accessing an existing group to communicate with or access information from its members.

2b. User A Swipes right twice to access relevant NPS news and/or share articles with friends or groups.

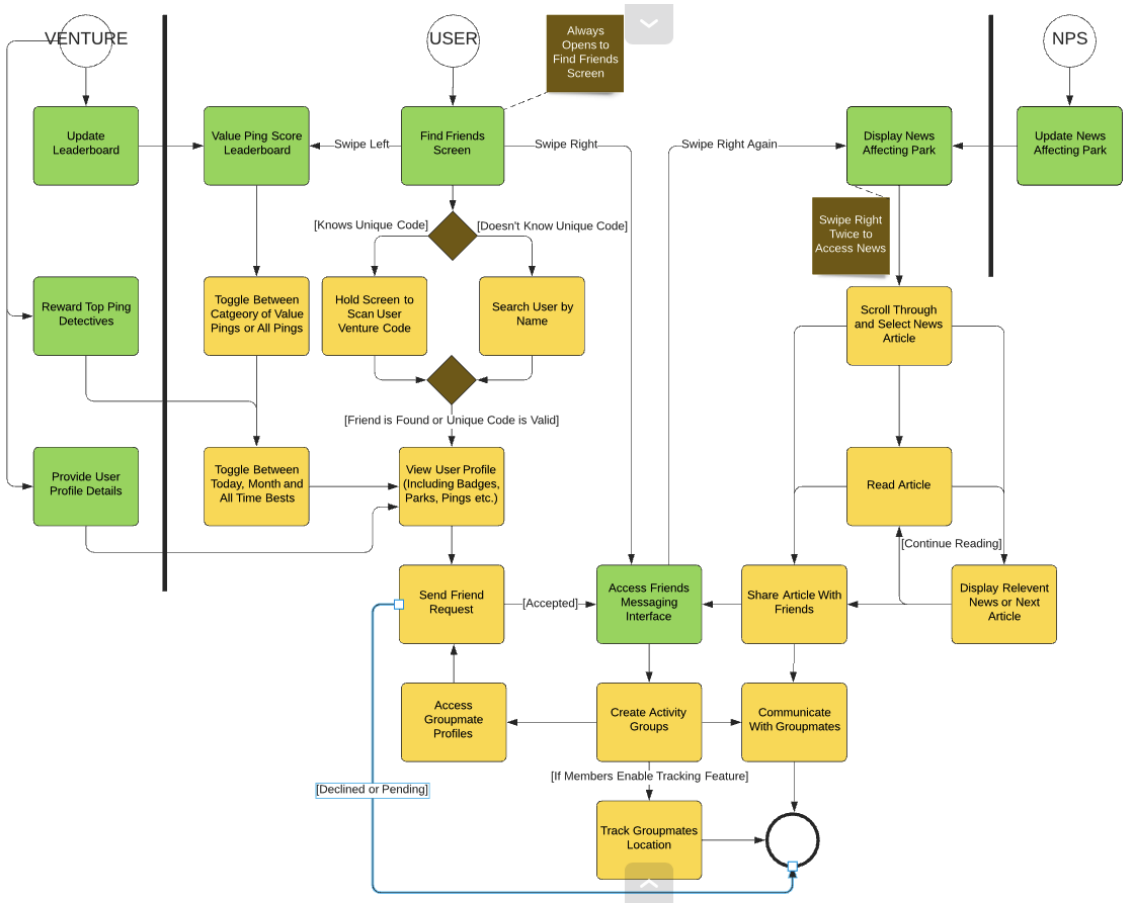
3a. User A filters leaderboard by type of value ping to find user with similar interests

3b. User A toggles between week, month and all time scores

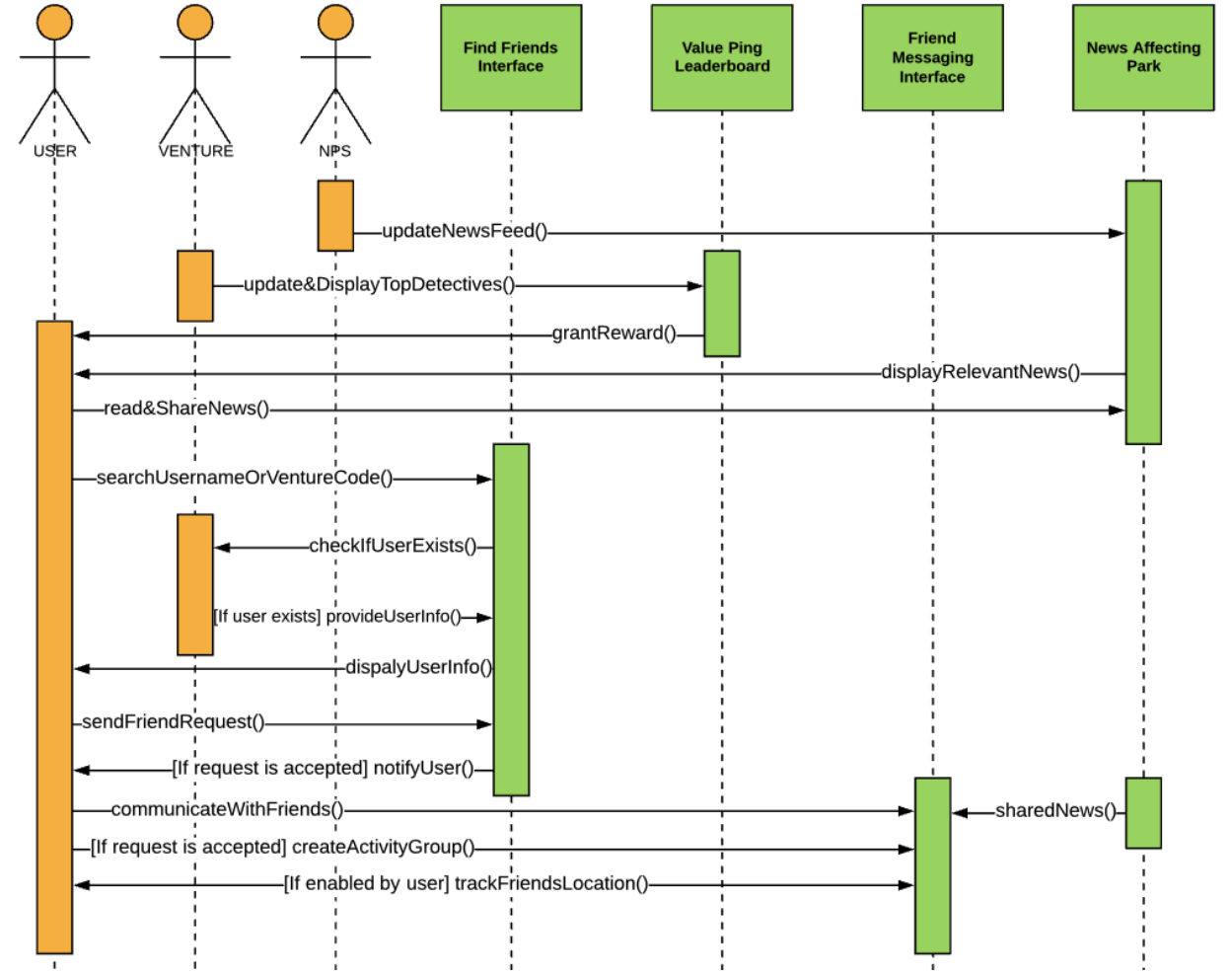
## Community Interface Activity Diagram

As mentioned above, within the activity diagram depicted below, notice that the majority of the information and variables displayed exist in the realm of the user. In comparison, the actions available to Venture and the National Park Service are very narrow in scope. Venture wants its users to feel as if the power and control is in their hands and that the services and value

provided are to serve them, not the National Park Service who is the ultimate beneficiary of the comprehensive user generated data that will provided great value in assisting their efforts to combat invasive species and map the archaeological resources of their parks.

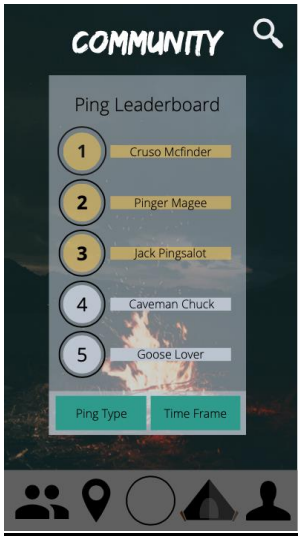


## Community Interface Sequence Diagram




The sequence diagram above reveals the chronological order of operations for the community interface on a simplified basis. Most important to note is that the National Park Service and Venture Software system continues to act independently of Venture users. The National Park Service will update the community news feed on a rolling basis no matter what a single user does. In the same way, Venture will continue to reward each park's top detectives on a monthly basis as long as there are users to award. From the user's perspective, finding friends, sending friend requests and instigating a dialogue between parties will look and act fairly similar to the systems found across other social media platforms. As you can see in the last stage in the diagram, the only means to track a friend's location is through each previous step required to

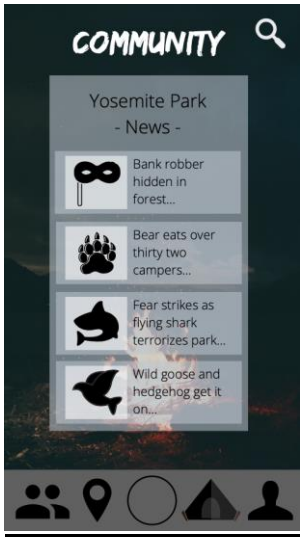
acquire that friend. You cannot track someone's location unless they are your friend and simultaneously have public tracking enabled or send you their private location directly.




**Swipe Left**


**Launch Screen**

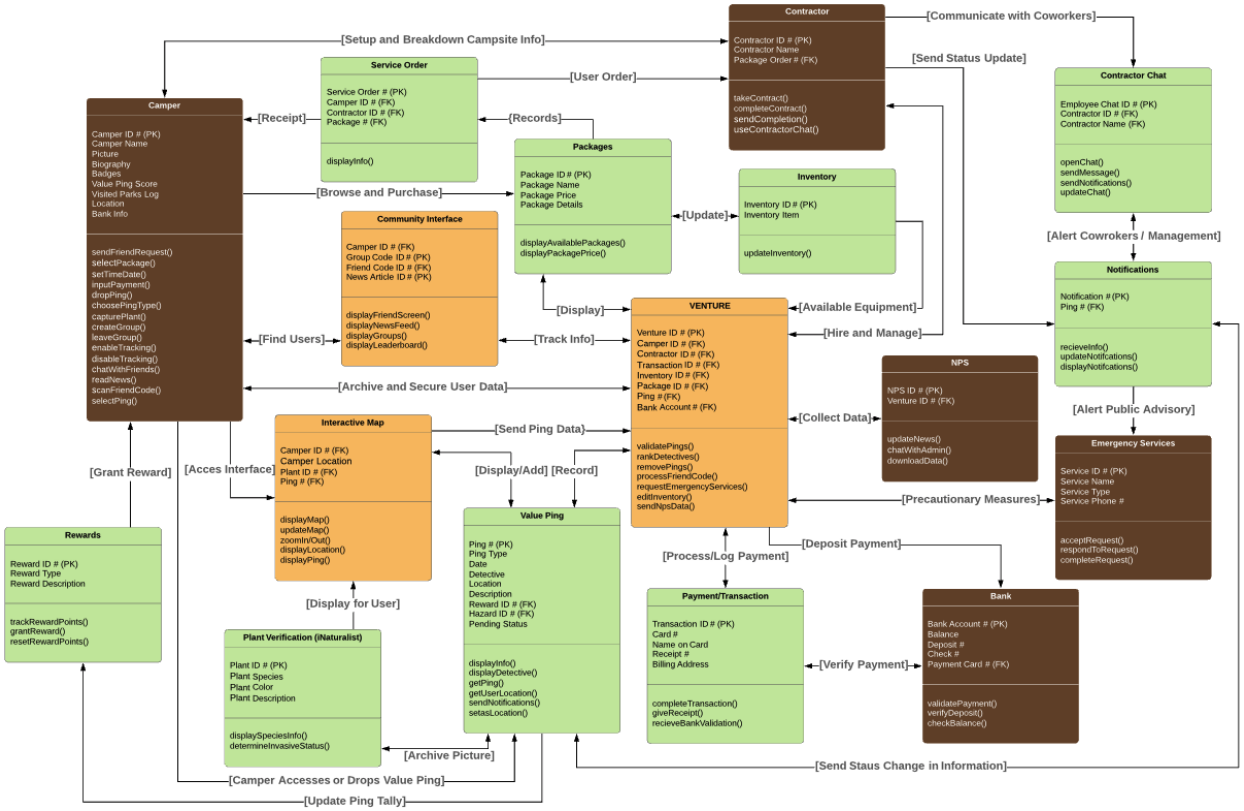

**Swipe Right**




**Swipe Right x2**

# Structural Modeling

## UML Class Diagram




The diagram above, which you may need to zoom into to read, depicts all the major classes that make up the Venture software system, how they are defined, the actions that they carry out, and how they interact with each other. Each class has a matching CRC card which can be found below. The dark brown classes are people or entities, the orange represents an interface and the green indicate variables involving those interfaces and users to create the experience that Venture seeks to provide.

# CRC Cards

## CRC Card #1 - Notifications

| **Class Name:** Notifications | **ID:** 1 | **Type:** Malleable |
|---|---|---|
| **Description:** Container and redistributor of relevant information to the user, venture or NPS | | **Associated Use Cases:** All |
| **Responsibility:**<br>- Receive data sent from other classes<br>- Send out information status update to users phone<br>- Allow enabling/disabling of certain notifications<br>- Provide details of notification | **Collaborators:**<br>- Value Ping<br>- Emergency Services<br>- Contractor<br>- Service Order<br>- NPS<br>- Venture | |

| |
|---|
| **Attributes:**<br>- Date Type<br>- Data Source (Subject)<br>- Message<br>- Date<br>- Generation Location (Device Screen or In App) |
| **Relationships:**<br>- Generalization: Database information distributor<br>- Aggregation: Data source, type and message from outgoing information classes |

## CRC Card #2 - National Park Service

| **Class Name:** National Park Service | **ID:** 2 | **Type:** Concrete, Domain |
|---|---|---|
| **Description:** The agency of the United States federal government that manages all national parks | | **Associated Use Cases:** All |
| **Responsibility:**<br>- Update Relevant News Feed<br>- Send Out Safety Notifications<br>- Communicate with Venture | **Collaborators:**<br>- Venture | |

| |
|---|
| **Attributes:**<br>- Park Name<br>- Account Administrator Name<br>- Current Total Park Pings Collected<br>- Last Period of Data Extraction<br>- Log of Data Extractions |
| **Relationships:**<br>- Generalization: Organization<br>- Aggregation: Park Rangers and Employees |

## CRC Card #3 - Rewards

| **Class Name:** Rewards | **ID:** 3 | **Type: Malleable** |
|---|---|---|
| **Description:** A rolling database of the top detectives on the community interface leaderboard that automatically granted the awardees at the beginning of each month with the reward respective of their value ping ranking | | **Associated Use Cases:** Community Interface |
| **Responsibilities:**<br>- Track the value ping points for each user<br>- Grant the top detectives their rewards on a monthly basis<br>- Reset value ping points each month | | **Collaborators:**<br>● Camper<br>● Value Ping<br>● Community Interface (Through Venture > Value Ping) |

**Attributes:**
- Reward ID # (PK)
- Reward Type
- Reward Description

**Relationships:**
- Generalization: Value Ping tally tracker
- Aggregation: Users and Venture

## CRC Card #4 - Community Interface

| **Class Name:** Community Interface | **ID:** 4 | **Type: Malleable** |
|---|---|---|
| **Description:** An interface to find and communicate with friends, create activity groups, stay up to date with park news, and check in on your competition. | | **Associated Use Cases:** 1 |
| **Responsibilities:**<br>● Display Friend Screen<br>● Display News Feed<br>● Display Activity Groups<br>● Display Leaderboard | | **Collaborators:**<br>● Camper<br>● Value Ping<br>● NPS<br>● Venture |

**Attributes:**
- Camper ID # (FK)
- Group Code ID # (PK)
- Friend Code ID # (FK)
- News Article ID # (PK)

**Relationships:**

- Generalization: Friends and Community
- Aggregation: Users, Venture and NPS

## CRC Card #5 - Value Ping

| **Class Name:** Value Ping | **ID:** 5 | **Type: Concrete** |
|---|---|---|
| **Description:** The most important piece in the Venture puzzle. The user placed markers that indicate a specific location and a descriptor to why that location is special in some way via a ping type. Used for topographic surveying and invasive species eradication. | | **Associated Use Cases:** 3 |
| **Responsibilities:**<br>● Display Info About the Value Ping<br>● Display the Detective Who Pinged It<br>● Get Interacting Users Location and Offer Ping Location as a Destination<br>● Send Notification of Validation or Removal | | **Collaborators:**<br>● Camper<br>● NPS<br>● Venture<br>● Interactive Map<br>● Notifications<br>● iNaturalist API |

**Attributes:**

- Ping # (PK)
- Ping Type
- Date
- Detective ID # (FK)
- Description
- Reward ID # (FK)
- Hazard ID # (FK)
- Pending Status
- Location

**Relationships:**

- Generalization: Map Marker
- Aggregation: Users, Venture and NPS

CRC Card #6 - Venture

| **Class Name:** Venture | **ID:** 6 | **Type:** |
|---|---|---|
| **Description:** Application users engage with; manage various services and functions of the Venture service such as the storefront, pings, and community information. | | **Associated Use Cases:** All |
| **Responsibilities:**<br>• Manage app functions and services<br>• Validate Detective 'Pings' from Interactive Map & Identified Species<br>• Provide rewards to Detectives from received ping information<br>• Remove outdated, invalid, or unnecessary pings<br>• Contact Emergency Services upon request<br>• Manage and edit company inventory list<br>• Release collected data to National Park Service | | **Collaborators:**<br>• Camper<br>• Contractor<br>• Payment/Transaction<br>• Inventory<br>• Package<br>• Ping<br>• National Park Service<br>• Emergency Services<br>• Bank |

**Attributes:**

- Venture ID # (PK)
- Camper ID # (FK)
- Contractor ID # (FK)
- Transaction ID # (FK)
- Inventory ID # (FK)
- Package ID # (FK)
- Ping # (FK)
- Bank Account # (FK)

**Relationships:**

- Contractor
- Payment/Transaction
- Inventory
- Package
- Ping
- National Park Service
- Emergency Services
- Bank

## CRC Card #7 - Contractor

| **Class Name:** Contractor | **ID:** 7 | **Type:** |
|---|---|---|
| **Description:** Employees and crew members providing set-up and breakdown services. | | **Associated Use Cases:** 2 |
| **Responsibilities:**<br>• Receive contracts and orders from campers<br>• Complete contracts through set-up and breakdown of campsites.<br>• Communicate with campers and contractors using Contractor Chat<br>• Send job completion notification | **Collaborators:**<br>• Camper<br>• Venture<br>• Notifications | |

| **Attributes:**<br>• Contractor ID # (PK)<br>• Contractor Name<br>• Package Order # (FK) |
|---|
| **Relationships:**<br>• Camper<br>• Venture<br>• Notifications |

## CRC Card #8 - Payment/Transaction

| **Class Name:** Payment/Transaction | **ID:** 8 | **Type:** Concrete, Domain |
|---|---|---|
| **Description:** A payment of money or its equivalent by customers in exchange for services. | | **Associated Use Cases**: Set-Up & Breakdown |
| **Responsibilities:**<br>• Complete payment transaction<br>• Receive bank validation<br>• Give receipt | **Collaborators:**<br>• Camper<br>• Bank<br>• Camper | |

| **Attributes:**<br>• Transaction ID # (PK)<br>• Card #<br>• Name on Card<br>• Receipt #<br>• Billing Address |
|---|
| **Relationships:**<br>• Camper<br>• Venture |

| |
|---|
| • Bank |

## CRC Card #9 - Bank

| **Class Name:** Bank | **ID:** 9 | **Type:** Concrete, Domain |
|---|---|---|
| Description: A financial institution used by the company to accept deposits from customers. | | **Associated Use Cases:** Set-Up & Breakdown |
| **Responsibilities:**<br>• Validate customer payment<br>• Verify deposit<br>• Check balance | **Collaborators:**<br>• Camper | |

| |
|---|
| **Attributes:**<br>• Bank Account # (PK)<br>• Balance<br>• Deposit #<br>• Check #<br>• Payment Card # (FK) |
| **Relationships:**<br>• Payment/Transaction<br>• Venture<br>• Camper |

## CRC Card #10 - Inventory

| **Class Name:** Inventory | **ID:** 10 | **Type:** Concrete, Domain |
|---|---|---|
| **Description:** A complete list of equipment owned by the company used by contractors to setup and breakdown. | | **Associated Use Cases:** Set-Up & Breakdown |
| **Responsibilities:**<br>• Update inventory | **Collaborators:**<br>• Package | |

| |
|---|
| **Attributes:**<br>• Inventory ID # (PK)<br>• Inventory Item<br>• Wholesale_Price<br>• Brand |
| **Relationships:**<br>• Venture<br>• Package |

CRC Card #11 - Package

| **Class Name:** Package | **ID:** 11 | **Type:** |
|---|---|---|
| **Description:** Options purchasable by campers using Venture storefront and fulfilled through set-up and breakdown services. | | **Associated Use Cases:** 1, 2 |
| **Responsibilities:**<br>• Display packages available to camper<br>• Display contents of chosen package plan, such as included equipment<br>• Display price of chosen package plan | | **Collaborators:**<br>• Inventory<br>• Venture |

**Attributes:**

- Package ID # (PK)
- Package Name
- Package Price
- Package Details
- Camper ID # (FK)
- Camper Location
- Plant ID # (FK)
- Ping # (FK)

**Relationships:**

- Inventory
- Venture

CRC Card #12 - Camper

| **Class Name:** Camper | ID: 12 | **Type:** Concrete |
|---|---|---|
| **Description:** User uses app and pushes different functions | | **Associated Use Cases:** All |
| **Responsibilities:**<br>● Choose which package user wants<br>● Select a time for when and where they want their package<br>● Input payment type<br>● Abide by the term and services agreement<br>● Choose if they would like to have GPS tracking on their application<br>● Input user information to profile | **Collaborators:**<br>● Venture<br>● Contractor<br>● Payment/Transaction<br>● Package | |

**Attributes:**
- Camper ID # (PK)
- Camper Name
- Picture
- Biography
- Badges
- Value Ping Score
- Visited Parks Log
- Location
- Bank info

**Relationships:**
- Venture
- Contractor
- Payment/Transaction
- Package

## CRC Card #13 - Interactive Map

| **Class Name:** Interactive Map | **ID:** 13 | **Type:** Malleable |
|---|---|---|
| **Description:** An interactive map where users can see the different value pings of the park like plants, hazards, friends, hikes, lakes, etc. | | **Associated Use Cases: 2** |
| **Responsibilities:**<br>• Receive data from different sources (Camper, Venture, Plant, etc.)<br>• Display objects in the park<br>• Update data on the map<br>• Sends notification to users about map | **Collaborators:**<br>• Camper<br>• Venture<br>• Plant<br>• Ping | |

| **Attributes:**<br>• Camper ID # (FK)<br>• Camper Location<br>• Plant ID # (FK)<br>• Ping # (FK) |
|---|
| **Relationships:**<br>• Camper<br>• Venture<br>• iNaturalist<br>• Value Ping |

## CRC Card #14 - Community Interface

| **Class Name:** Community Interface | **ID:** 14 | **Type:** System/User |
|---|---|---|
| **Description:** User will use the system to find friends and track points based off pings | | **Associated Use Cases:** |
| **Responsibilities:**<br>• Display Friend code of any user scan/inputted<br>• Display live news feed<br>• Display any groups saved by the user<br>• Display amount of points for user in app and for friends of user | **Collaborators:**<br>• Venture<br>• Camper | |

| **Attributes:**<br>• Camper ID # (FK)<br>• Group Code ID # (PK)<br>• Friend Code ID # (FK) |
|---|
| **Relationships:**<br>• Camper<br>• Venture |

## CRC Card #15 - Service Order

| **Class Name**: Service Order | **ID**: 15 | **Type**: 5 |
|---|---|---|
| **Description**: A function recording the service order of the camper to Venture | | **Associated Use Cases**: |
| **Responsibilities**:<br>- Records order from the packages selected<br>- Provides receipt to campers | **Collaborators**:<br>- Camper<br>- Venture | |

| **Attributes**:<br>- Service Order # (PK)<br>- Camper ID # (FK)<br>- Contractor ID # (FK)<br>- Package # (FK) |
|---|
| **Relationships**:<br>- Camper<br>- Packages |

## CRC Card #16 - Contractor Chat

| **Class Name**: Contractor Chat | **ID**: 16 | **Type**: 5 |
|---|---|---|
| **Description**: A function allowing contractors to send a message and update service status. | | **Associated Use Cases:**<br>1 |
| **Responsibilities**:<br>- Send messages to the camper<br>- Update service status to the camper<br>- Send notifications to the camper | **Collaborators**:<br>- Contractor<br>- Camper | |

| **Attributes**:<br>- Employee Chat ID # (PK)<br>- Contractor ID # (FK)<br>- Contractor Name (FK)<br>- Message |
|---|
| **Relationships**:<br>- Notifications<br>- Contractor |

## CRC Card #17 - Plant

| **Class Name:** Plant | **ID:** 17 | **Type**: |
|---|---|---|
| **Description:** User will take pictures of plants and the system will be able to identify the species, type, location, and more | | **Associated Use Cases**: 2 |
| **Responsibilities**:<br>• Display plant species, type, location<br>• Have descriptions of plants<br>• Have descriptions for endangered plants<br>• Send pings and data to interactive map | **Collaborators**:<br>• Ping<br>• Interactive Map | |

| **Attributes**:<br>• Plant ID # (PK)<br>• Plant Species<br>• Plant Color<br>• Plant Description |
|---|
| **Relationships**:<br>• Ping<br>• Interactive Map |

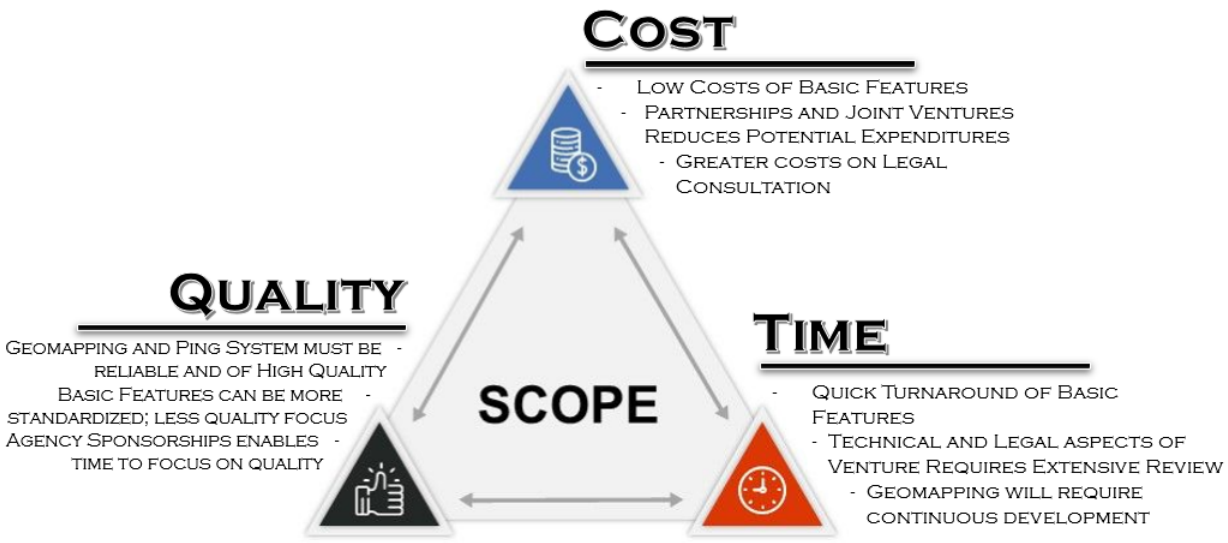
## CRC Card #18 - Emergency Services

| **Class Name**: Emergency Services | **ID**: 18 | **Type**: 3 |
|---|---|---|
| **Description**: Users will be able to view hazards, contact emergency services, know their location and have more information that will benefit their safety | | **Associated Use Cases**: 1 |
| **Responsibilities**:<br>• Track location of users<br>• Display hazards<br>• Sends notifications to users<br>• Contacts emergency services when requested | **Collaborators**:<br>• Venture | |

| **Attributes**:<br>• Service ID # (PK)<br>• Service Name<br>• Service Type<br>• Service Phone # |
|---|
| **Relationships**:<br>• Venture |

# Effort Estimation

To maintain the feasibility of our business venture we must ensure a reasonable balance in focus between the various services we plan to offer, and the costs associated with those services. In order to do this, we must estimate what areas of our current business plan that requires the most significant amount of effort needed to be put forward to complete them, as well as what areas we will need to either address or nullify in regards to their costs. To paint a complete picture of this effort estimation intersection between Cost, Quality, and Time, we will need to explore both the Venture app's general position within the marketplace as well as the effects of developing certain features. A general overview of the effort estimation can be found in the diagram below.




Regarding the time and the costs of developing many of the basic features of the Venture application, we have been able to determine that only 20% of our initial development time and costs will be needed to create the application itself, and thus initial launches or prototypes of the application can be conducted within a matter of months. This timeframe has come about due to the relative simplicity of creating a basic online storefront and how commonplace such systems, and the API used to develop and maintain them, already exists

within the market environment. To put this into perspective, based on the experience of some of the technical specialists we have consulted, the creation of the Camping Package Storefront as well as similar services such as the Community Hub, could be produced, at minimum, within a period of two-to-three months. In allowing ourselves this shorter timeframe for the more basic features of our application, we are able to save on development costs in the long-term and allow us to focus our attention on the more pressing aspects of our business venture. This is specifically in regard to general application and business maintenance which will constitute the latter 80% of our development focus.

Due to the high costs associated with developing and maintaining our own network and database systems, as well as having the necessary networking professionals on hand to manage such a system, we have determined that a more secure and more cost-reductive method is to secure the services of a cloud computing organization or system, such as Amazon Web Services (AWS) or Microsoft Azure. Considerations must also be made to the storage and maintenance of camping equipment, as well as eventual replacement due to wear-and-tear by users of the app.

Various factors must be considered when purchasing and handling what equipment will be used in Venture's camping packages, including the amount, quality, and durability. This is especially important in regard to seasonality and location, as different types of equipment would be more desirable or necessary when camping during different seasons or for camping in different terrains. One possible avenue for minimizing these costs is to partner with local industries or clubs, such as Recreational Equipment Inc., also known as the REI Co-Op. REI is a consumer co-operative retailer of outdoor equipment and goods which provides significant benefits to members, including discounts on equipment rentals and member events. REI, and similar local organizations, would be valuable organizations to seek partnerships or pursue joint-ventures with due to our overlapping market groups and similar environmental/recreational

goals. By storing more locally accessed goods on site from such groups as REI, we would be able to minimize procurement costs and gain access to a wider array of goods and equipment and higher quality. Offering advertising space within the Venture application to these industry and local organizations would also provide an additional means of funding should we decide to pursue this route of monetization to enable our nonprofit's finances to remain stable. Of course, other sources of funding would also take the form of sponsorship by various environmental and conservation agencies we have discussed previously, whose funding would enable our organization to minimize costs of the different areas being serviced by Venture. This additional support would enable Venture to take a wider breadth of time for quality assurance for certain systems, specifically the Geo-mapping and alert ping systems (the main focus of the non-profit).

Final considerations must be made to the legal aspects of the Venture app. In pursuing a quality and effective rollout of the geomapping and hazard map systems, we must ensure a level of precision is provided so that the data collected is reliable enough for both alerting users within the general area of a campsite, as well as also for providing to the National Park Service in accordance with our partnership. The GPS tracking and data collection of individuals within the boundaries of the national parks when using our application, as well as their storage, must be considered in regard to its legal implications both locally and abroad. Substantial costs must be put toward the creation of a legal analysis squad within the Venture group to handle how user data must be managed, and how we must differentiate between domestic and international users. This is especially necessary in light of specific legislation, including but not limited to, the European General Data Protection Regulation (GDPR), or the California Consumer Privacy Act (CCPA). Although we will be primarily launching our service domestically within the United States for US citizens, we must take into account potential uses of our application by international citizens or tourists to the national parks. The CCPA legislation would likewise be extremely important to examine and would require a lengthy period of addressing due to our

initial launch being located within the Yosemite National Park, a park located within the borders of California. A significant amount of resources and time will need to be allocated to address potential privacy and legal concerns arising from these factors and protect the company.

## Capital Requirements and Financial Forecast

To begin, because this is a system software based class and not a top to bottom business plan class, the intricacies of Ventures financials have been left out of this report. It is under the assumption that because Venture upholds a non-profit, morally driven, environment restoration focused business model, that environmental and conservation agencies such as Hawaii Exemplary State foundation and other non-profits whose sole purpose is to support and help maintain the wellbeing of the National Parks will align with our cause and support the financial burden required to create such software. Venture's independant revenue stream, the camping setup and breakdown services will go toward app maintenance and paying for the setup and breakdown service itself. Initial capital for the camping service will include our camping equipment, a forty foot matson container for its storage and a polaris for transportation of said capital from storage to the various campgrounds. To start we have projected that we should have at least ten camping packages (each with a full range of equipment) available to meet the demand of our service's early adopters. We can expand as needed when both demand and profits are realized.  The storage, transportation and initial set of equipment capital (fixed costs) will be required all at once, however, expansion into growing profits is very easy to achieve in stages by simply adding more available packages for rent. We will charge just enough to cover the variable expenses (our independent contractors pay for each set up and break down and other miscellaneous expenses such as laundry costs and gasoline) plus 0.001% of our fixed costs with each service. With this system break even, paying off our fixed costs such as the

storage container, camping equipment and polaris, after 100,000 setup and breakdown services. With a market estimation of about 47,500 people using the our camping service in the first year, assuming just 1% absorption, we should be debt free and making profit to put toward greater good by the end of about two full years of operation.

# Interview Feedback

James Baymen - Professor, Undergraduate Chair for the Department of Anthropology at the College of Social Sciences at UHM

Bayman's Work:

- Prepared Archeological Overview and Assessment for National Park of American Samoa
- Cultural Resource Preservation and Archaeological Certification Training for the Freely Associated States of Micronesia and the Pacific Territories
- Coordinator for masters degree in applied archaeology, geared toward indigenous pacific islanders who want to go to archaeology and the science and practice behind it.

**What was the extent of your experience with the National Parks Service, what work did you do or what partnerships did you forge?**

- *"Professor Baymen started working with NPS from a very young age in Arizona. He did seasonal field work for the parks throughout the state, gaining first hand experience with their mode of operation. Locations initially included Flagstaff and The Grand Canyon. A lot of the work involved searching for, recognizing, analyzing and recording the various cultural resources and archaeological sites on the land. He also trains others to do this type of work. His research later took him to Hawai'i, the Marianas, and American Samoa where he spends the majority of his time now."*
- *"He works to provide an overview of research questions that private consultants should consider when they come in to do their projects with the park. He also provides Cultural Resources Preservation and Archaeological Certification Training."*
    - This aligns with our mission as we actively try to consider as many variables such as ecological consciousness through our triple bottom line. This type of

expertise will be extremely beneficial in training our arrangers to be more conscientious of the environment in which they work and the sensitive cultural resources of the specific national park they are servicing.

- *“There is a law imposed by the Federal Government to inventory all the archaeological sites on their land.”*
    - Arrangers can help in the effort to recognize, report and protect the park's environmental and cultural resources while they go about their day servicing throughout the park. We can also pay them once every six months for park “expedition days” in which the trained Venture employees work together to inventory the sites of the park. Bringing something to the table aside from additional cash flow will likely improve the feasibility of securing a partnership with NPS.
- *“NPS will outsource their need to meet archaeological regulations. NPS may issue a contract to overview everything that's been done archaeologically, then recommendations are made. Consultants working in an area for the first time will need this knowledge to get them up to speed. Professor Baymens upcoming two week expedition in American Samoa will cost the NPS fifty-thousand dollars. This stage of work will entail teaching NPS staff who have limited knowledge of archaeology but are responsible for dealing with it. He’s going to train them on how to write reports, because the park service has its own bureaucracy that requires such paperwork. However, being in Samoa the labor force in terms of advanced education is not where it should be.”*
    - Instead of hiring an expensive Archaeologist every few years to come and survey the entire park we will instead have our team of arrangers, who have been trained and certified by the same archaeologist, take a paid exploration day to map out and discover or check in on the various resources throughout the park on a monthly basis. This way the park will have a more consistent stream of

knowledge about its land and important resources and won't have to pay a hefty fee for the same service every few years. Additionally the training our arrangers undergo will give them a better understanding of the land so they can operate with the knowledge and sensitivity necessary to recognize and protect the park's valuable resources.

- *"Then the park service offers overview and recommendations as a guide post for private consultants."*
    - We assist the park in creating those overviews and recommendations for free as a means to secure a partnership with them.
- *"He's worked alongside many native americans and indigenous pacific islanders who have had greater insights than even himself. Often however, they did not retain the skills to turn their knowledge into functional reports. There are also a growing number of indigenous archaeologists."*

**How did you go about securing a partnership with them?**

- *"Turned out to be rather happenstance because there are some archeologists in the federal building downtown and as I understand it, the need arose for someone to take on this contract. The National Park Service sends out a request, an RFP (Request for Proposal). However, in this case I was selected in a non-competitive bid. Someone knew I was here and it made more sense to take someone from UH than someone from Kansas."*
    - In light of competitive selection, we'll provide archeological surveying for free and bear the cost burden ourselves. This, the additional revenue stream from our business as well as the additional people on the ground to ensure park patrons are doing the right thing and eyes for those who aren't, should forge a solid foothold in securing a long-term partnership with NPS.

**Could training in these fields help fortify our triple bottom line? (Mission statement)**

- ***"****The training I provide can be paired with the service you provide to increase the awareness and site knowledge of each of your servicers. Something like this or some adaptation of this revolving around their specific agenda could definitely add value to your company. If they see a specific stone wall don't knock it over, an ancient plant, don't crush it. An untrained eye may not realize that they're in the midst of an important cultural or environmental resource. This training could help maintain the integrity of the sites they're servicing. It may be beneficial to even have an archaeologist on your team. You may also simply get a short term contract with an archeologist who is an expert in the specific region you work into to do the training instead of one who pretends to know what he's talking about."*
    - Not just a single archaeologist but a team of arrangers all trained and certified to carry out the same work that such an archaeologist would be working to meet the federal requirements of the park. All at no cost to NPS itself.

**Because the NPS is so large and backed by the government were there times when you felt pressured to operate a certain way within your partnership?**

- *"Never felt pressured from NPS because he exists in the academic bubble. Being exposed to governmental bureaucracy from an academic standpoint didn't always make sense but he understood that those things were part of the mission. Our business could help NPS increase efficiency and be streamlined because they won't have to do all the work internally."*

- *“Tasks agreements, essentially a contract, documenting the responsibilities of NPS as well as the obligations of the partner will be drafted and timelined so error by vagueness is not an option.”*

**Do you have any contacts we may use to take us a step closer to working side by side with them?**

- *“I have a lot of friends and contacts that you can reach out to if you take this business to the next level. You can come to me when you're ready and I'll have a list of names and numbers for you to contact.”*

**Kenneth Kaneshiro - (Researcher, PBRC, Program Director, Center for Conservation Research & Training, Head of Hawaii Conservation Alliance)**

**What is the Hawaii Conservation Alliance?**

- *“Initially it was called the Secretariate for Conservation Biology and the discussion started in the late 1980’s with funding from the MacArthur Foundation in trying to bring together natural resource managers from entities like the National Park Service, Department of Land and Natural Resources and the Division of Forestry with scientists, primarily from the University of Hawaii, to begin to see if there were areas of collaboration where the natural resource managers might need to have some research done on a particular subject in which the UH faculty have an expertise in botany, entomology, birds and so on. By having the natural resource managers ask questions that they had about how to protect the native plants and animals under their respective kuliana (responsibility) within the national park or their specific forest reserve the worked*

*for, being able to then communicate directly with the research scientists that had the knowledge to answer the question, the whole idea that the MacArthur foundation was interested in was how to bring the natural resource managers that are on the ground doing the work to protect the native ecosystem together with the research scientists so that they can be much more effective in providing the optimal solution to each problem. The funding came to us and I was the founder of the Secretariate for Conservation Biology in 1991. As we started to discuss among the different fields of study; the botanists, zoologists, geologists, anthropologists and so on, we started to realize that if you look at the ecosystem as a whole system, from a much more comprehensive approach, instead of just looking at the insects or the plants, if you look at it as a whole our work will be much more effective in developing a strategic plan to protect the natural resources of whatever the specific agency may be. Then we started to see if we could bring together not just the research scientists and the agencies, but to actually come to an agreement among the different entities about how to best develop a model system that other states or even countries can follow in taking this comprehensive system approach to environmental problem solving. The HCA formerly known as the Secretariate for Conservation Biology had our first conference back in 1993, and we had 75 people that brought together natural resource managers, scientists and students just locally. We were just beginning to talk to each other. Today, nearly thirty years later, we are tracking well over 1000 people from all over the pacific region and the mainland. We get inquiries from other states asking how we've brought these different agencies together. In the early days, even in the same agency, subunits were not even talking to each other. Now they are all joining together in addressing the top priority conservation issues at hand."*

**What are you currently working on or actively researching involving the HCA and how does this involve your many partnerships including the NPS?**

- *"Well one of our biggest issues is the incursion of invasive species into all our different habitats. This is an issue that has galvanized the entire consortium of agencies in the alliance. That's our current key issue. If your for profit business retained the capacity to train the staff that you have on the ground to recognize, report back and deal with them properly, assisting in a speedier solution, I am sure the NPS would be willing to subcontract your company and bring you on board. It's a matter of demonstrating the level of capacity that you have in addressing particular issues and problems that the parks have."*
    - We will train the staff that we have on the ground at the National Parks to recognize, report back and deal with the region's invasive species effectively and efficiently at scheduled times. By helping to relieve yet another critical issue among the NPS we should establish an even stronger foothold when trying to establish a partnership.

**Does your foundation offer training or certifications to give future arrangers the technical skills and capacity to deal with such invasive species?**

- *"There are internships and the big projects that we recruit volunteers for. Throughout these projects the volunteers gain a great deal of first hand experience and make them much more marketable in the job market. NPS also has its own internship programs for this type of training."*
    - We will obligate Venture employees to engage in NPS internship programs.

**If so, how did you go about securing such partnerships with them? (NPS specifically?)**

- *"Well it grew slowly from the 75 to 150 to 400 then 600, but within the last five years reaching over 1000 and at this past conference having 1200 the growth has been continual. Throughout the process our partner organizations felt that it was very important to really engage the broader community in addressing issues in the place where they live. Empowering the community with the tools to take ownership of the issues of the place they live. That kind of thinking is one key. The other is understanding that the culture of the host place, and core values come into play and strengthen the bonds between partnerships."*
    - Have instructional camping festivals in which we empower those who attend with the knowledge and skills to help alleviate the issues in their home communities. They come to camp, they leave with the ability to better their world.

**Do you have any advice or insights for operating side by side with the NPS?**

- *"I think in a partnership it's absolutely necessary that you demonstrate that you have the capacity to address the issues that the national park service is dealing with. If you don't have the capacity to assist in the responsibility of the national parks then they'll have no reason to bring you on board. So find as many skill sets and tools to assist the NPS so you have something substantial to bring to the table."*
    - Being able to recognize and handle the invasive species that happens to be the parks foremost issue as well as offering the archaeological surveying and cultural resource preservation service for free will give us the ability to bring something of value to the table. We can attain the necessary knowledge, skills and certifications from within the expansive body of the HCA as well as Professor Baymen and his various contacts. To maintain employment as a Venture arranger you must also engage in at least one NPS internship a year.

**Do you have any contacts we may use to take us a step closer to working with them?**

- *"Definitely, and actually because you're talking about something potentially a couple years down the road, in terms of getting the business off the ground, this is actually very timely because I have another organization that I've just established as a non-profit. This organization, Hawaii Exemplary State Foundation, aligns exactly with what you are talking about. We're working with the fund managers across all federal agencies and taking a systems thinking approach to address environmental issues. If you take this business seriously I would indeed be willing to partner with you to help build your capacity in addressing these issues. The fund managers will help fund our projects at a very significant level because they want a project that will be successful and serve as a model for the rest of the world. These managers said, we can get you half a billion dollars to fund your project right now. At first we turned them down because we did not have the capacity and were not ready. However, now we have the capacity and the funding is there in massive supply."*
    - He is willing to partner with us to help train our employees and bring them to capacity to be able to address the conservation issues the national park services are facing in the effort to help build a scalable model for resolving conservation and environmental issues, which is exactly what our business does when its not setting up and breaking down campsites.

<u>Gerald Lau, ICS Academic Advisor & Michael Brian (MB) Ogawa, Associate Specialist in Information Sciences and Instruction and Research Endeavors</u>

Our team has also conducted a joint interview with Gerald Lau and Michael Brian Ogawa of the University of Hawaii at Manoa's Information for Computer Sciences department. The following includes their educational and work background to give a sense of their credentials. In

the interview notes, Gerald Lau is referred to as “Gerald” and Michael Brian Ogawa is referred to as “MB.”

Gerald Lau is currently UH Manoa’s ICS Academic Advisor. He holds a Bachelor's degree in Mathematics and a Master’s degree in Computer Science. Before returning to the University of Hawaii, he worked 13 years in the industry. He has done work as a software programmer, systems analyst, and did the bulk of his work in the assembly and launching of satellites. Gerald worked with mainframe computers, has a technical and managerial background, and also did work in intel with the military where he worked with GPS navigation.

Michael Brian Ogawa (MB) is the Associate Specialist in Information Sciences and Instruction and Research Endeavors at UH Manoa. He holds a Bachelor’s degree in Business Management, a Masters degree in Educational Tech and LIS, and a PHD in Curriculum Instruction. Most of his work instruction has been in academics and within lots of schools in various environments. He has been contracted by private companies, by schools in Hawaii DOE, and private schools. MB holds contracts with Kamehameha Schools where he has directed a project and he has also done tech development in the airline industry. He has two fields of research, student success with undergraduates and information ethics. More recently, he has begun researching different components in security.

**Fronting Costs for Application (how much is the average startup or timeframe for app)**

- **MB:** depends on the component (Storefront vs. Tracking)
    - All at once: long-term plan
        - 1 component at a time:
            - Storefront – won't take too long
                - Month is a doable timeframe (considering if we already have a physical storefront setup)
                - Front-end expenditure and maintenance may be variable

        - Especially with contracts, they will take part of the pie decreasing funds
        - Most likely won't have full-time employees, instead independent contractors

- **Gerald:**
    - Developing app is about 20% of costs
    - 80% of costs in maintenance
        - Must update for each OS (retest, make sure app works)
        - Store data into the cloud to cut down costs on maintaining data due to not requiring physical hardware.
        - Pick a season – seasonal camping equipment
            - Will depend and will be designed differently depending on the season and can be expensive if covering all seasons
            - Is currently a part of the **REI Co-op Hiking**
                - Good partnership? Offers similar service.
                - Campers will quite like this to help maintain their environment; better target than 'weekend' campers.
        - Might need a generator/connection at the campsite.
        - Higher end of camping equipment for longer timelines (i.e. 2 days for camping vs. a 10 day of camping); how long will it last?

**Ensure a steady revenue stream (avenue for discussion: Gamification?)**

- **MB:** Money making procedure that's common:
    - Free Service – still costs to maintain the app; do you use ads? Get ads that don't distract user
        - May be poor choice if something significant is occurring and an app suddenly appears

    - Renting? Nominal Fee for duration? – monthly subscription, etc.
        - Depending on what the user engagement is will tie into how you.
    - One-time payment:
        - Weird. You buy an app to purchase more gear? Not realistic.
    - Engagement outside of the storefront/purchase of camping packages that can continue into normal life
        - This would make it more ad-revenue friendly
        - Also more friendly for rent-based
- **Gerald:**
    - “Disney model” once you get them to do one thing, you send them related stuff
    - Go free
        - Add onto different things say, by season for specifically Yosemite.
        - Breaking out into other parks?
            - Add onto service
    - Tack onto/join partnerships with Co-Ops.
        - May rent equipment from these individuals
        - Might also buy ad time themselves!
            - You support them, they support you!

**Maintaining Partnerships**

- **MB:** “What's in it for me?”
    - Identify the partnerships (that have lasting power) that are mutually beneficial
    - Be clear about goals and what you want out of that relationship
    - If things don’t align, walk away
    - MB Example:
        - You have different goals, but you still work together because it builds both your career

- **Gerald**: Agrees with MB
    - EX: 5 created ‘Miso Music’
        - Ukulele app made for IPhone built around the time iTunes came out(?)
        - Couldn’t gain access to music because it was all copywritten
        - Approached Apple with app and was just trying to sell app for a $ and Apple would take care of the music part
            - Since you would buy sheet music; Apple would cover costs of the copyright
        - After the iPad came out, they were approached by Apple to make a similar app.
    - Create this environment where both companies would have an advantage that was not there previously

**Gamification: Will gain points by taking pictures and if verified by NPS, will receive points?**

- **MB:** Potential issue: 3rd party verify? Time you don’t have. How quickly will customers get a reaction quickly? What is the turnaround time?
    - i.e. in a video game you don’t wait 1 hour to see that you won.
- **Gerald:** Starbucks?
    - Rewards/responses should be immediate.

**If as soon as a ping is sent to NPS, it would immediately be verified by an automated system by a background app and return as points**.

- **Gerald:** Can be done server-side in the cloud.
    - Hard but possible. Pattern recognition of animal or invasive species plant shapes will take substantial costs.
        - Would be something to pursue in a later business phase

    - Can just give points for sending in pictures. Pictures offer timestamps/etc which you can use to validate.
- **MB:** If you do want something that requires time/turn-based…
    - Say weekly challenges. Then there's already an expectation for waiting.

**Addiction of the App:**

- **MB:** Concern? No that's the goal.
    - You want consumers to have the desire to be on their app. Not so much addiction that they can't stop, but enough engagement and have the engagement tied so well to your app that it is integrated into the whole experience, not acting as just this side 'add-on.'
    - You will want the app to **augment** the experience. This will create engagement.
        - Once people can see people use the app, then that can attract advertisers or additional funding based on user engagement times.

**With significant data collection (Geomapping, GPS location, etc.) what issues are faced for hacks/cracks/etc, how should we respond?**

- **Gerald (tech details):**
    - Sign a waiver?
    - Perhaps for security, don't use apps on their own phones. Perhaps instead have a secured device taken on the camping trip already to access these functions?
    - <u>GENCYBER PRINCIPLES:</u>
        - Principles of cyber security.
        - Information Hiding – encryption when sending information
        - Privilege – only they have access to that piece of the app
        - Modular – if it does get broken into, that 'hack' is contained.

        - Domain separation – App different from server domain; you don't know what openings might be on consumer's own phones so you want to ensure separation from both the danger and the consumer's phone

- **MB:** Applicable laws
    - What about users coming from the European Union? Do you have data protection for these users? You must have.
    - CCPA (California Consumer Privacy Act( recent)) similar to GDPR
        - Especially important for Yosemite.
        - Need to be kept in mind.
    - Privacy laws haven't changed too much in the big picture since the Privacy Act of 1974.
    - Ask consumers if they live within say.. a GDPR region. If so, transfer them to different terms of service.

**GPS: Application will also allow consumers to turn on/off GPS tracking. What are the advantages and disadvantages of a phone-based GPS vs app-based GPS**

- **Gerald:**
    - Either one, doesn't matter. Either way it must work through the phone.
    - It's probably gathering data from the phone.
    - Problem with GPS app  terrain dependent
        - i.e. if you are in a valley, you might not have any signal.
        - Signals can vary; i.e. if you in a canyon but you are still receiving signals they might be inaccurate because the signal is being 'bound around' the canyon walls

        - As GPS grows in power, i.e. more satellites, it may become more reliable, however there will always be some small error

**Privacy risks with the GPS?**

- **Gerald:** iPhone can actually show you where you walked recently
    - Apple using it to show for COVID situation where you walked around in like, the past year
    - The phone can easily track where you are. Hackers that can track it and if a hacker can find out that information then there's a security risk as they now know you probably are not at home.
- **MB:**
    - Mid-2000's "robme.com"
    - Scraping people's myspace address and if they went on vacation, would be posted since they weren't home
    - Large amounts of data causes lots of privacy concerns
        - Most consumers don't know what companies are doing with that data
        - Legal side it's a big 'wait and see' since although privacy laws favor businesses at the moment (depending on zone, not so much in EU)
        - Might especially
            - Should maintain a lawyer to keep track of this information.

**GPS accuracy + White hats/Grey hats**

- **Gerald:**
    - White hats = protects systems
    - Grey hats = understands systems;
    - Black hats = hackers/attackers

- May be a tall-tail but… was a story where hackers told couple that they were being tracked

**What systems should be put in place to combat these issues? i.e. Warnings, etc.**

- **MB**
  - Be upfront in terms of service
  - What is opt-in/opt-out?
    - Weird Example: ICS 101 poster design contest
      - Opt-out because there's no loss to not be in it (you get the chance at EC points)
- **Gerald:**
  - Waiver? Know exactly what they are agreeing to and go from there.

**Application design: Applications have psychology of colors, whitespace, etc. What aspects**

- **MB:**
  - Colors revolve around cool-common colors to keep people in the app.
    - Blue, maybe some orange. Pastel colors.
    - Darker colored text.
  - Night mode is also becoming increasingly common.
  - Font-family; on a phone-screen will primarily use sans-serif font like Arial.
    - Most text should be short bursts (i.e. titles/headings/etc)
    - Courier not often used/recommended – has fixed character spacing and thus takes up more space
  - **‘Golden Rules of Design’ (HDI?)**
    - i.e. always have a back button, can take stuff out of a shopping cart.

- **Gerald:**
    - Is yellow-green color blind.
    - In the military, if something was okay it was green. If something went into a warning state, it went into a striped yellow pattern. If it was critical it went red and blinked.
        - These aspects helped for those with color blind issues, even if you were monochromatic.
    - Sans-serif is also good for those with poor vision

**Security Risks: Recommended Language?**

- Not too many choices
    - Javascript (
    - C# (and you have to buy the package)
    - ULA language: program in 1 language and can convert code into something work for android or iphone
        - Not very efficient though)
        - NOT RECOMMENDED – would be better to have 2 different baselines for different devices (i.e. Android/iPhone).

**Any last minute advice? Insights?**

- **MB**
    - Trying to figure out gap areas
    - Least explored = legal concerns
        - Necessary to keep
    - ‘Getting a government contract’ is not the norm. It's something people want.
        - i.e. NPS might offer an initial funding, but what do they want past that?

        - **GERALD SUGGESTION:** help out the parks!
            - **i.**e. Haleakala cabin to help maintain cabin you hike out to
            - Interest groups/chapters that specialize in each park?
                - Equipment and requirements and maintenance might differ!

- **Gerald:**
    - Silicon valley saying; 'if you're going to fail, fail fast.'
    - Check your plan as you go; if things are not going in the direction you want, how are you going to compensate for it and where should you stop and pull the chord?
        - Start-up success rate is really low.

Gerald and MB Interview Summary

Overall, Gerald and MB were able to give us valuable insight and advice about the system. Gerald was able to help us have a better understanding about the GPS systems involving our Geo-map and MB was able to help us with understanding about the marketing aspect of the system.

Google Forms Surveys

We conducted surveys through Google Forms regarding the gamification aspect of Venture to get additional insight from other professionals. Although the primary goal of the camera/photo feature will is used help support our application's internal systems and provide data to the National Park Service, we would like to provide potential rewards or incentives for users to engage with the feature, such as potential discounts, in-app achievements and awards, or offering interesting information on identified species. Plans involving the gamification of this service are currently being discussed.

Future prospects for our application are also being examined but are not high priorities at this time. Such ideas include extending our services and geo-mapping capabilities to other national parks or campsites as well as offering a potential forum/hub for ‘Venture’ app users to offer feedback, rate camping or hiking trails, or discuss camping tips with other users. We gathered information from two respondents. In bold is the question asked to our two respondents, and their answers in bullet points.

**Name (your preferred title and name)**

- Anonymous (you can quote me, but please don't use my name)
- Sean Mosier, M.Ed.

**Can you briefly describe who you are, your field of expertise, qualifications, and your current or past professional endeavors or focus of research? ***

- Anonymous - I am an associate professor in Information and Computer Sciences at the University of Hawaii at Manoa
- Sean Mosier, M.Ed. - I am a Ph.D. student in educational psychology, with a Master’s degree in educational psychology. My research focuses on the use of devices to increase student learning and engagement in the classroom.

**Gamification: For our application to be more user involved, we would like to add gamification to our application to make it so users will want to take photos.**
**What information should we pull from our data?**

- Anonymous - plants, animals, and hazards all sound good.  Both native and invasive plants and animals would be good to keep track of.
- Sean Mosier, M.Ed. - GPS coordinates, photos, how often someone contributes.

**How can this data be verified at a reasonable time in-order to give out points? (with the assumption that the photos will be able to be verified through a time and location stamp connected to the photo)**

- Anonymous - If you have a way of doing so, plant and animal recognition from image processing would be good.  You might then compare the results of this recognition from other images at nearby positions.
- Sean Mosier, M.Ed.-The phone's photo data location can be matched to the current GPS location.

**Knowing that Gamification can be addictive, what are the possible benefits or drawbacks with having gamification in our application?**

- Anonymous - Benefits is that people will want to use your app more.  The drawback is if people actually get addicted, but even that has the advantage that it would get people outdoors into natural environments more, so on balance it might be a positive.
- Sean Mosier, M.Ed. - The benefits are you increase the usage of the parks and the app, increase the amount of user data which benefits those who are trying to identify both natural features and hazards/invasive species. Potential drawbacks for gamification depend on the type of gamification. Leaderboards can be helpful for increasing engagement, but also discourage people on the lower end of participation from participating. Gamification can also discourage intrinsic motivation, which is a problem if people who like to go to the parks stop wanting to do so.

**Should there be a time period too when the ping is removed, so others could also gain those points? (ie: a month then the ping is removed) Why or why not?**

- Sean Mosier, M.Ed.-I'm assuming that this means the system would be designed so that once someone identifies a hazard or invasive plant, no one else would receive credit for attempting to do the same, and you are trying to identify if there should be a time after which the ping should be removed?I don't think a ping should be removed based on time, but perhaps it can be "grayed out" on the map after a month, and that ping can be updated. This actually makes a lot of sense, because if there are hazards or species that are posing a threat, updating the picture frequently can allow you to keep track of any changes occurring. Is the species spreading? Has the hazard gotten worse? Those kinds of answers can be extremely helpful to the park and park goers.

**Privacy and Security: With having a GPS based application, there are a lot potential privacy and security risks involved with making an application like this. For example if there were a hacker or cracker trying to get information out of our system, they would have major information regarding users. One of the risk being that the app will always have a GPS location so that would lead the hacker/cracker to knowing where the user lives. In-order to combat that, our group has decided the users will only have GPS in the parks that would allow our application. However this does not combat many other risks, such as protection of personal information, bank information, etc.**
**Are there any laws or regulations we must be aware of for keeping information secure and what data we are able to collect (i.e. in the vein of HIPPA, etc)**

- Anonymous - In Europe there are, and I think California recently came up with something also.

**Are there any privacy concerns we should be concerned about regarding our app and data collection?**

- Anonymous - In general, you should keep as little personal information as possible about your users.
- Sean Mosier, M.Ed. - It’s possible you can prevent some of these issues by only storing GPS data collected when the user is within the park.

**Based on your previous experiences in working with systems, applications, or etc, what are some well known security risks that may come up when creating this sort of application/system.**

- Anonymous - The major risks are from complexity (if the designers don't understand the design, they can't make it secure) and from saving too much information.

**Application performance: One issue surrounding applications is their issue to perform and run at a timely manner. How can we maintain our application’s run speed / performance requirements (i.e. no lagging, reasonable processing time, quick updating, input/output timings, refresh times for the map, etc)**

- Anonymous - Design for a secure system, which means understanding what threats you are trying to defend against.

**With GPS it may be hard to locate users if there is bad cell service or a lot of mountains. What would be a solution to be able to accurately pin-point users locations if one or both were an issue?**

- Anonymous - Dead reckoning means to assume that the vehicle continues in a straight line at the same speed.  You could adapt this by assuming the user follows the trail they're on, but it would not give very good accuracy.  The accuracy can be slightly

improved by recording the time and location when GPS is acquired again, but really, there isn't much you can do to accurately pin-point users when the device can't do it.

- Sean Mosier, M.Ed. - The park can set up iBeacons along the trails, which will both help keep the map in the app accurate, and allow users to accurately obtain their location when GPS is spotty.

**Are there any other recommendations you would like to provide?**

- Anonymous - Even if you hire people to program this, you need to develop clear specifications for your app. In other words, you will waste less time and effort if you can clearly understand what you want your app to do. This can be done incrementally (i.e. in an agile fashion) by first deciding what early features you want to see, and then building on that -- but if you give developers a good overall picture, then they can focus on developing the early features in the right context.

**Are there any comments about our system? (good or bad, any would be appreciated)**

- Sean Mosier, M.Ed.-If you do run with a leaderboard for contributions, ensure that you put them into leagues (like gaming leagues) based on their skill level/participation. That way for those who don’t go very often, they can still feel motivated to work towards the top of their league, and the competition doesn’t drive them to not attempt to contribute.

**Growth**

| **Quarter 1** | **Quarter 2** | **Quarter 3** | **Quarter 4** |
|---|---|---|---|
| Order Capability with Package Storefront | Data Management | Prep for Market (Marketing/Ads/ Finalize Product) | Training Process of ar(Rangers) |
| Inventory Maintenance | App Skeleton Completion | Finalized Hiring | Additional Features |

| | | | |
|---|---|---|---|
| Community Interface | Species Detection | Clean up visuals | Connect to NPS |
| Start Hiring Process | Geo-Mapping | | Plan for future maintenance |
| Start Alert System (Finish in year 2) | Safety Feature | | Functioning Alert System (Needs refinement) |

## Citations


Griswold, L. (2017, March 10). Yosemite National Park posts record number of visitors. Retrieved May 10, 2020, from https://www.fresnobee.com/sports/outdoors/article137880893.html

Cairn Consulting Group. The 2019 North American Camping Report 5-Year Trends. Retrieved May 7, 2020, from koa.uberflip.com/i/1101994-2019-koa-north-american-camping-report/0?m4=.

Mohsin, M. (2020, March 16). 10 Snapchat Statistics Everyone Should Know in 2020 [Infographic]. Retrieved May 10, 2020, from https://www.oberlo.com/blog/snapchat-statistics

NPS. (2020, May 10). Stats Report Viewer. Retrieved May 10, 2020, from https://irma.nps.gov/STATS/SSRSReports/Park Specific Reports/Annual Park Recreation Visitation (1904 - Last Calendar Year)?Park=YOSE