Nautilus Group Capstone Proposal

Spot.tr App

for

California Light Chasers

CST 499

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Executive Summary

Have you ever wondered how photographers know of the best locations to take photos? How did they know to take you on a mile walk to find a beautiful waterfall with greenery all around? Although photographers know many cool spots to take photos, there are a great deal of undiscovered land and locations for them. This is the exact problem that California Light Chasers and its members are currently facing.

In comes Spot.tr. This app will allow photographers to upload photography locations (name, latitude, and longitude) to a backend database. It will also allow photographers to upload pictures taken from those locations. This database will be accessible through a front end user interface which will include an interactive map of the locations available in the local area complete with marker pins and user added content. Having access to this information will make the sharing of information between photographers more fluid.

The process of looking for new photography locations online today is cumbersome. Spot.tr will alleviate this problem and create a highly tailored and useful solution for the California Light Chasers photography community. Spot.tr has plenty of opportunity to enhance and grow as a tool over time. Spot.tr, while initially built for the California Light Chasers has the ability to be used by other professional and hobbyist photography groups and communities as well as in ways not even considered at this moment. It is exciting to see how this app will evolve over time.

Beyond solving the specific need of the California Light Chasers, it is anticipated that Spot.tr will have greater and far-reaching outcomes. As it evolves, Spot.tr will allow additional groups with the photography community to connect with each other. This increased social interaction will allow professionals to ignite the passion of hobbyist and share information with them. This increased social interaction will also allow for not just the sharing of locations, but the ability to coordinate as a singular body to work towards preserving and maintaining these locations for photographers and others. Finally, it is believed that Spot.tr may have the ability to highlight and bring awareness to photographers and their work that might otherwise have remained unknown.

Table of Contents

Part I

Introduction

Since the advent of ARPANET, networks have played a critical role in computing. From dial-up modems to broadband to fiber, these networks have increased in speed over the years. In addition, these networks have gone from just a handful of computers to connecting over half of the world's population. Beyond land-based networks, mobile and wireless networks have also made significant gains over the years. Mobile networks are set to move from 4G LTE to 5G in the next two years boasting major increases in speed and decreases in latency. All of this continued growth and progress of networking has laid the foundation for social media networks.

People are social by nature and desire to connect with other people. Social media allows these connections to take place online. Social media continues to play an ever growing role in society. From Facebook to Pinterest to Twitter, people desire to connect and share with each other. While some social media apps allow for broad connections and communications, others serve a more focused role, offering specific interfaces and functionality that matter to specified groups of end users. The California Light Chasers (See Appendix C) is an example of one such focused group of end users and the specific group of end users for our application.

The California Light Chasers are a group of photographers mostly from Northern California. They have a Facebook page where they keep in contact, share information and add resources. At times, they have struggled with the limitations of their Facebook page as a means to maintain photography locations for conducting photography shoots. Without having a general location to store all these locations and photos, their choices are limited. There are some apps that share photos and locations, but not many that are really catered for photographers to scout

locations. The only two we found that really do this are the ShotHotspot app and the Really Good Photo Spots. An immediate drawback to ShotHotspot is that it has a very loud user interface with numerous ads running on the page. We appreciated that Really Good Photo Spots allows users to upload photos and look for photos in locations that the user enters in to the search box. However, Really Good Photo Spots does not display a map which is something users of the app have concerns with. Each application we found had some of the features that our end users desire, but these are often coupled with features and a design structure that is unesired. No application had all the features desired in one place and there were certain features not present in any solution available.

In comes Spot.tr. This app will allow photographers to upload photography locations (name, latitude, and longitude) to a backend database. It will also allow photographers to upload pictures taken from those locations. This database will be accessible through a front end user interface which will include an interactive map of the locations available in the local area. Having access to this information will make the sharing of information between photographers more fluid. The idea would be similar to how Redfin (a popular realtor app) works. Realty apps group photos by available houses; Spot.tr will use this structure. The process of looking for new photography locations online today is cumbersome. We believe that Spot.tr will alleviate this problem and create a highly tailored and useful solution to the photography community with plenty of opportunity to enhance and grow that tool over time.

Project Goals and Objectives

- Create a backend database with tables to store:
    - User information

    - Location information
    - Picture information
- Create a front end user interface to allow:
    - User interaction with maps, pictures, and locations
    - User input of new locations
    - User upload of new pictures
    - User interaction with each other
- Utilize Google's mapping API
- Utilize AWS to test and host website (See Appendix D)

Future Project Improvements

- Create mobile version of app (Android and iOS)
- Allow photographers to create 'verified spaces' to show off work
- Allow for real-time driving or walking directions to site locations
- Increase application's range to include photographers of varying skills
- Increase application's range to include photographers from different regions

Contributor Objectives

- Contributors will gain experience with AWS (E2C, Elastic Beanstalk, and Lambda)
- Contributors will gain experience with Javascript frameworks (JQuery and AngularJS)
- Contributors will gain experience with back end development (Database, SQL)
- Contributors will gain experience with front end development (HTML, CSS, Bootstrap)
- Contributors will gain experience with Google's mapping API

Client/End User: Stakeholders and Community

The principal end users for this project will be members of the California Light Chasers who also serve as the main stakeholders. The specific attributes of this relationship will guide the requirements for this project. As a result, project development will be Agile and implementation will focus on real-time interaction between developers, who serve as an additional stakeholder, and end users. Final testing will involve a selected focus group from the California Light Chasers. While this project focuses on the need of a specific group of local photographers, this project has greater application to photographers of varying skill levels and different geographic regions. Stakeholders stand to gain many benefits from this project. California Light Chasers will gain a mobile and web based application that will allow them to better communicate with each other and potentially with photographers outside of their geographic region. This application will benefit their craft and businesses. The developers will gain a web application that will benefit them academically, offering both practical learning and experience. In addition, this fully developed software application has the potential for future monetization as well as serving as a pathway to other development projects. With the exception of some privacy concerns, which we address later in this paper, there are no significant concerns for losses that either stakeholder stands to incur.

Approach and Methodology

- Research Competitive and Comparable Software Applications
    - Review comparable applications to ensure that Spot.tr will offer a unique solution and experience to the photography community.
- Learn AWS

    - Utilize online courses and materials.
- Learn AngularJS
    - Utilize online courses and materials.
- Meet with California Light Chasers
    - Make sure that features and requirements meet end users needs.
- Develop UML Diagrams (See Appendix A and B)
- Employ Test Driven Development
- Utilize Agile Development
    - Frequent scrum meetings.
    - Use Pivotal Tracker to monitor project velocity.
    - Use GitHub for code repository and code development.
    - Use Slack as communication channel.
    - Utilize pair programming.

Milestones

Milestone I

- Create back end database with MySQL.
- Setup AWS environment with Elastic Beanstalk.
- Create front end user interface.
- Use Google's Mapping API to implement Map Locations.

Milestone II

- Connect back end to the front end with mapping output.

Milestone III

- Increase UI functionality to allow for user account creation and user interaction with database.

Milestone IV

- Develop web application into mobile application.

Milestone V

- Add additional user functionality including the ability to interact with each other and showcase their photography.

Part II

Ethical Considerations

When undertaking any project, it is always important to consider the ethical implications inherent to either the research, design, or implementation phases; potential long-lasting ethical implications must also be examined. The Nautilus Group is considering a photography location sharing application for our capstone project called Spot.tr. The application would establish an online community for photographers to be able to share locations and the corresponding photographs. This write-up serves as a brief overview of potential ethical concerns that may exist as a result of this capstone project. All concerns would require a more thorough review as the capstone progresses. Some major ethical concerns during and after our capstone include:

- Who retains rights to photographs posted on this application?
- What is the best way to handle permissions related to people or businesses who might be posted in these pictures?

- Will navigation run in the background collecting data even when the user is not interacting the application?
- Will the application be free or have a fee?
- Will there be ads?

In addition, the Nautilus Group was interested in identifying who might be negatively impacted by our capstone, especially underprivileged groups. Photographers who want to keep their locations private may be negatively impacted. Unwanted or high levels of traffic could be an issue for locations, especially those near businesses, private residences, or institutions. Photographers who live in underprivileged communities may not have the same level of access to our application causing further inequity between them and photographers from other communities who would have access. A lack of diversity among the user base could lead to the application being favorable to only a segment of the population.

Next, we asked ourselves what is the potential short term and long term danger, social injustice, and environmental impact of our project. There is a danger that the application might be used to perpetuate hate or agendas unrelated to the application. There are concerns that the application might contribute to further inequity among groups already disproportionately disadvantaged. There are concerns that too much foot traffic to a particular location may lead to environmental harm.

Finally, we asked ourselves how to best eliminate or mitigate these ethical concerns. First, more research and discussion should be given to each concern. It would be wise to consult with focus groups and outside experts. Some issues could be eliminated such as not allowing a

location too close to an elementary school or giving property owners that are within a certain distance of a location the option to have that location removed. Other concerns could be mitigated by investing into resources that promote diversity and lower barriers for underprivileged groups to be able to use the application. We recognize that not all ethical concerns can be eliminated, but with thoughtful and intentional research, discussion, and design, we believe that all concerns can, at a minimum, be mitigated. Continued monitoring as part of quality assurance would be required to maintain these ethical goals long term.

Legal Considerations

Legal considerations when creating an app may seem cumbersome, but the truth is it should always be a main priority before presenting any product to a client. During the process of researching legal considerations we found that some of the main considerations that may affect the Spot.tr app are:

- Intellectual Property
- Child and Adult Nudity
- Safety
- Privacy Policy

Intellectual Property plays a large role in the development of any app. We have to take into consideration properties such as Trademarks, Copyrights and Patents (Franco, 2018). To eliminate the probability of running into an issue regarding Trademarks, we have researched the Trademark Electronic Search System (TESS), and found that there was very little similarities to the idea we had for the app (Trademark Electronic Search System, 2018). We searched words like: photography locations, photography scouting app, photography app. Considering copyright

infringement laws we have opted to create all artwork for the app ourselves, we will add a section in the app for all users to have access to read about copyright laws and we will make sure that the code we write is not copied from any other sources.

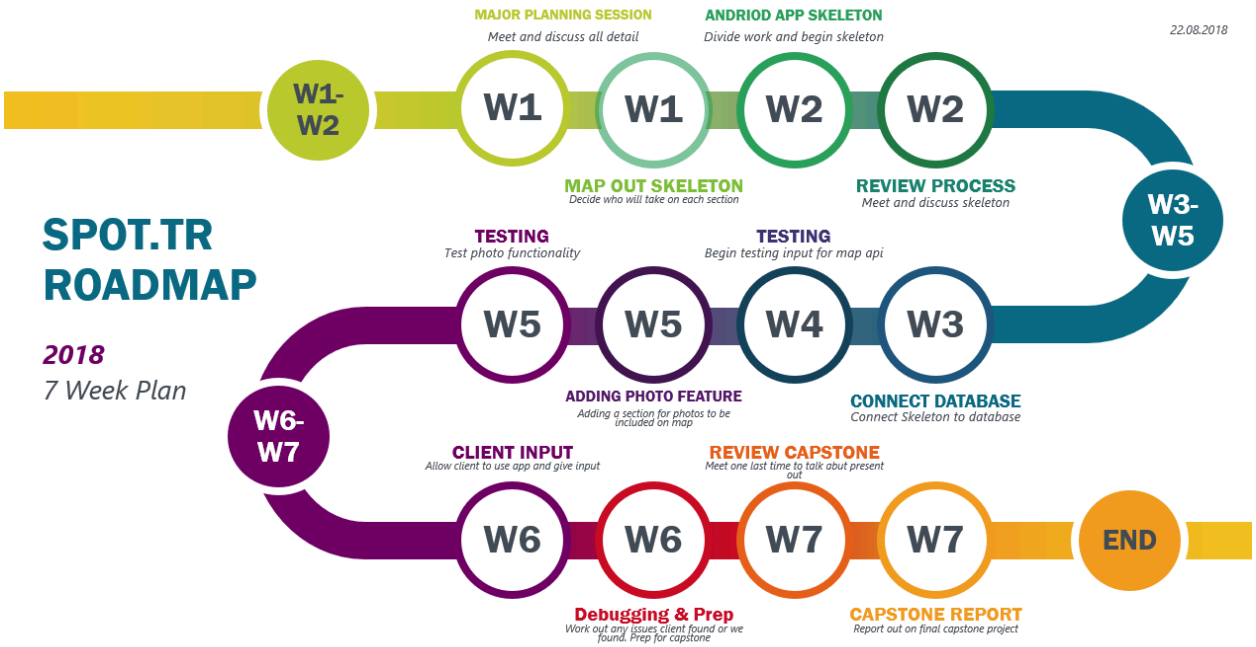
Facebook has had their fair share of issues dealing with nudity. They have written policies to meet laws and combat child nudity and revenge porn. Facebook does allow a certain amount of nudity that is either “newsworthy” or some types of artwork (Pham, 2017). This being said, with Spot.tr having the ability to upload photos it is expected that we should plan for situations similar to what Facebook has experienced (Facebook Community Standards, 2018). After much research, the best way to combat this issue is to dedicate resources to monitor for nudity. Another approach we will take is allowing users to flag content and contact us if they should come to find nude or disturbing content.

Safety is of the utmost importance when it comes to clients and stakeholders. We want to make sure to take every precaution when dealing with safety. Along with monitoring for nude or disturbing content we will need to monitor the apps content for any safety concerns we may encounter. This could range from suicidal content, bullying, harassing comments, hate speech, trespassing and violence. We cannot risk taking any of these points lightly. Any content that includes unsafe properties will be removed or handled appropriately.

Regarding Privacy Policy we plan to include a Privacy Policy section in the app to create a sense of trust amongst all stakeholders. We have reviewed California Privacy Laws regarding online content. We will use security features that protect users’ information and make sure that they are aware of privacy policies by adding in a “must read” feature when they sign up for the app.

Part III

Timeline/Budget:



Budget:

Spottr Budget

ANNUAL BUDGET VALUE: $238.48

ITEMS: 3

Item	DESCRIPTION	QTY	COST	Totals
Domain	Domain (Spottrphotoapp.com)	1	$15.00	$15.00
Amazon RDS	Amazon RDS db.t2.micro (8 hours per day)	2920	$0.03	$99.28
Amazon EC2	750 hours of Amazon EC2 Linux t2.micro instance	12	$10.35	$124.20

Resources Needed

- Android Studio
- Database, SQL
- Google Map API
- HTML, CSS and Bootstrap
- Javascript frameworks (JQuery and AngularJS)
- AWS (E2C, Elastic Beanstalk, and Lambda)

Risks and Dependencies

Risks:

Time Management - The project complexity may run the chance of having limited time constraints. We are all familiar with Android Studio, but development can run longer than expected. We can also run into an issue if the client wants to add more functionality within the time frame we have. Our current goal is to create the app for the Android platform, but that leaves out potential clients who use iOS. We are in the process of exploring a Progressive Web Apps (PWA) for this reason. PWA's offer more cross functionality on different platforms (LePage, 2018).

Client Approval - Not obtaining client approval could delay or permanently stall the project.

Dependencies:

Client Feedback - Feedback and testing from client will be critical to this project.

SaaS - JS frameworks, Google's mapping api, and AWS resources will be critical to the continued success and operation of our application.

Final Deliverables

Deliver a cross platform web and mobile based app to share potential photography locations for any photographer looking to scout locations. Setup Database using Amazon RDS and integrate Google Maps API into product. Finalize UI to achieve an attractive look and feel for all users. Market the product to all California Light Chaser members using a final promotional video. The project will also deliver:

- Security by dedicating resources to monitoring the input from users
- User input
    - Photo upload capability
    - Marker input capability
    - Comment input capability
- Login functionality to deliver personalized data to each user
- Ability to flag concerning activity
- Scalability to allow more users in the future

All deliverables were carefully thought out to meet the needs of the client. Security features have been added to protect both the client and anyone else who would be affected by the contents of the app.

Usability Testing/Evaluation:

Preliminary Usability Test Plan and Evaluation Form (See Appendix E)

Phase I (Web Testing by Nautilus Group)

Using a desktop PC connected to the Internet, members of the Nautilus Group will test the application through various Internet browsers (Internet Explorer, Chrome, and Firefox). Application will be tested for ease of use and functionality. Specific functionalities will be tested such as:

- Ability to look up location
- Ability to add a new location
- Ability to add a photograph
- Ability to add comments
- Ability to use mapping api

Phase II (Field Testing by Nautilus Group)

Using a mobile device with a data plan (smartphone, etc), members of the Nautilus Group will field test the application. Application will be tested for ease of use and functionality on the mobile screen. Specific functionalities will be tested such as:

- Ability to look up location
- Ability to add a new location
- Ability to add a photograph
- Ability to add comments
- Ability to use mapping api (field testing will allow us to actually follow map directions to the location and see what is nearby in proximity)

Phase III (Field Testing by California Light Chasers)

Using a mobile device with a data plan (smartphone, etc), members of the California Light Chasers will field test the application. Application will be tested for ease of use and functionality on the mobile screen. Specific functionalities will be tested such as:

- Ability to look up location
- Ability to add a new location
- Ability to add a photograph
- Ability to add comments

- Ability to use mapping api (field testing will allow client to actually follow map directions to the location and see what is nearby in proximity)

The app will be geared towards photographers looking for scouting locations, but eventually can be used for clients looking for photographers in the area. After the 3 phases of testing are complete, the application will be released on a limited basis to the local community in the Central Valley area of Northern CA.

Team Members:

Daisy Mayorga

- Focus on the front end CSS, HTML, JavaScript for UI
- Google maps API
- Help debug at each iteration
- Create content for the app (Logo and Photos)
- Create promotional video for the release of the app

Michael Cline

- Focus on connecting backend to front end
- Help debug at each iteration
- Code photo functionality
- Develop front-end mobile design
- Google maps API

Caleb Allen

- Focus on the backend creating PHP files to connect to database
- Setup database
- Create a backend database with tables to store records
- Help debug at each iteration
- Develop backend mobile design

References

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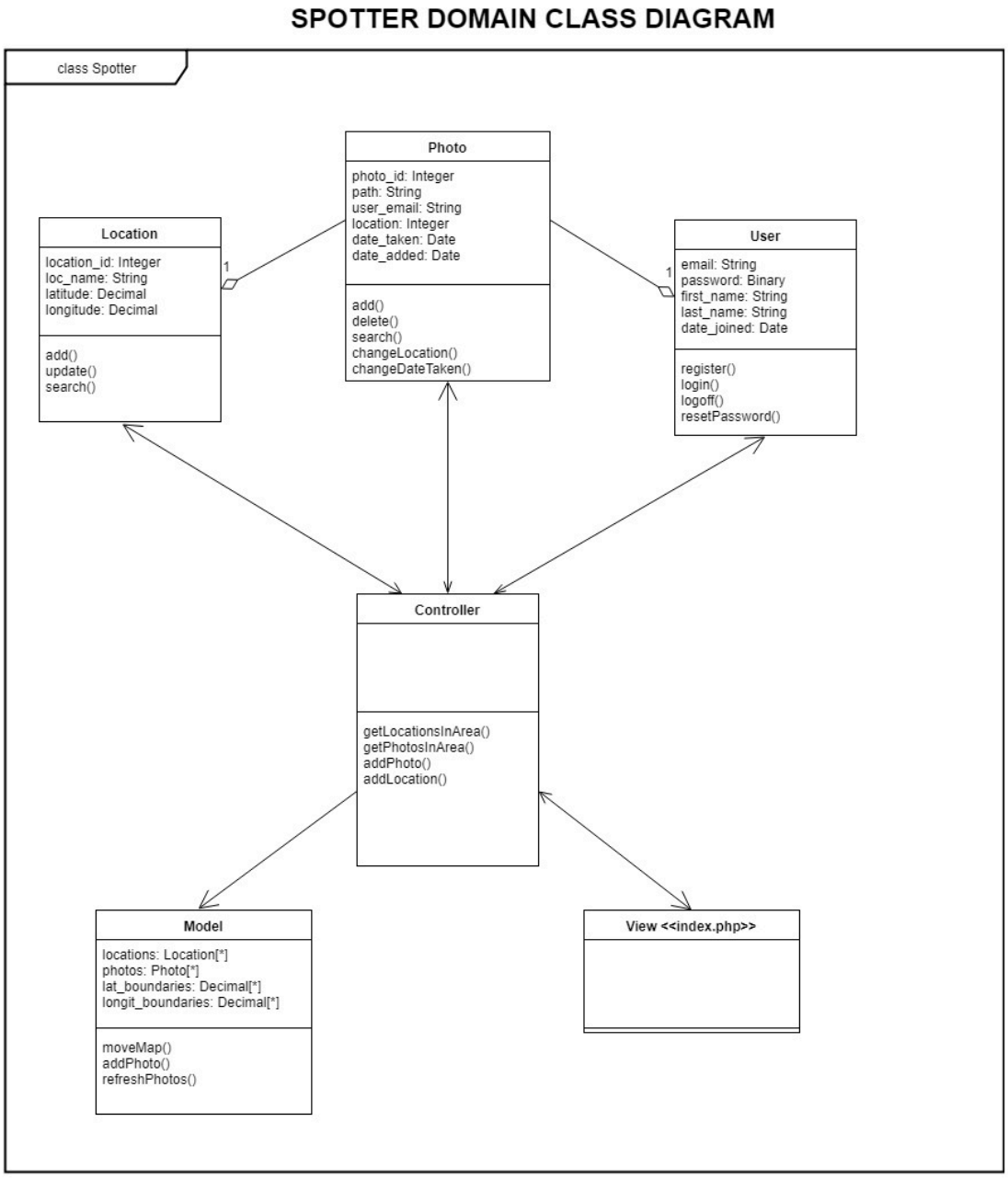
Appendix

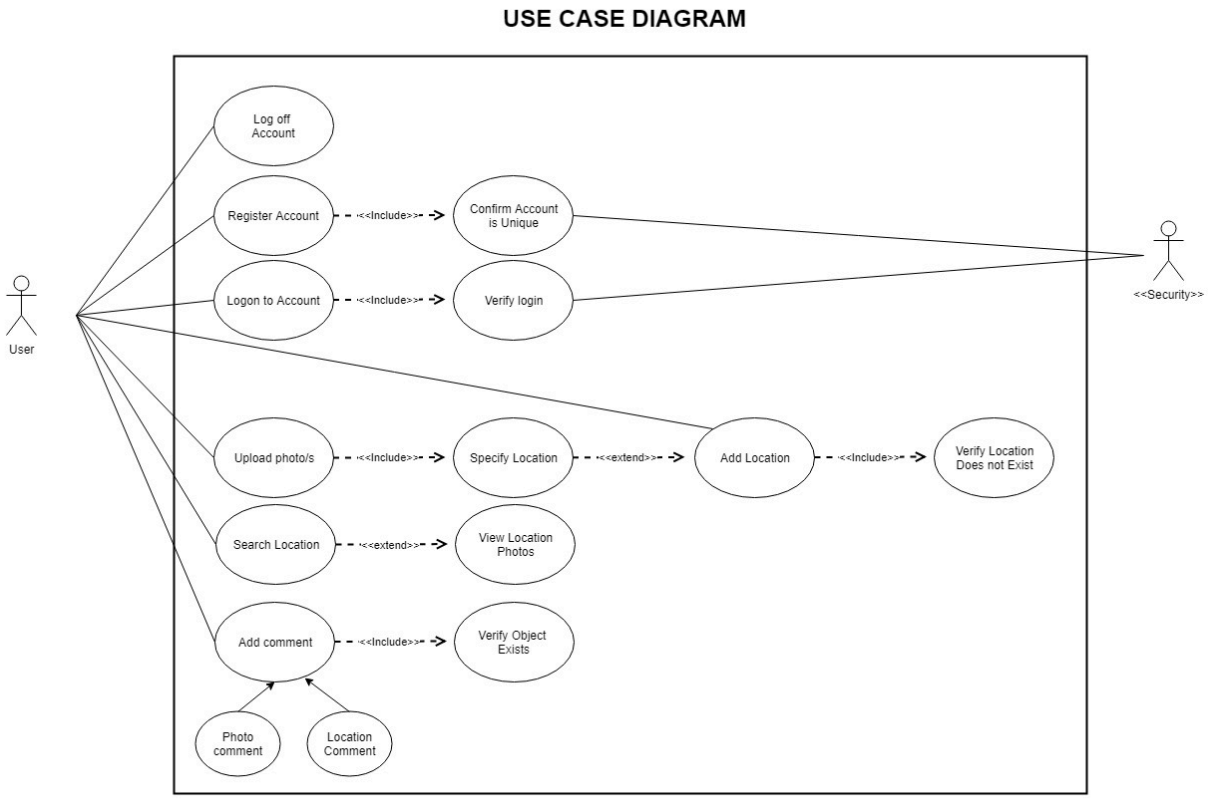
Appendix A

Spot.tr Domain Class Diagram



Appendix B

Spot.tr Use Case Diagram



Appendix C

About California Light Chasers

California Light Chasers (CLC) is a group of photographers and videographers from all experience levels. We are a local community of photographers with the same goals, dreams, and visions. We are based in the Central Valley, but have a network reach all over the state of California.

We believe highly in community. Our goal as a group to help each other out. Whether you just

picked up a camera, or you've been doing this for years, this is a place to grow.

We will be sharing tutorials, behind the scenes, interviews with photographers/videographers, hosting photo meet ups, stylized photo sessions, etc.

This is a private group, so before being admitted, we will need to know you are a photographer/videographer. How can we know? A link to your Facebook, website, or any social media is required.

After being accepted to the group, you have 48 hours to share an introduction about yourself. This should include: What you shoot, how long you have been shooting, goals you have, and what you hope to achieve within this local community.

We will have a set list of rules. This rules aren't to be taken lightly.

1. If you post, anyone has the right to give Constructive Criticism (CC). We all have our personal tastes in art, but this group isn't for getting likes on your images/videos, but instead, posting to learn and grow. If there is an issue with this, and you cannot handle CC, we will remove you from the group.

2. Keep it professional! This is a group of professional photographers/videographers. This means no client bashing, no photographer bashing, etc. Also, please be respectful towards each other. If there are any issues towards clients, models, or other people in the group as far as uncomfortable advances, you will be removed from the group immediately.

3. Do not remove your post, or disable comments, without admin approval. We are here to post, learn, and grow. If you do not like what you hear, be cautious of what you post. As artist's we have different opinions, and different ways of expressing those. What may sound hurtful, may actually be some beneficial advice.

4. No sales of products, services, or mentoring sessions without admin approval. There are times where people may get caught up in helping others, and some may say time is money. This group should be a solution to that. We are surrounded by a group of local professionals with plenty of experience. This isn't a self promotion group. It's a community.

5. No outside links to images or portfolios, *unless it's a share from another source other than yourself* We will have a portion of the page with website links.

6. No drama. Absolutely none. We are all professionals and we need to treat this group as so.

7. Have fun! We are all about growing and having fun while doing so. We achieve to make this group a wonderful experience.

Appendix D

About AWS EC2

Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides secure, resizable compute capacity in the cloud. It is designed to make web-scale cloud computing easier for developers.

Amazon EC2's simple web service interface allows you to obtain and configure capacity with minimal friction. It provides you with complete control of your computing resources and lets you run on Amazon's proven computing environment. Amazon EC2 reduces the time required to obtain and boot new server instances to minutes, allowing you to quickly scale capacity, both up and down, as your computing requirements change. Amazon EC2 changes the economics of computing by allowing you to pay only for capacity that you actually use. Amazon EC2 provides

developers the tools to build failure resilient applications and isolate them from common failure scenarios.

Benefits

ELASTIC WEB-SCALE COMPUTING

Amazon EC2 enables you to increase or decrease capacity within minutes, not hours or days. You can commission one, hundreds, or even thousands of server instances simultaneously. You can also use Amazon EC2 Auto Scaling to maintain availability of your EC2 fleet and automatically scale your fleet up and down depending on its needs in order to maximize performance and minimize cost. To scale multiple services, you can use AWS Auto Scaling.

COMPLETELY CONTROLLED

You have complete control of your instances including root access and the ability to interact with them as you would any machine. You can stop any instance while retaining the data on the boot partition, and then subsequently restart the same instance using web service APIs. Instances can be rebooted remotely using web service APIs, and you also have access to their console output.

FLEXIBLE CLOUD HOSTING SERVICES

You have the choice of multiple instance types, operating systems, and software packages. Amazon EC2 allows you to select a configuration of memory, CPU, instance storage, and the boot partition size that is optimal for your choice of operating system and application. For example, choice of operating systems includes numerous Linux distributions and Microsoft Windows Server.

INTEGRATED

Amazon EC2 is integrated with most AWS services such as Amazon Simple Storage Service

(Amazon S3), Amazon Relational Database Service (Amazon RDS), and Amazon Virtual Private Cloud (Amazon VPC) to provide a complete, secure solution for computing, query processing, and cloud storage across a wide range of applications.

RELIABLE

Amazon EC2 offers a highly reliable environment where replacement instances can be rapidly and predictably commissioned. The service runs within Amazon's proven network infrastructure and data centers. The Amazon EC2 Service Level Agreement commitment is 99.99% availability for each Amazon EC2 Region.

SECURE

Cloud security at AWS is the highest priority. As an AWS customer, you will benefit from a data center and network architecture built to meet the requirements of the most security-sensitive organizations. Amazon EC2 works in conjunction with Amazon VPC to provide security and robust networking functionality for your compute resources.

INEXPENSIVE

Amazon EC2 passes on to you the financial benefits of Amazon's scale. You pay a very low rate for the compute capacity you actually consume. See Amazon EC2 Instance Purchasing Options for more details.

EASY TO START

There are several ways to get started with Amazon EC2. You can use the AWS Management Console, the AWS Command Line Tools (CLI), or AWS SDKs. AWS is free to get started. To learn more, please visit our tutorials (Amazon EC2, 2018).

Appendix E

Spot.tr Evaluation Form (link below to Google Forms)

https://docs.google.com/forms/d/e/1FAIpQLSfgX8BCR-x-xwQmW2dDNsIJd13O

QCnVQamvtHdQC8sIlCWb1Q/viewform