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Systems Proposal: Part I - PhotoMap

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CSC 3150: Systems Design

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Spring 2024

May 5, 2024

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Introduction and Overview

Executive Summary

This document describes the system proposal of the application PhotoMap. PhotoMap is an application which photographers and clients alike use to schedule and coordinate a meeting place for photoshoots. It is done via a maps integration to show the users place on a map and it also allows them to drop a pin where they are located to share securely while doing a photoshoot. The problem statement describes further what the reasons for creating this application are, and further along this document are the requirements summary which discuss the factors that contribute to the building of this application. The takeaway that the reader should have after reading this document is that they are able to accomplish more, spend their energy more effectively, and streamline their photo shoot process while using the application PhotoMap.

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1.0 Introduction and Overview

1.1 Problem Statement

The project, titled "PhotoMap," founded by Paulson Kimani, strives to enhance the coordination and planning of photo-shoots between photographers and their clients by incorporating a geolocation feature in an interactive map application. This addresses the common challenge of vague or unfamiliar location descriptions, which often complicates scheduling and logistics in photography assignments. The application simplifies the site selection process by integrating a user-friendly map where participants can mutually agree on a precise meeting spot by placing a pin. It ensures that both parties agree regarding the location.

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The simplicity of design is a theme of PhotoMap and the need to streamline the logistical aspect of photography that professionals and amateurs face. This app reduces the time and effort spent on location scouting by allowing users to visualize potential photo shoot locations and

verify their public or private status. Also, the app caters to a broad spectrum of users, including photographers, models, social media enthusiasts, and businesses, who all benefit from a simplified and efficient planning process. If development follows the schedule, there is an envisioned launch by the end of the second quarter in 2024, which underscores the project's commitment to timely development and deployment.

1.2 Project Vision and Scope

The vision of this app is to become an invaluable accessory to any freelance photographer, that would like to improve the experience their clients have when booking photo-shoots. The scope of this system includes web and mobile applications that allow users to share and discover photography locations, interact with other users, and plan photo shoots. The boundaries are professional and amateur photographers, models, social media influencers, and companies seeking photography services.

1.3 Requirements Summary

The primary business requirements of this system are:

- **Geolocation Mapping:** Users must be able to select photo shoot locations with an interactive map that supports pin placement, zoom, and rotation.
- **User Profiles and Social Integration:** Profiles should display user activity and link to social media for sharing.
- **Location Suggestion Feature:** A feature to suggest photo shoot locations based on user history using data analytics.
- **Multi-Platform Compatibility:** The app should be accessible on web, iOS, and Android with a consistent interface.

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- Excluded Features: No messaging, newsfeed, or in-app camera to maintain focus on professional use.

1.4 Stakeholders and Their Interests

The stakeholders in this project include photographers, clients, social media users, companies, development team, marketing team, sales team, researchers, investors, and general users. Photographers want to find locations and connect with clients. Clients want to find and communicate with photographers and discover new locations. Social media users want to share and discover locations and connect with others. Companies want to reach their target audience through sponsored locations and ads. The development team will design, develop, and maintain the application. The marketing team will promote the application to potential users and advertisers. The sales team will establish contracts with clients and manage revenue streams. Researchers will gather data to improve the application and user experience. Investors want to see a return on investment through revenue growth and market share. General users want a user-friendly application for finding and sharing locations.

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1.5 Expected Costs and Benefits

Several cost areas are important to consider to ensure the successful launch and ongoing maintenance of the application. The primary financial investment will be in the development phase, which includes writing the necessary code and performing testing to ensure functionality and user-friendliness. This stage is foundational, as it dictates the overall quality and initial user reception of the app. Following development, marketing will represent a significant cost area. Effective marketing strategies are essential to attract users and gain traction in the competitive app market. This involves not only initial launch promotions but also ongoing efforts to maintain visibility and engage with potential new users continuously. Ongoing operational costs also form

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a considerable portion of the budget. These include server maintenance to handle user data and ensure smooth app operation, as well as customer support to address any issues users may encounter. Providing robust customer service is vital for retaining users and maintaining a positive reputation. Another critical cost area is compliance with legal requirements, such as obtaining the licenses and permits to operate the software legally. This will ensure that PhotoMap adheres to industry standards and avoids potential legal challenges that could disrupt the service. Lastly, expenses related to software and equipment are necessary to support the development and maintenance of the app. This includes purchasing or licensing the appropriate technology and tools needed by the development team, as well as investing in robust security measures to protect user data and ensure privacy.

1.6 Constraints

The development of PhotoMap faces several constraints that need to be addressed to ensure a successful outcome. The limited availability of skilled developers and designers with experience in advanced mapping technologies and mobile application development may impact the development timeline and quality of the final product. To mitigate this, early recruitment efforts, expanded talent pools, and partnerships with technology firms specializing in recruiting services are necessary. Additionally, the technical limitations of mobile platforms, such as varying capabilities across iOS, Android, and web, may affect the app's performance and user experience, and can be addressed through multi-platform development tools and extensive testing. Furthermore, handling location data and user information poses significant privacy and security challenges, which can be reduced through encryption, compliance with data protection regulations, and regular security audits. By addressing these constraints, we can minimize their impact on development and ensure PhotoMap delivers a user-friendly experience.

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1.7 Recommendation

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After reading this document, the reader should be able to consider whether they would utilize this application in their plans for holding a photo shoot. They should be able to understand the technical challenges in creating the application, as well as the design considerations made to solve the challenges faced by the stakeholders. They could plan their business around the features of the app, should they choose, and integrate them in the features of their own plan. The next steps should be to determine if other applications they use have similar functionality and would be better serviced by this application.

1.8 Document Overview

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This system proposal is organized into several sections. The section after the title page, is the Introduction and Overview which contains the Project Vision and Scope, Requirements Summary, Stakeholders and Their Interests, Expected Costs and Benefits, Constraints, Recommendation, and Document Overview. Following that is the System Initiation which includes the Project Initiation Report (PIR). After that is the Feasibility Assessment which includes an Introduction, Feasibility Analysis, Additional Comments, and Conclusion. Then there is the Requirements Definition which contains an Introduction, Functional Requirements and Non-functional Requirements. Next, there are the Appendices. Following that is the Glossary. Last is the Bibliography.

2.0 System Initiation

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2.1 Project Initiation Request (PIR)

PIR-00000 [PIR Number to be assigned by the Project Office]
Level1 v6.0

Project Initiation Request (PIR) –

Project Name: PhotoMap

Student Name: *Paulson Kimani*

This Project Initiation Request (PIR) is to be completed for all requests expected to require over 40 hours of effort or over 4 weeks of total duration. For larger requests requiring over 40 person-days or estimated project costs greater than \$5,000, this template is used to assess the product's feasibility and get approval to scope and plan the proposed project.

If approved, the Level 2 template (System Proposal: Part 1 and Part 2) must be completed.

NOTE: Sections 0-4 are required. Section 5 is optional, but any ideas on estimating costs should be included. Replace the *italic prompts* with your answers/information. [Expand each section in this template as needed.]

0. General Project Information

Project Name:	<i>PhotoMap</i>
Two Sentence Request Description:	<i>An application built to help photographers and their clients determine where to host a photo shoot. It has a map that the user can place a pin on a location where both the photographer and the client agree on where they can meet.</i>
Requested Launch Date(s):	<i>This project can launch by the end of Q2 2024 (June 2024)</i>
Department(s) Affected By Project:	<i>Software Development, Marketing, Sales, Research (R&D)</i>
Project's Customers:	<i>Photographers, models, social media users, companies</i>
Date Request Submitted:	April 15, 2024

1. Project Sponsor and Manager

Project Sponsor

Name:	Andy Cameron
Title:	Professor
Department:	Computer Science - SPU
eMail:	acameron@spu.edu

Business Project Manager & Requestor

Name:	<i>Paulson Kimani</i>
Title:	<i>Software Engineer II</i>
Department:	<i>Development Team</i>
eMail:	<i>kimanip@spu.edu</i>

2. Business Problem or Opportunity: The motivation for this request

Describe the problem or opportunity that you would like to solve. Include a simple, high-level description of this request's business problems or opportunities. Focus on the problem or opportunity, not the solution. Be sure to include any date or deadline-related dependencies or needs related to the project.

When photographers schedule with clients, it is sometimes not easy to bring everyone together. Describing a location can be too vague, or the other person isn't familiar enough to know where it is. Also, it can be challenging for the photographer to dial in the correct settings while there, with the limited time frame the client will pay for. In addition, there can be many choices that the photographer and client have, and seeing them without visiting each of them makes the process simpler. Finally, it's challenging to determine which are available for the public or on private property.

This project will be implemented in several phases until completion. We should start by describing on a persona board the typical user or users that would download and use the app. It would show their demographics, interests, and potential reasons for wanting to use the app. Then, we should draft an outline of the user interface so that the end-users know how the app will interact. It is essential to include only the key features at this point to streamline development. Next, we should begin the programming and creating the code based on the design. This is the most expensive phase of the design process. Afterward, we test the app and ensure it performs well in all situations. Finally, we market the app and involve the sales department in interacting with larger customers, such as existing social media companies.

This app needs a customer user base, workers to research and design, and capital to fund the employees. Our customers would provide the data for the app and be the community we hope to develop. The more people that use the app, the more valuable it becomes. Research and design include asking photographers what they want to see in an app like ours and how our ideas could improve. It also means testing map software and navigation features and how to integrate them with other technologies. The capital would come initially from investors and banks, which would then support payment modes that the app will accept.

3. Justification, Impact, and Importance

What is the financial impact and justification for this request? How will the investment of time, resources, and capital be returned to our company? (Please note any contractual or regulatory requirements associated with the request. If you have an NPV, IRR, or ROI calculation, please provide the link(s) in this section.)

Assumptions

- Include at least two. Add more rows to each table as needed.
- Most of the financial cost will be to the developers who plan, design, and build the app and test all the included functionalities. The secondary costs would be to the marketing team, which advertises the app, and the sales team, which will make contracts with larger clients.
- To justify this request, I would say that an idea like this is not yet in common usage, if it exists at all, and it would be beneficial since many people are exploring photography, becoming gig workers, and engaging in creative disciplines.
- Also, it will generate revenue upon completion by serving sponsored locations and advertisements through the application. Businesses can pay the company (us) to have their locations featured above other places so that we may generate revenue.

Competitive Landscape / Context

- Include at least two.
- A competitor could be Instagram, which has a location feature when you post an image that shows where you posted from on a map, along with the pictures from other users who took a photo there. However, it is not simple to look at a map and find the best locations for photos; you have to know where to look to view the images for that location.
- Another competitor is Snapchat, which has a location map. Yet, it is not the best for photography since people use their smartphone cameras, and it is only for temporary pictures, not studio photography. Similarly, the demographic I would like to serve is not the same as Snapchat since it is for people of all ages, not just youths in school.
- Last, there is WhatsApp, Google Maps, and Apple Maps, where you can drop a pin and send it to a person to mark the exact location on a map. These would be direct competitors. However, there is no social integration since it is based on individuals interacting.

Tangible Return, Opportunity, or Value

	One Time	On-Going
▪ Include at least two. Estimate the best you can.	\$ 0	\$ 0
▪ Sponsorship of locations on the map as a "Featured Location"	\$ 7,500	\$ 5,000
▪ Advertisements within the app that 3rd party companies buy	\$ 3,000	\$ 2,500

Intangible Benefits

	Impact or Value
▪ Include at least two.	\$ 0
▪ Market share of social media applications	\$ 20,000
▪ Network effect of the app being spread among social groups	\$ 100,000

4. Product Requirements

The Project team will gather detailed requirements once the project is approved. Use this section to articulate the critical solution components to help scope the project's size and complexity. Do not describe how the solution will be implemented; instead, only list the functionality or results you expect to receive when the product is complete/delivered.

4.1. Must Haves

4.1.1.	<i>Include at least two. Add more rows to each table as needed.</i>
4.1.2.	There will be a main page with a map where the user will see other users' pins and be able to place their pins. A pin is a specific point on a map where the user determines a good photography location. The user can zoom in, zoom out, and rotate the map.
4.1.3.	Each user will have a profile showing the pins they have placed and the clients they have worked with. Each user will have their own settings page, login page, and sharing page to link to other social media accounts.
4.1.4.	A feature will suggest locations the user should visit based on their history. It will analyze the users' history and make correlations using data science and analytics to determine where the user would most likely prefer a photo shoot next. This feature would help with user retention, making the app more relevant, especially to new users.

4.2. Could Haves (Nice to Haves)

4.2.1.	<i>Include at least two.</i>
4.2.2.	The map may have several view modes: satellite images, a simplified design showing only roads, a feature displaying landmarks as icons on the map to help with navigation, and color schemes for the visually impaired. It will have a native design for each platform (web, iOS, Android) and look like a modern, sleek, and consistently designed application.
4.2.3.	The map may also have turn-by-turn navigation, so the user can use this app to find a location to meet and use the same app to navigate to the meeting place instead of turning to a competitor's app to handle the navigation.
4.2.4.	It may feature language translation features so that the user interface is readable by non-English speakers and could enable the app to be used in foreign markets. This may include using automatic language translation instead of hiring people to translate each language.

4.3. Won't Haves (Don't Do's, aka Out of Scope)

4.3.1.	<i>Include at least two.</i>
4.3.2.	This app won't have a messaging feature. It would become too broad if there were an instant messaging feature since there are many more established platforms, such as Facebook Messenger, where people can talk to each other. Also, it would distract from the app's primary purpose, which is to be a map, and it could lead to people not using the app for its intended purpose.
4.3.3.	This app won't have a newsfeed where people scroll through posts. It takes away from the focus being the map locations. When users interact with the app, they should think of navigation, not necessarily the pictures people post to show what the area looks like.
4.3.4.	This app won't have a camera feature. It will not allow users to take pictures directly with their cameras on their phones because I want the focus to be on professional photography. The user should own a standalone camera that they use for either business or casual use.

5. Project Costs (Operating and Capital: Onetime and Recurring) [Optional]

*This section is typically fleshed out after the requestor has submitted a PIR and received approval for the initial scoping effort. It captures the effort estimates, capital expenditures, and other costs associated with performing this work and creating the product/solution. If the submitter has thoughts or estimates on these costs or suggestions on how they might be estimated, please include those here. Add brief descriptions as needed. **Include at least 2 comments on your thinking around these items, even if you don't have specifics yet.***

Labor Costs

Type	Team(s) Affected	Low (hrs)	High (hrs)
Analysis & Design		0	0
Development		0	0
Testing and Quality Assurance		0	0
Systems Integration		0	0
Deployment		0	0
Support and Maintenance		0	0
Sales and Marketing		0	0
Total		0	0

Comments: *Include notes here on what the costs are or how they can be estimated. (optional)*

Capital Costs (Equipment, Software, Licenses, ...)

Description	Quantity	Cost (\$)
<i>Item 1</i>		\$ 0
<i>Item 2</i>		\$ 0
Total		\$ 0

Comments: *Include notes here on what these are or how they can be estimated. (optional)*

Maintenance Costs (Costs after the product is live)

Type	Hours / Month Low	Hours / Month High
System / User Support	0	0
Business / Process Support	0	0
Total Support & Maintenance	0	0

Comments: *Optional.*

3.0 Feasibility Assessment

PhotoMap Feasibility Analysis Executive Summary

3.1 Introduction

Paulson Kimani created the following feasibility analysis for the PhotoMap application. The System Proposal is attached, along with the detailed feasibility study. There is a scale of low, medium, and high risk. The highlights of the feasibility analysis are as follows:

Technical feasibility:

- Existing technologies can support the app's development
- Learning curve for the team, but experts can be brought in to assist

Resource Feasibility:

- Sufficient tools and personnel to start the project
- Need to bring in additional skilled workers to fill gaps

Schedule Feasibility:

- Project timeline is manageable, avoiding busy holiday periods
- Comfortable launch date in the second quarter of 2024

Organizational Feasibility:

- Strong internal support from departments and senior management

Legal Feasibility:

- Need to address user data handling and privacy laws
- Legal experts will be consulted to ensure compliance

Contractual Feasibility:

- Careful consideration of contracts with partners and service providers
- Legal team will review and guide contract negotiations

3.2 Additional Comments:

- Team is learning and adapting as the project progresses
- Competitors like Instagram and Snapchat are being monitored to ensure competitiveness

3.3 Conclusion:

The PhotoMap app project is feasible, with a solid plan and strong internal support. By addressing technical and legal challenges, the project is on track for a successful launch in the second quarter of 2024.

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4.0 Requirements Definition

PhotoMap Requirements Definition Executive Summary

4.1 Introduction

This section is about the requirements for PhotoMap, which is a mapping app for photographers and their clients to easily find and agree on photoshoot locations. The requirements are split into two types: functional, which are about what the app needs to do, and non-functional, which cover other important factors like security and how fast the app needs to work.

4.2 Functional Requirements

These are the core actions the PhotoMap app needs to perform:

- Geolocation Mapping: Users should be able to pick a photoshoot spot on a map that supports dropping pins, zooming, and rotating the view.
- User Profiles and Social Integration: The app should let users create profiles where they can show their activity and link to their social media accounts.
- Location Suggestion Feature: Based on past choices, the app should suggest potential photoshoot locations.
- Multi-Platform Accessibility: The app needs to work smoothly on web, iOS, and Android devices.

4.3 Data Requirements

- Database: This application will hold data describing the user accounts of the photographers and the clients both. It will store their username, email address, password, if they decide to share, for the photographer their camera model, and for the client their preferred location be it city or neighborhood.
- Architecture: The app will be developed locally on the application developer's machines, and it will be hosted on cloud infrastructure as a SaaS application. This means there will be user agreements for the user's data to be accessed in the cloud.

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- External data: User messages that the photographer and the client send securely to each other outside the app. These are not managed by the developers of PhotoMap, however, they are still critical to the operation of the application since they determine the usage of the application.
- Photos: These are the agreed upon pictures that the photographer will take, based on the client's requirements. It is also not the responsibility of the developers of PhotoMap to manage these. It is part of the application's Terms of Service that no pictures that violate the policy will be used with PhototMap.

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4.4 Non-functional Requirements

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- Operational Needs: The app pulls data from a main database but doesn't store new data back to it. It also handles online orders without storing sensitive payment details permanently.
- Performance and Security: There are no specific performance or security enhancements needed beyond standard practices.
- Cultural and Political Considerations: No special requirements here.

5.0 Requirements Model

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5.1 Introduction

This Requirements Model will describe several use-cases such as navigating from the main menu, opening the map, adding a location, including the settings from the photographer’s camera, navigating out of the map feature, and securely communicating the location to the photographer or the client.

5.2 Use-Case Diagram

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5.3 Use-Case Descriptions

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Use Case Name: User Navigates from the Main Menu		ID: 01	Importance: Must Have
Primary Actor: Photographer		Use Case Type: Detail, Real	
Supporting Actors: Client			
Stakeholders and Interests: The photographer: will utilize the app to describe their camera settings The client: will receive information from the photographer where to meet The app designers: will read specifications and code the application			
Brief Description: This menu of the application will help the photographer and the client to determine the necessary flow of movement through the application.			
Trigger: The user opens the application on their device (mobile (iOS, Android) or web)			
Type (mark one): <input checked="" type="checkbox"/> External <input type="checkbox"/> Temporal			
Relationships: Association: User opens the map Include: User opens the map Extend: N/A Generalization: N/A			
The Normal Flow of Events:			

The user opens the application. Then, they will navigate from the main menu to the map interface. From the map interface, they will select a location on the map and place a pin.
Sub-flows: <ol style="list-style-type: none">1. User opens the application2. User navigates through the map interface3. User places a pin on the map
Alternate/Exceptional Flows: N/A
Special Requirements: Security <ol style="list-style-type: none">1. The user will not have their location shared until they place a pin on the map.2. The application will not ask for user permissions outside of location. Performance <ol style="list-style-type: none">1. The app will navigate responsively and not take more than 600ms to load each webpage User Interface <ol style="list-style-type: none">1. The application will be multilingual and be designed with accessibility and incorporate technology such as screen readers.
To do/Issues: N/A

Use Case Name: Photographer adds settings from camera		ID: 04	Importance: Must have
Primary Actor: Photographer		Use Case Type: Detail, Essential	
Supporting Actors: N/A			
Stakeholders and Interests: Photographers: will be able to view saved settings			
Brief Description: The photographer arrives at a specified location to take photos. Then, they dial-in their settings on their camera. Since they want to remember their settings for if and when they return to that location, they use the use-case to store their settings with the application.			
Trigger: 3. User adds a location Type (mark one): <input checked="" type="checkbox"/> External <input type="checkbox"/> Temporal			
Relationships: Association: N/A Include: N/A Extend: N/A Generalization: User adds a location			
The Normal Flow of Events: The user has already set their location on the map. Now, they set the correct settings on the camera. Then, they set the appropriate settings on the app.			
Sub-flows: <ol style="list-style-type: none"> 1. The photographer has already dialed in their settings 2. The photographer puts the settings into the application 			

Alternate/Exceptional Flows: N/A
Special Requirements: N/A
To do/Issues: N/A

Use Case Name: Photographer sends location to client		ID: 06	Importance: Medium
Primary Actor: Photographer		Use Case Type: Detail, Essential	
Supporting Actors: Client			
Stakeholders and Interests: Photographer: has invested into their company and is looking for improvements that increase business Client: believes the photographer will provide their services and wants to have a streamlined experience			
Brief Description: The photographer has already set their location on the map. Then they securely send the location to the customer external to the application so that the customer receives the location.			
Trigger: The user has set the location on the map			
Type (mark one): <input checked="" type="checkbox"/> External <input type="checkbox"/> Temporal			
Relationships: Association: Actors are the photographer and the client Include: N/A Extend: N/A Generalization: Leads to the user exiting the application			
The Normal Flow of Events: The photographer and client are the main actors. The role of the photographer is to set a location on a map where they determine they want to meet their client. Then, the client will receive that location and accept or deny the location. Afterwards, the photographer will exit the application. All of the communication is done externally to the application			

Sub-flows: <ol style="list-style-type: none">1. Photographer sets location on the map2. Photographer communicates securely outside of the application with the client3. Photographer exits the application
Alternate/Exceptional Flows: <p>N/A</p>
Special Requirements: <p>User Interface</p> <ol style="list-style-type: none">1. The user interface will belong to a secure external messaging platform <p>Security</p> <ol style="list-style-type: none">1. Security is required for the communication due to safety of photographer and client
To do/Issues: <p>N/A</p>

6.0 System Evolution

This app includes future developments and will expand upon existing functional and non-functional requirements. It will include enhanced map features such as zoom (both pinch to zoom and zoom buttons), secure and accurate routing and navigation for the application user, and allow for corporate or business sponsorships for locations on the map interface. Then, there should be a user profile functionality where users can display their saved locations and a post browser where the photoshoots done at that location can be displayed to potential clients securely.

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7.0 Conclusion and Recommendations

This application PhotoMap will help the user become more comfortable when holding photo shoots. It allows the photographer to select a location and for the client to accept or reject the location. Similarly, the client can select a location and the photographer can accept or reject the location. In addition, it allows the users to save the location, although communication of the location must be done with another external application.

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The recommended use of this application is to coordinate between the photographer and the client. It should be seen as another tool in the accessory kit of a photographer, who wants to save their settings for their favorite locations, and as a seamless utility for the client who wants to schedule a photoshoot. The constraints of this application are that it does not allow for communication between the photographer and the client directly. It is also limited between photographer and client relationships only.

Glossary

application – any software that can be used that includes functionalities that are able to be used by the user

communication – the way by which the end user may transmit information between themselves and another user

feasibility – the condition of which a use case is able to be accomplished

geolocation – the location of a place on a map which corresponds to a place on the globe

navigation – the ability for the user to be directed by software securely from the location they are to the location they determine

newsfeed – a page in an application where the user is able to view posts or events that are consecutive

photography – a profession where individuals use digital or film cameras to photograph according to the contract set by themselves and the client

platform – the ways the application can be accessed, either through web browser, iOS mobile operating system, or Android operating system

project initiation request (PIR) – a document whose purpose is to describe the scope of a project.

project – the planning, documentation, and results of work on a task or goal

report – written documentation that describes a certain aspect of the project

security – the means of being certain that the information, means of communication, or otherwise technical qualities are managed to be available to only the necessary parties

social media – any service or platform that allows users to communicate with their friends

specifications – the details of the way a specific product is implemented

stakeholder – anybody who is involved or has investment in a process or project

Bibliography

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