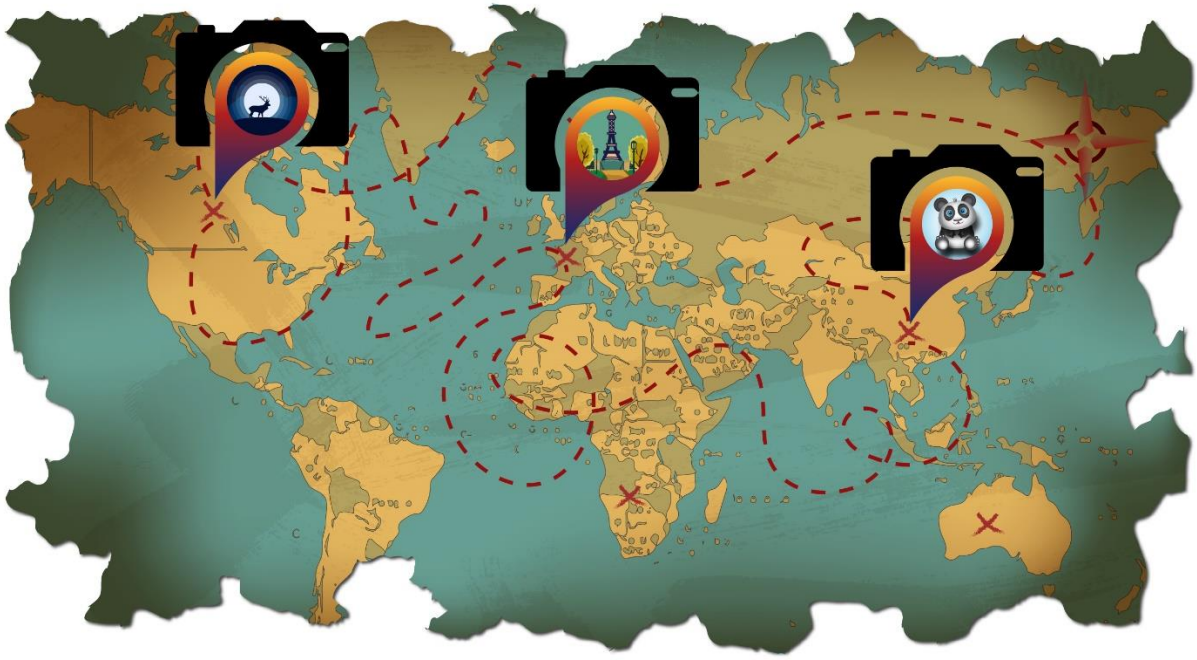

PixPlace
Social Hub

Stage 1 (The Bid) Report

Group 3 | PixPlace Software Development

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Compendium

Requirements Specification

Table of Contents

1. Introduction

1.1. Purpose

This document outlines the requirements for "PixPlace", an image sharing platform with user challenges. "PixPlace" is a social media application designed for users to share photos of objects and animals, with an emphasis on photo challenges which provide the user with experience that allows them to gain ranks and compete against others. The platform will be designed to cater to multiple users, providing support for education, competition and sharing, to support the specified user base.

The readers of this document will be the client and PixPlace Software Development. It is intended for reading by:

1. The client and their company to examine and evaluate the outlined end product.
2. PixPlace Software Development as the outline for development of the platform.

1.2. Aims and Objectives

Our team aims to compete with other photo-based social media platforms. Our product differentiates itself from others by putting a focus on safety and privacy, monitoring the platform will be of the highest priority. Our platform will only allow for the sharing of objects and animals, not people. We will use photo detection software to ensure that our rigorous, yet fair rules are adhered to. Too often with current social media are people exposed to unrealistic content which can be degrading for the user. By restricting the content, we ensure that people are not going to be exposed to content that could potentially be harmful to them. We aim to combat the common issues generated by social media by creating a fun and interactive environment for our users. The end product will be a safe, user-friendly and fun platform designed to be accessible to users from a multitude of backgrounds.

1.3. Scope

There is one software product – PixPlace, a competitive social media hub for sharing images.

The product will contain a web-based application, that will across the newest versions of the most used internet browsers, as well as the newest firmware's of the most common mobile operating systems. The system will be designed with server-side operations that will be able to handle as much traffic as possible within costing. The databases used will provide utilities for a large number of users, with potential for growth as the user base expands over time. Dynamic applications will be used in conjunction with the system for a platform that can adapt to new demands. Professional users will be able to create an exemplary portfolio whereas the more casual user can simply interact with friends and family as well as other users across the globe.

1.4. Overview

The following document provides an overview of the platforms functionality before taking an in depth look at specific systems requirements for the platform as created by PixPlace Software Development.

2. General Description

2.1. Product Perspective

PixPlace is a social media application. The main function of the product is to allow users of the platform to post images, and to be able to interact with other users' images. The platform will have also included requirements for a levelling system to create a gamified app, as per the clients' request.

2.2. General Capabilities

PixPlace will offer users these core functions, which are also detailed in the requirements sections.

1. Users will be able to post photos to the platform as long as they abide by the rules of the platform.

2. Users will be able to create their own channels for specific purposes (e.g. for particular images, for a group of close friends etc.).

3. Users will earn points and rank up in an online game system that allows users to compete to earn the most possible experience and complete the most challenges.

The platform will include other specifications that enhance the experience of these main requirements or provide new functionality that improves the overall product.

2.3. General Constraints

The application will be designed for any member of the general public, so it will be designed to ensure a suitable environment for all ages and backgrounds. The platforms images and text sections will be monitored using text and photo detection technology to make sure that this environment is maintained.

For the safety of the users account, user passwords will be regulated. If they do not conform to a high enough standard, they will need to use a different password. This should go some way towards preventing unwanted access to users' accounts, for potentially malicious purposes.

The server side will have the capacity to deal with a large and ever-growing user base, expanding to fit new users as the demand rises. All sensitive user information will be encrypted when sent between servers to maintain security.

The system must also be capable of running on different operating systems and allowing users to switch between them when needed. Most modern browser version, and most modern mobile firmware's will be supported to allow the majority of users' access to the platform without having to upgrade technology or move to a different software.

2.4. User Characteristics

The users of this application will be:

- Any member of the general public.
- The client.
- The development team.
- Administrators and Admins.

The system is designed to be available to users at all time, with a 99.9% downtime to account for system maintenance. The system is also designed with accessibility in mind, choices will be prioritised that increase the user friendliness of the platform.

2.5. Operational Environment

The server application will run on a Docker container cluster managed by Kubernetes framework, and the database will be a relational database running PostgreSQL.

The client-side application will be able to run on most widely used browsers and mobile operating systems, and the user may change login into their account on any operating system and be able to access all features of the system, in a simple and seamless manner.

2.6. Game Design

Overview:

For the game aspect of our social media app we have decided that our implementation will coincide with an experience point based system. We will encorporate continuously rotating challenges for the users to complete in order to gain experience. A reward scheme will also be in place to give purpose to levelling and completing challenges. Leaderboards will offer competition for users that want to be competitive.

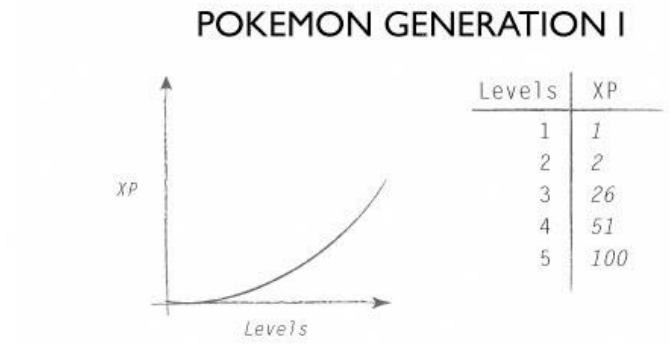
Level System:

Each user will have a numerical level associated with their account. New accounts will most likely start off at Level 1. Users will be able to increase their level by gaining experience points (XP). We will use a formula that follows a rough exponential curve. This means that as the level of the user increases, the amount of XP that needs to be gained will also increase at a exponential rate. This function however will be adjusted if it takes too little/too much to achieve the next level. We will also have a level cap that suits the scaling of the user level. This will be the maximum level a user can have associated with their account. This level cap may have to be increased in future versions of the app but for now we will most likely cap the level at level 100 using the scaling function used in Pokemon shown in Figure 1.

Generation 1 Pokemon

Pokemon actually has two leveling systems, this is the faster of the two.

```
function nextLevel(level)
    return round((4 * (level ^ 3)) / 5)
end
```



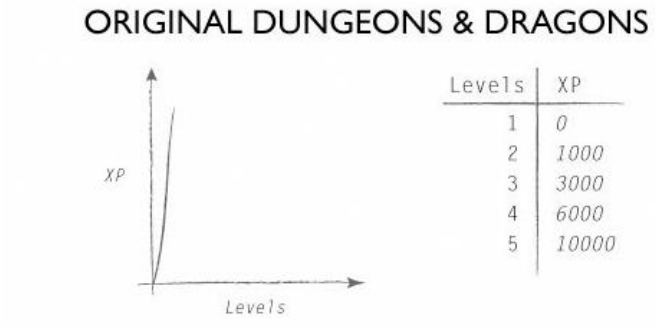
Source: http://howtomakeanrpg.com/a/how-to-make-an-rpg-levels.html

The reason a scaling system such as the one in Figure 1 would work well for our application is that the "steepness" of the exponential curve is not too great nor too shallow meaning that the levelling system should contain smooth transitions. Due to the great success of Pokémon in its first generation, we can assume that this levelling system will suit our target users because it will give our users a sense of familiarity when they are experiencing our levelling system. Furthermore, since the release of this levelling system, many other applications have implemented similar functions due to its simple, intuitive design.

Original D&D

Dungeons and Dragons is the game many early JRPGs used for their inspiration, so it seems only fair to include it's level function.

```
function nextLevel(level)
    return 500 * (level ^ 2) - (500 * level)
end
```



Source: http://howtomakeanrpg.com/a/how-to-make-an-rpg-levels.html

Figure 2 shows another interpretation of a levelling system from the game "Dungeons and Dragons". The reason a system like the one shown in figure 2 wouldn't be suitable for us is because the steepness of the curve is too high meaning that once a user reaches a level like 50, levelling up to 51 would require 1,225,000XP. In fairness a model like this could work as we would combat this by increasing the amount of XP rewarded for each challenge. However, the numbers would start to get large very quickly so keeping the numbers smaller like in Figure 1's system would most likely make data handling as well as user comprehension much better.

Challenges:

We plan to set challenges that will rotate based upon a specified time frame as well as having account orientated challenges such as "upload 100 pictures". The general rule of thumb that we will follow will be that the greater the defined time frame a user gets to complete a challenge, the larger/more complex the challenge will be to complete but said challenge will yield a greater amount of XP than a shorter, easier challenge. The generic timeframes that we will follow will be Daily, Weekly, Monthly challenges. The reason why creating time-based challenges suits our application is because it gives the user a reason to log onto our app everyday hence increasing our potential for app reusability. There will be new challenges for the user to complete which compels them to keep coming back to our app. Challenges also add level of fun and excitement as well as competition to our app that not many other social media platforms have managed to capture within their scope.

Example Challenges:

- **Daily** - "Take and Upload 2 pictures of Ducks" 5XP
- **Weekly** – "Take and Upload 30 pictures of Oak Trees" 50XP
- **Monthly** – "Take and Upload 250 pictures of Yellow Cars" 500XP

The way we intend to monitor challenges is by using the same open source software (Open-CV) that we use to check to see if images contain humans as this software allows us to scan for other objects as well. So, we will in effect be able to detect what the picture is of and check this object against the challenges and award progress where fit. When we roll out the first versions of the app, if we find users are completing challenges too easily or are finding the challenges too difficult, we will adjust them accordingly.

Reward Scheme:

Our reward scheme will give users a reason to come back to our app to level their account up. The rewards users can get will range from customisation items they can use on their personal avatar all the way to trophies/badges/medals to display on their account. The avatar will be a rendered model cartoon person that users can fully customise by earning items in order to customise them to their own personal taste. This is to stay within our specification because we are not allowing people to upload pictures of themselves or others, so this is our alternative to current methods such as profile pictures. As well as this, users can earn trophies/badges/medals that they can display on their profile to show off to their friends. Reward schemes have been proven to work well on a variety of platforms such as Steam where they implement a badge display on user profiles. Rewards will be earnt through challenge completion as well as XP milestones. For example, completing the above monthly challenge would grant the user a "Yellow Car Veteran" badge as well as reaching a level of 50 would grant the user a "Level 50" medal.

Leader Boards:

We will have multiple leader boards for users to view and compete on. These include

- **Global Leader board** – Contains every user on the app
- **Country Leader board** – Contains users from country X
- **Friend Leader board** – Contains users that are friends of user X

On top of this, the leader boards will be able to be sorted by Score, Pictures uploaded, Badges/Medals/Trophies earnt. Leader boards make achieving the sense of a game/competition within our app much easier as it is a direct method of showing people how other users are progressing.

Issues with Our Game Implementation:

The following is a list of potential issues we could run into with our game implementation:

- **Cheaters/Hackers/Exploiters –** There are many ways people find to cheat/hack/exploit games, all we can do to prevent this is make our code as secure as possible by means of encryption. A potential threat is people exploiting challenges via re uploading the same picture to register a challenge progression multiple times. To combat this, we will have to check pictures on people's accounts are different from each other. Another potential exploit could be people downloading images from google and uploading them as their own. Location checking as well as plagiarism checking could potentially be solutions to this issue but it's completely context dependant, i.e. Location tracking would work for landmarks but not for generic objects like trees.
- **Detection software doesn't work as intended –** If OpenCV doesn't work how we want it to then we will have to adjust how we check for certain case satisfaction.
- **Issues with Level scaling –** It is impossible to predict how well a levelling system will work until it is implemented and tested widely. This is something we will have to monitor with every version update, challenge update to make sure that it is functional and smooth.

3. General Requirements

Abbreviations

F	Functional
NF	Non-Functional
R	Requirements
UR	User Requirement
SR	System Requirement

Priorities

◉	**High Priority**
◉	**Medium Priority**
◉	**Low Priority**

3.1. Functional Requirements

F-R1	Registration
F-UR1-1.1	◉ **Register user account** Anyone who uses the app will be able to create a user account using an email and password.
F-UR1-1.2	◉ **Create username** Users will be able to assign themselves a username, as long as the current username has not been registered.
F-UR1-1.3	◉ **Create user biography** Users can create 150-character long biographies to describe their account.
F-UR1-1.4	◉ **Create user avatar** Users will be able to assign themselves a custom avatar that will act as their profile photo, from a selection of available avatars.
F-UR1-2	◉ **Verify email** New users could be sent a one-time verification email to confirm their email address, after which they would be allowed access to the platform
F-UR1-3	◉ **Login and logout** Users will be able to login into their account using their username or email along with their password and can logout at any time.
F-UR1-4	◉ **Age restriction** Users must be at least 13 years old in order to create an account and use the platform, registration will confirm user age through their date of birth.
F-UR1-5	◉ **One account per email** An account on the platform can only be linked to one email, attempting to create a new account with an already registered email will not be permitted.
F-UR1-6	◉ **Delete account** A user account can be deleted at any time, once deleted all user information will be removed from servers, and the email linked to the account shall be available again. Account deletion is irreversible, users will be warned before proceeding.

F-R2	Platform use
F-UR2-1.1	🔴 **Post images** Users registered to an account with the system shall be able to post photos.
F-UR2-1.2	🟢 **In app camera** Photos can be taken and then posted directly through the app if the user grants the app permission to access the devices camera.
F-UR2-2	🔴 **Channels** Users can create channels, which they will be automatically granted admin rights for. Photos within a channel can be arranged however a user like. Other users can be invited to the channel and may post and interact with others in the channel. Only users within the channel will be able to see or interact with the channels content.
F-UR2-3	🟡 **Post visibility** Users can set the visibility of their posts to one of four levels: ▪ **Global:** Anyone will be able to view the picture. ▪ **Local:** Only users within a certain distance from the poster will be able to see the post. ▪ **Friends:** Only the users' friends will be able to see the post. ▪ **Private:** Only the user will be able to see the post. Posts with a visibility of friends or private will not be eligible for challenges and cannot earn the user experience.
F-UR2-4	🔴 **Post location** Users can attach the location where the photo was taken to the post. Posts that do not have an associated location will not be eligible for certain challenges.

F-R3	Navigation
F-UR3-1	🔴 **Homepage** The platform will create a personalised user homepage, that will recommend other channels and image posts from users based on their previous use of the platform.
F-UR3-2	🟡 **Search** The platform will have a search option that will allow search for users, channels or photos with that tag. When searching by tag, the platform will also allow for displaying results from related tags.
F-UR3-3	🟢 **Friends** Users can navigate to a friend's page by either looking through their friends list, or by searching their friends list for a specific friend.
F-UR3-3	🔴 **Profile** Contains all posts from the user, and all rewards they have achieved.
F-UR3-4	🔴 **Bottom anchored navigation bar** All the different subsections of the app will be directly accessible through a navigation bar always anchored to the bottom of the app.
F-UR3-5	🔴 **Top anchored navigation bar** Access to user settings and notifications will be found on a navigation bar anchored to the top of the app.

F-R4	Interactions
F-UR4-1	🔴 **Comments** Users will be able to comment on pictures other users have posted.
F-UR4-2	🔴 **Point-based rewards** Users will be able to award points to pictures other users have posted with points.
F-UR4-3	🟡 **Sharing** Other platform users should be able to share other users' photos to their channels.
F-UR4-4	🟢 **Saving** Users can save posts from other users or their own posts, with a section of the platform dedicated to viewing all previously saved posts.
F-UR4-5	🟢 **Tagging** Posts will be tagged based on what animal/object they contain.
F-UR4-6	🟢 **Reporting** Users can report other posts that break the policies and conduct of the platform. Moderators will be notified of reported posts.

F-R5	Game
F-UR5-1	🟡 **Challenges** Users can complete daily, weekly and monthly challenges to earn experience. Longer timeframe challenges will be more difficult but will offer more experience as a reward.
F-UR5-2	🟢 **Experience** Experience is the main reward for the game side of the app. It is used as a gauge of success and loyalty, and as experience is gained the user will level up and earn new rewards and benefits.
F-UR5-3	🟢 **Level system** Users can gain levels by earning experience, each level requires more experience than the last to reach. The maximum achievable level is 100.
F-UR5-4	🟢 **Rewards** Users can earn rewards for reaching certain milestones within the game (e.g. completing a certain number of challenges, reaching a certain level). Rewards can be placed on a user's profile for others to see, and take the form of avatar cosmetics, or badges/medals/trophies.
F-UR5-5	🟢 **Leader boards** Multiple leader boards will be available to allow users to compare their progress to another subset of users. Such leader boards include: ▪ **Global:** Compare against all other users on the platform. ▪ **Local:** Compare to all other users within a certain vicinity (country, town, area). ▪ **Friends:** Compare to all the users on their friends list. All leader boards can be sorted by either score, pictures uploaded, or rewards earnt.

F-R6	Safety
F-UR6-1	◉ **Photo detection** The platform will be able to detect any photos deemed inappropriate or showing people, even partially, and remove them from the platform.
F-UR6-2	◉ **Blacklisted words and phrases** The platform will be able to detect any text deemed inappropriate and not conforming to the platforms rules and policies. The text will be removed, and repeat offenders will have their account deleted and their email blacklisted.
F-UR6-3	◉ **Anti-cheat** The platform will be able to detect players who are using unfair means to cheat the game into giving them rewards. Such players will be removed from the platform and their email will be blacklisted.

F-R7	Administration Tools
F-UR7-1	◉ **Channel admin** Admins have all moderator privileges and can use their privileges on moderator accounts. Admins can promote user accounts to moderator rank.
F-UR7-2.1	◉ **Moderator privileges** Moderators will have extended privileges over regular user accounts.
F-UR7-2.2	◉ **Edit channel posts** Moderators can edit channel posts (edit post text, change visibility etc.).
F-UR7-2.3	◉ **Delete channel posts** Moderators can delete channel posts and remove them from the channel.
F-UR7-3	◉ **Interactions with other moderators** Moderators cannot use their extended privileges on other moderators' accounts.

F-R8	Analytics Data
F-SR8-1	◉ **Usage data** Details of user activity (time of use, number of images posted per day, concurrent users, number of registered users etc.) will be collated into an analytics report available to administrators.
F-SR8-2	◉ **Report actions** Administrators will be able to provide feedback based on analytics reports, and the platform will be changed accordingly in an effort to better suit the needs of the client/users.

3.2. Non-Functional Requirements

NF-R1	Hardware
NF-UR1-1	◉ **Cross-platform support** The system should operate on the following platforms: **Mobile Devices:** ▪ Android ▪ iOS ▪ Windows While also providing a high standard of user experience across each platform.
NF-SR1-2	◉ **Standard hardware specifications** The standard operating environment for the system should include the following hardware: ▪ Camera ▪ GPS sensor ▪ Wireless network interface controller
NF-SR1-3	◉ **Storage** The system capacity will be scalable to account for increasing numbers of users and data.

NF-R2	Software
NF-UR2-1	◉ **Software support** The system should operate on the following software: **Web browsers:** ▪ Google Chrome ▪ Mozilla Firefox ▪ Apple Safari ▪ Microsoft Edge While also providing a high standard of user experience for each software.
NF-SR2-2	◉ **Firmware support** The system should support firmware releases from the last 3 years for each platform the app is available on.
NF-SR2-3	◉ **Model-View-Controller** The system will utilise MVC design as a framework to breakdown the system into related components.

NF-R3	Data
NF-SR3-1	◉ **Data storage** User data will be stored securely on a remote server.
NF-SR3-2	◉ **Backup of data** All critical user and platform data will be securely backed up to another location, in case of emergency.
NF-SR3-3	◉ **User details** User details will not be directly stored, session data will be used to create a seamless experience when returning to the platform on a previously used device. Any user logins from a new device will be alerted to the user through their email.

NF-R4	Security
NF-SR4-1	🔴 **Secure platform** The platform will use encryption and web application firewalls to prevent data breaches from malicious attackers.
NF-SR4-2	🔴 **Secure login** Access to the platform will be through secure protocols (such as HTTPS) to protect sensitive user data.
NF-UR4-2	🟡 **User visibility** Users can choose the visibility level (Global, Friends or Private) of their account information.
NF-UR4-2	🟡 **Password guideline** Users must create passwords in accordance with the following criteria: ▪ **Length:** Password must contain at least 8 characters. ▪ **Numbers:** Password must contain at least one number. ▪ **Special characters:** Password must contain at least one special character (!"#$%&'()*+,-./:;<=>?@[\]^_`{|}~). ▪ **Case:** Password must contain at least one uppercase and one lowercase letter. In order to prevent others from easily gaining access to their account:

NF-R5	Usability
NF-UR5-1.1	🔴 **Supported users** The platform will support facilities for the following kinds of users: ▪ **Photographers:** Users who will use the app to showcase their work, building a portfolio and community. ▪ **Collectors:** Users who will showcase their collections of photos of a particular theme, and challenge others to showcase their collections of similar work.
NF-UR5-1.2	🟡 **More supported users** The platform should support facilities for the following kinds of users: ▪ **Academics and hobbyists:** Users who will use the app as a way of educational outreach, running public events such as showcasing wildlife and landmarks. ▪ **Game players:** Users who want to find the most optimal ways of scoring points and completing challenges.
NF-UR5-2	🔴 **User privacy protection** The platform will not allow for the even partial images of people. Also, users will be warned about sharing any personal information that could compromise their privacy.
NF-UR5-3	🟢 **Disability support** The platform could include functionality that improves accessibility for users (deaf or hard of hearing, visually impaired, etc.).
NF-UR5-4	🟢 **Support diversity** The platform will be inclusive space for users of any and all backgrounds.
NF-UR5-5	🟢 **Safe environment** The platform will be appropriate for all users 13 and above, and will not contain any explicit images, explicit or derogatory text. Every challenge will be designed to suit all users and will never put the users into dangerous or difficult situations.
NF-UR5-6	🟡 **User manual**

	The settings menu will contain access to the user manual, providing a brief overview of the platforms different features and how to use them.

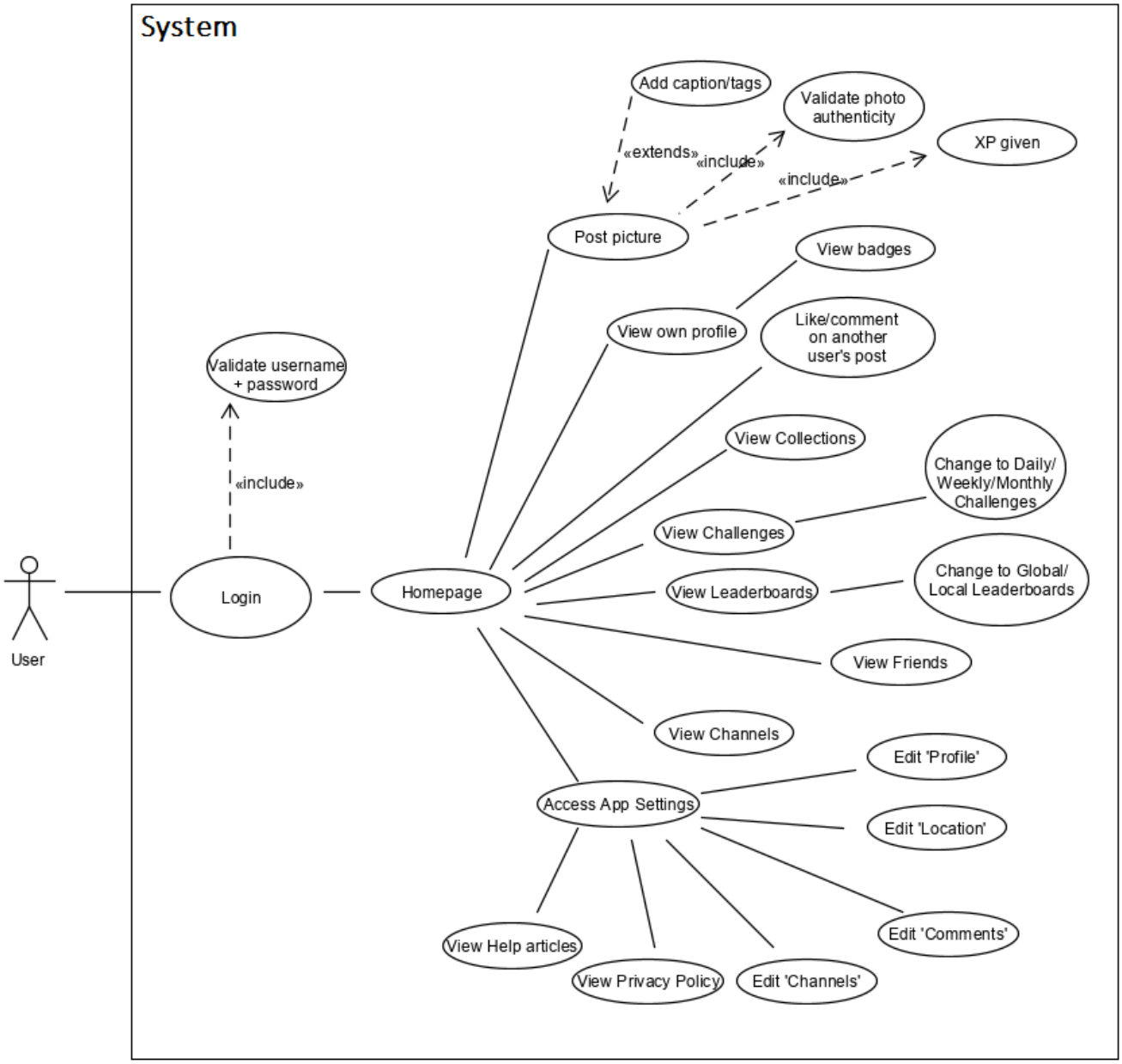
NF-R6	Time
NF-SR6-1	◉ **Release date** The completed product will be ready for commercial deployment by Thursday 1st April 2021.

NF-R7	Legislation
NF-SR7-1	◉ **Data protection** All data obtained from users shall be held in accordance with the Data Protection Act 2018.
NF-SR7-2	◉ **Legal disclaimers** All user information will be held in the United Kingdom, and session data (cookies) will be used. All users must agree to the secure holding of personal data, and the use of cookies in accordance with the European Union Cookie Directives.
NF-SR7-3	◉ **Privacy policy** The platforms privacy policy will be easily accessible through the apps settings menu.

NF-R8	Performance
NF-SR8-1	◉ **Responsiveness** The system will respond to user input within 3 seconds.
NF-SR8-2	◉ **Capacity** The server will have capacity for a large number of user accounts, and the system will be able to handle a large number of concurrent users.

4. Design Diagrams

4.1. Use Case



4.2. Use Case Descriptions

USE CASE: Login
GOAL: User logs in to their account
ACTOR: User

Main Flow:

1. User enters their username and password on the login screen
2. Include(Validate username + password)

Alternative Flow:

2a. Wrong username and/or password
1. System flags username and/or password as incorrect and asks user to try again
2. Return to step 1 main flow

USE CASE: Validate username and password
GOAL: Check that the entered information is correct
ACTOR: User

Main Flow:

1. System checks the entered username and password against the database
2. System verifies that the username and password match
3. System allows the user to proceed

USE CASE: Post picture
GOAL: User has posted a picture to their account
ACTOR: User

Main Flow:

1. User selects the upload photo button
2. User selects the photo they want to upload from their camera roll
   Extension point: Add caption/tags
3. User uploads the selected photo
4. Include(Validate photo authenticity)
5. Include (XP given)

Alternative Flow:

3a. Selected 'photo' is wrong file type (e.g. not an image file)
1. System is unable to upload the selected 'photo'
2. Return to step 2 main flow

3b. Selected photo goes against the app's guidelines and/or terms of service

1. System is unable to upload the selected 'photo'
2. Return to step 2 main flow

USE CASE: XP given
GOAL: Grant XP to user's account
ACTOR: User

Main Flow:

1. System registers photo upload from user
2. System grants XP to user's account

USE CASE: Validate photo authenticity
GOAL: Photo verified as authentic
ACTOR: User

Main Flow:

1. System uses the photo validation software to verify the uploaded photo follows the app's guidelines and terms of service
2. System allows the user to proceed to upload the photo

EXTENSION USE CASE: Add caption/tags
GOAL: User adds a caption and/or tags to their photo
ACTOR: User

Segment Flow: Post picture

1. User adds a caption and/or tags to their photo
2. User proceeds to the upload screen

USE CASE: View own profile
GOAL: User views their own profile
ACTOR: User

Main Flow:

1. User selects the Profile button to view their profile

USE CASE: View badges
GOALS: User views their collected badges on their profile
ACTOR: User

Main Flow:

1. User scrolls through their badge section of their profile to view all their collected badges

USE CASE: Like/comment on another user's post
GOAL: User likes/comments on another user's post
ACTOR: User

Main Flow:

1. User scrolls through their feed on their homepage
2. User selects the like button to leave a like or the comment button to leave a comment

Alternative Flow:

2a. System error causes the like/comment action to go unrecorded
    1. User's like/comment is not recorded by the system
    2. Return to step 1 main flow

USE CASE: View Collections
GOAL: User views Collections
ACTOR: User

Main Flow:

1. User selects the Collections button on their profile
2. User scrolls through their photo collections

USE CASE: Change to Daily/Weekly/Monthly Challenges
GOAL: User selects and views their challenges over different time periods
ACTOR: User

Main Flow:

1. User navigates to Challenges
2. User selects drop-down menu for the challenges and picks a time period (Daily/Weekly/Monthly)
3. User scrolls through the challenges for that time period

USE CASE: Change to Global/Local Leader boards
GOAL: User selects and views the different Leader boards
ACTOR: User

Main Flow:

1. User navigates to Leader boards
2. User selects the drop-down menu for the leader boards and picks Global/Local
3. User views the names and XP of those on the selected leader board

USE CASE: View Friends
GOAL: User views their list of added friends on their profile
ACTOR: User

Main Flow:

1. User scrolls through their Friends list on the homepage

USE CASE: View Channels
GOAL: User views their favourite and recommended channels
ACTOR: User

Main Flow:

1. User scrolls through the lists of their favourite/recommended channels

USE CASE: Access App Settings
GOAL: User accesses the app's settings menu
ACTOR: User

Main Flow:

1. User selects the settings icon on the homepage
2. Settings menu appears

USE CASE: View Privacy Policy
GOAL: User reads the app's Privacy Policy
ACTOR: User

Main Flow:

1. User selects 'Privacy Policy' option from Settings
2. App's Privacy Policy appears

USE CASE: View Help Articles
GOAL: User navigates to the required help section
ACTOR: User

Main Flow:

1. User selects 'Help' option from Settings
2. User navigates the various help articles to the one they require

4.3. Textual Use Case

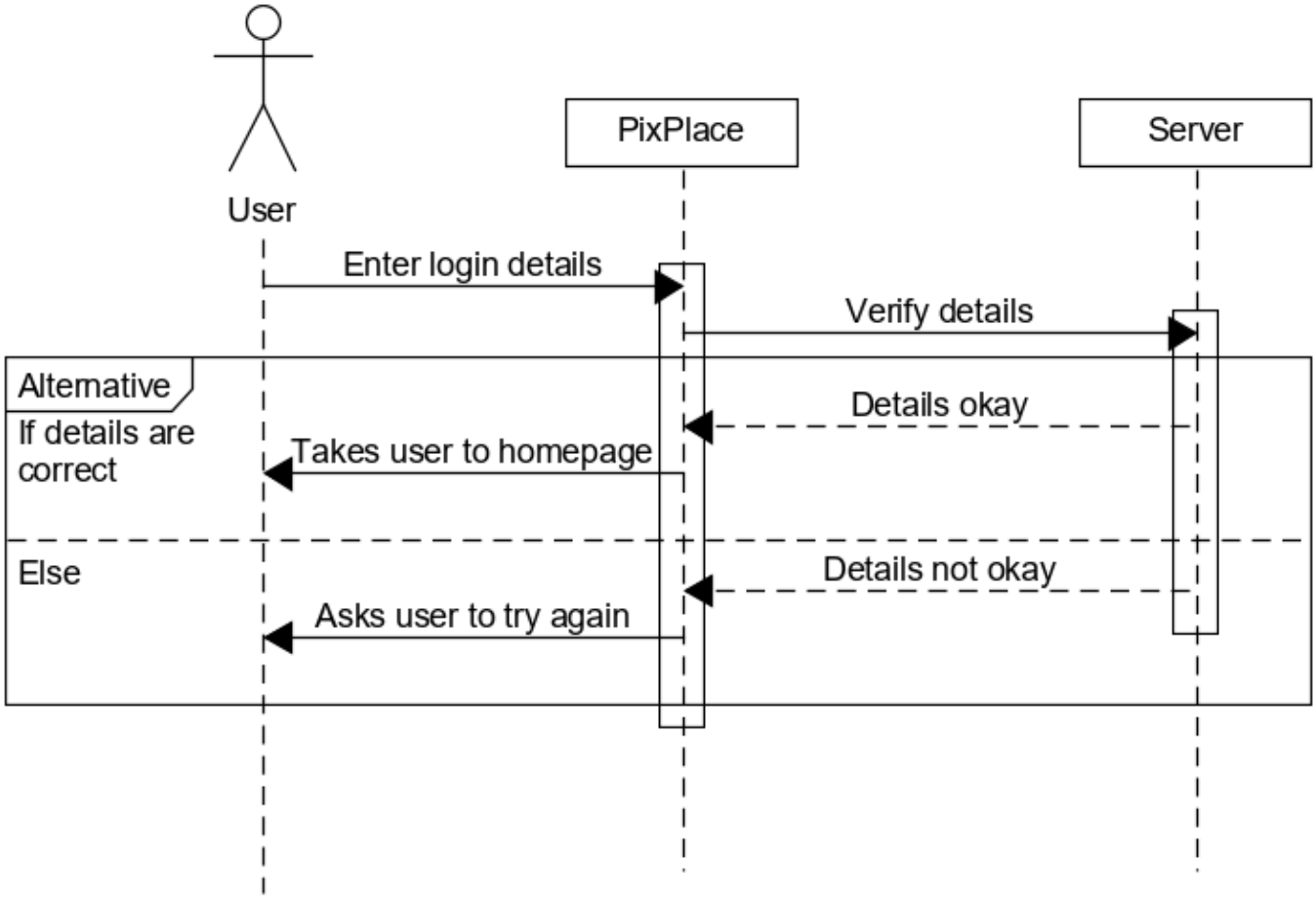
Use case ID:	F-UR3-3
Use Case Name:	Adding another user as a friend
Created By:	Ghazi Yusaf
Date Created:	22/11/20

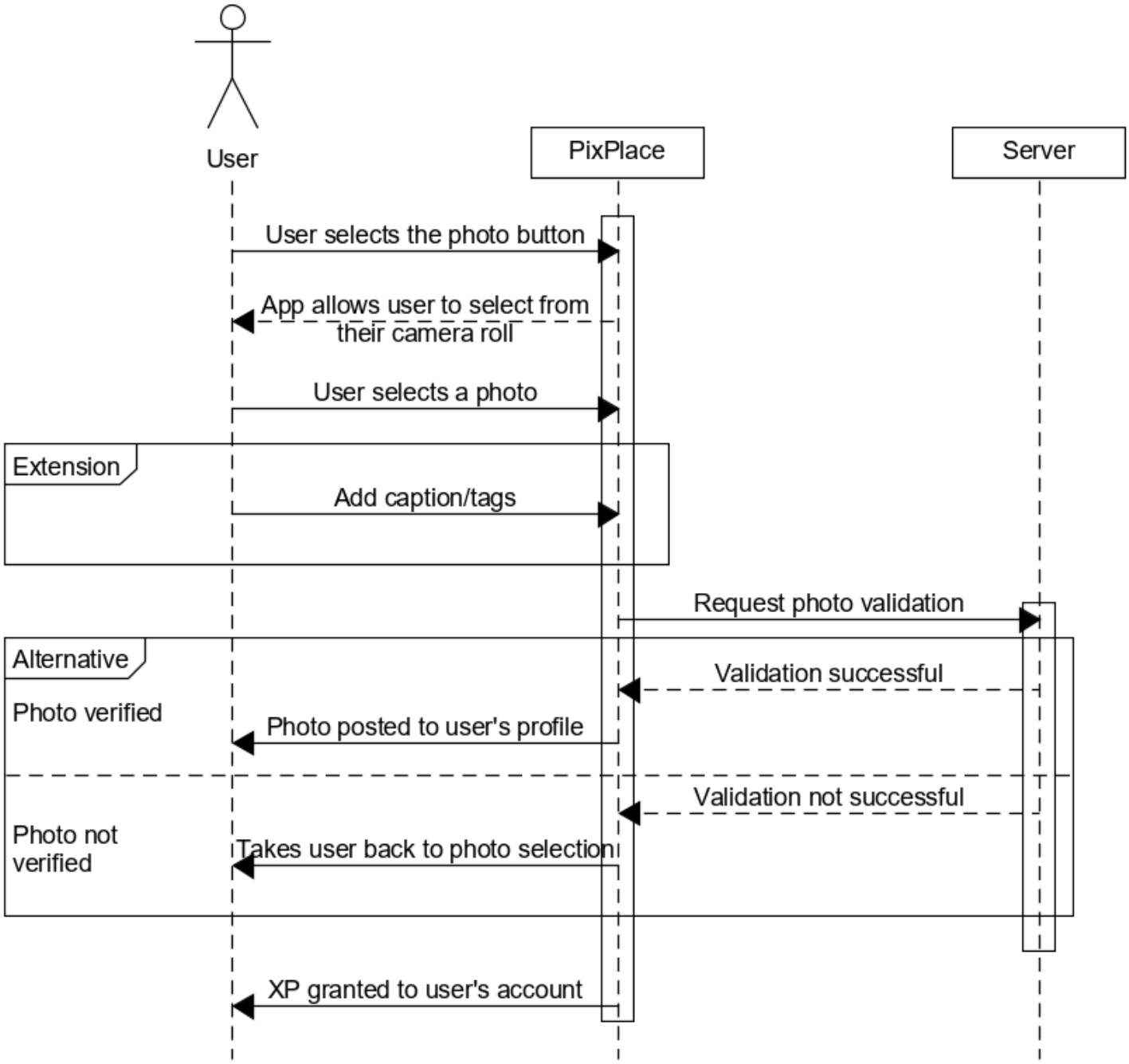
Actors:	User 1 (adding friend), User 2 (user being added)
Description:	Allows two users to become friends
Trigger:	Click the "Add friend" button available on user 2's profile page
Preconditions:	Both users registered, both users are currently not friends, users visibilities allow each other to view their individual profiles
Post Conditions:	Users are now friends
Priority:	Low
Ordinary Sequence:	1. User 1 navigates to user 2's profile. 2. User 1 presses the "Add friend" button on user 2's profile page. 3. User 2 receives a notification stating that user 1 has added them as a friend. 4. User 2 accepts the friend request.
Exceptions:	1.1. If user 2's visibility is not set to Global (i.e. only certain other users can see their account) and user 1 is not within that visibilities scope, they will not be able to see user 2's profile and therefore will not be able to add them as friend. 4.1. If user 2 declines the friend request, the users will not become friends.

Use case ID:	F-UR2-2
Use Case Name:	Creating a channel
Created By:	Ghazi Yusaf
Date Created:	22/11/20

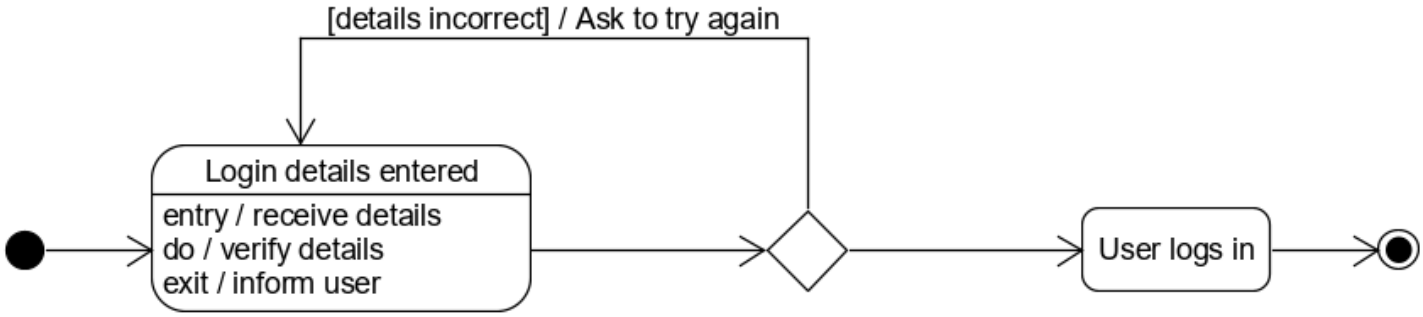
Actors:	User
Description:	Allow a user to create a new channel
Trigger:	Click the "Create new channel" button from the settings menu
Preconditions:	User has a verified email address; user does not own three channels.
Post Conditions:	The new channel is created with the user as an admin
Priority:	High
Ordinary Sequence:	1. User navigates to the platform settings. 2. User clicks the "Create new channel" button from the channel settings section. 3. The user gives the new channel a name. 4. The user may choose any users they want to add to the channel (they can add more later). 5. The user presses the "Done" button.
Exceptions:	2.1. If the user does not have a verified email, they will not be granted the option to create a channel. 3.1. If the channel name is unsuitable (e.g. contains rude or insensitive language) the user will be asked to rename the channel to something that fits within the platform's standards. 3.2. If the user already has another channel with the same name, they will have to rename it to something different.

4.4. Sequence


User
PixPlace
Server
Enter login details
Verify details
Alternative
If details are correct
Details okay
Takes user to homepage
Else
Details not okay
Asks user to try again


User
PixPlace
Server
User selects the photo button
App allows user to select from their camera roll
User selects a photo
Extension
Add caption/tags
Request photo validation
Alternative
Validation successful
Photo verified
Photo posted to user's profile
Validation not successful
Photo not verified
Takes user back to photo selection
XP granted to user's account

4.5. State Machine



5. Changelog

5.1. Revisions

Date	Author(s)	Changes
22/10/20	Ghazi Yusaf	Document created.
06/11/20	Aaron Molesbury	Purpose, scope and aims and objectives added.
06/11/20	Aaron Molesbury	Added game design section.
01/11/20	Ghazi Yusaf Jose Fernandes	Functional requirements added.
04/11/20	Ghazi Yusaf Jose Fernandes	Non-Functional requirements added.
06/11/20	Ghazi Yusaf	Priority levels created; every requirement given a priority level.
06/11/20	Ghazi Yusaf	Requirements refactored for cohesion.
11/11/20	Ghazi Yusaf	Purpose, scope and aims refactored.
12/11/20	Ghazi Yusaf	Overview added.
18/11/20	Ghazi Yusaf	Added system requirements, changed certain requirements to be system instead of user.
20/11/20	Ghazi Yusaf	Added information to all the sections in general requirements.
20/11/20	Ghazi Yusaf	Added Textual use case diagrams.
21/11/20	Tania Henderson	Added use case diagrams, sequence diagrams and state machine diagrams.
21/11/20	Tania Henderson	Added use case descriptions.

Risk Analysis

Table of Contents

1. Introduction

1.1. Purpose

This document aims to find the most pertinent potential risks to the development of this system. These risks could affect team members, the software being used, the client, the university or more. This could potentially affect the schedule of the development, the cost of creating the system or the quality of the platform.

In an effort to effectively plan for and alleviate the negative consequences of such risks, this document proposes the risks and also strategies to effectively combat their consequences.

1.2. Audience

This document is intended for reading by:

1. The client may read through the risks identified and maintain an active correspondence to make sure they are satisfied with the safety of the development.

2. PixPlace Software Development will use this document as a reference for strategizing against risks as development moves forward.

3. Project Manager and coordinator will oversee any important decisions the development team may have to take in response to a hypothetical risk-taking place.

1.3. Approach

Risks are considered as ongoing threats to the development cycle, and planning will be reconsidered at multiple points to make sure the current strategies have not become outdated. The approach to risks can be broken down in to three steps. First risks are identified and given a probability and impact rating. Next those risk are analysed and prioritised, with each risk given a potential strategy to combat it. These strategies will then be monitored in the last step, reconsidering the current threat each risk poses to the system at that time, and whether any changes within the team or product requirements have caused current strategies to be ineffective, and if so, re-evaluate them and create newer strategies with the new circumstances in mind. This adaptive approach will provide the team with an elastic framework that should nullify the threat of the following risks.

2. Risks

2.1. Overview

Risk identification was first performed to find what potential risks the group may be presented with. Every risk has been carefully considered by the team and given a probability index as well as an impact index.

> Probability: The likelihood that said event will take place. These risks have been compared to each other, and the risks which seem the most likely, given circumstance or environment, have been given a higher probability. High probability risks will be the most carefully monitored, though they're impact is low they will take up the most of the teams' hurdles in the development process.
>
> Impact: The impact of each risk gives an idea of the effect it will have on the project. Higher impact risks will disrupt the development of the system much more than lower impact risks. Though most high impact risks have low probabilities, they pose the largest threat to the system, and as such require detailed strategies to combat their impact.

2.2. Potential Risks

Risk ID	Risk	Probability	Impact
RK1	Lack of contribution from team member.	Very Low	Moderate
RK2	Progress lost due to accidental deletion/corruption/theft.	Very Low	Serious
RK3	No or few team members possess experience/skills in development.	Low	Serious
RK4	Project manager is unavailable throughout the project.	Low	Serious
RK5	Team member temporarily loses access to files/wi-fi.	Moderate	Minor
RK6	Team member permanently loses access to files/wi-fi.	Very Low	Serious
RK7	Requirements need to be changed later during the project.	High	Minor
RK8	Software/hardware becomes unavailable/outdated/useless.	Very Low	Serious
RK9	One or more team members temporarily fall behind in the course.	High	Minor
RK10	Project misses own deadlines (i.e. deadlines within the group).	Moderate	Moderate
RK11	Project misses course deadlines.	Moderate	Moderate
RK12	Team member has external circumstances that temporarily prevent them from working on the project (e.g. sickness, other responsibilities).	Very High	Minor
RK13	Team member has external circumstances that permanently prevent them from working on the project (e.g. dropping out, death).	Very Low	Serious
RK14	Current means of communication within the group is no longer available.	Very Low	Negligible
RK15	Group underestimates difficulty/time to complete project late in development.	Low	Serious
RK16	Act of God: natural disaster strikes Edinburgh/Heriot-Watt	Very Low	Catastrophic

3. Risk Planning

3.1. Background

The identified risks are now analysed. Considering their impact and probability, each risk is given a priority. Higher priority risks pose larger threats to development, and their strategies will be prepared for first over lower priority risks. Each strategy poses either reactive or proactive solutions to the risks, depending on whether a proactive approach is actually feasible. If not, a reactive response will be used instead.

3.2. Strategies

Risk ID	Strategy	Priority
RK1	Another team member steps in and takes over the tasks.	Medium
RK2	Files will be saved and backed up in multiple locations to prevent permanent loss.	High
RK3	Tasks and roles will be distributed with the skills each member possesses in mind and if necessary, team members will learn required skills.	High
RK4	Project Coordinator will be contacted for advice on how to proceed.	High
RK5	Team member will wait to regain access; another team member will step in and take over tasks if necessary.	Low
RK6	Team members redistribute the missing member's tasks and Project Manager will be contacted.	High
RK7	A group meeting will take place to discuss in-depth what needs to be changed and how, and if necessary, the requirements document will be updated.	High
RK8	Group will find new resources and adapt current work to fit with new resources.	High
RK9	Team member(s) will do their best to catch up, other member(s) can take over their tasks if necessary until they have caught up.	Low
RK10	Team will work harder to catch up and meet future deadlines as well as discuss why deadlines were missed in order to avoid repetition.	Medium
RK11	As with RK10, team will work harder to catch up, perhaps contact Project Manager if necessary. Team will also hold a meeting to work out a way to prevent missing future deadlines.	Moderate
RK12	Team member will take a step back from the project to recover/complete their other responsibilities and another member will take over their tasks if necessary.	Low
RK13	Team will contact both Project Manager and Project Coordinator for advice going forward and redistribute the tasks.	Medium
RK14	Team will consult with each other via email before settling on a new method of communication.	High
RK15	Group has split tasks into manageable Sprints and has frequent meetings to make sure everyone is up to date on their tasks. Organisational Manager will contact Project Manager if they are struggling.	High
RK16	Should a natural disaster strike Edinburgh/Heriot-Watt, the project will likely be cancelled but team will contact Project Coordinator for confirmation.	Low

3.3. In Depth Analysis

RK7 - Requirements need to be changed later during the project.

In order to try and prevent this from happening, team members will try to explore every requirement possible, however as that is also not always a realistic expectation (especially so early in the project), we would focus on minimising the impact. The team will hold a meeting to discuss what changes need to be made to the project, how they will be made, and which team members will work on making those changes happen. The requirements document will be updated to reflect these changes.

RK9 - One or more team members temporarily fall behind in the course.

To prevent this from happening, team members will do their best to keep on top of the course and watch/study recordings for any lectures they may miss. Should this happen anyway, to minimise the impact the affected team member will do their best to work on their current tasks but if one or more of their tasks requires knowledge from the course, they will take a step back and one or more team members will take over their current tasks until they have the required knowledge to continue.

RK12 - Team member has external circumstances that temporarily prevent them from working on the project (e.g. sickness, other responsibilities).

As preventing this from occurring is not always a realistic expectation (other courses becoming a priority, external circumstances keeping them back, sickness etc…) we would focus on minimising the impact of this risk. To minimise the impact, the affected team member will temporarily take a step back from the project to take care of their external circumstances/recover and one or more team members will take over their current tasks until they are comfortable with returning.

4. Changelog

4.1. Revisions

Date	Author(s)	Changes
27/10/20	Tania Henderson	Document created.
27/10/20	Tania Henderson	Potential risks added.
04/11/20	Tania Henderson	Risk management strategies added.
24/11/20	Ghazi Yusaf	Added purpose, audience and scope.
24/11/20	Ghazi Yusaf	Added overview for risks, and background for risk analysis.
24/11/20	Tania Henderson	In depth strategies added.

Project Decisions and Plan

Table of Contents

1. Project Decisions

1.1. Software Development Methodologies

AGILE methodologies will be used during development as the requirements given by client are volatile and subject to change. Our chosen AGILE framework is Scrum. Scrum was chosen for its iterative nature, which fits nicely into the design principles of Git and the coding lifecycle. Scrum sprints of two weeks will be used, and the development of the system will be broken down to streamline the development process.

1.2. Development Framework

The main front-end application is going to be developed using the Flutter framework. It was chosen because the team acknowledged that the application needs access to the device's native performance, a fast development environment and, at the same time, be available on different platforms (iOS and Android, as well as supporting multiple web browsers). The Dart language is also a plus for the development process because the team is, in general, familiar with the Java programming language allowing for an easy adjustment period to the new development environment. Flutter has a very robust UI (User Interface), as well as native support for standard UI components of individual platforms.

1.3. Version Control

For version control, the project will be based on a git version control system which will provided by a private GitHub organization collection of repositories. This was chosen for its robustness, reliability, and big community. This system will allow the team to manage the code base remotely.

1.4. Team Communication

Communication between team members is done primarily through Discord. All team members have easy access to Discord, it provides an easy hub for audio and video chat and can be used to send files and share links to resources. Microsoft teams will be used to communicate with the project manager. The majority of file sharing will be done through Microsoft OneDrive.

1.5. Task Management

Management of current tasks will be done through ClickUp. ClickUp works as a tool for creating groups and allowing them to assign and create tasks. It creates a simple stop for all team members to see what tasks are currently in the pipeline, and it has functionality for priorities and due dates. ClickUp also has multiple different task views, including a board view, which can be used to emulate a Scrum board, perfect for our team following the AGILE Scrum methodology.

1.6. Mock-ups

User interface mock-ups are created through Balsamiq.

1.7. Database

For the database, the choice will be PostgreSQL since it is free to use commercially, open-source and it extends the normal SQL databases functionalities. Its implementation on docker containers is already widely used in the industry which allows for an easy integration with our global system.

1.8. Server

The server and client API will be provided by GraphQL that has libraries on any server language used within industry and for web applications. The Flutter client-side application will use a community-based library to interact with the server API. This Flutter GraphQL library is not mature and it will be reverted if it does not match the standards for this project.

1.9. Blacklisted Words

The system will contain a master list of blacklisted words (which can be updated). FuzzyWuzzy text matching will be used to spot offensive or inappropriate text. FuzzyWuzzy returns an index of similarity for two strings, if that index is above a threshold, it will be considered harmful and the text will be removed. This index can be adjusted at any time in an effort to avoid false positives.

1.10. Photo Detection

OpenCV will be used to detect what is present in an image. All photos of people uploaded to the platform will be immediately spotted and removed from the platform. OpenCV can also check for inappropriate objects within photos and also remove them from the platform. Users will be given an option to overrule OpenCV's decisions if they feel it is acting erroneously. A platform admin will then look over the photo and provide a final verdict on whether the image can remain on the platform.

1.11. Solution Evaluation

Usability

The team has identified usability as the priority for this project because we expect to have a large and diverse set of users, and the app must be accessible to everyone. To assess this aspect of our solution we will use a variety of different approaches that will test our design extensively.

The first and most important approach will be to do a usability study using a series of potential interfaces, and questionnaires that will test our design and usability assumptions before the development. The team expects to gather and process a set of data, from where conclusions about our design can be drawn to enrich the user experience.

The evaluation of our usability will not be exclusive to the planning stage. We plan to conduct an iterative usability testing evaluation using the A/B testing technique. This usability testing is often used by industry especially by companies using our software process. Using this technique, we expect to have a measurable and immediate process to respond to users' needs.

Client Expectations

To meet the client expectations, we plan to deliver a robust, reliable, and scalable solution on time, following the information from the draft project specification. This document is the most important source of information because the project specification will be derived mostly from that information. It is implicit in this process that the client expects every future contact to have the only purpose of extending the specification rather than any type of clarification on what was already explicitly required on the document.

The information given on the draft was very explicit on the fundamental priorities such as legal and financial issues, target users and features that must be included. Nevertheless, the client was purposefully general on some aspects to allow creative freedom on how to engage with the users. These are the aspects that the client expects to get feedback on.

The Bid is a crucial step on our project since it is the final proposal to the client. We must provide the client with documentation, analysis, costing, concepts, and findings that prompt the client to commit to our contractual terms. The client will expect a high-quality project specification that gives confidence and excitement.

Technical correctness

This aspect of the solution must be practiced and supervised by every team member as it needs to be an ongoing process during the development stage. The team acknowledged that this software engineering process is distributed and, consequently, every member has the same level of responsibility during development.

The indispensable tool for any successful software activity is testing and this project will not be an exception. The testing is enforced by any member, especially when the member implements any feature or functionality. Any member that does not carry out testing, can threaten the success of this project.

Additionally, the team agreed, on initial meetings, that it was urgent to create and follow programming conventions, not only to ensure the quality of the code but also to ease collaboration and evaluation in a very iterative software engineering process.

2. Team Roles

2.1. Overview

Each group member has been assigned a role based on their strengths and weaknesses, what they would prefer to be working on, and the university degree they are working towards.

2.2. Ghazi Yusaf

Formal Role: Organisational Manager

Primary Role: Programming and Project Planning

2.3. Jose Fernandes

Formal Role: Technical Manager

Primary Role: Back-end Developer

2.4. Aaron Molesbury

Formal Role: Liaison

Primary Role: Lead Games Developer

2.5. Tania Henderson

Formal Role: Reporter

Primary Role: Documentation

2.6. Magnus Mackay

Primary Role: Game Developer

2.7. James Graham

Primary Role: Front-end Developer

2.8. Qianqian Fan

Primary Role: Testing

2.9. Zhiyuan Lou

Primary Role: Marketing

3. Project Plan

3.1. Overview

The following charts show the breakdown of labour across the development of the system. The tasks have been prioritised and appointed to team members based on their roles. Though tasks are assigned, nothing is compartmentalised, and other team members can pursue or help other team members with tasks outside their own should the want or need arise. The hope is to distribute the workload evenly between the members.

The core system functionality will be created in the stage 2 sprints, with a precise layout of how the requirements will be implemented shown in the Gantt chart. The client would like the product to be ready for demonstration on the 4th of February 2021, so functional requirements are of the highest priority so the system will be ready on time for this deliverable.

In stage 3, with the core functionality of the system in place, team members will begin to work on implementing non-functional requirements. These requirements will improve usability, system response time, aesthetics and performance. By the end of stage 3 the system will be ready for commercial deployment, on the 1st of April 2021.

Each sprint is composed of the current most important tasks, many of which will require reviewing and changing and so most early tasks continue to be present in sprints further down the line. Sprint tasks are based of the requirements documents, as well as any additional reports needed for each stage. All tasks are self-organised, team members can pick choose the tasks they would like to contribute to using the virtual sprint board. Each task has been assigned to specific users given their soft roles, but these can be adapted as we see fit. Once tasks are finished they will be reviewed by another team member before being marked as complete.

Stage 1 Gantt Chart

PROJECT NAME

PixPlace

PROJECT MANAGER

Jessica Chen-Burger

PROJECT START DATE	PROJECT END DATE	TODAY'S DATE
13/10/12	01/04/21	24/11/20

							Sprint	1	2	3
							Start Date	16/10/20	30/10/20	13/11/20
#	Task Name	Team Member(s) assigned to task	Duration (hours)	Percentage Completed	Priority	Date Completed				
1.0	Requirements Specification									
1.1	Write introduction	Aaron Molesbury, Ghazi Yusaf	1	100%	High	06/11/20		✓	
1.2	Write general description	Ghazi Yusaf, Aaron Molesbury	5	100%	Medium	20/11/20	✓		✓
1.3	Create requirements list	Ghazi Yusaf, Jose Fernandes	15	100%	High	18/11/20	✓		✓
1.4	Create design diagrams	Tania Henderson, Ghazi Yusaf	8	100%	Low	21/11/20			✓
2.0	Risk Analysis									
2.1	Write introduction	Ghazi Yusaf	1	100%	Low	24/11/20			✓
2.2	Identify risks	Tania Henderson	3	100%	High	27/10/20	✓		
2.3	Create strategies for risks	Tania Henderson	4	100%	High	24/11/20	✓		✓
3.0	Project Decisions and Plan									
3.1	Write up on project decisions	Ghazi Yusaf, Jose Fernandes	6	100%	High	23/11/20			✓
3.2	Team Roles	Ghazi Yusaf	2	100%	Medium	18/11/20		✓	✓
3.3	Project Plan	Ghazi Yusaf, Jose Fernandes	5	100%	High	24/11/20			✓
4.0	Project Costing									
4.1	Write introduction	Ghazi Yusaf	1	100%	Low	23/11/20	✓		✓
4.2	Create costing tables	Tania Henderson, Qianqian Fan	2	100%	High	23/11/20			✓
4.3	Costing analysis	Tania Henderson, Qianqian Fan	2	100%	Medium	23/11/20			✓
5.0	Usability Evaluation									
5.1	Write introduction	Ghazi Yusaf	3	100%	Low	12/11/20	✓	✓	
5.2	Testing plan	Aaron Molesbury	3	100%	High	23/11/20		✓	✓
5.3	Testing protocol	Ghazi Yusaf, Jose Fernandes, Magnus Mackay	5	100%	High	20/11/20		✓	✓
5.4	Test Results	Aaron Molesbury, Jose Fernandes	5	100%	High	23/11/20			✓
5.5	Conclusions	Aaron Molesbury, Jose Fernandes	1	100%	High	24/11/20			✓

Stage 2 Gantt Chart

PROJECT NAME

PixPlace

PROJECT MANAGER

Jessica Chen-Burger

PROJECT START DATE	PROJECT END DATE	TODAY'S DATE
13/10/12	01/04/21	24/11/20

							Sprint	1	2	3	4	5
							Start Date	27/11/20	11/12/21	26/12/20	09/01/21	23/01/21
#	Task Name	Team Member(s) assigned to task	Duration (hours)	Percentage Completed	Priority	Date Completed						
1.0	**Company Website**											
1.1	Create Website	Zhiyuan Lou, James Graham, Qianqian Fan	20	0%	Medium	N/A		✓	✓	✓		
1.2	Host website online	Zhiyuan Lou, James Graham, Qianqian Fan	10	0%	Low	N/A				✓		
2.0	**Application Development**											
2.1	F-R1: Registration	Ghazi Yusaf, Jose Fernandes	20	0%	High	N/A		✓	✓			
2.2	F-R2: Platform use	Qianqian Fan, Tania Henderson	25	0%	High	N/A			✓	✓	✓	
2.3	F-R3: Navigation	James Graham, Magnus Mackay	20	0%	High	N/A			✓	✓		
2.4	F-R4: Interactions	Ghazi Yusaf, Aaron Molesbury	30	0%	Medium	N/A				✓	✓	
2.5	F-R5: Game	Aaron Molesbury, Magnus Mackay	40	0%	Medium	N/A		✓	✓	✓	✓	✓
2.6	F-R6: Safety	Jose Fernandes, Tania Henderson	20	0%	High	N/A		✓	✓	✓	✓	✓
3.0	**Progress Report**											
3.1	Report write up	Tania Henderson, Ghazi Yusaf	10	0%	Medium	N/A			✓	✓		
3.2	Testing of system	Qianqian Fan, Zhiyuan Luo	15	0%	High	N/A				✓	✓	
4.0	**Demonstration**											
4.1	Document write up	Ghazi Yusaf, Jose Fernandes	5	0%	Low	N/A				✓	✓	✓
4.2	Create demo tasks	Aaron Molesbury, Magnus Mackay	10	0%	High	N/A					✓	✓

Stage 3 Gantt Chart

PROJECT NAME

PixPlace

PROJECT MANAGER

Jessica Chen-Burger

PROJECT START DATE	PROJECT END DATE	TODAY'S DATE
13/10/12	01/04/21	24/11/20

							Sprint	1	2	3	4
							Start Date	25/02/21	18/02/21	03/03/21	16/03/21
#	Task Name	Team Member(s) assigned to task	Duration (hours)	Percentage Completed	Priority	Date Completed					
1.0	**Marketing Analysis and Strategy**										
1.1	Produce marketing strategy report	Zhiyuan Lou, James Graham	10	0%	Low	N/A			✓	✓	
2.0	**Continue Application Development**										
2.1	F-R7: Administration tools	Ghazi Yusaf, Jose Fernandes	25	0%	High	N/A		✓	✓		
2.2	F-R8: Analytics data	Qianqian Fan, Tania Henderson	10	0%	High	N/A		✓	✓		
2.3	NF-R2: Software	James Graham, Magnus Mackay	10	0%	Medium	N/A			✓	✓	✓
2.4	NF-R3: Data	Ghazi Yusaf, Aaron Molesbury	20	0%	High	N/A			✓	✓	
2.5	NF-R4: Security	Aaron Molesbury, Jose Fernandes	20	0%	High	N/A				✓	✓
2.6	NF-R8: Performance	Jose Fernandes, Magnus Mackay	15	0%	Medium	N/A		✓	✓	✓	✓
3.0	**Final Usability Evaluation**										
3.1	Test final product	Jose Fernandes, Aaron Molesbury, Magnus Mackay	25	0%	High	N/A				✓	✓
3.2	Write up on usability findings	Tania Henderson, Ghazi Yusaf	20	0%	High	N/A					✓
4.0	**Design and Implementation**										
4.1	System Overview	Ghazi Yusaf, Jose Fernandes	15	0%	High	N/A		✓	✓	✓	
4.2	Design Diagrams	Tania Henderson, Ghazi Yusaf	10	0%	Low	N/A			✓	✓	
4.2	Summary and final design description	Aaron Molesbury, Magnus Mackay, James Graham	10	0%	Medium	N/A					✓
5.0	**Project Evaluation**										
5.1	Organisation	Ghazi Yusaf, Tania Henderson	5	0%	Medium	N/A		✓	✓	✓	✓
5.2	Implementation	Jose Fernandes, Qianqian Fan	10	0%	High	N/A		✓	✓	✓	✓
5.3	Product	James Graham, Qianqian Fan, Aaron Molesbury	20	0%	High	N/A		✓	✓	✓	✓
6.0	**Final Demonstration**										
6.1	Document write up	Ghazi Yusaf, Jose Fernandes	5	0%	Medium	N/A				✓	✓
6.2	Create demo tasks	Aaron Molesbury, Tania Henderson	5	0%	High	N/A				✓	✓

4. Changelog

4.1. Revisions

Date	Author(s)	Changes
22/10/20	Ghazi Yusaf	Document created.
18/11/20	Ghazi Yusaf	Added Team roles and added roles for each team member.
23/11/20	Ghazi Yusaf Jose Fernandes	Project decisions added.
24/11/20	Ghazi Yusaf	Overview added.
24/11/20	Ghazi Yusaf	Stage 1 chart added.
24/11/20	Ghazi Yusaf Jose Fernandes	Stage 2 and 3 charts added.
24/11/20	Jose Fernandes	Solution evaluation added, created more detailed descriptions of project decision.

Project Costing

Table of Contents

1. Introduction

1.1. Purpose

This document projects the cost of the individual components required to develop the system, including cost of products as well as labour. References are included at the end of the document to provide insight into how we arrived at each cost. This document only includes costs of the system as it is currently modelled, and as such these costs are only an estimate. It is likely that during development if requirements change and priorities are re-evaluated, these costs may change, but they offer the team and client a beginning estimate of the costs involved in the development of this system.

2. Costing

2.1. Staff

Role	Quantity	Cost per Hour	Hours	Cost per Person		Total Cost
Project Manager	1	£30	50	£1,500		£1,500
Team Leader	1	£21	100	£2,100		£2,100
Software Developer	7	£18	100	£1,800		£12,600
					Aggregate	**£16,200**

2.2. Hardware

Equipment	Quantity	Cost		Total Cost
Server	1	£700		£700
Development Machines	8	£550		£4,400
Mobile Testing	1	£355		£355
			Aggregate	**£5,435**

2.3. Software

Program	Cost		Total Cost
Windows License	£0		£0
Open-Source Software	£0		£0
		Aggregate	**£0**

2.4. Training

Training	Quantity	Cost		Total Cost
Admin	10	£1,000		£10,000
			Aggregate	**£10,000**

2.5. Summary

Program		Total Cost
Staff		£16,200
Hardware		5,435
Software		£0
Training		£10,000
	Aggregate	**£31,635**

3. Costing Analysis

3.1. Comments

Staff hours estimation comes from our project's current time spent (approx. 60 hours) multiplied by 3 (for the 3 stages of the project) and then rounded up to 200 to account for future stages requiring more time/things going wrong in the project and the time taken to fix them. then that total is divided by 8, assuming there will be an equal distribution of work. Project Manager's hours was a rough estimate.

Server cost was taken as the highest price given for a mid-range server. Mobile testing device cost was taken as the average cost for a smartphone in the UK. Development machines cost was taken from the worldwide personal computer average selling price (price was given in US dollars but was converted using an online currency converter), this was to account for the performance of an average home computer that may be used by the development team. (See references below for further details).

Windows licenses will come with the development machines and the open-source software used is free (subject to change).

- Flutter: free under 3-clause BSD license
- OpenCV: free under Apache 2 license
- FuzzyWuzzy: free under GPL-2 license
- GraphQL: free under MIT license
- PostgreSQL: free under PostgreSQL license
- Kubernetes: software is free under Apache 2 license
- Docker: free under Apache 2 license

Admin training comes from the UK average cost to train new employees (approx. £1,000 per trainee) and we estimate 10 will be needed to help moderate content on the app to start with, potentially more needed as the app grows in popularity.

3.2. Sources

Salaries:

Project Manager Salary
https://www.glassdoor.co.uk/Salaries/software-project-manager-salary-SRCH_KO0,24.htm?clickSource=searchBtn

Team Leader Salary
https://www.glassdoor.co.uk/Salaries/software-team-leader-salary-SRCH_KO0,20.htm?clickSource=searchBtn

Software Developer Salary
https://www.glassdoor.co.uk/Salaries/software-developer-salary-SRCH_KO0,18.htm?clickSource=searchBtn

Hardware:

Server Cost
https://startups.co.uk/technology/how-much-will-a-server-cost/

Computer Cost
https://www.statista.com/statistics/722992/worldwide-personal-computers-average-selling-price/

Mobile handset Cost
https://www.uswitch.com/mobiles/news/2020/07/mobile-phone-prices-soar-over-20-years/

Currency Conversion
(price for development machines was calculated on the 24th of November 2020, subject to change)
https://www.xe.com/currencyconverter/

Training:

Hiring Cost
https://theundercoverrecruiter.com/true-costs-hiring-uk/

4. Changelog

4.1. Revisions

Date	Author(s)	Changes
24/11/20	Tania Henderson Qianqian Fan	Added costing tables.
24/11/20	Tania Henderson Qianqian Fan	Added costing analysis comments and references.
24/11/20	Ghazi Yusaf	Added purpose.

Usability Evaluation

Table of Contents

1. Introduction

1.1. Purpose

This document includes detailed descriptions of the usability tests conducted to assess prototype designs, and the acquired results.

The purpose of this report is to test design decisions established by the team during the initial planning stage. These assumptions will be tested by a sample of potential users through a questionnaire. Resulting data will allow for informed design revisions, implemented in the end product.

The readers of this document will be the client and PixPlace Software Development. It is intended for reading by:

1. The client and their company to understand the approach being used to create a more viable and user-friendly end product.

2. PixPlace Software Development for use as a design reference that caters to user needs.

1.2. Aims and Objectives

The aim of the testing is to scrutinise the user interface and user experience aspects of the application. The client's requirements are intentionally broad, allowing for a high level of design freedom.

These design choices will be tested as they were derived from the team's interpretation of the requirements. All aspects extrapolated directly from the requirements will not be tested since they were already validated by the client.

1.3. Overview

The usability evaluation involves the following steps:

- Testing Plan
- Test Protocol
- Test Results
- Conclusions (Result Analysis and Proposed Modifications)
- Appendix

Test Plan will cover the decisions made to create an effective and comprehensive protocol that will collect the most valuable data. Ideal scenarios to test, what metrics will be used to measure results and the most ideal participants for testing the target market will be discussed.

Test Protocol will describe the testing procedure used to gather quantitative and qualitative data from the test participants. The test protocol will be piloted by the team to measure its effectiveness.

Test Results will provide multiple visual representations of all the data gathered from the conducted tests.

Conclusions will analyse the data gathered and use this analysis as a team to create a list of suitable modifications to the prototype design.

The Appendix contains the ethics and consent forms, which must be read and agreed to by all test participants, prototype design Mock-ups used in the testing phase, and a copy of the questionnaire that the participants were asked to complete.

2. Testing Plan

2.1. Objectives

The necessity for us to ask questionnaires is high because to better understand the demographic that we are targeting, we need to gauge what they like and dislike about potential features. Our goal for the questionnaires is to gain insightful knowledge on our target audience to better aid the design and development of our application.

2.2. Participants

For our target audience, we have decided it is best if we opt for 18-24-year olds. This is because our most of our team fits into this category so this enables us to better connect with the target audience. The better understanding we have of our target audience the more likely it is that we can develop a suitable application for them. However, we will not exclusively have 18-24-year olds be tested as this can lead to bias results where we wouldn't have data from a varied enough sample group. Instead we should test a slightly more diverse range of ages to allow for a greater perspective of opinions on our proposed mock-ups.

2.3. Test Scenarios

For the tests, we will ask subjects for their first impressions of the mock-up page. This will largely be open-ended responses and we do this to help us gauge the appeal of the styles of each of the pages. We will then ask them to describe how they would perform a simple task on that page in order to better test the usability and how intuitive the page is to use. The results of their completion of the task will be one of the following three events:

- Correct – The subject was able to complete the task without any prompts or guidance
- Required Assistance from Investigator – The subject needed minimal guidance in order to complete the task
- Not Completed – The subject was unable to complete the task even with the aided prompts

Finally, the subject will be asked to give any suggestions/improvements that they believe would make the application better. For questions with multiple mock-up versions, the subject will also be asked which version they prefer.

2.4. Metrics

The main types of data we are receiving from the subjects are in the form of Qualitative and Quantitative data. The Qualitative data is mainly coming from the first section of the questionnaire where we ask about the general opinions of the mock-ups. The Quantitative data comes in the form of Likert scale ratings. This is because Likert scales are very easy to compare, and they are also relatively simple to answer for a subject making the questionnaire more engaging. A wide variety of metrics means we will receive a greater range of valuable data which will indicate what we need to work on.

2.5. Questions

We have chosen to write some direct questions because these will give us the subjects explicit opinions on the mock-ups. The statements help us see if subjects agree with the proposed suggestions we make. We will put forward statements that we as a team may agree or disagree with to gauge if the subjects are thinking along the same lines as us. The questions should lead to us gaining insightful feedback on our application design.

3. Testing Protocol

3.2. PixPlace Usability Test

To be completed by an investigator

Investigator Name: _____ Date: _____

Participant No. _____ Location: _____

Introduction

Thank you for volunteering to take part in our usability study. This study will help us to improve the prototype design of our social media application PixPlace. Please answer each question asked of you as openly and honestly as you can, all feedback will be crucial to improving the design of our system.

You will be shown a series of user interface mock-ups from the application. The investigator will ask you a series of questions for each new mock-up. All your responses will be noted. You will then be asked to complete a simple task based on your intuition of the UI. Your success at the task will be recorded. All data from this study will be anonymised.

After this test there is a final questionnaire that may be filled in. It would be appreciated if you could take a moment to fill this form in once this test is finished.

You may end the test at any time by informing the investigator. If you wish to remove all your data from the study, you may also contact the investigator to do so.

Questions

1. Login Page

a) What do you think this page is for?

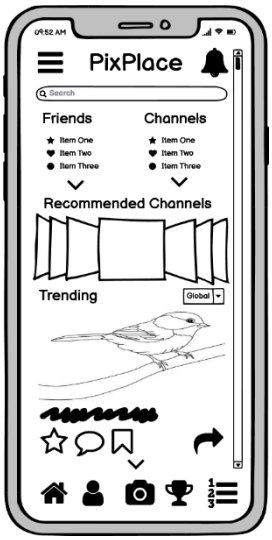
b) How would you describe the look and feel of the page?

c) Please login into the platform as if you already had an account with the system.

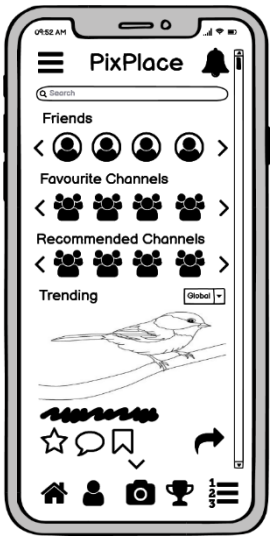
◉ Correct ◉ Required assistance from investigator ◉ Not completed

Do you have any additional comments?

2. Homepage



Version A



Version B

a) What do you think this page is for?

b) How would you describe the look and feel of the page?

c) Sort the trending section of the homepage by friends only.

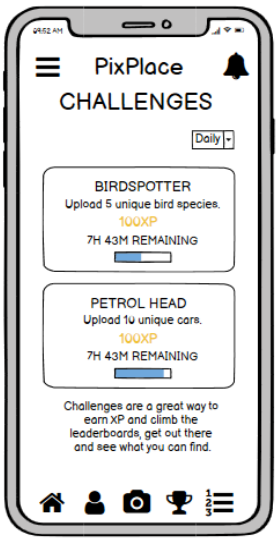
◉ Correct ◉ Required assistance from investigator ◉ Not completed

Do you have any additional comments?

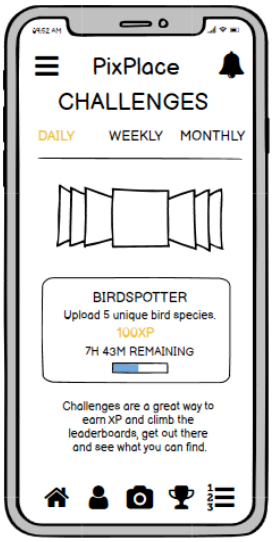
Which version do you prefer?

◉ Version A ◉ Version B

3. Challenges



Version A



Version B

a) What do you think this page is for?

b) How would you describe the look and feel of the page?

c) What do you think the different sections of the challenge page are for?

d) Navigate to the weekly challenges section.

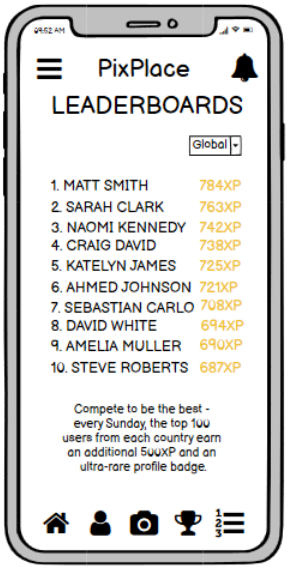
◉ Correct ◉ Required assistance from investigator ◉ Not completed

Do you have any additional comments?

Which version do you prefer?

◉ Version A ◉ Version B

4. Leader Boards



Version A

Version B

a) What do you think this page is for?

b) How would you describe the look and feel of the page?

c) What do you think the bell in the top left corner is for?

d) Navigate to the system notifications area.

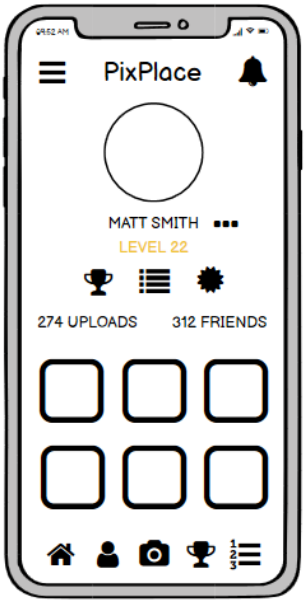
◉ Correct ◉ Required assistance from investigator ◉ Not completed

Do you have any additional comments?

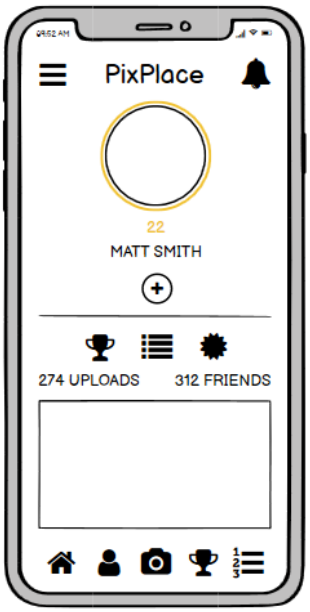
Which version do you prefer?

◉ Version A ◉ Version B

5. Profile



Version A



Version B

a) What do you think this page is for?

b) How would you describe the look and feel of the page?

c) Navigate to this users trophy section.

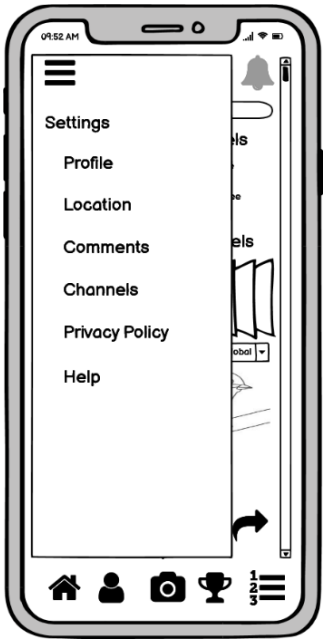
◉ Correct ◉ Required assistance from investigator ◉ Not completed

Do you have any additional comments?

Which version do you prefer?

◉ Version A ◉ Version B

6. Settings



Version A

Version B

a) What do you think this page is for?

b) How would you describe the look and feel of the page?

c) Navigate to the channel settings section.

◉ Correct ◉ Required assistance from investigator ◉ Not completed

Do you have any additional comments?

Which version do you prefer?

◉ Version A ◉ Version B

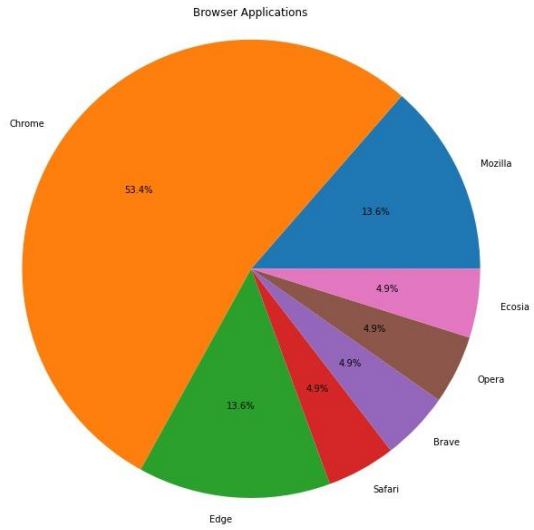
4. Test Results

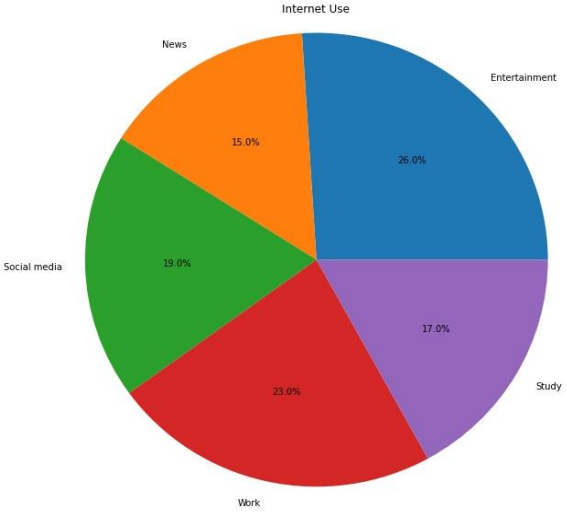
4.1. Test Participants

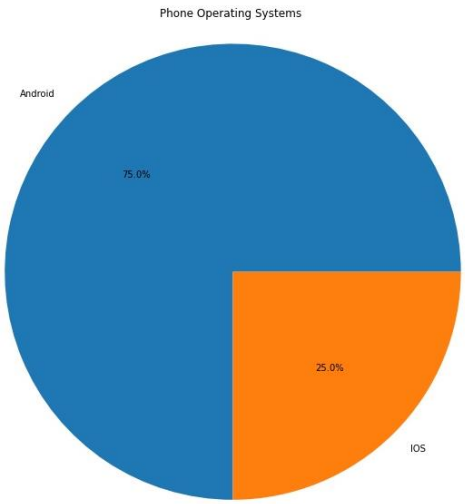
*[**Disclaimer**: 2 of the Qualitative data forms are missing hence why 12 subjects answered google forms yet only 10 subjects are mentioned in the Qualitative data section]*

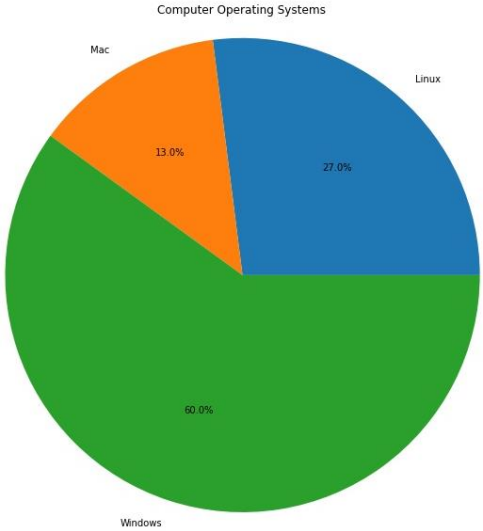
Overview of the Characteristics of our Subjects

As previously discussed, our target audience for our app is generally a younger audience primarily students aged 18-24 who use the internet/social media platforms fairly regularly. For this reason, 80% of our subjects were 18-24 with the other 20% being 24-34. We chose not to interview 100% 18-24 because we would like to still gain feedback from other age ranges as they might have a different, more insightful perspective on the mock-ups. Even if we are attempting to target 18-24-year olds, it would be naïve of us to assume all of our traffic is going to be from users of that age range thus we need a slight variety. Most of our subjects were male but there were also some female and non-binary subjects which also ensures that the mock-ups suit our audience despite us not defining a specific gender in our target audience. All subjects are familiar with the internet as they all access it multiple times a day via a variety of platforms/devices for entertainment/personal and social media purposes alongside work.









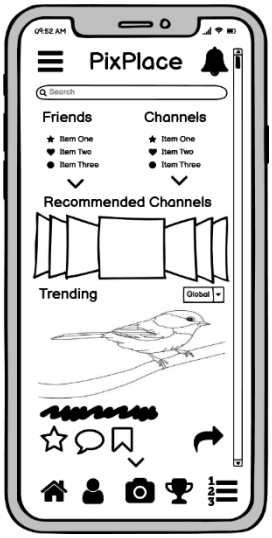
4.2. Qualitative Findings

Login Page

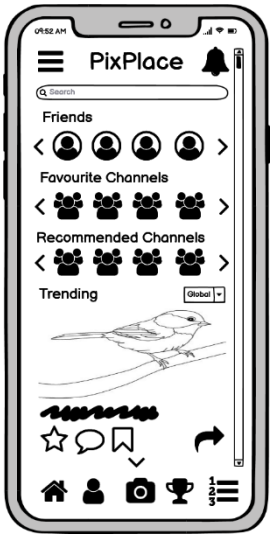
For the Login Page, the general consensus is that subjects found the page to be simple and intuitive. Every subject was able to describe how to log into an account meaning the functionality of this page is clear. Despite having a clean and clear style, some subjects suggested that we introduce a colour scheme (a common theme throughout the questionnaires) to add vibrancy to the page whilst others said they liked the monochromatic scheme so when it comes to the implementation, we can trial different colour ways and make a decision as a team. One subject suggested removing the scroll bar from the image because there's no need to have a scrolling function as all information is already on the screen which is understandable and was perhaps a mistake in making the mock-ups as it shouldn't have been included. On the whole the page successfully met the criteria which it needed to with minimal suggestions on updates we can add.

Home Page

The Home Page had a slightly more varied consensus than the Login Page. This is because subjects found the function of the page clear but visually noisy/cluttered. In spite of this, 90% of subjects were successfully able to sort the trending section into friends only with the other subject only requiring slight assistance. This implies the design is still relatively intuitive but maybe needs de-cluttering. This could be done through having more of a thread/feed style over sections. On the whole subjects found version A (8 votes) to be a better version than B (2 votes) due to the better management of sections and clarity. Potential improvements include removing the scroll bar, slightly reduce clutter of sections, remove sections that aren't usually included within a homepage such as friends list (should be accessed through account page). There were mixed opinions on the style of the channels section in A, some subjects found it more engaging whereas others found it unnecessary and distracting. On the whole the page successfully met the criteria which it needed to with a few suggestions on updates we can add.



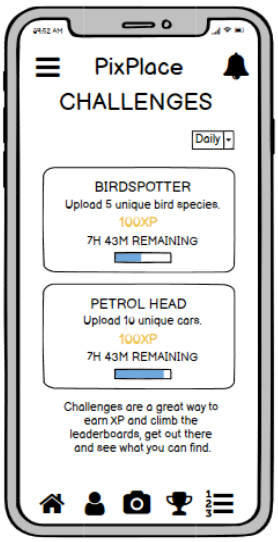
Version A



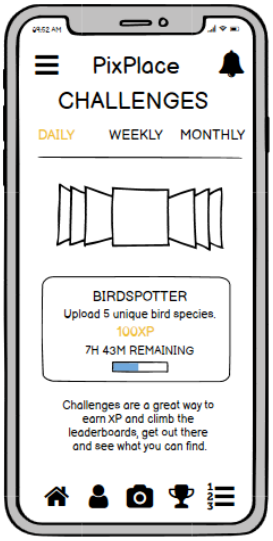
Version B

Challenges Page

The Challenge page was much less diverse despite the votes for versions A and B being more varied (7 votes and 3 votes respectively). Subjects found the dropdown menu in A to be cumbersome as well as visually unattractive. Subjects much preferred the tab style of version B (even if they preferred A on the whole). The same mix in opinions of the sliding windows from the home page appeared here as well. Subjects found this page easy to navigate exhibited by 100% of subjects being able to navigate to the different challenge timeframes. One subject suggested as an improvement that we do weekly, monthly and yearly challenges as opposed to daily, weekly and monthly. However, we as a team believe that the yearly time frame would be far too long of a time frame and would potentially become monotonous/repetitive for users as time goes on. Another improvement was to change from the side scrolling windows to a sideways list. This might be clearer but that depends on user perception and preference and we must go with the majority vote. On the whole the page successfully met the criteria which it needed to with minimal suggestions on updates we can add.



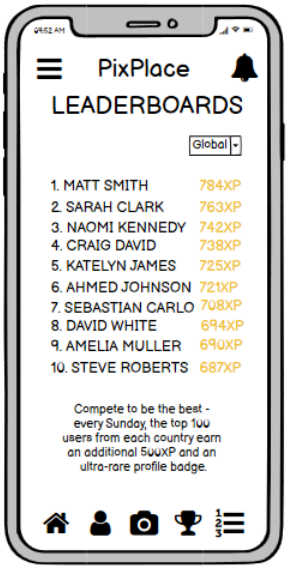
Version A



Version B

Leader Boards Page

For the leader boards Page, the subjects were in near 100% agreement of the style and intuition of the page. All subjects were able to navigate to the systems notification area and all subjects preferred version A over B. The aforementioned common themes from previous pages popped up again such as the dislike for the drop-down menu in version A and the lack of colour for the general scheme of pages. Potential improvements suggested were to add a line underneath the top ten users and then display the user's rank name and XP as well as maybe having a gradient colour which changes as you get higher in the leader boards instead of having them all yellow. We like the idea of adding in the user's position as this makes comparison of the users own score against others much simpler and it also adds clarity to the page. On the whole the page successfully met the criteria which it needed to with minimal suggestions on updates we can add.



Version A

Version B

Profile Page

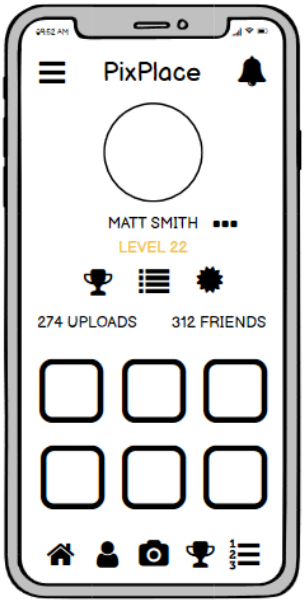
The profile page was the most mixed-review page that we had shown to subjects. Version B had the most votes with 6 votes and version A had 2 votes and the other 2 unaccounted for votes both said they'd prefer a hybrid that utilises the top half of B mixed with the lower portion of A. All subjects were able to successfully navigate to the trophy area of the system displaying the pages intuitive design. Subjects generally liked the Yellow XP bar around the profile's avatar as well as the clean layout of both designs; they said it was nice and symmetrical. However, there is a reasonably extensive list of potential improvements as follows:

- **Add a Bio section –** This is so that users would be able to say a little description about their user page.
- **Display earned/top Trophies on Profile Page -** This would better showcase user achievements whilst making the profile page more stylistically clean
- **Combine Options with Avatar button –** This would make it so the options for the account appear when you press your avatar resulting in a decluttered profile page.
- **Remove duplicate buttons –** the buttons in the middle of the screen on both versions also appear along the task bar at the bottom so to reduce visual noise we can remove the

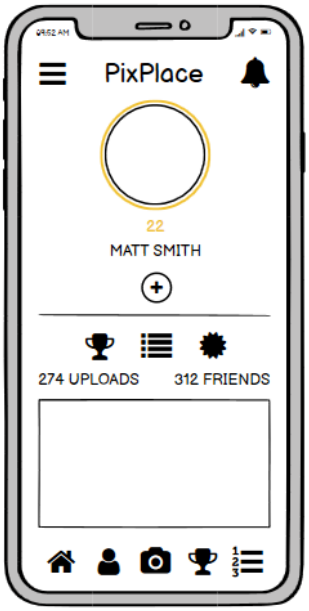
duplicated buttons. Also, the function of some buttons was not immediately apparent to some subjects so we should rethink how we style some of the buttons.

- **Aforementioned gradient colour scheme –** If we decide to implement the gradient colour scheme mentioned in the leader boards section, we could match the XP bar to the colour of their leader board XP
- **Add the label Level to version B in front of the numerical level (just like version A) –** Just helps with clarity otherwise the number is just randomly floating with a potentially unclear meaning.

Despite the list of suggestions, the basic functionality of the page on the whole is still clear and easy to comprehend.



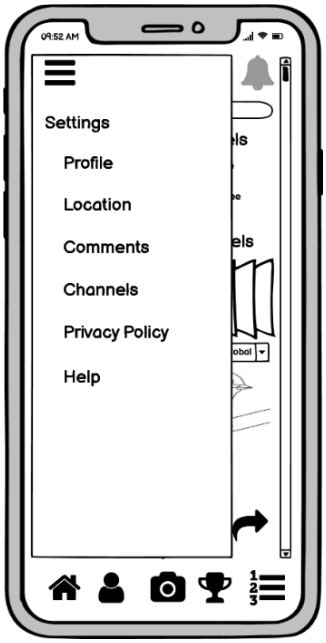
Version A



Version B

Settings Page

All subjects found version B to be better than version A because they liked how it took up the full screen versus it "hanging over" the screen. They also said the style was simple and clean just how a settings page should be. All subjects could change the settings of one of their channels.



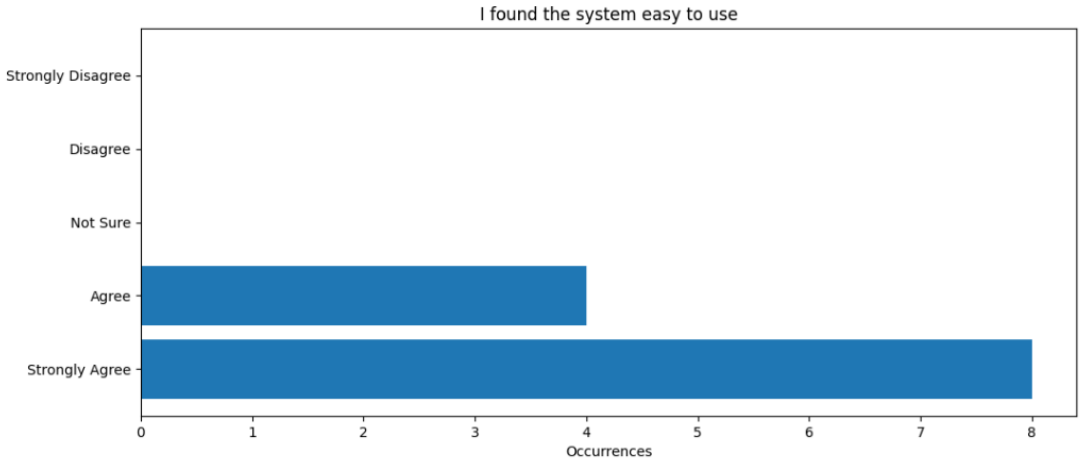
Version A

Version B

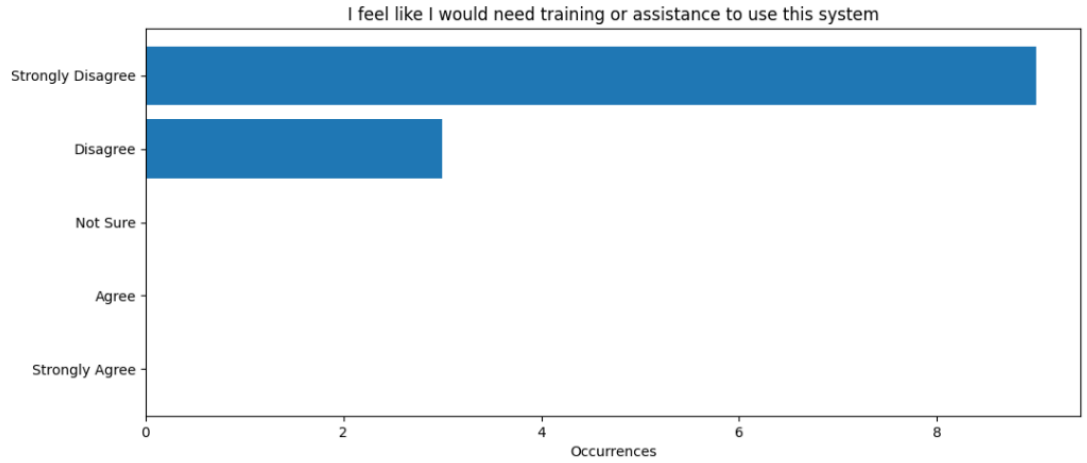
4.3. Quantitative Findings

Ease of Use of The System

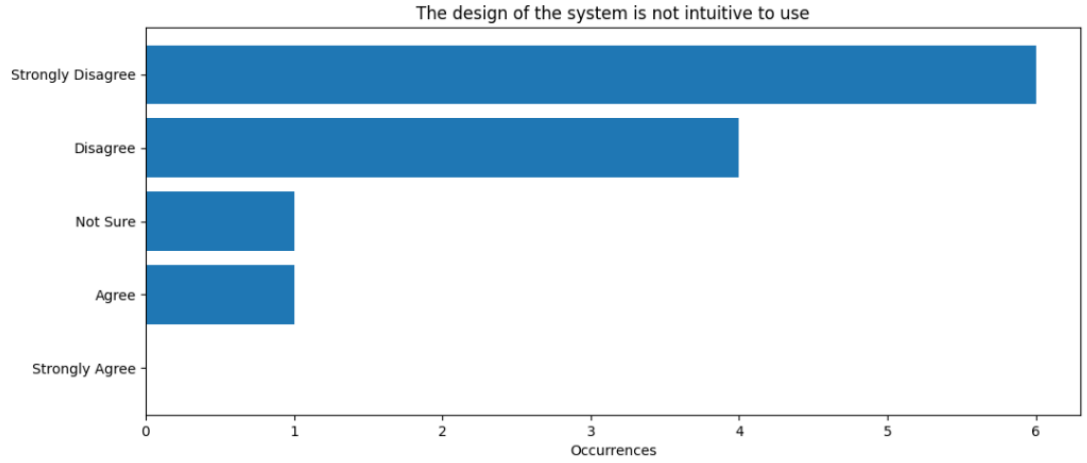
To test the ease of use of the system, we developed several statements which had agreement answers in the form of a Likert scale rating between 1 to 5 with 5 being strongly agree and 1 being strongly disagree. The first ease of use statement said, "I found the system easy to use". All subjects agreed with to this statement to a relatively decent extent with 33.333% agreeing with a Likert rating of 4 and 66.667% strongly agreeing with a Likert rating of 5. This shows that the subjects felt the system was trivial to understand.



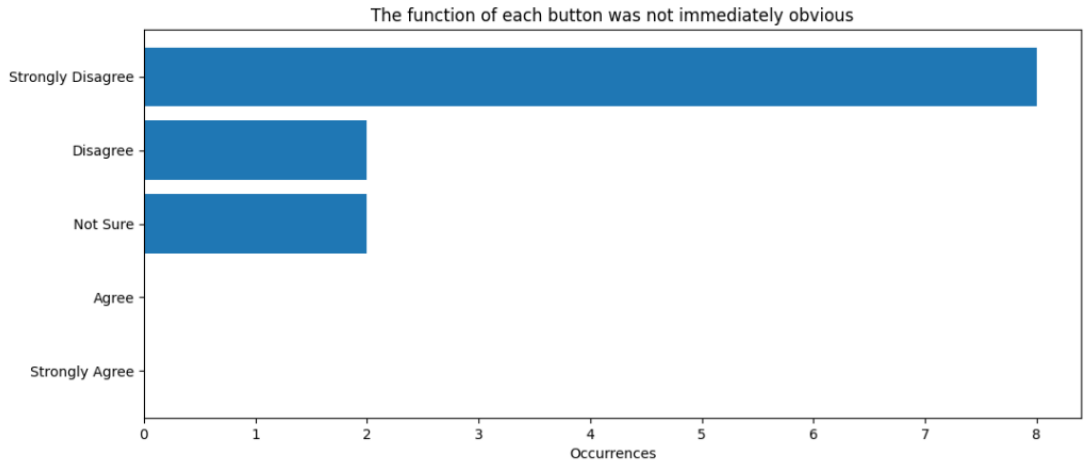
Another statement suggested "I feel like I would need training or assistance to use this system" which again had subjects in unity as they all disagreed with the statement (3/4 strongly disagreed).



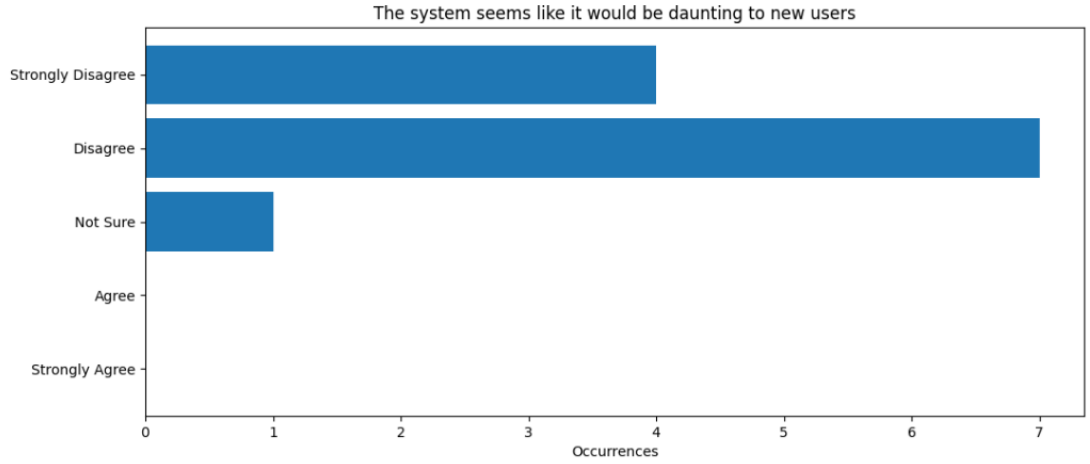
Furthermore, we asked if "The design of the system is **NOT** intuitive to use". This statement gave more of a mixed response with the majority of subjects disagreeing with the statement implying it **is** intuitive to use, however 1 subject agreed and thought that the design is **not** intuitive, and another subject was down the middle. This means 83.333% disagreed with the statement and hence we can confidently say our design for the most part is intuitive. This does however mean we should take into consideration some of the improvements that have been suggested from the qualitative data.



Our next statement said "The function of each button was NOT immediately obvious" which had subjects in for the most part concordance with 10/12 subjects disagreeing with the statement meaning our buttons have an immediately obvious function.

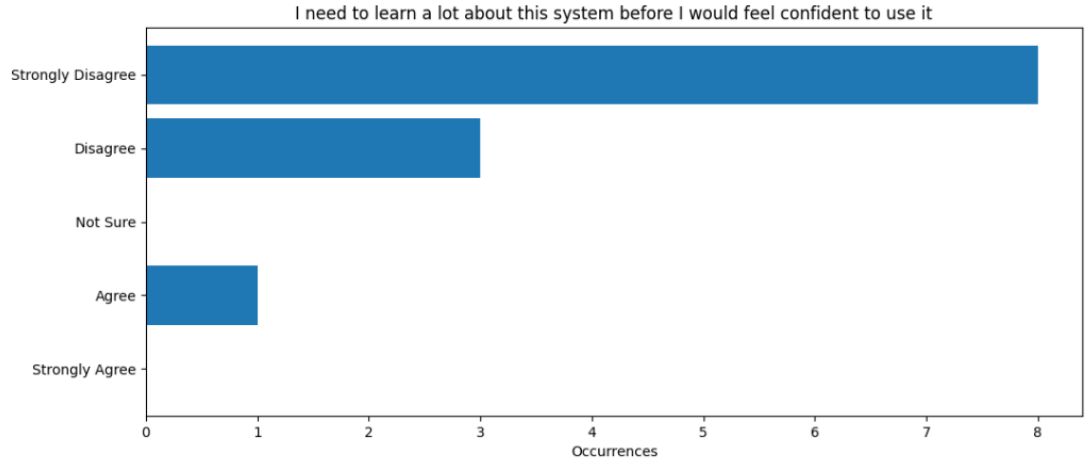


The penultimate ease of use statement proposed "The system seems like it would be daunting to new users". This statement had subjects disagreeing with the statement with 4 subjects strongly disagreeing (Likert scale rating 5) and 7 subjects disagreeing (Likert scale rating 4). The remaining subject was unsure (Likert scale rating 3).

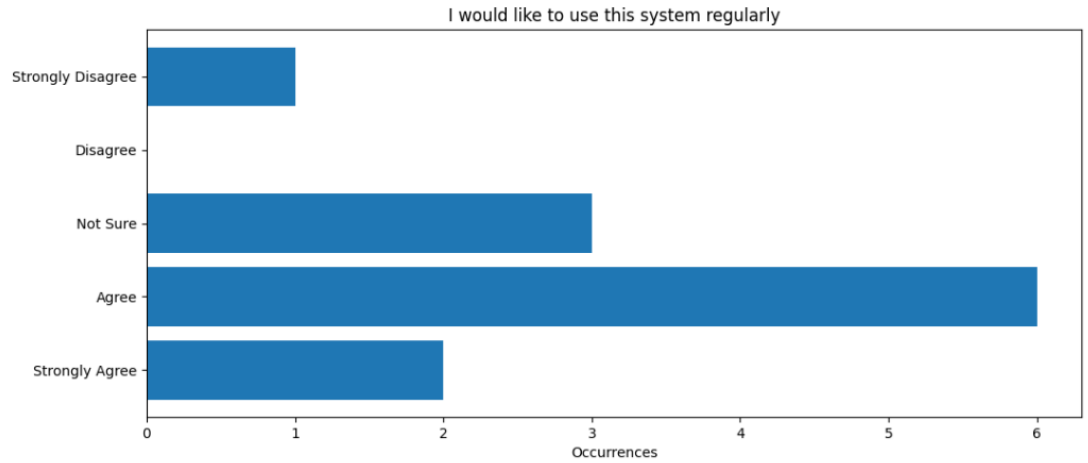


The final statement suggested "I need to learn a lot about this system before I would feel confident to use it". The general consensus was that subjects disagreed strongly with this statement as 66.667% gave it a 5 on the Likert rating scale. 1 Subject did however agree with the statement again implying we should do some minor adjustments in order to satisfy the ease of use for more users.

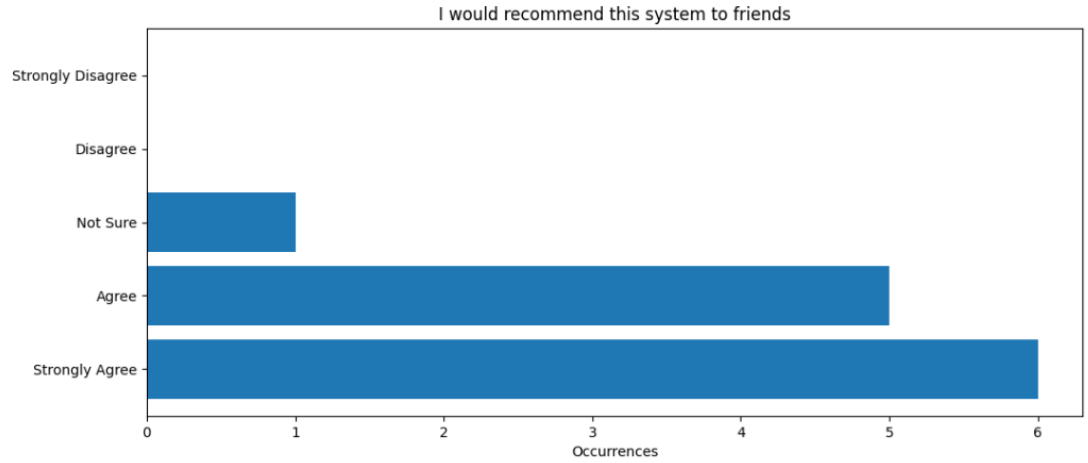
Style and Appeal of System



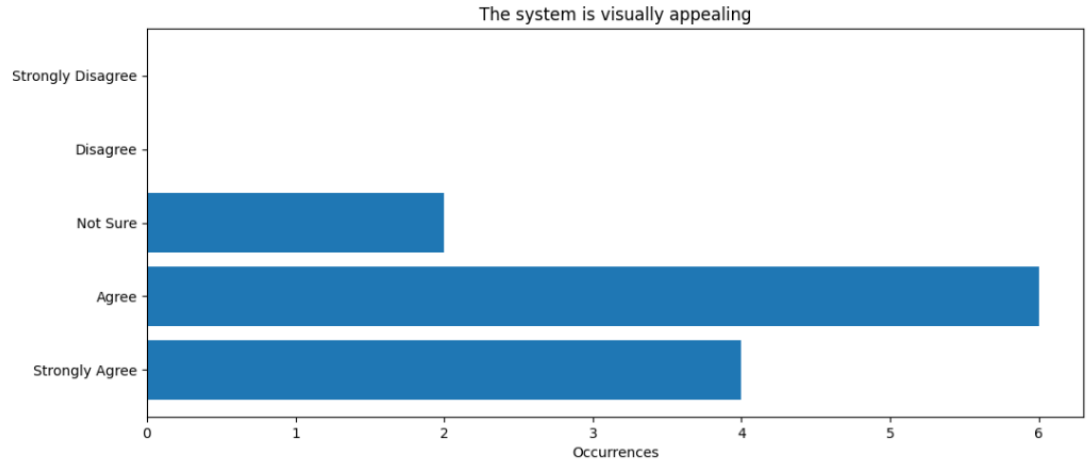
To test the style and appeal of the system, we again developed several statements which had agreement answers in the form of a Likert scale rating between 1 to 5 with 5 being strongly agree and 1 being strongly disagree. We first stated, "I would like to use this system regularly" and this gave a very diverse response with the general consensus being that most subjects would agree to some extent with the statement. 50% of subjects rated this statement as a 4 (agree), 16.667% rated it as a 5 (strongly agree), 25% rated is as a 3 (not sure) and 8.333% rated it as a 1 (strongly disagree). This diversity could be caused by the individual subject's opinion on social media as it typically has negative stigma surrounding itself. We have to as a team understand that our app is not going to be to everyone's liking so for us to get a majority vote that suggests users would regularly use the app is a more than positive result.



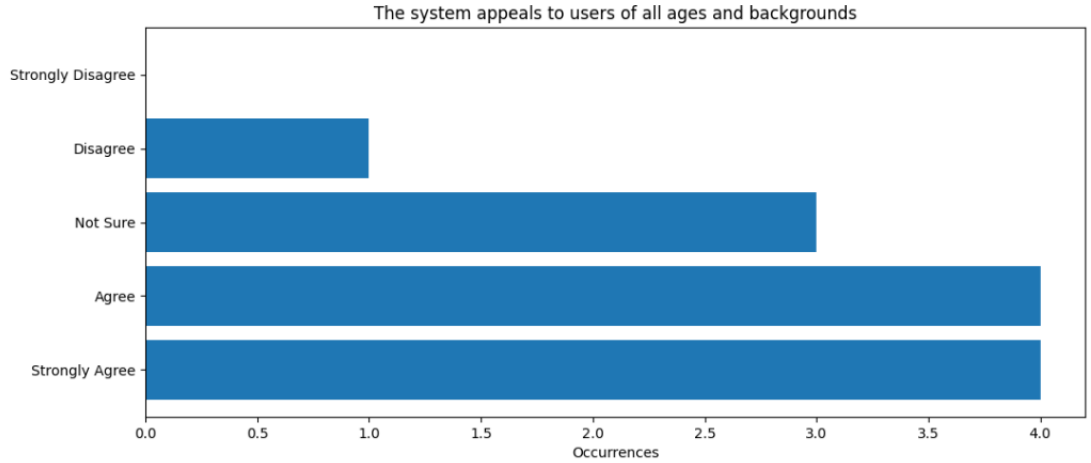
The next statement was along similar lines to the previous as it says, "I would recommend this system to my friends". This surprisingly had less diversity with 11/12 subjects agreeing with the statement. It is interesting that despite some subjects not wanting to use the platform regularly, they would probably still recommend this to their friends. This may mean that our system shows positive potential for growth via word of mouth which is typically renowned for being the best method of expansion into markets.



In terms of style, we suggested "The system is visually appealing" and subjects were again in general in agreement with the statement. This means that subjects liked our concise, clean monochromatic scheme on the whole.



Finally, we proposed that "The system appeals to users of all ages and backgrounds". Out of all the statements, we predicted this would produce the most varied response and that it did. 33.333% of subjects strongly agreed with this statement and another 33.333% of subjects agreed with this statement. 25% of subjects were unsure and 8.333% disagreed. This shows that subjects thought it might appeal to users of all ages and backgrounds, however there is a slight mix of uncertainty. Despite this, it is again really positive that 8/12 subjects agreed to any extent with the statement showing that we have managed to create a system that has the potential to appeal to a range of audiences that may not necessarily be our main target. This is a feat that we believe many social media platforms fail to hit the mark on.


The system appeals to users of all ages and backgrounds
Strongly Disagree
Disagree
Not Sure
Agree
Strongly Agree
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Occurrences

5. Conclusions

5.1. Result Analysis

Ultimately, from the data we have collected we can proudly say that both intuitively and stylistically speaking, we have managed to for the most part meet the criteria for an easy to use and appealing app. The qualitative data suggests that we need to make some minor tweaks to some UI pages such as the profile page but on the whole our design is most likely ready to be implemented. The quantitative data also suggests our app hits the mark as most results are what we were hoping for with minimal diversity. This does not mean however we can ignore and disregard the useful suggestions made by subjects, we need to keep improving our app in order to satisfy a broader community of users.

5.2. Proposed Modifications

The following is a list of changes that we as a team have decided will make our app higher quality.

- **Rework the Profile Page UI** – There are multiple issues with the profile page UI that need reworking. For example, the aforementioned issues such as duplicate buttons, the way we display data, introduce bios etc. We plan to juggle these things about and see what works but in general we plan to keep the avatar with the XP bar surrounding, followed vertically downwards by a personal bio and a display of the users' trophies. Then there will be a grid list of the users uploaded pictures.
- **Rework the Home Page UI** – We need to remove the clutter from the homepage and look into styling it more like a news feed/thread similar to what you would find on a platform like Twitter or Instagram.
- **Change Minute Details** – There are some general tweaks that we need to assess such as the scroll bar needs removing off of the login page. These can be ironed out so to speak later in the implementation of the app.

6. Appendix

6.1. Consent Form

PixPlace Social Hub

Heriot-Watt University

Consent to Act as a Subject in an Experimental Study

Principal Investigators: Ghazi Yusaf, Jose Fernandes, Tania Henderson, Aaron Molesbury, Magnus Mackay, James Graham, Qianqian Fan, Zhiyuan Lao

Description: The purpose of this study is to evaluate the usability of a social media hub PixPlace, designed to host photos of objects and animals from users, who compete to earn points and complete challenges to rise up leader boards. This study will help pinpoint strengths and weaknesses in the user friendliness and accessibility of the products design.

There are minimal risks for you to participate in this study. All personal information will be kept confidential in a secure filing cabinet or in password-protected computer directories. Your participation will not affect how well you do in your courses (if you are a student) or affect your relationship with the university in any way.

You are free to decline to participate in this study. Should you decide to participate, you are free to end your participation at any time. Such a decision by you will not adversely affect or alter you status with the university in any way. You have the right to omit a response to any of the questions asked.

Data protection: All personal data will be held in compliance with the GDPR (General Data Protection Regulation) and in accordance with the Data Protection Act 2018.

Activities	**Initials**
I confirm that I have read and understand the above information and have had the opportunity to ask questions and had these answered to my satisfaction.	
I understand that all information I provided will be used confidentially and I will not be named in any written work arising from this study.	
I understand that I can withdraw myself from this study at any point of my choosing, without providing any explanation. This will not impact on my relationship with the University.	
I agree that any data collected from me may be published anonymously in future reports.	

Voluntary consent: I certify that I have read the preceding and that I understand its contents. Any questions I have pertaining to the research have been and will be answered by the team. My signature below means that I have freely agreed to participate in this study, and that I agree to the publication of the results for scientific purposes and to the distribution of the recordings and transcripts of the sessions for research purposes so long as my identity is not revealed.

_____ _____ _____

Date Subject Signature Inv. Initials

Investigator's certification: I certify that I have explained to the above individual the nature and purpose, the potential benefits, and possible risks associated with participation in this research study, have answered any questions that have been raised, and have witnessed the above signature.

_____ _____

Date Investigator Signature

6.2. Participant Details Form

Please complete the following form to give our team and idea of the demographics of the usability participants. Remember, all personal details will be held in strict confidentiality and any published results of the experiment will be anonymised.

What is your full name?

_____

If you are a student, please enter the degree you are studying.

_____

How old are you?

- ○ 18 – 24
- ○ 25 – 34
- ○ 35 – 44
- ○ 45 – 64
- ○ 65 or above
- ○ Prefer not to say

What is your gender?

- ○ Male
- ○ Female
- ○ Non-Binary
- ○ Prefer not to say
- ○ Other (Please type here)

How often do you access the internet?

- ○ Multiple times a day
- ○ Once a day
- ○ 2 – 3 times a week
- ○ Rarely, only when I absolutely need to use it
- ○ Never

What do you use the internet for? (Select all that apply).

- ☐ Entertainment (videos, music, games etc.)
- ☐ Watching/reading news
- ☐ Posting to and browsing social media

- ☐ Communicating with friends and family
- ☐ Discovering new locations to visit
- ☐ Work
- ☐ Studying
- ☐ Other (Please type here)

Which devices do you use to access internet? (Select all that apply).

- ☐ iPhone
- ☐ Android phone
- ☐ Windows computer
- ☐ Apple computer
- ☐ Linux computer
- ☐ Other (Please type here)

Which of the following applications do you use? (Select all that apply).

- ☐ Safari
- ☐ Google Chrome
- ☐ Mozilla Firefox
- ☐ Microsoft Edge
- ☐ Opera
- ☐ Other (Please type here)

6.3. Final Questionnaire Form

This form will ask how you feel towards different aspects of the system. Please answer as honestly as you can.

What is your full name?

_____

I found this system easy to use

1 2 3 4 5

Strongly Disagree — Strongly Agree

I feel like I would need training/assistance to use this system.

1 2 3 4 5

Strongly Disagree — Strongly Agree

I would like to use the system regularly.

1 2 3 4 5

Strongly Disagree — Strongly Agree

The design of the system is NOT intuitive.

1 2 3 4 5

Strongly Disagree — Strongly Agree

I would recommend this system to friends.

1 2 3 4 5

Strongly Disagree — Strongly Agree

The function of each button was NOT immediately obvious.

1 2 3 4 5

Strongly Disagree — Strongly Agree

The system is visually appealing.

1 2 3 4 5

Strongly Disagree — Strongly Agree

The system seems like it would be daunting to new users.

1 2 3 4 5

Strongly Disagree Strongly Agree

The system appeals to users of all ages and backgrounds.

1 2 3 4 5

Strongly Disagree Strongly Agree

I need to learn a lot about this system before I would feel confident using it.

1 2 3 4 5

Strongly Disagree Strongly Agree

7. Changelog

7.1. Revisions

Date	Author(s)	Changes
21/10/20	Jose Fernandes	Document created.
05/11/20	Jose Fernandes	Purpose, aims and objectives and overview added.
12/11/20	Ghazi Yusaf	Purpose, aims and objectives and overview refactored.
12/11/20	Ghazi Yusaf	Consent Form added.
20/11/20	Ghazi Yusaf	Added testing protocol.
23/11/20	Aaron Molesbury	Qualitative Data Analysis added.
24/11/20	Aaron Molesbury	Quantitative Data Analysis and Conclusion added.
25/11/20	Aaron Molesbury	Questionnaires/Appendix added.
25/11/20	Aaron Molesbury	Added write up for testing plan.