

Atlis

(Online travel bucket list)



atlis

to travel is to live

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1. Introduction

1:1 Overview

Traveling is a lot more accessible to people today than it was a few decades ago. Most young people, around the ages of 15-30, have travel on their mind. However a lot of young people don't actually see their travel plans come to life due to poor planning and lack of money. Working holidays, International academic partnerships and volunteer programs are becoming increasingly popular among students and Universities. [\(1\)](#) 2012 seen 207 million students traveling, which in turn, accounted for around 20% of 2012's global travel market.

The chosen topic for this project is travel based. The main aim of the project is look at a web application that allows users to create an interactive 'travel bucket list' using an interactive map. The following project is a smaller test project for creating a travel based social networking site. In order for the project to work as this type of mini project, content and functionality needed to be carefully planned out.

1:2 Project Aims & Objectives

As the project progressed over the last couple of months, the initial projects aims and objectives has evolved to meet the needs of the project's user group and to enhance the user's experience.

1:2:1 Aims

The project aims to provide users with an interactive environment to create their own online travel bucket/wish list. The application will provide users with the facility to identify individual locations, provide a brief description of the location, and place a marker to identify these places on an interactive map.

The project aimed to be a mini project to test the market for the potential for a dedicated social networking site for users interested in traveling. Therefore the project should be well organised and will securely store user data.

1:2:2 Objectives

1. The application will be accessible and compatible with different devices and platforms.

2. The product will use modern web technologies to all the application to be as future proof as possible.
3. The main functionality of the application will be integrated with an interactive map.
4. The application will use a clean and minimalist design.
5. The project will take a ‘user first’ approach to ensure that the application focuses on the user’s needs.
6. The application will focus on a user’s experience rather than third party commercial partners.

1:3 Overview of Work Undertaken

Throughout the project a number of design and implementation tasks have taken place. The project looked and analysed its demographic as it aimed to take a user centred design approach. This was done various ways, from user surveys, user personas and content strategies. This not only allowed for informed decisions to be made on the look and feel of the application but it also allowed for the functionality of the application to be carefully planned to accommodate the needs of the user. During the project, a brand was created along with an online application that uses a map API as its main feature.

1:4 Overview of Rest of Report

The following report will look at all aspects of the project from early stages of system and user experience design to final stages of testing and evaluation. The report will go into detail on the decisions made and how they have influenced the final product. The report will also discuss any problems that occurred during the project and evaluate how they effected the final outcome.

2. Concept Definition Statement

The following section of the report will take a look at how the idea has evolved to produce a product that is appealing to the targeted user group. It will look at idea generation, requirements, paper prototyping, feasibility testing and finally methodology selection.

2:1 Idea Generation

The idea for the application was first introduced out of interest of online materials and tools available to people who are interested in travel. There are various ways to get involved with like-minded people on the web, some of which include Facebook and Twitter.

However there are more specialised sites such as TripTease and Trip Bucket which are a lot closer to the idea for this project.

2:1:1 Mind Mapping

To decide on what the application would do and what the main purpose of the project. The idea generation kicked off with a mind-map. This not only helped kickstart the project, but it also sparked a number of ideas for the name of the project. **Figure 1** shows the early stages of min-mapping.

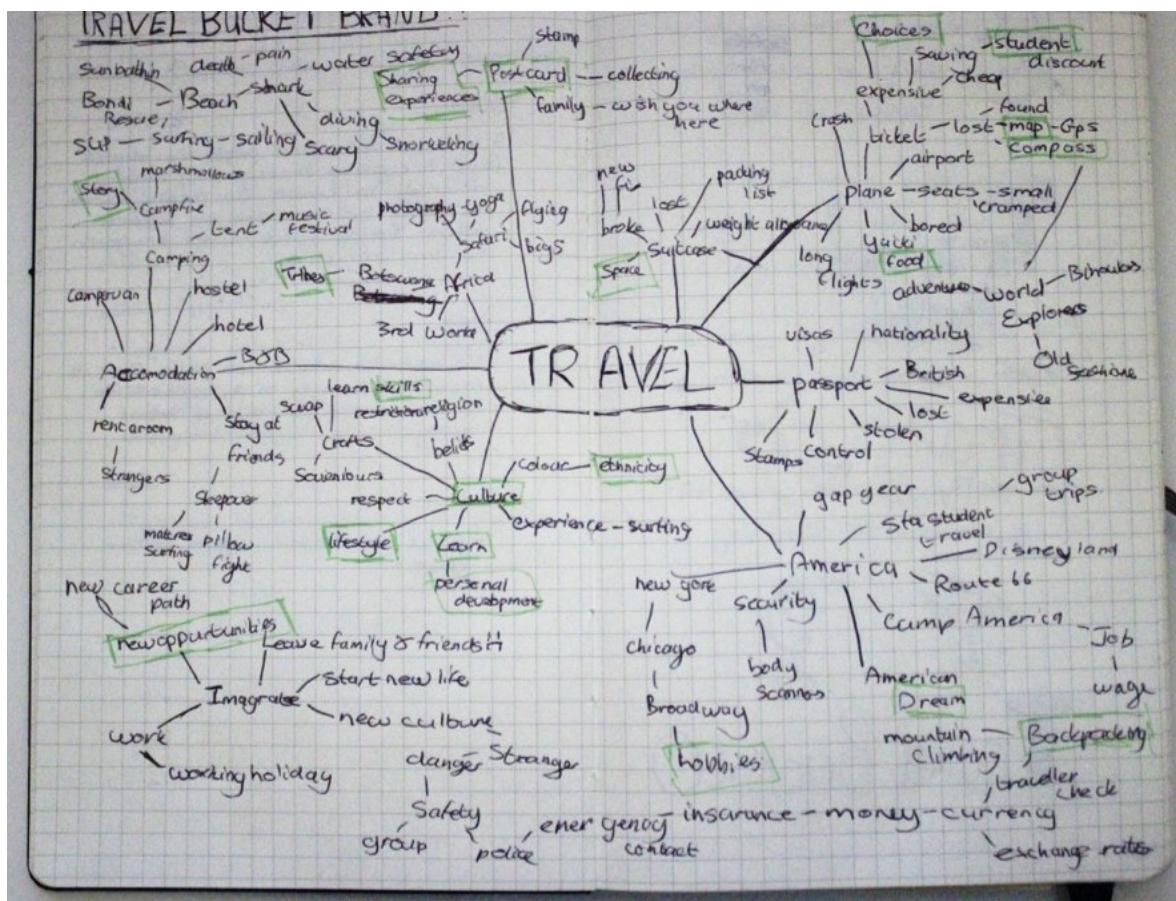


Figure 1

After completing the first stage of expanding the initial idea into a product, it was decided that it was important that the main feature of the application is map. The reasoning behind this was that it not only communicates with the user the subject that the application is based on travel, but it also gives the application more to work with in terms of usability.

Another important element of the idea generation that came out of the mind mapping process, was the type of content that the map needed to generate. When the idea of the

project was first thought of the content for the map was mainly leaning towards video. More specifically good quality video of adventures travellers. This idea was sparked by the good quality and creative videos from the [\(2\)'DSLR Backpacker'](#) group on Vimeo. However this idea was short lived after research had been carried out into the capabilities of the Vimeo API. It was then decided that the content that the map should offer users the capabilities to create an interactive bucket list.

2:1:2 Research into Potential Competitors

The second stage of the idea generation process was to carryout research with similar products. In this case, it was TripTease and Trip Bucket. During the research stage both products were analysed in terms of the user journey, features, design and what type of people were using the site.

It was a concern that both sites carried too many similarities to the project idea which was worrying incase it closed the market for another travel site. However after a brief evaluation and investigation into both of these sites it was concluded that Trip Bucket was aimed at a wider user group and the commercial advertisements are both pushy and intrusive, which in turn, hinder the user's experience.

Trip Tease on the other hand, is a beautifully designed site which helps deliver a pleasant user experience. The site's community is rapidly growing due to the simplicity and usability of all of the features. However it was noticed that the purpose of the site was to review destinations, accommodation and activities rather than create a list/plan like Trip Bucket.

After doing some research to see whether or not there would be room on the market for the planned application for this project, there is room on the market for the project. However the site and any marketing campaigns will need to be carefully planned out and positioned to draw the attention of its niche market.

2:1:3 Defining User Group

At the beginning of the project, the possibility of creating a mini social networking site for users was being explored. However due to the level of programming skills being used, this would be a large risk to project and it was therefore scaled down to creating an online tool. However during the early stages of research a report published by Guardian in 2008⁽³⁾ was

explored to help understand how different types of user groups use the web and they use it. The report allowed for the following group to be identified:

- **Netpreneurs** - These type of users tend access the web only to make money.(4% of users in 2008)
- **Connectors** - This kind of user tends to share information and links of whatever they finds interesting. (10% of users in 2008)
- **Transumers** - These type of users are easily influenced and tend to join groups of their interest.
- **Collaborators** - These type of users tend use these type of sites to create and organise events. (28% of users in 2008)
- **Essentialists** - These type of users like to keep in youth with friends and family via social networking sites. (38% of users in 2008)
- **Scene Breaking** - This kind of user will often share new brands that they have found online. (10% of users in 2008)

Continuing background research it was found that a large portion of the user group that is being targeted by this project (18-24 year olds) spent around 45% of there time on the social networking sites in 2008⁽⁴⁾, which has undoubtedly doubled since then with the increase of 'always being connected' through smart phones and tablet computers.

As mentioned in 2:1:2, the site aims to attract a specific user group as there are similar competitors out there and therefore targeting the user group is of up most importance to the project's success. To ensure that the ideologies behind the project are user specific, a number of different surveys and user interviews have been carried out throughout the project. **Appendix 1**, is the initial user survey that was carried out to get a feel for how the targeted users use the internet and to see if they would be interested in the intended site.

Moving on from the initial user survey a further interview was conducted to gather more detailed about the sort of personality and the needs of the targeted user group. This helped create accurate user personas (Appendix 2). By creating user personas at the beginning, it has allowed the project to adopt a 'user centred design' approach which also demands constant feedback throughout the project.

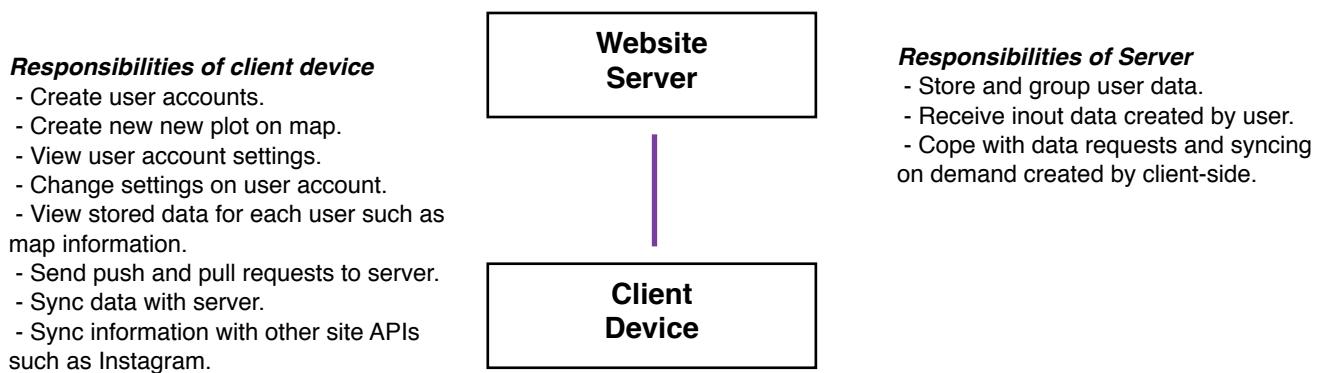
2:2 Requirements Specification

The following section of the report will discuss the requirements specification for the project. Here the report will look at the breakdown of the system, how the system will work, what process the user will need to carryout in order to complete tasks within the system, Dependancies of both the project and the developer.

2:2:1 Project Perspective

The project will focus on producing an online tool that will allow users to create their online travel bucket/wish list. The project aims to deliver this through an interactive interface on the client side. However in order for this to work, the site will need to have a secure server side to allow fro data to be stored and retrieve data through different requests.

The application was only intended to be used for those who can access the internet as this will be an online application. The project will deliver the application via the web and there are no future plans, at present, to produce and Android or IOS version of the site. As mentioned previously, the sever and client side will need to talk to each other to deliver the user experience. Synchronisation between the server and client-side of the application is impotent for the user to work with real time data that they are creating when using the website. The following diagram shows how both sides interact with each other to achieve this.



2:2:2 Core Application Features

The following section will look at the core features of the application. Some of the core features have changed and evolved since the initial requirements specification. Because of these changes all of the core requirements have been outlined.

User Registration

- All users will be brought to the homepage of the site. Here they will be given two options, login or register. When the user clicks on the register button a pop-up window will appear.
- The user will be prompted to enter a username, email, confirm email, password and confirm password.
- When the user clicks sign-up a message will be displayed prompting the user to check their email to activate their account.
- When user clicks on the link in their email, their account will be automatically activated and they will now be able to login and access the site. .

User Login

- All users will be brought to the homepage of the site. Here they will be given two options, login or register. When the user clicks on the login button a pop-up window will appear.
- The user will be prompted to enter their email and password.
- If log in is successful, user will be redirected to their profile page. If log in is unsuccessful their will get an error message displaying.

Profile Customisation

- The user profile is deployed after logging in. To customise their profile, the user must click on the edit profile button.
- A pop-up form will be displayed on screen allowing the user to enter their full name, country of origin, a short bio and a new username.
- Once user clicks on the save button the new information will appear on the user's screen.

Map interaction

- User can access/view map on their profile page. To add a new marker, the user will right click and a pop-up will show prompting the user for marker information. When the user hits save the marker will be displayed permanently in the map.
- Once a new marker is created, a new item will be added to the travel list.
- To delete the marker the user must click on the marker to display the marker info window. Here they will see a button to delete the marker.

2:2:3 Additional Application Features

The additional features for the site have not changed since the initial report (see **requirements specification** for a detailed comparison). *The site will still have a help feature and will still be designed responsively.*

2:2:4 Operating Environment

The system is an online system that executes on a web browser. Due to the nature of the application all of the typical characteristics the and design patterns of a website needed to be optimised to use on a mobile device. To facilitate this, a range of new emerging technologies have been used to accommodate the needs of a mobile device to create a simplistic UI. The website would not only need to be able to work on multiple platforms but it will also need to be browser compatible with all leading web browsers such as IE, Chrome, Firefox, Safari and Opera.

It was discussed in the initial requirements specification that the use of the interactive map would be completely different on a mobile device and would be in the form of possibly a menu. However this isn't the case any more due to the user experience evolution of the project (please see user experience design for more).

2:3 Paper Prototyping

The following section of the report will look at the paper prototyping stage of the project and how it evolved and benefited the user experience design of the application. During the early stages of prototyping, a paper prototyping report was produced (see paper prototyping report for further details).

The first report focused heavily on problem areas, known at the time, by looking at 1ups and 6 ups. By using the commonly used 1up and 6ups process it allowed different scenarios to be explored, particularly when it came to the general layout of the profile page. **Figure 2** shows the initial 6ups and **figure 3** shows the 1up that was explored at this stage.

It was during this process that it was realised that the map could be used on a mobile device as well as a desktop device and therefore, there was no need to design a menu to replace the map on a mobile device.

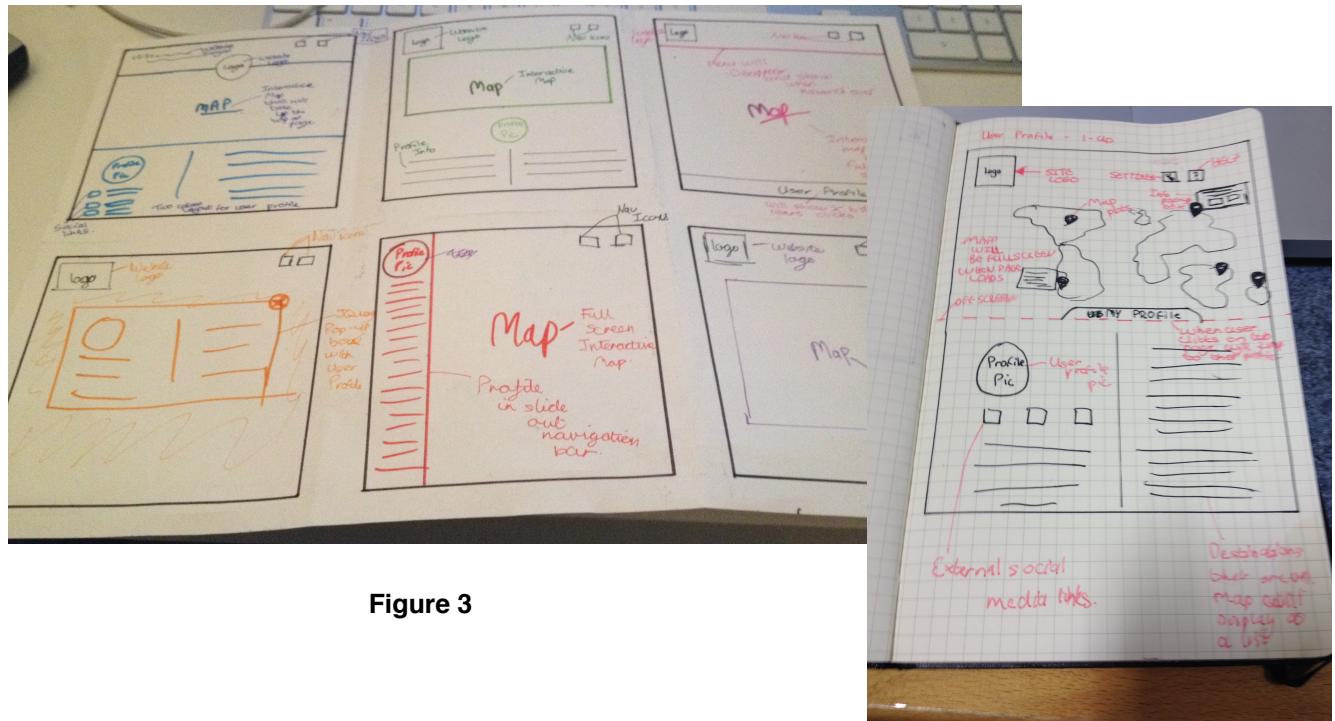


Figure 3

However during the later stages of the design process. the paper prototyping was revisited as there were concerns about the lack of detailed that was explored. The main reason behind this is that the responsiveness of the site hadn't been explored in depth which caused concern that this would affect the final outcome of the product being developed. **Figure 4 & 5** Show the more detailed version of paper prototyping which were used to create wire frames in illustrator.

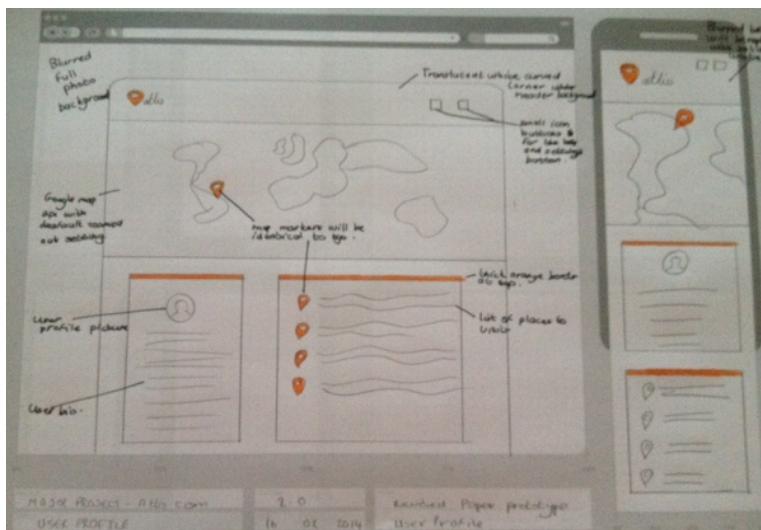


Figure 4

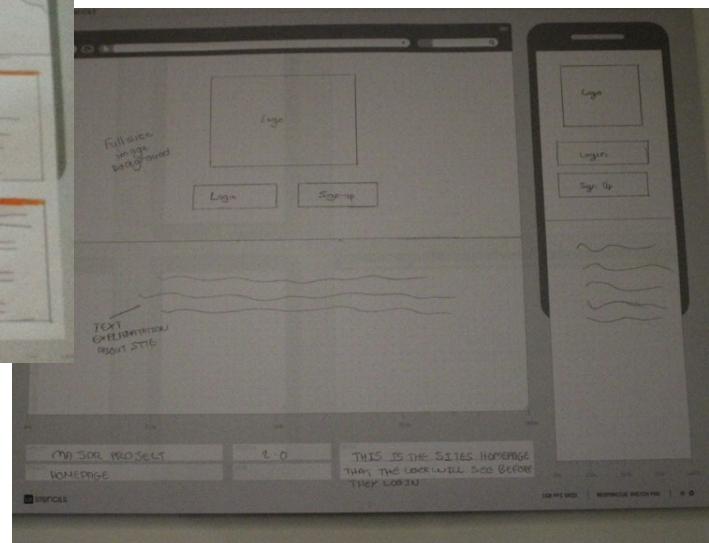


Figure 5

2:4 Feasibility Testing

In this section of the report, the feasibility of the project is discussed. Here the report will take a look at risks as well as the project's strengths.

From the beginning until the mid point of the project, the map posted as the biggest risk as the developer has no previous experience of working with map APIs. However it then became apparent during the implementation of the sites backend would be the largest risk given the level of ability that the project developer has and the level of complexity of the chosen technologies for the project. In saying this, it doesn't mean that the project is completely unfeasible it just meant that the critical path for the project was the back-end development.

The biggest strength from start to finish of the project was the front-end side of things. The reason behind this is that the project developer comes from front-end industry experience and therefore has experience trouble shooting in a project environment as opposed to an educational environment.

2:1 Methodology Selection

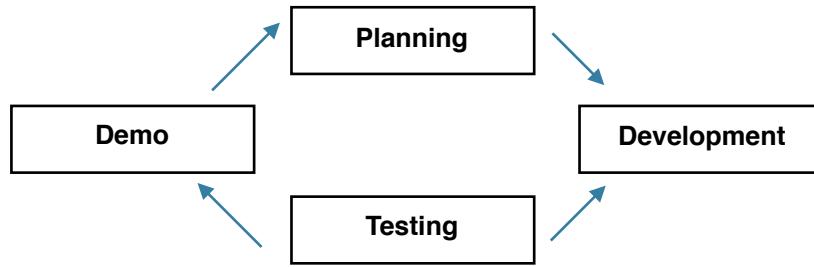
At the beginning of the project it was decided that the project would take a waterfall approach. However when the project kicked off, it was clear that this needed to be reconsidered as the Waterfall would make it difficult change the specification and back track through the project. It was decided that using an Agile approach would be better suited and would be less risky for the project. This would give the project the flexibility of developing working software to make up for the project in smaller incremental phases which is ideal for allowing different phases of the project to be tested and tinkered with throughout the project.

The Agile Methodology is a type of incremental model that integrates some of the workings of the waterfall model. It works well for 'time critical' projects and works well for projects that are subject to change their specification later in the project to meet the needs of the user and the customer.

Even though the Agile Software development cycle has been used, throughout the project, the prototyping methodology might have been better suited to test the application in terms of usability and technical viability. However due to the limited skills and lack experience

from the project developer as well as time constraints on this project this wouldn't work as well sat the Agile method. Not too mention the fact that the project only has one developer and the prototyping method requires a team of highly skilled developers to produce efficient and effective prototypes of the application

As mentioned previously, the Agile methodology produces software for the application in incremental phases. Each phase of incremental development go through the following steps to successful completion.



Planning - Each stage of the incremental development process was carefully planned out. This includes technical requirements as well as the visual look at feel.

Development - The development stages of the incremental process of the project is were the function/feature that is being development is built and implemented according to the plans and specification of the project.

Testing - The testing phase of each stage involved testing after the implementation was complete for the current stage of the project. Testing was carried out various ways. Some of which include; browser testing, device testing.

Demo - Once the stage reached the demo, it was most likely included in the final product as everything was tested and was in working order.

After the above stages were completed during the stages of development the features/function that was being developed was then added into the main project. However it became clear during the process of the project, that some of the located times for some phases of the project were not realistic as unforeseen issues occurred.

3. Design

3:1 User Experience Design Evolution

In the following section of the report the design of the project will be discussed. This will include the brand that has been created for the project, the design of the site and how the site's interaction has been planned out to accommodate its users.

3:1:1 Content Strategy

To begin defining the user experience design of the site, a content strategy was carried out. The content strategy relied heavily on the user persons that had been created towards the beginning of the project (see **appendix 2**).



Figure 6 (5)

Figure 6 is the 'User Experience Honeycomb'. This is often referred to when planning content for a site as it allows the content to be assessed in a depth way which helps achieve relevant content for the site.

This diagram was useful throughout the whole project especially when it came to deciding on the content to be used.

3:1:3:1 Scope of Content

The primary objectives are:

- To provide interesting and relevant content to users.
- To create a useable

The following section is a content strategy evaluation.

Why?

The site would like to bring users an interactive tool that allows them to:

- Place markers on a map that has Geo data.

- Distinguish between countries that they have visited and countries that they haven't visited.
- Help feed an interest and passion for travel

Who?

The site will speak as a brand and will feed the users interests and passion through a multiple personas that will be developed to speak for the brand through the website itself and various marketing channels such as blogging. The three personas will consist of:

- Casual backpacker travelling during holidays/vacations.
- Volunteer changing the world one country at a time.
- The memoirist who likes to tell a good story.

When?

The site is built using modern cutting edge technologies to help keep the application future proof for a few years which will cut down on the site's maintenance. The content of the main site will be generated by users. However various marketing channels such as the blog will need to *be maintained on a regular basis*.

What?

The site also adheres to the brand guidelines at all times to ensure that:

- Content on the site speaks with an informal, credible, friendly tone.
- Support the key messages of the brand.
- Stay up to date with trends in travel to ensure features on the site don't become dated.

Where?

The sites' brand expand and engage its online community via online social media platforms such as Facebook, twitter and Pinterest. The site will also have a dedicated blog that will discuss trends in travelling as well as having guest posts from experienced travellers.

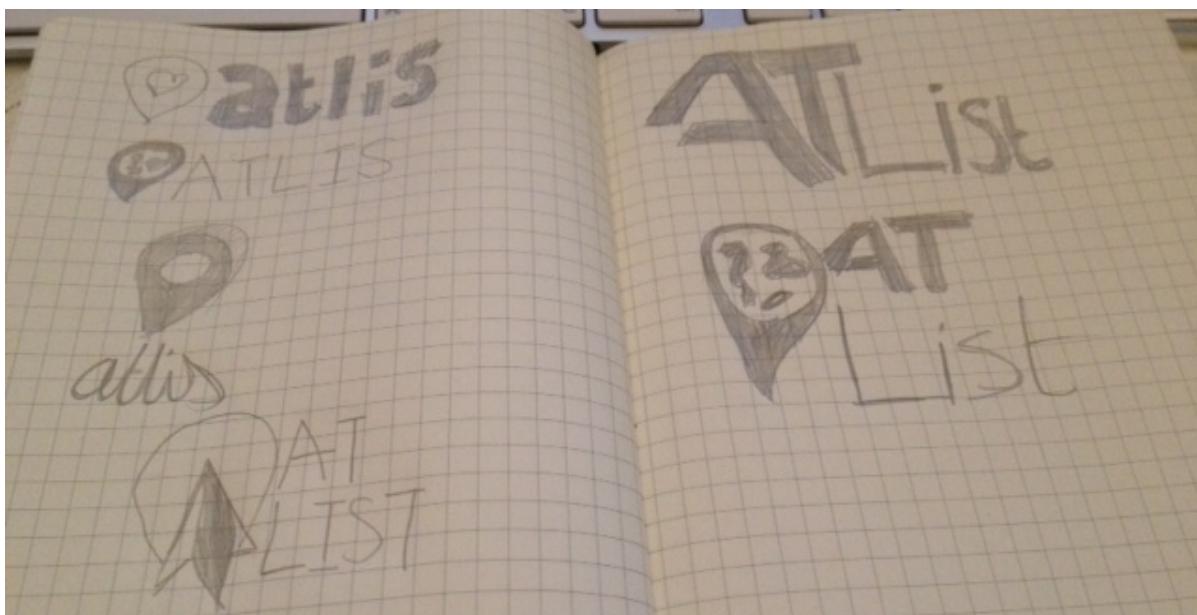
3:1:2 Developing a Brand

To begin developing the brand for the project, the first step was deciding on a name for the project. To begin this process, the initial mind map diagrams used to define what the project was, were used (**Figure 1 - 2:1:1 Mind mapping**).

At the beginning of the project the name ‘Travel Bucket’ had been chosen for the site. However during the early stages of research it was discovered that the ‘Trip Bucket’ was taken by a similar competitor. After another mind-mapping session, the name @las was thought of. However this name would not have been possible to use in a domain name. The name ‘Atlis’ was then thought of. The name sounds slightly like atlas which people associate with maps and geography and by replacing the ‘a’ with an ‘i’ to represent that the site is about creating lists.

3:1:2:1 Logo Design

The first stage in the logo design was sketching on paper. At this stage, it was known that the logo needed to use a symbol somewhere. This would make it easier for people to identify what the brand it is representing. **Figure 7** shows the initial sketches for the brand.



After completing hand drawn sketches the logo design reached the stage of being digitised. Illustrator was used to do this as it works with vectors which allows the shapes used to be resized without pixelation.

The main focus was the typography and colour of the logo as they are the two main areas that can make a brand evoke emotion and they also play a large part in user engagement. The logo is also the beginning of the brands story and is therefore important that the brand communicates its purpose to its audience.



Figure 8

During the sketching stage, one of the ideas was to use a small map inside of the pin/marker as though it would make the marker more symbolic and be explanatory about the story behind the brand. However when this was applied this theory in illustrator it was decided that it made the logo look cluttered and tacky. It also takes your attention away from the logo's type which is helpful for anybody.

3:1:2:2Typography

As mentioned above one of the main focuses on the logo design was the typography. During the early stages of sketching and digital prototypes the design was heading towards using a san serif font. The reason for that was to try and make the logo as minimalist and simplistic as possible. However when carrying out some research on dribble and Behance a design pattern was noticed that many designers are using today

which was using a serif style font in conjunction with lots of white space and very little clutter. This gave the brands an elegant feel.

The font that was used is ‘Pacifico’. This font is licensed under the SIL Open Font License so it can be used within my project at no cost.

The font has been downloaded from here: <http://www.fontsquirrel.com/fonts/pacifico>

Pacific works well with the logo as it has a calligraphy style brushed script which gives the brand simplicity and elegance which is perfect the brand’s story.

It was decided that a tagline would be beneficial and helpful when telling the users the brand’s story it also provides the brand with a more detailed explanation. The different tagline options considered included:

- Travel Bucket List
- Dream Big
- Where the world is your home
- To travel is to live

The chosen tagline was; ‘to travel is to live’ as as it would help attract users who are passionate about trailing. It was also a worry that if ‘Where the world is your home’ was used that it might confuse people to think that Atlis is about travel accommodation which would be miss leading users.



3:1:2:3 Colour

After the logo design was decided upon the next step was to look at the brand's colour palette.

After giving it some thought and research ([Smashing Magazine, Professional web Design, page 82](#)) it was decided to go with a warmer more earthy colour palette as this would be good at telling a story about traveling our planet.

To introduce a colour palette like this various oranges and browns were explored. Warm colour palettes tend to evoke thoughts of sunsets, heat, autumn leaves, and heat. This is very fitting to a travel website as most people associate travel with going somewhere warmer and seeing beautiful sights including sunrises etc.

Orange was chosen in particular as it is generally associated with vitality and is an energetic and vibrant colour. Travelling is normally escapism from the stresses of everyday life at home which is why orange was perfect colour to focus on for the brand.

A neutral colour was included to accompany the orange to help create an earthy feel as well as picking a less intense colour to complement the orange which automatically creates a nice subtle contrast between the two colours.

Grey was experimented with however it gave the logo a very corporate feel and made the orange feel colder. Finally, it was decided on using brown as it is the warmest colour out of the neutral colour palette which enforced the warmth of the logo. **Figure 9** shows the finalised colour palette.

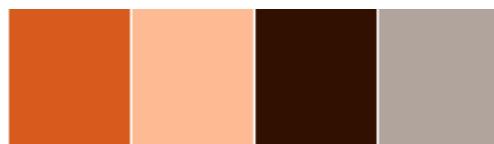


Figure 9

Overall, the brand works well in telling the user story. It also works well adapting to different situations for example it adapts well to being displayed portrait or landscape in online environments. Evidence of this can be seen in 3:3 - designing for web as well as the following images which shows a sneak-peek of the brand on other media.

3:1:2:4 Designing for Web

The following section looks at designing the online user experience for the main product - the Atlis Website. This section will look at a number of different aspects such as the user journey and user interaction.

3:1:2:5 Homepage

Because of the nature of the site it was decided that using a lot of photos and imagery on the site would be a good idea because most of the content is user based. The design of the logo didn't really sit onto of a full colour image because of the use of contrasting colours. To overcome this issue a blurred image has been used. The use of the blurred background adds mystery to the page as it doesn't show a specific location. This is suited to the site as it is about users exploring.

Figure 10 shows the top section of the homepage in action. One major criticism about this bit of the homepage is that it is difficult to read the tagline. This could have been fixed by changing the colour of the tagline or changing the opacity of the background image to make the logo stand out more.

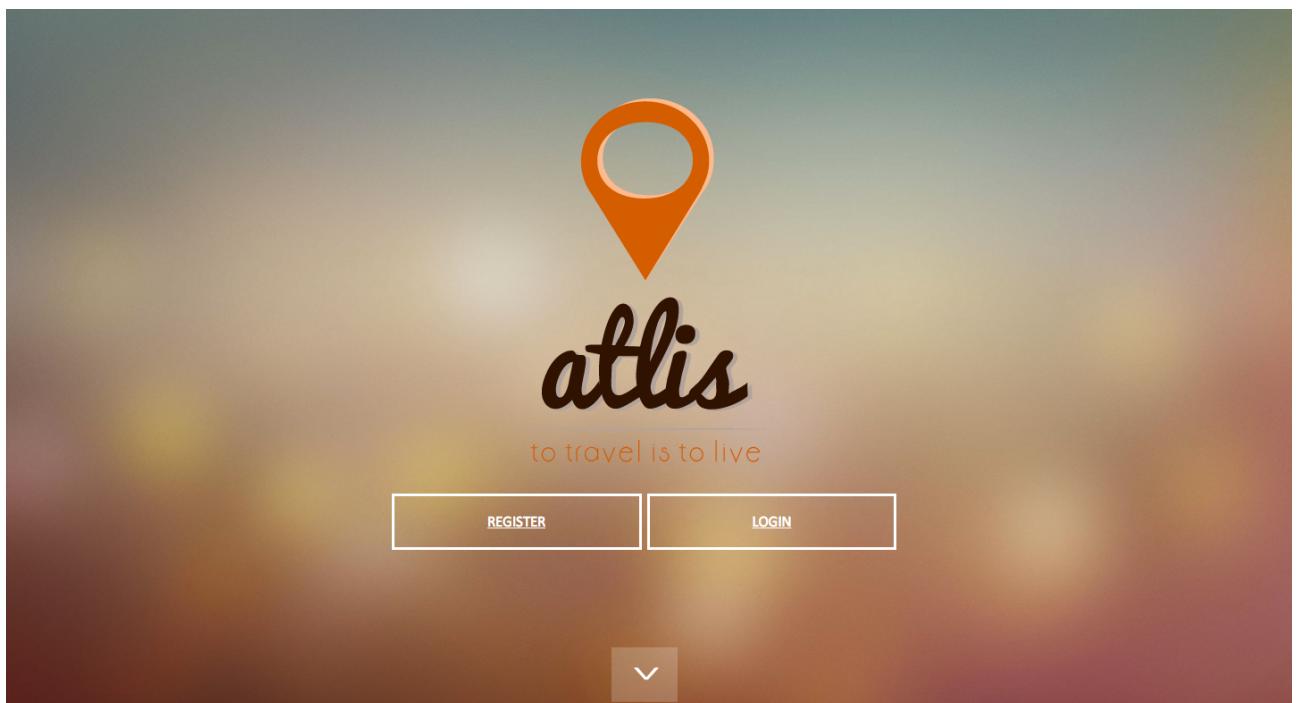


Figure 10

To minimise the clutter of this section, both the login and register buttons been made transparent and are visible with a thin border. This also minimises the clutter round the strong branding presence on the site.

The page itself has been split into multiple sections allowing for a clean and clear layout that draws the user to read the most important sections. To navigate through format the firsts section, a translucent arrow has been included. This will allow the user to quickly jump to then next section. A jQuery Plugin has been used here to create a nice scrolling effect. These type of arrows and shortcuts are becoming an increasingly poplar design pattern on the web today so most users will have come across this type of scrolling before especially given the age group of the intended users. (See user personas).

The titles that have been used are all uppercase to make more of an emphasis. The brown from the logo colour palette has been used to reinforce the ideologies behind the branding across the website.

The chosen type face that has been used across the site is Calibri . Calibri is a San Serif font that is useable on the web. It is clear and looks all in both uppercase and lowercase. 1.5 linespacing has used as it breaks up the copy in the site more and makes more inviting for the user to read.

Icon design has been introduced in the section where the page explains to the user how to use the site in for easy steps (the fourth one being go and explore). Each icon represents the task that the user will be doing in a visual way for example a mechanical clog has been introduced here to represent customisation of settings. Again the use of icons for functions like this are becoming increasingly poplar and user are more receptive to using icons to navigate their way round the application. The icons on the homage are a great example in demonstrating how icons can aid the designs spacing and X height and with of an element.

“ When used thoughtfully, icons can aid navigation, highlight important areas and provide feedback or instruction.”

Source: [Icon Handbook, John Hick, page 27.](#)

Erin-Katie Strapp

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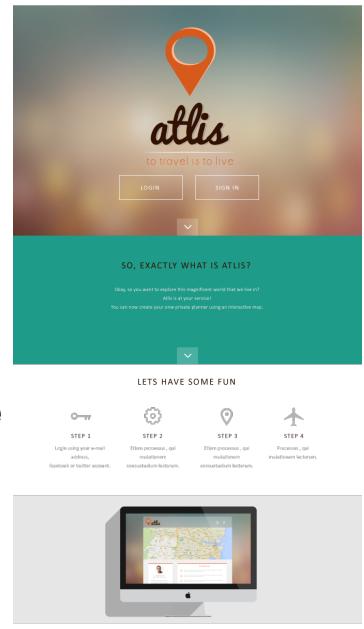


Figure 11

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As you will see through the rest of the designs, icons have been used where possible to help aid ‘User Workflow’ throughout the project as most users don’t take the time to read all of the copy on a site. This helps minimise confuse and makes the user interface more intuitive.

Figure 11 shows the final design of the implemented homepage.

3:1:2:6 Profile

During the early stages of the design the user profile was designed to have a navigation type header using the brown from the logo as well as a map with a customised colour palette. The customised map was one of the original objectives that was originally defined at the start of the project. However it was a big concern that the user profile feels too different to the homepage and may even make the user feel that they have went to a different site.

After having looked at the first previous designs it was decided mid project that the user profile needed to be redesigned. To achieve this successfully, paper prototyping needed to be looked at again (**Figure 12**). The following picture shows the new sketches of the user profile. One aspect was particular concern form the first set of designs is that there wasn’t enough attention focussed on the responsive design of the site. As you can see on the wireframes, an alternative responsive layout has been looked at.

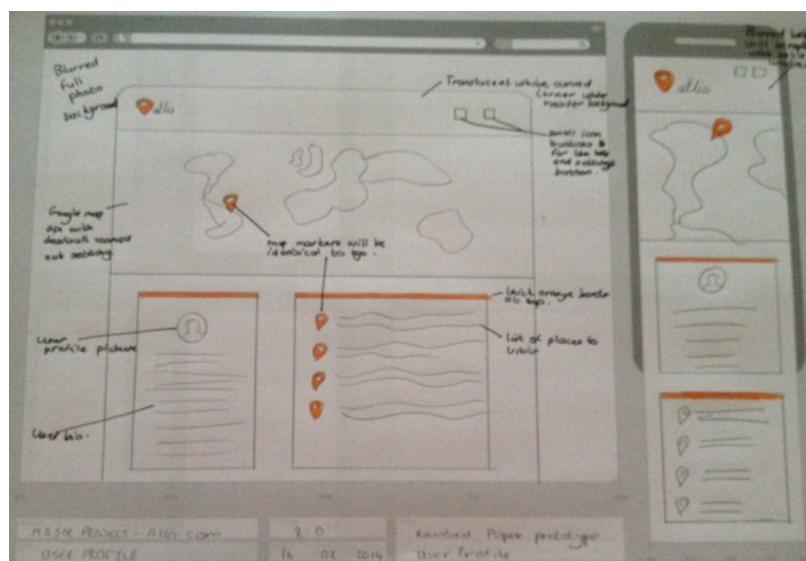


Figure 12

It was important that the design of the profile page has as many similarities as possible to the homepage. The biggest one that was introduced to the newer profile design, is the use of the blurred background image that was used on the homepage.

To address the issue of the old header being too bold it was decided that it would be a nice idea if the header had a reduced opacity. This makes the main page content feel more attached to the background image without upsetting the logo (**figure 13**).

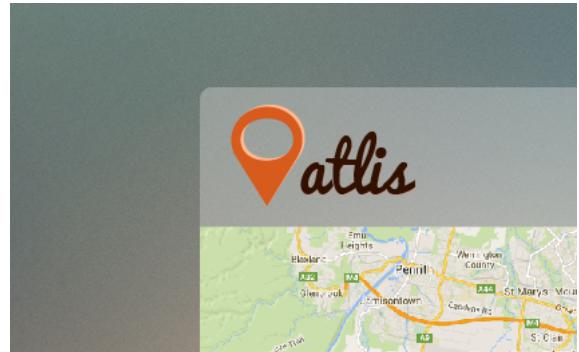


Figure 13

As mentioned previously, it was stated in the earlier project objectives that it was important that the map was styled and tailored to the site's brand. However after reviewing the previous design it was a concern that by costuming the style of the Google map API it would be getting dangerously close to making the design of the profile tacky and the map would clash with the already bright and colourful brand. Therefore it has been changed to use the google map style. The style of the google map will also add ease of use for the site's users as most internet users are familiar with Google maps and its interface.

The marked that are used on the map have been customised to be the same as the marker used in the log. This helps establish brand ownership through the entire page. A drop shadow has been added to the logo which was saved as a transparent PNG file. This helps the marker standout and brings the map to life more.

Underneath the map on the user profile page is where the information that is saved into both the user and marker tables will be displayed. The brand consistency has been kept with the two info boxes by creating a simple orange border along the top. The text box background colour is white to make the content easy to read without being too distracting. The two boxes have been placed on a light background with a slight drop shadow using CSS3 to make them subtly stand out and not get lost in any possible page clutter.

The avatar picture for the user profile has been placed inside its own div which acts as frame to add CSS3 radius properties which is a more efficient way of editing images that

the user uploads without using jQuery and Ajax to do the work in back ground which ultimately will slow down the image upload process.

In the first set of designs it was mentioned that makers would be used as a bullet point for the items on the user's travel list. However during the implementation these were dropped as it was realised that they would be taking up unnecessary page space. To ensure that by taking out the marker bullet points, the name of the location was then changed to uppercase and the orange colour has been applied. This works really well as it allows the user to differentiate between the description and the name at first glance. This therefore makes the site easily read.

It was highlighted during the early phases that the user profile will have a drop down list allowing the user to access help, edit their profile and logout. This still exists however rather than it still be powered by query , it was discovered that CSS3 would be better suited as it takes less time for the browser to process as well as it is more efficient to implement . This ultimately buys the developer more time to trouble other issues with the design implementation of the project.I have kept the idea of using a jQuery drop-down/dialogue style box when the user clicks on the help or settings icon in the header.

As mentioned previously, I had stated in my earlier project objectives that it was important that the map was styled and tailored to the site's brand. However after reviewing my previous design I was worried that by costuming the style of the Google map API I would be getting dangerously close to making the design of the profile tacky and the map would clash with the already bright and colourful brand. Therefore I have decided on using the default google map style. The style of the google map will also add ease of use for the site's users as most internet users are familiar with Google maps.

Appendix 3 shows the final design of the user profile after implementation. The visual design issues that the project was faced with in the project design were successfully overcome particularly when it came to making the profile page and homepage feel like they belong to the same site, as this was a concern after the first design report in January.

3:1:2:7 Forms

From the beginning of the project, it was recognised that the design of the forms of the site would be an important aspect as it is one of the first tasks that the user will perform when they attempt to login/register with the site. During the design of the project, the idea of having the forms appear in pop-up windows or in separate pages was looked at. Ultimately the decision to include the forms in pop-window was made as it makes the user journey shorter and more efficient.

The login and sign up forms are accessible through the two options that have been clearly marked on the homepage. In the initial designs it was decided that the forms would direct the user to a new page which would display both forms side by side to make it easier on mobile devices.

The modal.js was used to create the jQuery pop-up box (**figure 14**). This pop-up was an ideal pop-up to use as it stays in the centre of the screen and is still usable when used on small screen sizes (**figure 15**)

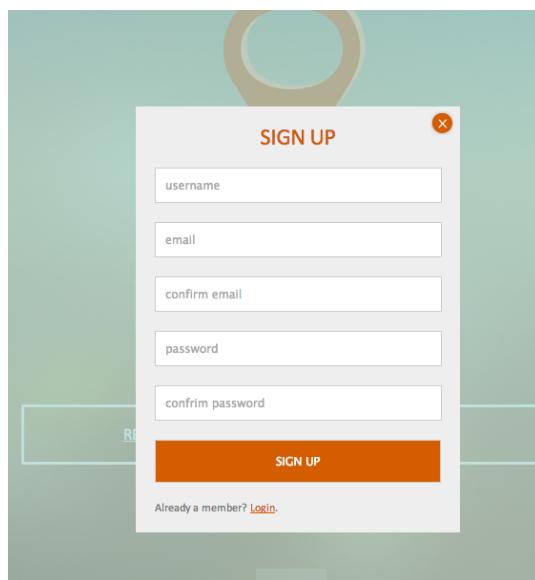


Figure 14

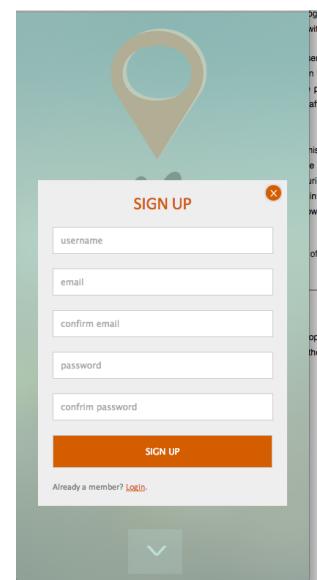


Figure 15

The z-index overlay was used within the jQuery plugin. A pale green was chosen as it is a nice contrast with the brand colours that is already used on the page.

To save space and help the user identify the correct field name, placeholder text has been used. However upon implementation of the form design, it became apparent after

speaking with Chris Murphy, that the placeholder text needed to be more descriptive and ‘human friendly’ to help pull together the story behind the site.

To add ease of use on mobile devices a mobile first approach was taken with all of the forms on the site. Various mobile friendly features have been implemented such as placeholder text. Using placeholder text will not only reduce the amount of time the user focuses on a form label to associate the correct input box. It also saves the amount of screen space that is needed for the form. The new HTML5 features have been taken advantage here as well, by selecting an appropriate keyboard that the user needs for the individual field. For example if the user is filling out the e-mail field, the email friendly keyboard will show on their mobile device. This will save the amount of buttons the user will need to press to complete the form and will hopefully reduce login and sign-up time.

3:1:2:8 Email

One thing that was explored during the design phase of the project was the email correspondence that the site would use to keep in contact with registered users.

During the research into email design. Many lessons were learned such as there is a thin line between spamming the registered users and being helpful and friendly. However it was also discovered that by keeping correspondence with users can help define our brands voice as well as continue your brand’s story.

The only e-mails that were initially planned was to send to users the following:

- Welcome e-mail - this will be sent once the user has successfully registered with the site. It includes the register token link which allows the user to activate their new account
- Password reset - If the user has the misfortune of forgetting their password they can simply enter their email to trigger an automated link that will allow them to create a new password.

It was planned that every e-mail correspondence that the site has with the user would be styled using the Atlis brand. It would have been nice to include a character similar to the one that Mail Chimp uses or even a character style tone of voice like [moo.com](#) uses however due to the limited time assigned to developing the brand there wasn’t enough time to explore this aspect. However this would be looked at when the project is revisited again after graduation.

it was decided to make the e-mails that would be sent to the user simple so that the user wont confuse it as spam. However it would have been a good idea to style the email according to the brand. **Figure 16** shows a prototype that was designed for the project. Due to time constraints, the register email couldn't be styled. This would be something to look at after final year when the project is re-evaluated.

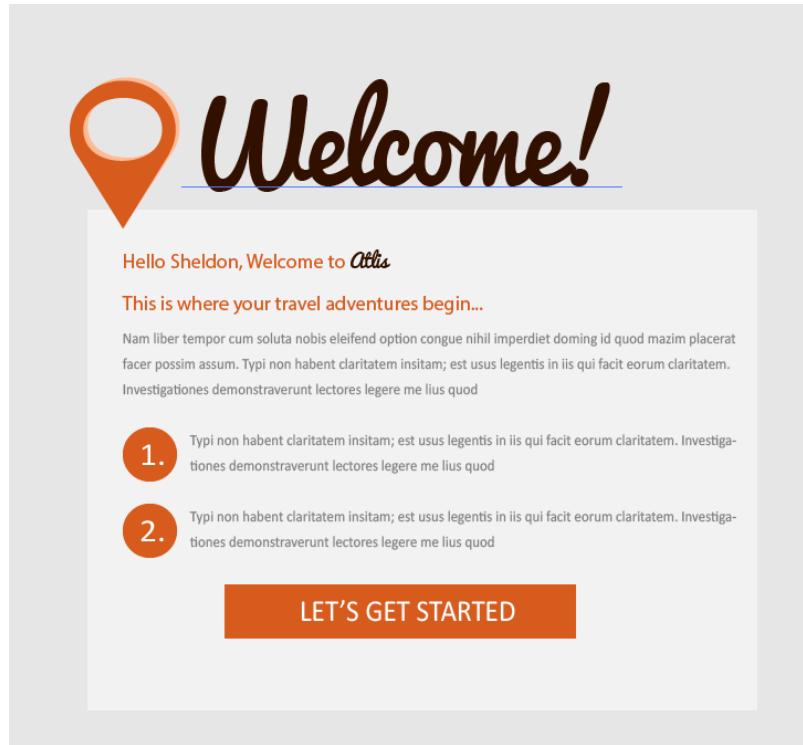


Figure 16

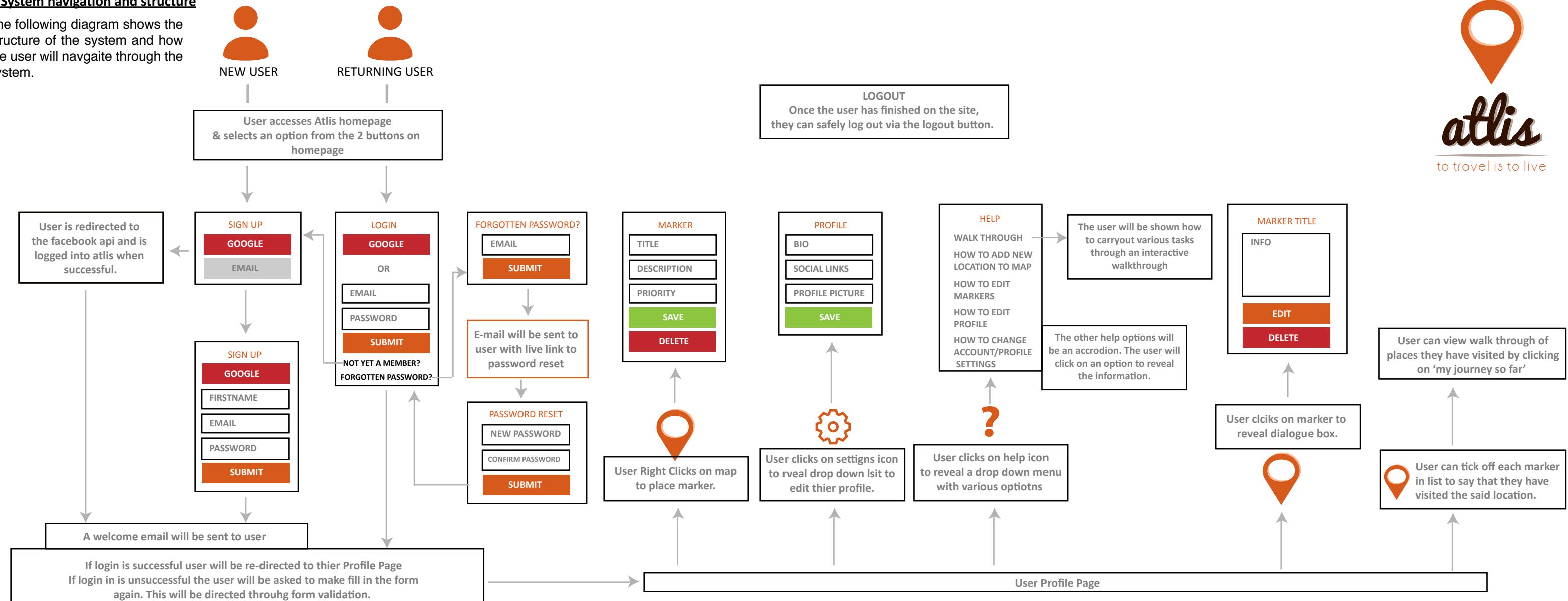
User Journey

The purpose of a user journey is to allow for careful planning, research an intricate design principles into usability to applied to a product. This was the first time that the developer/designer has undertaken such a task and the successfulness of such an experiment in the usability and functionality testing of the project. The results can be seen in the testing section.

The following page shows the design user journey. After having researched number of sites such as TripTease, the user journey has been refined to reflect the success of such sites.

6: System navigation and structure

The following diagram shows the structure of the system and how the user will navigate through the system.



ERROR CATCHING

The htaccess file will be designed around error handling and will have page redirects for 404 and 403 errors.
The htaccess file will also be designed around stopping the system's directory from hacking.

3:2 System Design

The following section of the report will look at a detailed design of the system and the benefits that the system has had on the overall architecture of the system. This section of the report will also look at suggests improvements to the overall design if the system.

The following areas will also be explored in regards to the system design:

- Client Server Model
- Model View Controller
- Database Design
- Design Patterns

3:2:2 Client Server Model

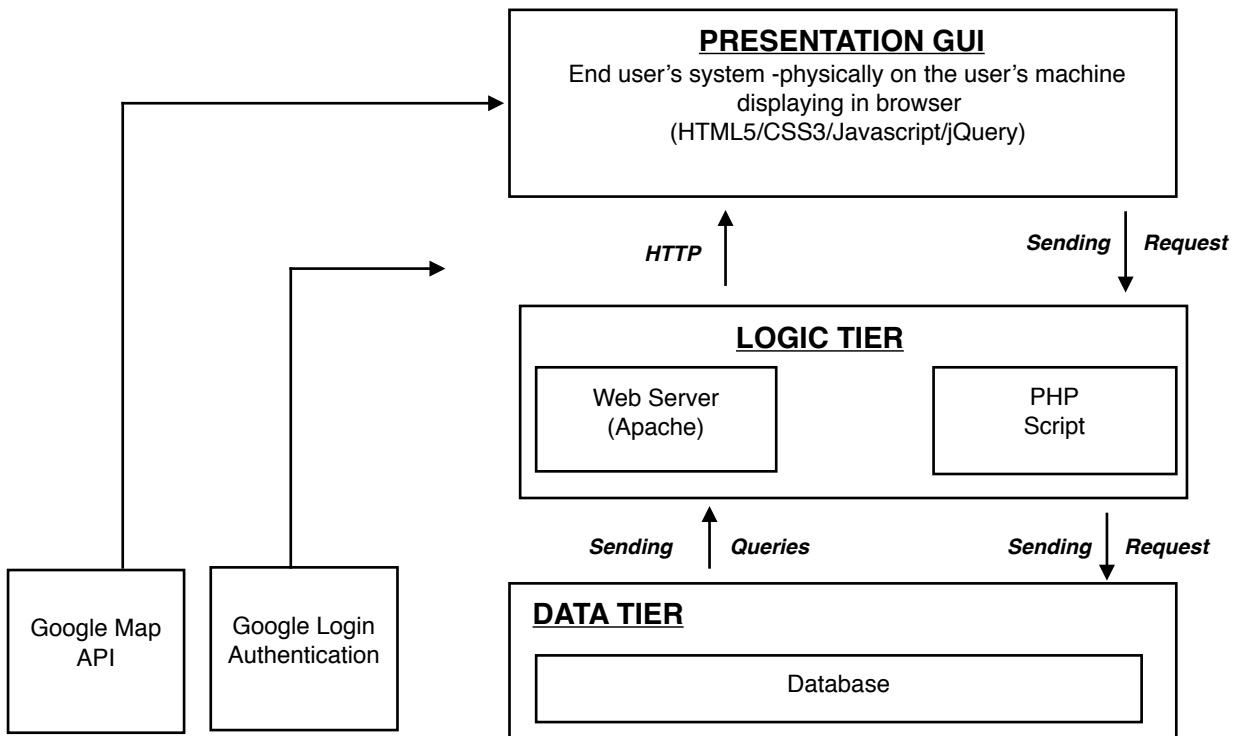
The rolling section of the report will look at the spinet server model that has been used and adapted to suit the application,

Chosen Architecture

As specified in the previous system design report a ‘MultiTier System Architecture’ has been elected to build the site around This has not changed as a presentation tier, logic tier, data tier was needed to give more flexibility of adding technologies such as APIs and SASS.

Revised System Architecture

Figure 2 shows the system architecture with the technologies that had previously explored.

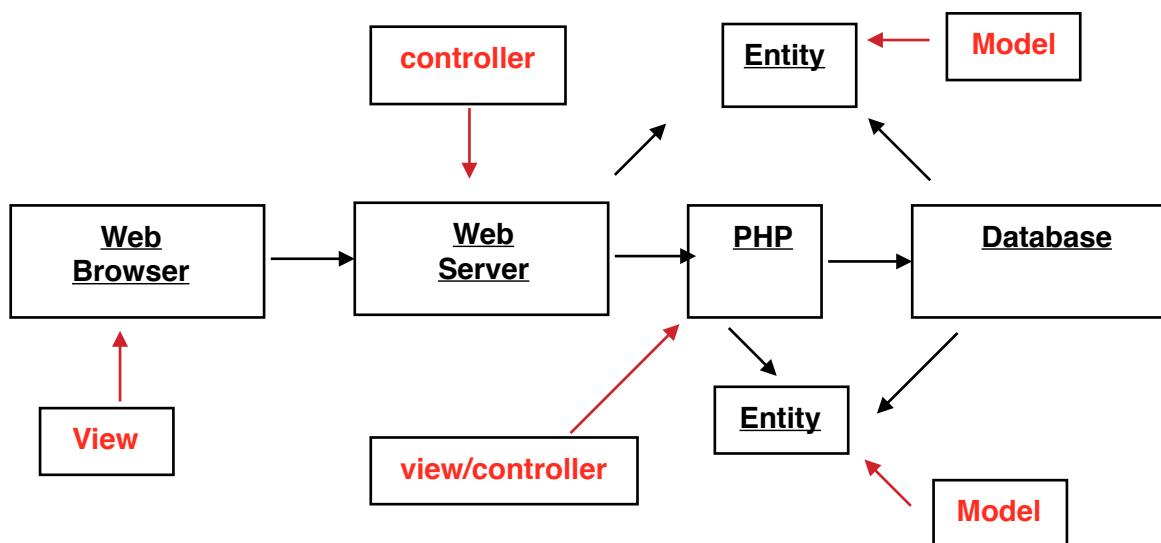


3:2:3 Model View Controller

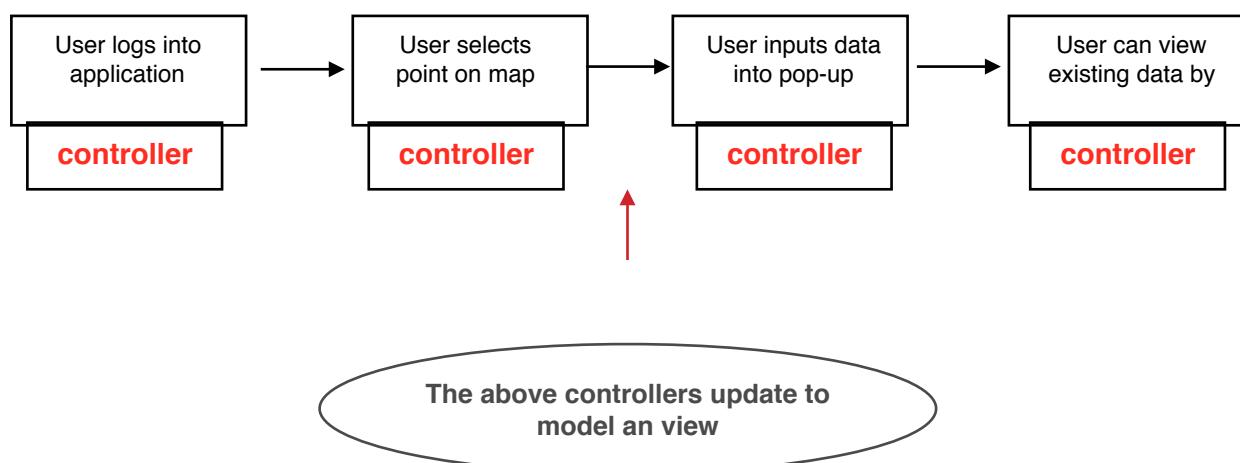
The model view controller is a widely used software design pattern within the software engineering/development world used for designing user interfaces. The model view controller is beneficial to any project as it allows the system to be planned out in three separate stages:

- Model - The model's job is to notify the view state when the controller has sent a new request or changed a command.
- Viewer - The viewer requests information from the model and displays it to the user. This is the presentation GUI tier of the system's architecture.
- Controller - This is the link between the user and the model that sends commands to the model.

The following Diagram shows a general MVC of the applications architecture.



The following MVC diagram shows how the main function of the application will work using the model View controller design pattern.



3:2:4 Model View Controller

The application's database mainly uses one to one relationships between tables. However the user table uses a one to many relationship with markers table as one user can have many markers:

- One user, one activation email
- One user, many markers

User Table

The user table stores all of the data needed for the user's registration/login and their basic information for their profile page such as their avatar and a brief biography. The following diagram shows the MySQL syntax for the table.

```
id INT NOT NULL AUTO_INCREMENT,  
ext_id TEXT,  
username VARCHAR(16) NOT NULL,  
email VARCHAR(255) NOT NULL,  
password TEXT,  
lastlog DATETIME NOT NULL,  
signup_date DATETIME NOT NULL,  
activated ENUM('0','1') NOT NULL DEFAULT '0',  
avatar VARCHAR(255),  
full_name VARCHAR(255),  
country VARCHAR(255),  
bio VARCHAR(255),
```

Activation Table

The activation table was designed to communicate with the user via an email which enables them to click a link to activate their account. The user's email is taken from the user account which will be found using the user's id. A token is sent as a link to the user's email account. When the user clicks on the link to activate the account the user's record will be removed from the activation table and the activation field in the users table will be changed from 0 to 1 after the account is activated.

```
id INT NOT NULL AUTO_INCREMENT,  
user VARCHAR(255) NOT NULL,  
token VARCHAR(255) NOT NULL,  
ipaddress VARCHAR(255),
```

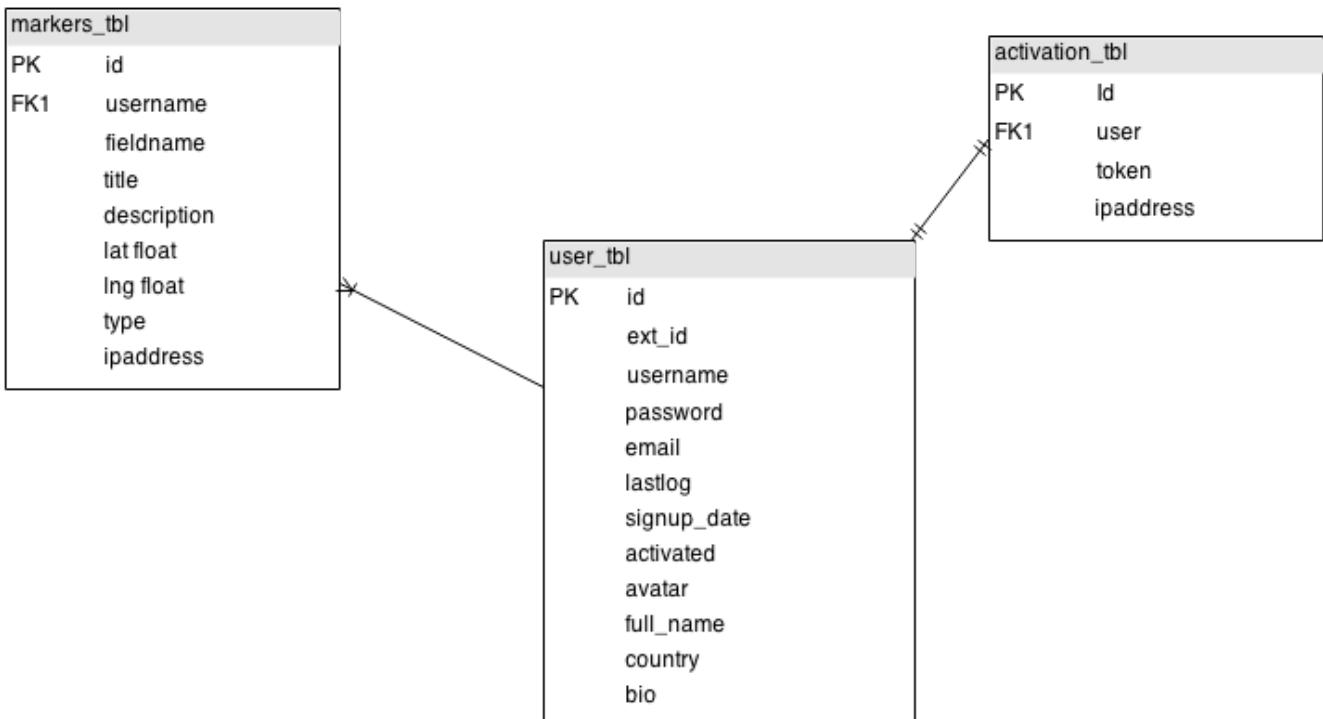
Marker Table

The purpose of the marker table is take the data that the user has inputted into the new marker form using the map API. The table will store a title, description as well as the longitude and latitude coordinates of the marker.

```
id INT(11) NOT NULL AUTO_INCREMENT,  
username VARCHAR(16) NOT NULL,  
title VARCHAR(255) NOT NULL,  
description VARCHAR(255) NULL,  
lat float(10,6) NOT NULL,  
long float(10,6) NOT NULL,  
type VARCHAR(50) NULL,  
ipaddress VARCHAR(255),
```

ER Diagram

The following diagram shows the relationships between the tables within the Atlis database.



4. Implementation

The following section of the report will look at the implementation of the application. Here tool selection and tool use will be looked at as well as notable achievements and changes that have been made to over come problems with the implementation of the system.

4:1 Technology Tool Selection

The following section of the report will look at the tools and technologies that have selected for the application

4:1:1 Technologies

The following section will look at the technologies that have been used to build the application as well as the the technologies that were planned but were never implemented.

Data Handling

The technologies that had been originally planned for storing and handling data that is needed for the application has remained the same through out the implementation of the site. The server that has been used to run the application is an Apache Web server which a commonly used HTTP we server developed in 1995.

A MYSQL database had been used with PHP PDO to write and retrieve the data to and from the database in the server side of the application.

MySQL is the most popular database system use which runs on the server side of a site. Using MySQL is a perfect database to use for the site as it is suitable for small and larger websites. At the moment the site will be very small however seeing that this is acting as a ‘mini project’ for a larger idea that is in mind. Using this type of database will be perfect as it will be flexible and will be able to grow as the site grows and becomes more complex. Another advantage to using MySQL as the sever side database is that is simple and easy to use which is perfect for the project developers skill set.

PHP was planned an implemented for the scripting language for the site. PHP is the most popular scripting language to be used with a MySQL database. PHP is reliable and flexible language which can be developed quickly for any site. A number of sites with a social networking nature to use PHP, such as Facebook. PHP offers a Number of security features to make a site secure which is a large priority for the system as it will be handling personal user data such as email addresses, passwords etc.

To make the site as future proof and as efficiently organised as possible PDO was [planned an used (PHP Data Objects)]. This is an object orientated design pattern which is used in PHP as a more advanced to organise and group reusable code. This is done in three different methods:

- Encapsulation
- Inheritance
- Polymorphism

Even though PHP is relatively secure there are a number of different ways in which a PHP and MySQL application can be hacked. Some of which include;

- SQL injection
- Directory Transversal
- Authentication Issues

An number of of security measures have been take to ensure that the site his as secure as possible. These will include the following:

- Using the .htaccess file to lock down the file directories in the site to protect against people getting to know the site's file structure.
- HMAC and BCRYPT have been used to encrypt the users password. This involved the creation of a random security key that will be stored in a key.txt file. It is important that the key.txt file is moved out of the root directory or deny access through the .htaccess file. This means that even if the file directory of the site is hacked the key.txt will not be accessible by the hacker.

Front-end Technologies

In this section of the report, the front-end technologies that were planned and the technologies that have been implemented into the site.

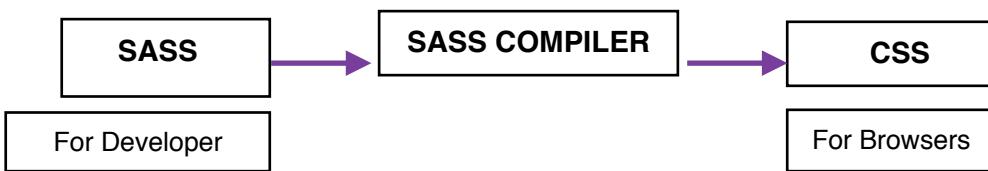
HTML5 and CSS3 have been used for the basic mark-up of the site. The main reasoning behind this is to allow the site to be built using the latest emerging web technologies which enables the system to be as future proof as possible. By using HTML5 it allows the site to have access to a number of different features and capabilities that ensures that the site is accessible and user friendly. An example of this would be optimised form fields which automatically detects the type of data that the user needs to input such as an email address or password. The form field type will change the type of keyboard a user will have access to on mobile device. For instance if the user is inputting an email characters such as the '@' symbol will be present on the keyboard without having to navigate to a secondary keyboard.

As mentioned previously CSS3 was planned and implemented. This meant that the site uses less images such as rounded corners as CSS3 has the capabilities of doing this in the browser from me. It was also used to replace a jQuery dropDown menu on the profile page. However with new CSS rules such as the ones that come along with CSS3 means more CSS writing. To overcome this issue and making writing CSS more efficient the use of SASS has been successfully introduced to the site.

SASS was created by Hampton Catlin in 2006. The main purpose of using SASS is to simplify workflow using a DRY (don't repeat yourself) approach. This in turn makes amending and maintaining easier and more efficient when it comes to writing CSS. SASS does this in a number of ways, of which include:

- Variables
- Mixins
- Nestings
- Selector inheritance
- Extending Selectors

In order to run SASS successfully, apps such as compass need to be installed (<http://compass.kkbox.com/>). Browsers don't have the capabilities to read the SASS file extension (.scss), therefore by using the compass app this will convert your SASS into 'browser friendly' CSS files. Apps such as compass will need to run in the background of the developers machine in order to update CSS files from SASS files in real time. The following diagram demonstrated how SASS works.



In addition to using CSS3 and HTML5 a modenizr.js has been implemented in order for the elements included in the mark-up to be compatible across older browsers and different platforms. In addition to the main.css file the following stylesheet have been included:

- normalize.css - This allows the 'user agent stylesheet', a default stylesheet included in most browsers, to be reset. This will make it easier when adding styles to the site as it there won't be any rules to inherit from the browser.
- media-queries.css - To reduce the size of my main stylesheet this includes my media queries in a separate stylesheet. This also makes it easier when amending styles for smaller screen size.
- font.css - It was specified in the site's design report that a number of customised web fonts needed to be introduced to the site. This will require the @font-face rule to be used multiple times therefore creating a separate stylesheet will make it more efficient when amending.

It was initially stated in the precious design reports that A grid.css file was going to be introduced. However because the developer has properly introduced the use of the media query stylesheet the grid.css wasn't needed in the site

To make the site easier to use as well as more appealing to the user group, a number of jQuery plugins have been carefully selected and implemented into the site. The main one being the modal.js plugin. This was used to create the pop-ups for the web forms in the site. Other plugins include; parallax scrolling on the homepage and the help plugin on the user page to make the help guide more interactive and immersive to the user.

APIs

During the system design phase of the project it was highlighted that the project would include three different APIs. These included Google Maps, Facebook, and Google Plus. However during the implementation there were a number of issues creating the basic login system itself so the Facebook and Google maps have been left out for now.

It had initially been specified early in the project that a different map API other than Google was going to be used. However during the prototyping stages of the project it was realised that by not using the Google map could potentially hurt the success of the project as it provides more support, security and has a lot of flexibility when using it for the site. However if the site does grow Google will start charging the site for use of the API which would be an added expense.

The Google map API has excellent online documentation with many code examples which has therefore made it easier for the developer to implement the map into the application. The API required the use of Javascript, PHP and AJAX to function fully in the application.

4.1.2 Developer Tool Selection

The following section looks at the tools and programmes that have been used to aid the development of the application.

IDEs

The project developer normally prefers to use Sublime Text 2 because of the dark development background. However because the chosen technology to write CSS was SASS the IDE needed to be changed to one that supports the .scss file type. Adobe Edge Code was then used to develop the system.

In order to compile and convert the Sass code the Compass.app was used. This ran in the background watching the project folder and automatically converted the .scss file into a css file.

Browser Development Tools

in order to cut down development time and to help troubleshoot in the browser environment, Chrome developer tools and firebug was used. However Chrome was the main tool.

The developer tools helped solve any javascript/jQuery bugs as well as making the creation of CSS more efficient. The developer tools also allowed the speed of documents being loaded by the browser to be tested through out the development of the application.

4:2 Technology Tool Use

The following section of the report will discuss the use of the previously listed technologies and how successful they have been in helping achieve the project goals. Each section of the application will be looked at individually. **PLEASE NOTE: In order to learn the skills to build the login system a you tube tutorial was used to help guide the developer ()**.

Setting-up Database

To begin the database set-up, the db_connect.php file was created. As mentioned previously . It had been specified that the site is to be built using PDO as this will ensure the security of the site. This needed to be put into action from the beginning of the implementation which includes the connection file. **Figure 17** shows the PDO script used to set-up the connection file.

```
<?php

//PHP CONNECTION FILE CREATES A CONNECTION TO THE ATLIS-MAPS DTB.

//INITIALIZE DTB VARIABLES
$dtb_host = "localhost";
$dtb_username = "atlismap_estrapp";
$dtb_pass = "03Gm92hc";
$dtb_name = "atlismap_atlis";

//TRY CATCH BLCK TO PICK UP ANY CONNECTION ERRORS WITHIN THE DATABASE.
try{
    $dtb = new PDO('mysql:host='.$dtb_host.';dbname='.$dtb_name,$dtb_username,$dtb_pass);
    $dtb->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION);
}
catch(PDOException $pe){
    die('Connection error, because: '.$dtb->errorInfo());
}

?>
```

Figure 17

PDO has three different types of error handling:

- PDO::ERRMODE_SILENT - When an error occurs within the PDO script this will do nothing. It won't show an error message when caught unless specified by using `errorInfo()` or `errorCode()`.
- PDO::ERRMODE_WARNING - When an error occurs when executing the script and PHP error message will show without halting the script.
- PDO::ERRMODE_EXCEPTION - When an error occurs using this method, it will throw a PDO exception and its properties will be changed to show the error message which allows the problem areas to be quickly identified as the script will be immediately terminated when the errors occur, therefore this makes it easier when debugging

during the development of the script. This type of error handling has been used in the try catch block of the connection file because of its ease of error catching. Thankfully there were no issues for this to be used.

During the system design phase of the project, the application was placed on an live server. Due to the complexity of some its functions, such as the activation email. The site was placed in a server outside of the university as it was a concern that it would be possibly a risk to the project that this may have caused problems due to permissions on the university servers.

After having successfully created the database connection, the tables then were created. Rather than creating the tables directly in PHP MyAdmin, a php file was created using SQL syntax to crete the tables. The advantages to creating the tables this way is that it can be easily recreated on a different server by running the php file. **Figure 18** shows a sample from the create_tables.php file.

```
// ++++++ USER ACTIVATION TBL ++++++
// THE OPTIONS TBALE IS DESIGNED TO ADD AN EXTRA LAYER OF SECURITY TO THE SITE.
// THIS WHERE THE DATA WILL BE STORED TO ASK THE USER ADDTIONAL SECURITY QUESTIONS
// WHEN CARRYING CERTAIN FUNCTIONSSUCH AS CHANGING THIER PASSWORD.

// SQL SYNTAX TO CREATE USR ACTIVATION TABLE
$tbl_activation = "CREATE TABLE IF NOT EXISTS activate (
    id INT NOT NULL AUTO_INCREMENT,
    user VARCHAR(255) NOT NULL,
    token VARCHAR(255) NOT NULL,
    PRIMARY KEY (id)
)";

// IF STATEMENT TO VERIFY IF THE TABLE HAS BEEN SUCCESSFULLY CREATED
if ($dtb->query($tbl_activation)){
    echo "SUCCESS creating activation table";
} else{
    echo "ERROR creating activation table";
}
```

Figure 18

Figure 19 shows the create_tables.php file running. This allowed the php to be tested even before php MyAdmin was tested.

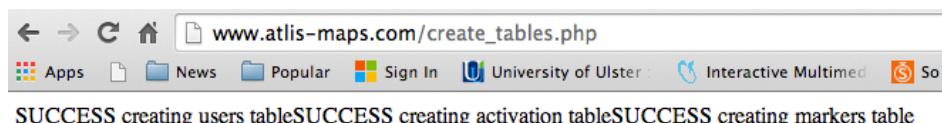


Figure 19

.htaccess File

To help ensure that the file directory is secure in the root folder, the ht.access file was created. This helps ensure that no-one can access the folder structure which would be a breach of security as they would then be able to access the key.txt file secures the

password encryption. the htaccess file also contains re-direct pages for both 404 errors and 403 errors. This helps to make the site more ‘user friendly’ as the customised pages can offer support fro users who aren’t technically inclined.

Homepage

The homepage is the first page that the user comes too when they access the site. The homepage was built using a lot of HTML5 elements as already stated early in the system design section of the report.

In the head of both the homepage and the profile page there has been ‘no-js’ detection included. this works with the modernizr.js file runs, it removes no-js and replaces it with js which allows the CSS to detect whether or not javascript has been enabled.

Both the the profile and homepage call the following js files that are stored in the ‘scripts’ folder:

- modernizr-2.6.2.min.js - This allows the HTML5 elements and the CSS3 elements to be supported even ion older browsers which is adds extra insurance that the elements on the page will work in met modern day browsers. [\(6\)](#)
- jquery-1.10.2.min.js - This is the link to the latest jQuery library. This should really be included as a CDN link. However the developer would like control over updating the site as testing will need to be a carried out to ensure that any future updates don;t break anything on the site.
- scripts.js - This is the customised script file that is needed to run any javascript and jQuery that is implemented into the application. This mainly included the additional settings and inclusion for any plugins.

In order to encourage the user to view the sections underneath the login and register buttons on the page a scroll arrow has been introduced. The button uses a query plugin called waypoints.js. This allows for the settings to be customised to suite the application.

The plugin us reliant on the following libraries in order to add the query animation etc:

- jquery.stellar.min.js
- jquery.easing.1.3.js

The mark-up for the homepage mainly uses the HTML5 section attribute to separate the different sections within the page. However in order for the modal.js window to work correctly, the form section for both login and the register buttons the forms had to be placed within a section of their own. The sections were then set to display none in the CSS which is then changed using jQuery when the button for the forms are clicked to allow the pop-up windows to show.

Registering a New User

After the database and db_connect file had been set-up and the database was working correctly, the register.php file was then created. The register.php file aims to do number a of things when a new user registers:

- Validate the form. The form will validate to check that the user has completed all of the forms fields, both passwords and both emails match as well as check for invalid characters. The username field is also case sensitive. For example if a character other than a number or letter is used in the password of username field an error will be shown. When the data from the register field is posted to the database the whitespace will also be trimmed using the strip_tags and preg_replace. (**Appendix 5**)
- Encrypt the password - The register form has been set-up to use HMAC encryption on the user's password. HMAC stands for 'key hash message authentication code'. HMAC uses specific construction for calculating an authentication code. It involves Cryptographic hash function. In this case the cryptographic hash function being used is SHA512 which is part of the SHA2 family. Examples of other functions that can be used are MD5 and SHA1. However these aren't as secure as SHA512. This is because MD5, in particular isn't as complicated and is therefore much more easily broken. However MD5 has been used to encrypt a secure token that is generated to allow the user to activate their account. Because the generated token is temporary, it didn't warrant HMAC encryption. (**Appendix 6**)
- Save user information to database - When a new user has been registered, their information will not only be inserted into the users table but it will also generate a temporary record into the activation table. This is where the token discussed in the previous point comes into play.
- Send email - to complete the transaction, an email will be sent to the user. This pulls in the token that has been generated, the user email and the username. It was decided early in the user experience design, that the email that is sent to the user would be

styled so that it holds a strong grading presence. However due to time constraints the email generated for the user was never styled.

activation.php

The activation email is generated as discussed previously by the register.php script. However the activation.php script is where all the magic happens. **Appendix 7** shows the activation script. Here the activation field in the user table will be changed from 0 to 1. This in turn authorises the user to login to the site. The record that was created in the activation table during the registration process is then removed.

Login.php

Once the user has successfully activated their account they can now login to the site using their email and password. The login script (**Appendix 8**) will get the data that the user has entered via the POST method. Both fields use the trim function to get rid of unnecessary white space.

The script then assigns the inputted values to variables. The password is checked against the HMAC encryption. Once the variables have been assigned, a prepared statement checks to see whether the users account is activated and if it exists in the database.

If the user accounts exists, the last log is updated in the database to the current date and time is updated in the user table. By adding in this field, it will make it easier to monitor how frequent the registered users visit the site which will be useful if the site grows in the future.

Sessions and cookies are then created using session variables. If the login is successful the user is then redirected to the profile.php page.

Map API

To assist with the integration of the map API , the documentation provided by Google was heavily used [\(8\)](#). In order for the map to save markers to the database, the map works off two files; map_process.php and map.js.

The map api is linked within the profile.php file via the api CDN link. The project is using the API V3 version of google maps and therefore no API key is required in the new version of the API.

map.js

In order for the map initialise correctly on the profile page a number of customisable options have been set directly to the API. (**See Appendix 9 and comments in map.js**). The first one specified a direct latitude an longitude coordinate. The map was then set to be centred around this point. This was set to central Europe as most users no where that would be even if they aren't familiar with geography.

Both the street and map view of the map have been kept. The reason behind this is that It was decided that this would be a nice feature to include in terms of usability. It allows the user to use the street view to see exactly were they have plotted the marker. This also limits the risk of the user navigating away from the site to find a smiler experience elsewhere.

To allow the user to place the marker on the site, the action has been set to right click. In reflection this may have been better to have this just as click. However it was a concern that this may have made it difficult for users to drag the map when navigating round the api.

When the user right clicks, an info window appears on screen. The info contains a form that allows the user to input information that they would like to insert in relation to the marker.

The marker info, including the form, is processed through to the database using ajax. The google map documentation was used with this to help assist the implementation of the ajax.

Each of the markers on the map are animated when they are placed on the map and they will drop in when the page is loaded. When the user clicks on the map an info window powered by the API appears pulling in information from the database using AJAX and XML.(**see map_process.php** comments for a detailed explanation.)

4:3 Notable Challenges

The following section of the report will discuss any notable changes that occurred from the system design to the actual implementation of the application.

During the implementation of the site a number of issues occurred when it came to implementing user sessions. It was decided in the system design section that the site would be built in PDO to ensure that the site is as secure as possible. However this was the first time that the project developer had used PDO and it proved to be bigger learning curve than had been initially thought. This in turn made the project more challenging than what it should have been.

The biggest challenge in regards to PDO was getting the system to work with sessions. The project aim of making the system secure had been over though and over engineered thus making the login/registration system a lot more complicated than what it needed to be.

As the system currently stands, the login script can create cookies and begin sessions. The sessions can be used to pull in the username to the profile.php. However when the same technique of creating a variable and then assigning the session using the user id or username is used in a prepare query statement with a PDO::PARAM_STR it throughs up a fatal error. A number of different techniques where tried using sessions and select statements. However it wouldn't register the sessions in association the fields such as bio that are stored in the user table.

To try and overcome this obstacle as time was running out at this stage, after spending two weeks of the project time, which ultimately reduced the quality of the application in the other areas. It was time to do go down another route to love this issue. The old login system was ditched to try and build a simplified login system that the sessions could be easily created. The main reason behind this, is that the developer has had more experience with simplified MYSQLi sessions and therefore adjusting a simple PDO statement to work in a simple fashion may have made things easier.

In theory this approach should have worked. However the code would not execute correctly. To trouble shoot the issue echo statements were placed at various points of the code. This helped the developer narrow down that it was the final if statement that was
Erin-Katie Strapp

even trying to execute. At this stage the project was a week away from the final submission deadline, so a time cap was placed on trying to fix the problem to a further day so that other aspects of the site could be completed after having sought advice from project mentor.

During this day a number of outside the box techniques were tested as peer suggestion from the project mentor. Some of these looked the format of the file being upload. The files in question were brought into coda so that it could be checked that the file was an ASCII fie as apposed to Binary as this may affect how the file works. Another precaution that was taken, also using Coda, was to check for hidden control characters.

The third test was to see if the live server that was being had PDO drivers to support the PDO script. In order test this the code seen in **figure 20** runs a PDO statement to check the drivers. This showed that PDO was supported.

```
<?php  
if (!defined('PDO::ATTR_DRIVER_NAME')) {  
    echo 'PDO unavailable';  
}  
elseif (defined('PDO::ATTR_DRIVER_NAME')) {  
    echo 'PDO available';  
}  
?>
```

Figure 20

After a final day of trouble shooting, and seeking expert advice from various academic staff (including a PDO expert) this issue was still not resolved and time could not be spared to continue trying to get to the bottom of the issue.

```
$stmt = $dtb->query('SELECT * FROM markers');  
$markerName = array();  
$markerDescription = array();  
while($row = $stmt->fetch(PDO::FETCH_ASSOC)) {  
    $markerName[] = $row['name'];  
    $markerDescription[] = $row['description'];  
}  
  
$stmt = $dtb->query('SELECT * FROM users WHERE id="17" LIMIT 1');  
while($row = $stmt->fetch(PDO::FETCH_ASSOC)) {  
    $full_name = $row['full_name'];  
    $bio = $row['bio'];  
}
```

Figure 21

Therefore the site isn't a fully functional prototype as initially planned. The user can register, log into the system and update their information in the back-end via the bio.php form however as far as the map interaction and showing the data related to the logged in user goes. The ids of particular fields have had to be called inside a PDO::FETCH_ASSOC with a prepared sql query(**Figure 21**). This works fine with using static queries from the database. However it's won't be able to demonstrate how this would interact with individual user accounts which is very disappointing considering the learning curve up until now.

Due to the time spent trying to solve the issue with the sessions the remainder of the planned functionality that was planned for the user profile suffered as a result of this. An interactive help tutorial was planned to help explain the purpose of the site better. This would have been implemented through a jQuery plugin.

Another feature that also resulted was the Ajax that was to be used to load the data to the travel list under the map.

4.4 Notable Achievements

Even though a tutorial was used to help learn the secure PDO login. The fact that the developer who had no previous skills in this area managed to create a register and login system that uses HMAC security encryption for the password, was very big achievement.

Another big achievement with the implementation of the code was the fact that the developer got the Google Map API saving marker information to the database. using XML PHP and AJAX.

Prior to the completion of the project, the developer had no previous experience of using CSS compilers and managed to set-up and use SASS correctly.

5. Testing

The following section of the report will look at the websites testing. It will discuss testing approach, ethnology used, test results, user survey responses.

5:1 Testing Approach

A number of different testing approaches has been used. The site mainly used the Black Box testing method and some White box testing.

Black Box Testing

The black box testing method means that the tester tests the functionality and doesn't dive deeply into infrastructure of the system. The tester would normally carryout a series of test cases without any knowledge of what is happening in the background. This is a great way of getting to know the system from a user's perspective rather than a developers perspective as the tester will only have the expected outcome of the software.



This was ideal for the application as it has been stated that the project was going to spot a user centred design approach.

White Box Testing

White box on the other hand looks at the internal infrastructure of the system ensure that the database has been tested etc. White box testing is usually carried out by a skilled tester with a knowledge of what the code is doing in the back ground. This is an important type of error catching before it breaks an important function on the system.



Usability Testing

It was stated that the project would take a 'users centred design' approach to the creation of the application tool. This has been the plan from the start but actually seeing if this has been the case is the real test. To test if this was successful integration of black box testing has been used as well as user surveys.

5:2 Testing technologies and tool use

Various technologies have been used to test the application. These included a mix between online tools, user surveys as well as physical testing software. Even thought the

project developer has had experience with some testing. The testing has never had to be so thorough. The following section will explore the different mediums of testing that have been used.

Google Developers - PageSpeed insights

Google PageSpeed insights allows you to look at speed and the quality of user experience the user experience that user gets when they look at your site both on a mobile and desktop. **Figure 22** and **23** shows the results that were given when the URL for the application was entered.

This test was very insightful. It allowed an accurate analysis to be made quickly and easily of the site's performance. This was perfect due to the fact that a lot of time had been lost

The figure consists of two side-by-side screenshots of the Google PageSpeed Insights mobile and desktop reports. Both reports show a score of 100/100.

Mobile Report (Figure 22):

- Overall score: 100 / 100 User Experience
- Issues found:
 - 1 Should Fix: Use legible font sizes (with a link to fix)
 - 3 Passed Rules (with a link to details)
- Overall speed score: 100 / 100 Speed
- Issues found:
 - Congratulations! No issues found.
 - Avoid landing page redirects (Your page has no redirects, with a link to learn more about avoiding landing page redirects)
 - Eliminate render-blocking JavaScript and CSS in above-the-fold content (You have no render blocking resources, with a link to learn more about removing render blocking resources)

Desktop Report (Figure 23):

- Overall score: 100 / 100 Suggestions Summary
- Issues found:
 - Congratulations! No issues found.
- Performance recommendations:
 - Avoid landing page redirects (Your page has no redirects, with a link to learn more about avoiding landing page redirects)
 - Eliminate render-blocking JavaScript and CSS in above-the-fold content (You have no render blocking resources, with a link to learn more about removing render blocking resources)
 - Enable compression (You have compression enabled, with a link to learn more about enabling compression)
 - Leverage browser caching (You have enabled browser caching, with a link to learn more about browser caching recommendations)
 - Minify CSS (Your CSS is minified, with a link to learn more about minifying CSS)
 - Minify HTML (Your HTML is minified, with a link to learn more about minifying HTML)
 - Minify JavaScript (Your JavaScript content is minified, with a link to learn more about minifying JavaScript)
 - Optimize images (Your images are optimized, with a link to learn more about optimizing images)
 - Prioritize visible content (You have the above-the-fold content properly prioritized, with a link to learn more about prioritizing visible content)

out troubleshooting during the implementation. Overall the results were satisfactory. Due to time constraints the User experience was unable to be improved upon.

Tobii Eye Tracker

To test the user interface and the placement of important features on the site, the Tobii Eye Tracker was used⁽⁹⁾. Using the eye tracking equipment allowed for the study of the user consumes the content on the page. Overall the results shown in **Figure 24, 25, 26 ad 27** are very pleasing. The user was focusing on key points of the screen. For example, on the homepage the user was immediately drawn to the logo and the buttons. This shows that the design for these buttons has been successful. On the profile page the user is immediately drawn to map which is exactly what the API aims to do.



Figure 23

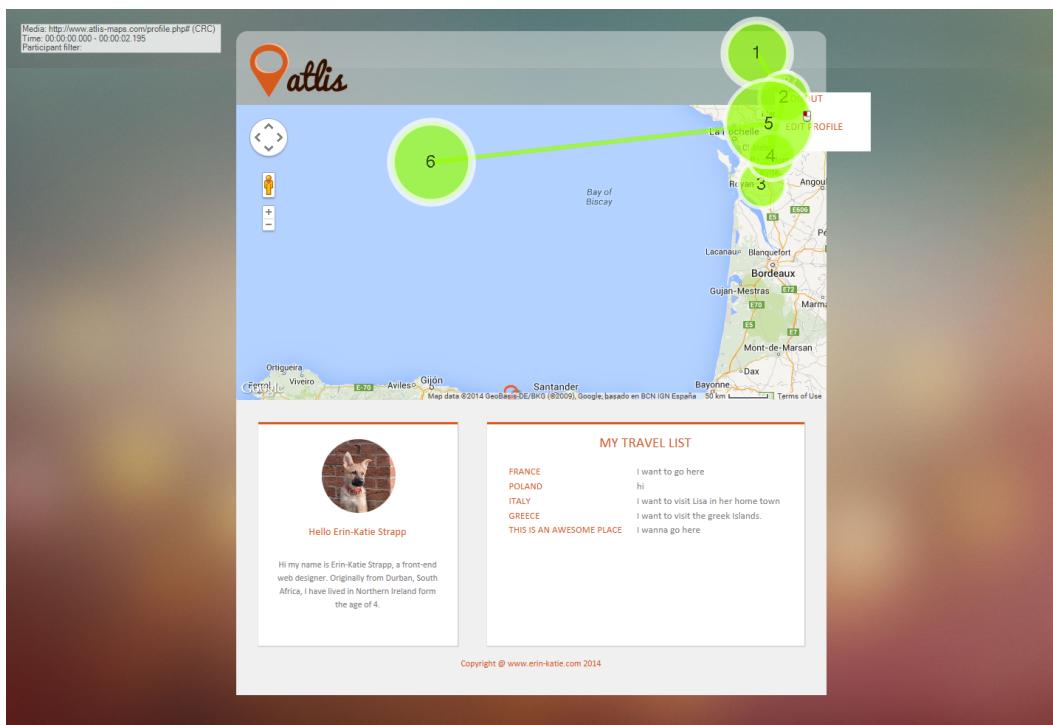
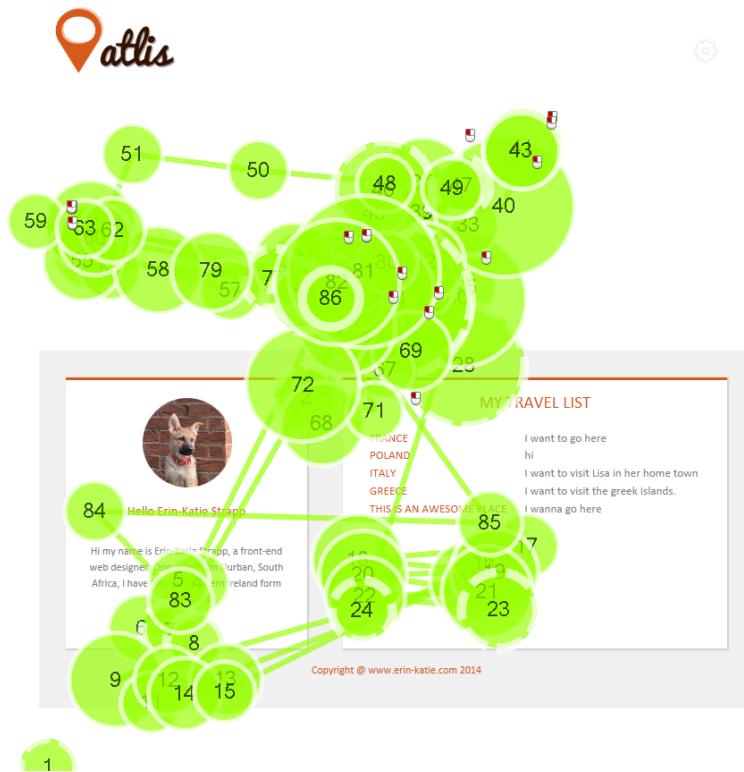


Figure 24

In order to successfully use the eye tracker, a new project firstly needed to be created. Once this was done the user of the device needed to calibrate the tracker by positioning themselves so that the sensor could pick up their eye movement. When the tracker had



finessed calibrating a screen recording was made of their eye movements. This data was then available to process into heat maps and click counters.

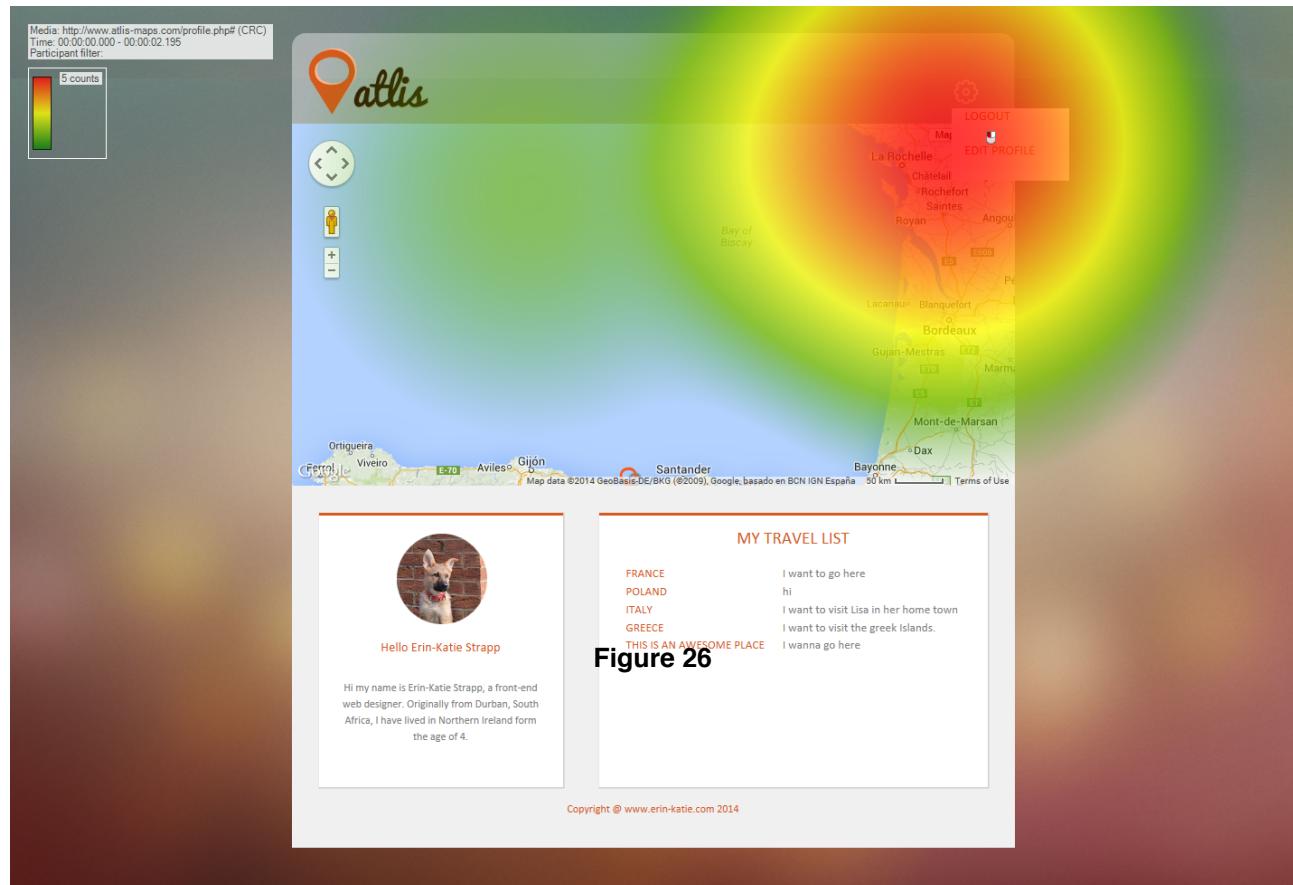


Figure 26

5:3 User Survey Responses

In order to make surveying the user more efficient, an online surveying device was used (10). This survey tool was used early in the project and was therefore easy and quick to create. **Appendix 10** shows the results from the survey.

The survey proved to be invaluable which was far more useful than what was initially predicted. The survey draught a lot of unknown bugs with the register process. The main one being the redirect page showed an error and didn't redirect the user to the correct file. This was easily fixed and re -tested during black box and white box testing using testing.

The survey was carried out before the test cases. The reason behind this is that it allowed for simpler errors to be picked up on first which would possibly eliminate the amount of bugs in the system.

Test cases for White and Black Box Testing

The following section shows a table with a large sample of the test cases carried out on the site.

Test No.	Description	Expected Outcome	Actual Outcome
1	Access the homepage via www.atlis-map.com	Homepage will load.	Homepage loaded
2	Open register form using register button on homepage.	Dialogue box containing a form will appear	Dialogue box with form appeared.
3	Open login form using register button on homepage.	Dialogue box containing a form will appear	Dialogue box with form appeared.
4	Switch from register dialogue box to login dialogue box using the link at the bottom.	Dialogue box will switch.	Dialogue box switched.
5	Switch from login dialogue box to register dialogue box using the link at the bottom	Dialogue box will switch.	Dialogue box switched.
6	Use register form to create a new account.	An activation email will be received.	Activation email was received.
7	Activate user account by clicking on link in activation email.	Re-direct to a page showing success message with option to login.	re-directed to page with login link but with an error showing and a broken link.
8	Login into site after account has been activated.	Re-direct to profile page.	Re-directed to the profile page.
9	Add marker to map by right clicking on screen.	Marker will be placed on map with an info window containing a form to enter data into the database.	marker appeared accompanied by info window and data was saved into the marker table
10	View travel list	Refresh page to see the new marker added to the list.	new marker item appeared on list.
11	Select marker on map to show info window.	Info window will appear	Info window appeared.
12	Delete marker using the delete button in info window.	Marker will disappear from map and record will be removed from database.	Marker disappeared from map and row was removed from database.

Test No.	Description	Expected Outcome	Actual Outcome
13	Update user info in database by opening the form using the edit profile button.	User details will update in database.	User details updated in database.
14	Logout of system.	When user logs out of system they will be redirected back to the ibex page.	User was redirected to the homepage after button was clicked.

As shown on the table, the majority of the test cases worked on the site. However there was an issue that had been previously pointed out with the page that the user is brought to once they had clicked the activation email in their email. This was fixed by changing the file that the activation.php script was pointing too so that it redirected the user back to the homepage so that they can login. An if statement was also removed as it was checking that the user folder existed. However when the script was first created it was going to be used to store the avatar photos, which is no longer needed, due to the fact that the avatar function was never implemented.

6. Evaluation

The following section of the report will evaluate the application, taking into consideration the testing results, feedback and challenges that occurred during the implementation of the project.

6:1 Evaluation of user Survey

The user survey mainly looked at how the user was able to navigate their way round the main functions of the site, seeing as the Tobii Eye Tracker told the truth about what really drew the user's attention and why they thought was clickable or not.

Most of the feedback given in the survey was positive. This was very surprising as the site is lacking many features that were initially supposed to be implemented to improve the user experience. However a lot of the users that the site was tested with picked up on the fact that the activation/login links wasn't working correctly. As mentioned these were fixed after the test plan was carried out.

Even though the user survey that was carried out was beneficial. It could have been more focused on their actual experience. Or how the site helped them and what improvements

could have been made instead of did the functionality work. In saying that, this type of survey would be extremely useful if the project is revisited at later stage.

6:2 Evaluation of Project Aims and Objectives

The overall aim of the project was to provide user with an online interactive tool that would enable users to create their own online bucket list. The project has met this aim to a certain extent. The user can create a list of places to go using an interactive map. However the items added to the map aren't unique to the specific user as the user sessions failed to work no implementation. In turn, this has effected the overall success for meeting the project aim and the project has therefore only met part of the aim.

It has been interesting to see what kind of response people have had in general with regards to the idea of such a tool. People have responded well and some have even been enthusiastic about the idea. It was discovered that the users who tested the site were sympathetic of the fact that the efforts with creating sessions had failed. This in turn has given the idea more encouragement to succeed when after the hand in.

Objectives

1. During the user experience design, a mobile first approach was attempted and successful use of some media queries particularly the homepage are evident. Features such as placeholder text and defining the input type allows for the user to save time and reduces the steps that the user has to take.
2. The website has done a brilliant job in adopting new web technologies. Technologies such as HTML5, CSS3, SASS and even AJAX are very known and are mainly supported by modern day browsers. However measures such as using modernizr.js have been taken to ensure that the new technologies don't affect the performance of the application in older browsers.
3. The main functionality of the site is the Google Map API.
4. The application has a clean and minimalist design.
5. The project planning did aim to take a user first approach to ensure usability of all features. However due to unforeseen problems some aspects of the implementation took longer than anticipated which meant that some aspects of the usability suffered. This objective wasn't met.
6. The application has not used any commercial links and has put a lot of effort into ensuring that the design is suited to its users. This objective was successfully met.

6:3 Evaluation of Methodology

The following section will look at how well the methodology was used, how this affected problem areas and how it allowed to project to achieve its goals.

The Agile methodology was definitely the most appropriate methodology to use. It allowed for the flexibility of the specifications and requirements to be change. This was perfect for this type of project as it was a very daring and scary project for the project developer to undertake.

However, the methodology would have worked better if the time was managed differently. Meaning that there were a number of obstacles faced in this project such as steep learning curves, documentation of the project planning and work deadlines outside of the control of the project. At the beginning of the project a gantt chart was created to help manage and prioritise time on the project. At the beginning of the project the critical path had been identified as the map api as this was an area of no experience. Yet as the project went on, objects like the site secure made the technologies more complicated and complex which then moved the critical path to the backend. Unfortunately this wasn't spotted until late in the project which affect the outcome of the final product.

6:3 Overall Project Evaluation

The following section will take a look at the suggested improvements that could be made as well as evaluating the strengths weaknesses and improvements of the site.

Strengths

The strengths of the project reflect on the improvement of skill level gained by the project developer as well as the phases of the projects that had been planned out well.

Out of all the work that has been put into the project, The brand has to be one the applications strongest points. The brand did struggle at the beginning of the design phase as there was some inconsistency between the homepage and the profile page. Fortunately, after this was later revisited in the interim user design phase, this was improved upon after getting some user feedback

In regards to the functionality of the site, the map has to be one of the best features. Even though the map may not work with user sessions, it still manages to use a collaboration of languages to insert and display data to the profile page. This was decently a mile stone for the the project.

Weaknesses

The main weakness of the project was an under estimation of how long some tasks would take, not allowing for time to learn new languages and technologies. Thus opening the project up into more risk. This could have been avoided if the project goals and milestones were thought of more critically d a proper assent of the critical path analysis was done at the start of the project planning.

Suggested Improvements

Even though the brand itself was a strength, this could be made more detailed so that it could convey more of its story to the users. This could be done through various ways. Whether it is creating a brand dictionary which would then be used in everyday web elements such as micro text and error messages.

User experience deign is another area where there is definite room for improvement. The user experience design began well during the planning stages until problems began to arise in the implementation.

7. Conclusion

The port has concluded a mix of results. Some aspects of the project have been done very well such as the brand and there has been a good effort made t try and introduce as many new a best practice techniques and technologies. However the report has also found that there were many mistakes made which has brought down the quality and reduced the commercial viability of the product do to lack of planning and poorly estimated time scales.

In saying that, the report has also identified many ways to improve the product in order for it to achieve maximum potential. Looking at that and that fact that this project was supposed to a mini project for a much bigger vision, this has allowed the project developer to re accesses the approach taken. This would benefit the product in the long run as it still small and hasn't cost the development team a whole lot.

7:1 Reflection on Role as Developer

This was always going to be a challenging project to do. Many mistakes were made which I have learned from. But many new skills have also been obtained as well. Skills in areas such as SASS, User Experience Design principles, Development Lifecycle's and of course PDO.

Due to the personal impact that this project has had on me seeing that traveling is the one area that I feel passionate about. I have tried to be optimistic from the get go about the potential of this project which has encouraged me to step far outside my comfort zone to try and make the site as secure and robust as possible. However I think I ventured too far away from what I am good at. An example of this is the PDO sessions issue. I knew that my skills weren't the best when it came to any PHP development but wanted to make the site secure against hackers and ventured down the route of a language that very few people know which limited the support I had.

In hindsight I would have stuck to using mysql/mysql to begin with and then build upon it to make more secure. This would have given me enough time to ensure that all my other plans could have been implemented into the site.

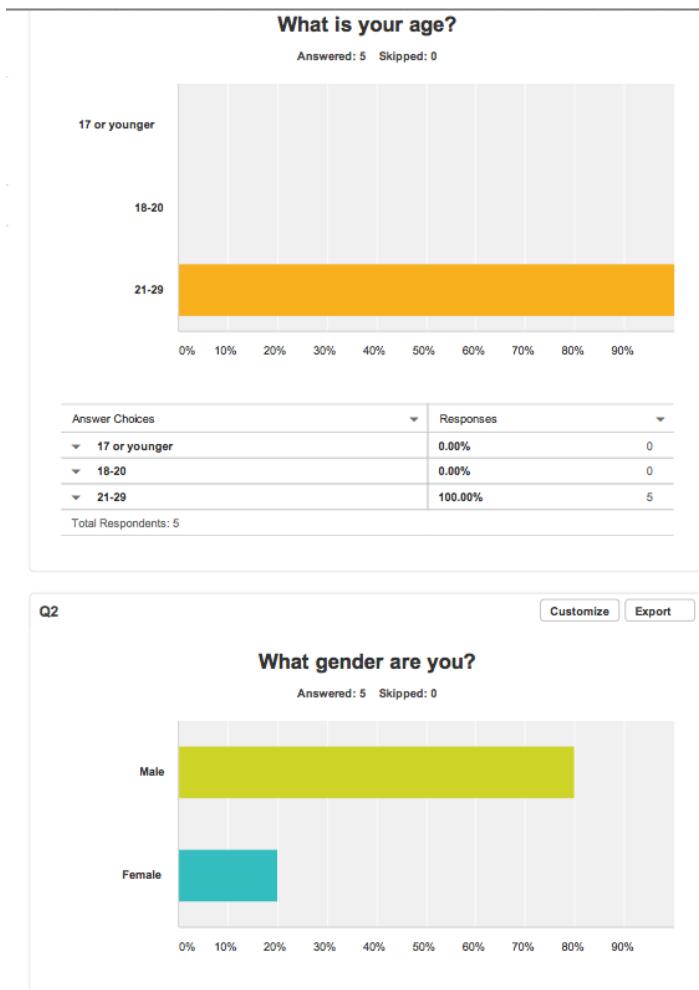
Even though this project didn't turn out like I expected it to, I am not going to give up and I intend on revisiting the project and building it again.

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2. User Personas

User Persona 1

Zak Hardy - University Student

Zak is a 19 year old 2nd year university student studying a computing degree. He has never really had much of an interest in travelling until he met his group of friends at university. He has only ever been to Spain and has developed a hunger to travel the rest of Europe (Particularly to Germany to see what all the fuss over german beer is about). Even though Zak has an idea about where he would like to visit he is having a hard time to list the countries that he would like visit which is making his travelling plans a little messy.

Context

Zak would like to have access to a site that allows him to list the places that he would like to visit in a visual way as opposed to a list. He is always on the go and will be accessing the site on his Samsung Galaxy phone as well as using his windows 7 Dell laptop where he uses Google Chrome as his default browser.

Aims

These are the things that Zak would like to achieve on the purposed site:

- A hassle free login system that uses Zak's Facebook login as he isn't good at remembering passwords.
- An easy way to create a visual list of places to visit.
- Access to a map as geography wasn't Zak's strongest point at school.
- Integration with his existing user account on Facebook.

Key Actions

This is what I would like Zak to do on the site:

- Register to create an account or use a twitter or Facebook login.
- Create a 'bucket' list of places to visit.

User Persona 2

Sarah Stewart - Florist

Sarah is a 23 year old university graduate. She has decided to take a break for year and would like to spend it travelling. She has a very adventurous and out going personality. She loves anything to do with china and is desperate to visit the country.

Context

Sarah has mentioned that she would like to interact with like minded people on the web and has look at sites such as 'trip Bucket' however she doesn't like that they are commercially driven. Sarah tends to use and iPad to use the internet.

Aims

These are the things that Sarah would like to achieve on the purposed site:

- A secure login system as Sarah has problems in the past with accounts being hacked.
- A simple interface suitable for iPad to create her travel list.
- A facility to detail actives that she would like to do in each country.

Key Actions

This is what I would like Sarah to do on the site:

- Register to create an account or use a twitter or Facebook login.
- Create a 'bucket' list of places to visit.
- Detail activities for each country.

User Persona 3

Liam Stewart - University Student

Liam is a 21 year old student studying environmental science currently completing an intern year with a Fishery Scientist. He enjoys fishing and is involved in a number of environmental organisations as well as working with his local council. He mainly uses the commuter for managing some his Facebook pages that he moderate as well as writing reports and isn't the most technical minded.

Context

Liam would like to do some travelling once he has got his career on track and has number of places that he would like to travel to the first stop being Texas. He will be accessing the site on his windows 7b desktop PC using Firefox.

Aims

These are the things that Liam would like to achieve on the purposed site:

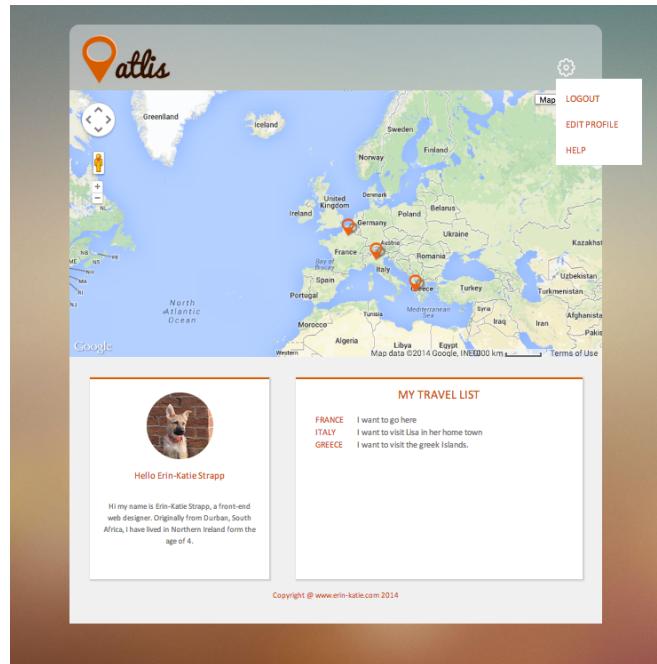
- An easy to use login system.
- A facility to detail actives that she would like to do in each country.

Key Actions

This is what I would like Liam to do on the site:

- Register to create an account or use a twitter or Facebook login.
- Create a 'bucket' list of places to visit.
- Detail activities for each country.

3. Completed user profile:



4. Registration Form - Validation

```
if(isset($_POST['username'])) {
    $username = preg_replace('#[^a-zA-Z0-9]#i', '', $_POST['username']); // USERNAME CAN ONLY BE LETTERS AND OR NUMBERS AND IS CASE SENSITIVE
    $email1 = strip_tags($_POST['email1']);
    $email2 = strip_tags($_POST['email2']);
    $pass1 = $_POST['pass1'];
    $pass2 = $_POST['pass2'];

    // ++++++ VALIDATION +++++++

    //CHECK THAT FEILDS ARE NOT BLANK
    // USING THE TRIM FUNCTIONS TAKES OUT ANY WHITE SPACE THAT THE USER HAS INPUTTED INTO THE FORM
    if(trim($username) == "" || trim($email1) == "" || trim($pass1) == "" || trim($pass2) == ""){
        echo "ERROR: Please make sure that there are no blank fields in your form. Press back to try again.";
        $dtb = null;
        exit();
    }
} // CLOSES BLANK FILEDS IF STATEMENT

//CHECK THAT THE INPUT DATA FOR BOTH EMAIL1 AND EMAIL2 MATCH
if($email1 != $email2) {
    echo "Emails do not match!";
    exit();
} else if ($pass1 != $pass2) { // CHECK THAT THE INPUT DATA FOR THE PASSWORD FIELDS MATCH
    echo "Passwords do not match!";
    exit();
} // CLOSES EMAIL AND PASSWORD MATCH IF STATEMENT

// VALIDATE EMAIL INPUT
if(!filter_var($email1, FILTER_VALIDATE_EMAIL)){
    echo "Your email is invalid!";
    $dtb = null;
    exit();
} //CLOSES VAILD EMAIL IF STATEMENT
```

5. Registration Form - Password Encryption

```
// ++++++ HMAC SECURITY ++++++++
// CREATE HMAC
// CREATE THE HMAC USING SHA512
$hmac = hash_hmac('sha512', $pass1, file_get_contents('php_includes/key.txt'));
// GENERATE 16 RANDOM BYTES FOR THE SALT KEY
$bytes = mcrypt_create_iv(16, MCRYPT_DEV_URANDOM);
// ONCE SALT KEY HAS BEEN CREATED CALL THE SALT VARIABLE AND REPLACE ANY '+' CHARACTERS WITH '.'
$salt = strtr(base64_encode($bytes), '+', '.');
// ENSURE THAT THE BCRYPT IS THE REQUIRED LENGTH OF 22 CHARACTERS LONG
$salt = substr($salt, 0, 22);
// HASHED PASSWORD TO BE STORED IN THE DATABASE
$bcrypt = crypt($hmac, '$2y$12$' . $salt);
// MD5 ENCRYPTION TO BE USED IN THE ACTIVATION TOKEN
$token = md5($bcrypt);
```

6. Activation.php

```
//GET RECORD FROM THE ACTIVATION TABLE ACCORDING TO THE USER
if(isset($_GET['user']) && $_GET['user'] != "" && isset($_GET['token']) != ""){
    include_once("php_includes/db_connect.php"); //CONNECT TO THE DATABASE
    $user = preg_replace('#[0-9]#', '', $_GET['user']); // CAN ONLY BE LETTERS AND OR NUMBERS AND IS CASE SENSITIVE
    $token = preg_replace('#[^a-zA-Z]#i', '', $_GET['token']);
    $stmt = $dtb->prepare("SELECT user, token FROM activate WHERE user=:user AND token=:token LIMIT 1"); //SELECTS THE USER AND TOKEN FROM THE ACTIVATE TABLE
    $stmt->bindValue(':user', $user, PDO::PARAM_INT);
    $stmt->bindValue(':token', $token, PDO::PARAM_STR);
    try{
        $stmt->execute();
        $count = $stmt->rowCount();
        if($count > 0){
            try{
                $dtb->beginTransaction();
                $updateSQL = $dtb->prepare("UPDATE users SET activated='1' WHERE id=:user LIMIT 1"); // CHANGED THE ACTIVATION ENUM FIELD FROM 0 TO 1 WHICH
ENABLES THE USER TO LOGIN
                $updateSQL->bindValue(':user', $user, PDO::PARAM_INT);
                $updateSQL->execute();
                $deleteSQL = $dtb->prepare("DELETE FROM activate WHERE user=:user AND token=:token LIMIT 1"); // ONCE ACCOUNT HAS BEEN ACTIVATED THE RECORD
WILL BE REMOVED FROM THE ACTIVATION TABLE
                $deleteSQL->bindValue(':user', $user, PDO::PARAM_INT);
                $deleteSQL->bindValue(':token', $token, PDO::PARAM_STR);
                $deleteSQL->execute();
                if(!file_exists("users/$user")){
                    mkdir("users/$user", 0755);
                }
                $dtb->commit();
                echo 'Your account has been activated! Click the link to log in: <a href="login.php">Log In</a>';
                $dtb = null;
                exit();
            }
            catch(PDOException $e){
                $dtb->rollBack();
                echo $e->getMessage();
            }
        }else{
            echo "Sorry, There has been an error. Maybe try registering again derp.";
            $dtb = null;
            exit();
        }
    }
    catch(PDOException $e){
        echo $e->getMessage();
        $dtb = null;
        exit();
    }
}
```

7. Login.php

```

//GET RECORD FROM THE ACTIVATION TABLE ACCORDING TO THE USER
if(isset($_GET['user']) && $_GET['user'] != "" && isset($_GET['token']) && $_GET['token'] != ""){
    include_once('php_includes/db_connect.php'); //CONNECT TO THE DATABASE
    $u
        if(isset($_POST['email']) && trim($_POST['email']) != ""){
            $t
                //TRIM STRIPS OUT WHITE SPACE
            $s
                $email = strip_tags($_POST['email']); //STRIPS WHITE SPACE AROUND EMAIL
            $s
                $password = $_POST['password'];
            $s
                $hmac = hash_hmac('sha512', $password,
            tr
                file_get_contents('php_includes/key.txt'));//INCLUDES THE KEY.TXT FILE TO ENCRYPT PASSWORD
            //SELECTS DATA FROM DATABASE DEPENING ON THE EMAIL AND PASSWORD THAT IS BEING POOSTED FROM THE USER LOGINFORM.
            $stmt1 = $dtb->prepare("SELECT id, username, password, country, bio, full_name FROM users WHERE email=:email AND activated='1' LIMIT 1"); // USER
            CAN ONLY LOG IN IF THEY HAVE CLICKED ON THE LINK FROM THE ACTIVATION EMAIL FORM THE REGISTRATION PROCESS
            $stmt1->bindValue(':email', $email, PDO::PARAM_STR); // BIND EMAIL TO THE PREVIOUS QUERY STRING
            try{
                $stmt1->execute(); //EXECUTE QUERY
                $count = $stmt1->rowCount();
                //IF COUNT IS GREATER THAN 0 - IF 1 RESULT IS RETUNED FROM QUERY, THEN RUN THE FOLLOWING IF STATEMENT.
                if($count > 0){
                    //THE FOLLOWING WHILE LOOP WILL FETCH THE DATA FROM THE QUERY
                    while($row = $stmt1->fetch(PDO::FETCH_ASSOC)){// FETCH ASSOCIATE ARRAY
                        $uid = $row['id'];
                        $username = $row['username'];
                        $userPassword = $row['password'];
                    }
                    //CHECK THAT THE PASSWORD VALIDATES.
                    if (crypt($hmac, $userPassword) === $userPassword) {
                        // QUERY TO UPDATE THE LAST LOG FIELD IN THE USERS TABLE IN THE DATABASE.
                        $dtb->query("UPDATE users SET lastlog=now() WHERE id='$uid' LIMIT 1");
                        // SESSIONS TO CREATE PERSISTANT DATA THROUGHTOUT THE WEBSITE.

                        $_SESSION['uid'] = $uid; //USER ID SESSION VARIABLE
                        $_SESSION['username'] = $username; // USERNAME SESSION VARIABLE.
                        $_SESSION['password'] = $userPassword;// PASSWORD SESSION VARIABLE.
                        // SET COOKIES TO REMEBER USER FOR 30 DAYS INTO THE FUTURE. COOKIES WILL BE EQUAL TO THE SESSION VARIABLES
                        setcookie("id", $uid, strtotime( '+30 days' ), "/", "", "", TRUE);
                        setcookie("username", $username, strtotime( '+30 days' ), "/", "", "", TRUE);
                        setcookie("password", $userPassword, strtotime( '+30 days' ), "/", "", "", TRUE);
                        header("location: profile.php");
                        exit();
                    } else {// ERROR CATCHING FOR INVALID PASSWORD
                        echo 'Invalid password Press back and try again<br />';
                        exit();
                    }
                }
                else{ // ERROR CATHCING FOR EMAIL ADDRESS. IF THE EMAIL ISNT VAILDADTED OR STORED IN THE DATABASE. THE USER WILL NOT BE ABLE TO LOG IN.
                    echo "A user with that email address does not exist here";
                    $dtb = null;
                    exit();
                }
            }
            catch(PDOException $e){
                echo $e->getMessage();
                $dtb = null;
                exit();
            }
        }
    }
}

```

8. Map API settings - see map.js file

```

var mapCenter = new google.maps.LatLng(51.508742,-0.120850); //Google map Coordinates
var map;

map_initialize(); // initialize google map

////////////////// Google Map Initialize ///////////////////
function map_initialize()
{
    var googleMapOptions =
    {
        center: mapCenter, // map center
        zoom: 3, //zoom level, 0 = earth view to higher value
        zoomControlOptions: {
            style: google.maps.ZoomControlStyle.SMALL //zoom control size
        },
        scaleControl: true, // enable scale control
        mapTypeId: google.maps.MapTypeId.ROADMAP // google map type
    };

    map = new google.maps.Map(document.getElementById("google_map"), googleMapOptions);

    //Load Markers from the XML File, Check (map_process.php)
    $.get("map_process.php", function (data) {
        $(data).find("marker").each(function () {
            var name = $(this).attr('name');
            var description = '<p>' + $(this).attr('description') + '</p>';
            var type = $(this).attr('type');
            var point = new google.maps.LatLng(parseFloat($(this).attr('lat')),parseFloat($(this).attr('lng')));
            create_marker(point, name, description, false, false, false, "http://www.atlis-maps.com/images/icons/pin.png");
        });
    });

    //Right Click to Drop a New Marker
    google.maps.event.addListener(map, 'rightclick', function(event) {
        //Edit form to be displayed with new marker
        var EditForm = '<p><div class="marker-edit">' +
        '<form action="ajax-save.php" method="POST" name="SaveMarker" id="SaveMarker">' +
        '<input type="text" name="pName" class="save-name" placeholder="Enter Title" maxlength="40" placeholder="Place Name"/>' +
        '<textarea name="pDesc" class="save-desc" placeholder="Enter description" maxlength="150" placeholder="Enter description here"/>' +
        '<select name="pype" placeholder="Type" class="save-type"><option value="restaurant">country</option><option value="bar">Bar</option>' +
        '</select>' +
        '</form>' +
        '</div></p><button name="save-marker" class="save-marker">Save Marker Details</button>';

        //Drop a new Marker with our Edit Form
        create_marker(event.latLng, 'New Marker', EditForm, true, true, true, "http://www.atlis-maps.com/images/icons/pin.png");
    });
}

```

9. User survey from survey monkey.- <https://www.surveymonkey.com/s/HCGDLGW>

