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Application Development

Computing

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1. Introduction

This report will include information on the web application made. This report aims to inform on the subject matter of the web application and why the idea is necessary. All the information on the functionality will be included under the Requirements section explaining the technical functions to make the web app work. Also, this report will inform on the design and implementation of the web application, showing the main design features and screen shots. Finally, a section will be showing all the testing made on the web application to assure all the functionality works as expected.

2. Application Development Concepts

2.1 Web Development Trends

A web Development trend is something that has a high popularity use when developing a website on the internet [1]. All the new trends that arise give developers a wider range of tools when developing for the internet to create a wider range of webpages that can all perform in different ways.

2.2 Top Trends of 2019

2.2.1 Artificial Intelligence (AI) or BOTS [2]

Artificial intelligence gives the machine the ability to create its own functions and control its own actions. Leading it to learn trends in data large data sets when processing.

2.2.2 JavaScript [2]

JavaScript is the most popular code language for the last six years [2]. The constant updates and new releases of the frameworks and libraries are keeping it so popular. As with every update or introduction of one of these gives the developer a wider range of options to create vaster applications, Angular, React.js and node.js are a few examples.

2.2.3 Single Page Application (SPA) [2]

This type of webpage is based on JavaScript as these are scripts that pulls new HTML from the server to client device and doesn't reloads the page. This decreases errors as the pages doesn't reload and improved performance. SPAs have recently become so popular with the release of Angular, React frameworks.

2.2.4 Blockchain Technology [2]

Blockchain is a decentralised peer-to-peer network that is ultra-secure, and any request made on the network is virtually untraceable. As it is decentralised there is no one sole owner of the network so nobody can control the content shared on it, which does concern some people. IBM, Microsoft and Amazon are all exploring ways to use blockchain [1].

2.2.5 Cybersecurity [2]

Cybercrime has been at its all-time higher recently [1] as the number of places that can be exploited is growing fast. This is making users on the internet more conscientious about where and who they are sharing their data with.

2.2.6 Progressive Web App [2]

A PWA will look the same visually as a normal webpage on the internet, but has “a high level of functionality” [2], as the PWA will offer mobile application features but through a website. PWAs are used on the internet for many different things, but all have the same features.

2.2.6.1 Features

There are lots of different features supported by PWAs, some of these are [3]:

- Service worker
- Web push notifications
- Offline browsing
- Background synchronisation
- Add to home screen
- Bluetooth
- Geolocation
- Image capture
- Video capture

2.2.6.2 Advantages of PWAs

PWAs offer a higher level of privacy and secure access than native mobile apps [4]. This is the case as making website secure has been done for years and all can be done in house, whereas when developing applications sometimes 3rd party resources can be used making it less secure.

PWAs are developed on the internet and then accessed by any mobile device running any operating system. This allows a company to develop one PWA and not have to change any code for IOS or Android use. Also, according to the GitHub 2019 report [5], the top 2 code languages used by developers are web specific and the top used language is JavaScript [4].

As PWAs are accessed on the internet there is no download size like native mobile applications. Facebooks iPhone app is 400MB, some users won't want to slowly download this app and then leave it on their device using storage. This is where the PWAs are used over the mobile app, the functionality and layout is the same just the way it is accessed is different. Some examples of PWAs used are Forbes and Twitters website. These companies use PWAs to adopt the strategy for all these advantages, and gives an increase in conversion and decrease of load time [6].

3. Requirements

3.1 Description

The web application is called 'Forecasting' and it provides different services that are needed when predicting the surf. Firstly, the user enters their local area location name and then their live local weather data will be shown. There is a surf report section for the surf breaks Llangennith in Gower, Wales, and Thurso in The Highlands, Scotland. This show the user of the webpage the surf forecast for each break from the current day and the following four.

3.2 Purpose

The purpose for this website is surf forecasting as the user can see the local live wind and weather for the area that they choose. This is needed by surfers as the wind is a massive part of surfing so being able to check all the spots local wind will be very helpful. Also, to go with this is the forecast data for the local surf spots on the same website.

3.3 Target Audience

The target audience for this web application is any surfer who is interested in surfing the local area to Llangennith or Thurso. People that want to see live local weather data will also use this website as there is a target audience that just want to see live weather information.

3.4 Relevance

This application is relevant for surfers as, the only other way of getting surf forecast data and then able to check the live wind on the internet at the moment the UK is by jumping from website to website taking up time.

3.5 Mobile First Strategy

The web application developed is designed with a mobile first approach, over the desktop first approach. So, the design starts, “from the mobile end then which has more restrictions, then expand its features to create a table or desktop version [7].”

A mobile first strategy is important to implement as in a study from GlobalStats in October 2016 shows that internet usage on a phone and tablet is now higher than PC usage [7]. Furthermore, when developing mobile first, the page loading time is reduced [8] as there is less content to load.

3.6 Media Queries

To achieve the web application to show the content correctly on all devices there are two media queries used. The first query is for a tablet view, the minimum width is 768 pixels. This media query is recognising that the user’s device is over the minimum width so then displaying different CSS selectors, showing the content on the screen differently.

Also, there is another media query that is doing the same but for tablets, minimum screen width of 992 pixels. All the CSS in this media query are content size or display commands. As on a bigger screen size more content is added and the spacing is different to space out the content equally on a bigger screen.

3.7 Content Display

The content on the screen changes when the different sized screens load the same page. This is to make all the different pages still look aesthetically pleasing to the viewer on all devices. As the tablet and larger display screen sizes are bigger than the phone screen size, there is different possibilities for more content to be displayed. On the forecast web applications this is used on every page, as each page has different images and text on them.

On the Home and the Report page the images disappear to give the text enough space on the phone. Then on the contact page the two sections are side-by-side on the larger screen view, but on a tablet and phone they stack under each other to make it readable on smaller screens.

When the navigation bar in the header is shown on a smaller screen the page links stack in the centre under the logo as this spacing is more user friendly on the smaller screen. This was done

using a media query recognising all the bigger screen sizes and floating the logo and navigation bar items to the corners, as the web application was designed mobile first.

3.8 APIs

3.8.1 OpenWeather API

The first API that was implemented is a Current Weather Data API from OpenWeather. This API is passed a string that contains the location name that will be searched. The returned is the JSON and from this the data that will be shown is pulled and formatted.

To get the data to show there is a JavaScript 'GetNewCity' function that is run. This function fetches the JSON dataset and puts the data that will be used in variables. These are then shown on the page by appending what is already shown by the HTML and is found using ID tags.

Once the data has been pulled from the API and then the page displays that data under the form with an image. This section is then shown as when the user initially loads the page there is no data, so the section isn't shown. After the function is run once it can still be used and searched in again, this doesn't reload the page, it fetches a new dataset that has been searched and shows that new data.

The content displayed is different on each device when looking at this page as on a phone the data is all formatted underneath the last point, whereas a tablet and large screen will show the data in three different sections along the page. It was designed like that as when the user is on the page on the bigger device there is no need to scroll down as all the information can be shown on one page.

3.8.2 Magic SeaWeed API

The second API that is used on this web application is much more complex as this API is providing data on the surf forecast from Magic SeaWeed (MSW). It includes data for the next five days including the current day of the call of the API, each day has eight forecasts for every three hours of these days. This is resulting in the API providing an array that is forty elements long. Some of these elements also include their own arrays. This API only allows the forecast data for two surf spots, Llangennith and Thurso. The APIs data will be used on the two report pages Llangennith and Thurso. It is showing all the data in the four tables on both of the different reports.

All code for the API has its own JavaScript file called 'APISurfReport.js'. When the report webpage is loaded the API is then called by the page calling the 'SpotNumber' functions and passing the spot ID into the function. This function then will fetch all the data from the API using the spot ID from the specific page, making sure all the correct forecast data is fetched for the correct spot.

Once the JSON data is fetched using a loop all the data that is needed from the API is passed into different arrays and variables. The APIs data includes the time and the date of the forecast data, but this date is in the UNIX format, this is changed in the functions to a readable date and time.

The data is then formatted in the function. All the rows are created first, each table had its own specific set of rows as each day is different. The rows are created using a loop placing the APIs data into the HTML code. Each tables body is then put in an array for later use. The same process is then used to create the four tables in a loop and within this loop the unique rows are passed in. Finally, the JavaScript displays the tables on the webpage.

The content displayed on each device size is the same for this page just scaled for the size so it can all fit on the width of the page. This is where a lot of the media queries are used to give the table different spacing.

4. Design and Implementation

4.1 Design Features

4.1.1 Surf Forecast Pages

One of the main design features is the on both the report pages. These have the API data showing the surf report. When this was designed the table needed a header row, subheading row and then the body rows. All these different rows have their own style as the heading row is higher with larger fonts and uses more vibrant colours to catch the eye of the person requesting the data. Then the subheading row is smaller using a smaller font and the blue is a lighter blue with light grey border to lift and break the table up more. Then the tables body shows the surf forecast data. There is units needed to be added to the data like 'FT' and 'MPH', these are formatted in a smaller font as this informative data and not as important.

4.1.2 Footer

A main design feature is in the footer. This is the case as when the footer is viewed on a phone screen it is shown with the Menu, Email then Social all stacked under the previous element. Whereas on a tablet the Menu is on the left and as it is a long element the Email and social sections go to the right of the page and stack over each other. Then on a large screen in the footer there are four sections, these are the Menu, Email, Social and then an image of the logo. This logo is only displayed in the footer on the larger screen as it has enough screen width to fit all the information in. This was done using the media queries as each section has its own class, then using those media queries the different sections can be hidden or shown and spaced out differently.

4.2 Main JavaScript Functions

4.2.1 Photo Gallery

On the Photos page the interactive functionality is the image slideshow. On the page there is a slideshow that the user can cycle through the images. This was done JavaScript functions, it firstly resets all the images to hidden on the screen. Once the next button is pressed the images cycle through and the new image is displayed block, so it is viewable. When the previous image button is clicked on the first image the function needs to go to the last image in the sequence.

4.2.2 Contact Form

On the Contact page there is a contact form with interactive functionality. When the user inputs all the information that is required, if the web application was connected to a SQL database it would post it into the database and the form will reset. There is also an alert that is shown using JavaScript.

4.2.3 Email Subscription

On every page there is an email subscription form in the footer. This section is powerful with interactive functionality. The user can input their email address for a subscription to the newsletter but only with one email address. So, there is a JavaScript function that will, get the email address value for later use. Then the form and caption will be hidden, and a new section shown. This section will inform the user that they have entered their email address successfully and show that email address back out to them.

4.3 Screenshots

Refer to Appendix 1 Screenshots.

5. Evaluation

5.1 Testing

5.1.2 Current Weather API

5.1.2.1 Test 1 – Enter a Location

This is testing that the user can enter a location and the API collects the correct data for that location. Then the specific location data is displayed.

Test Data	Expected Result	Actual Result	Screenshot	Status
Paris	Display the weather information	As expected	Refer to Appendix 2 Testing – Enter a Location	Pass

5.1.2.2 Test 2 – Re-enter a Location

This test is showing that the user can re-enter a new location after a previous location has been searched. The data should be updated but the page should not reload. Before this test will be completed the page will have a precondition of Swansea.

Test Data	Expected Result	Actual Result	Screenshot	Status
Sydney	Display the updated weather information	As expected	Refer to Appendix 2 Testing – Re-enter a Location	Pass

5.2 Magic SeaWeed API

5.2.1 Llangennith Surf Report Data

5.2.1.1 Test 1 – Display Data Llangennith

Testing that the data for that location is being used and displayed from the API correctly. When the function is called by the page on load, the 'spotID' is passed in changing the API address and therefore the location.

Test Data	Expected Result	Actual Result	Screenshot	Status
SpotID = 32	To display the surf report forecast data for Llangennith	As expected	Refer to Appendix 2 Testing – Display Data Llangennith	Pass

5.2.2 Thurso Surf Report Data

5.2.2.1 Test 1 – Display Data Thurso

This is testing the Thurso Surf Report API data is being used and displayed from the API correctly on the screen. When the function is called by the page on load, the spotID is passed in changing the API address and therefore the location.

Test Data	Expected Result	Actual Result	Screenshot	Status
SpotID = 47	To display the surf report forecast data for Thurso	As expected	Refer to Appendix 2 Testing – Display Data Thurso	Pass

5.2 Reflective Evaluation

5.2.1 Utility

There are many different functionality features on this web application. Firstly, the responsiveness of each webpage. As every page will change the content or way the content is displayed on the page depending on the device this web application is very responsive. Also, there is the use of two APIs, these give the web application additional functionality by fetching data on surf forecasting and live current weather data.

There is interactive functionality on this webpage as depending on what the user on the page is interacting with the page will react and display different content. If the user interacts with the email subscription box in the footer then the page will be different due to the interactive functionality.

5.2.2 Usability

The design of the website is very clean and minimalistic, as this is the case it allow all the pages to adopt the same design. This keeps the same colours and typography the dame throughout the web application. Also, this allows each page to have the same design, this is the case as they all have the header navigation, bar and then the footer that will display the same content on each

page. This keeps the house style the same and will keep the user of the web application feeling like they know every page.

There is a navigation bar on the header of every page and then there also is a navigation menu in the footer of every page. This allows the user to move around the website quickly as there is always a way to navigate the website close to the content they are viewing.

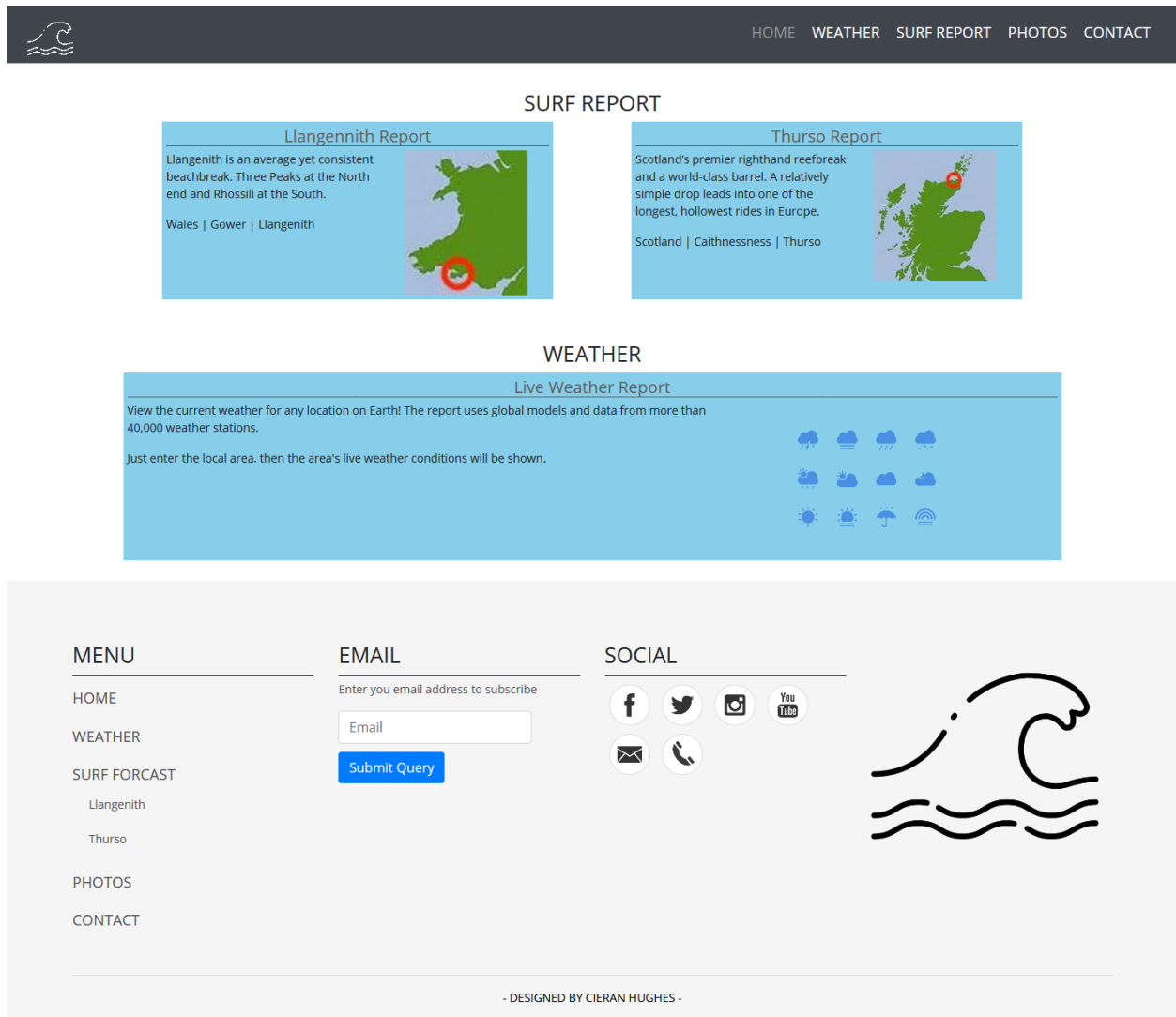
5.2.3 Recommendation and Improvements

A recommendation and improvement to the web application would be the navigation bar in the header. This navigation bar shows all the webpages on the website apart from the specific pages for the surf report, to get to these the user will need to go to the report page then into the location. Although there is a navigation menu in the footer this would be a good improvement.

6. Appendix

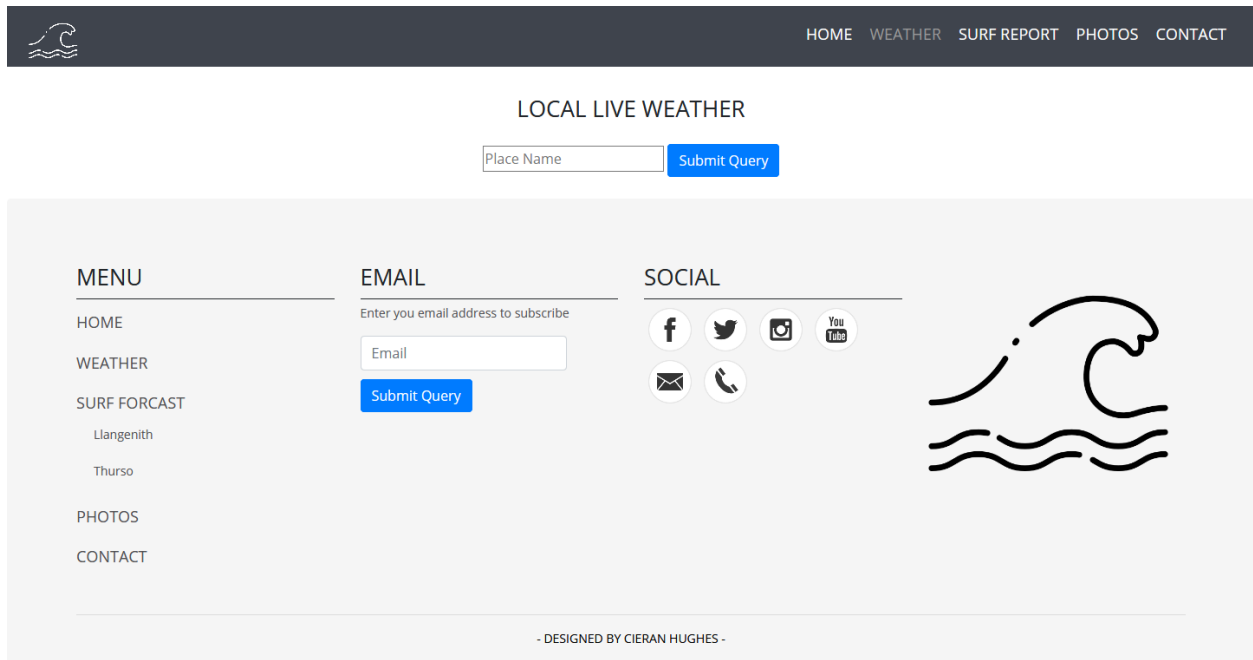
6.1 Appendix 1 Screenshots

6.1.1 Home



6.1.2 Weather

6.1.2.1 Weather Empty Search



6.1.2.1 Weather Swansea Search

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LOCAL LIVE WEATHER

[Submit Query](#)

Swansea

Weather: Clouds

Description: few clouds

Cloud Cover: 20%

Min Temperature: 5 °C

Max Temperature: 8.89 °C

Wind Speed: 2.1 MPH

Wind Direction: 180 Degrees



MENU

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 - Thurso
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- CONTACT

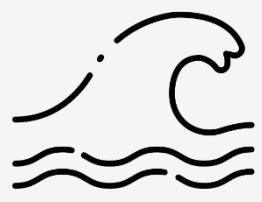
EMAIL

Enter you email address to subscribe

[Submit Query](#)

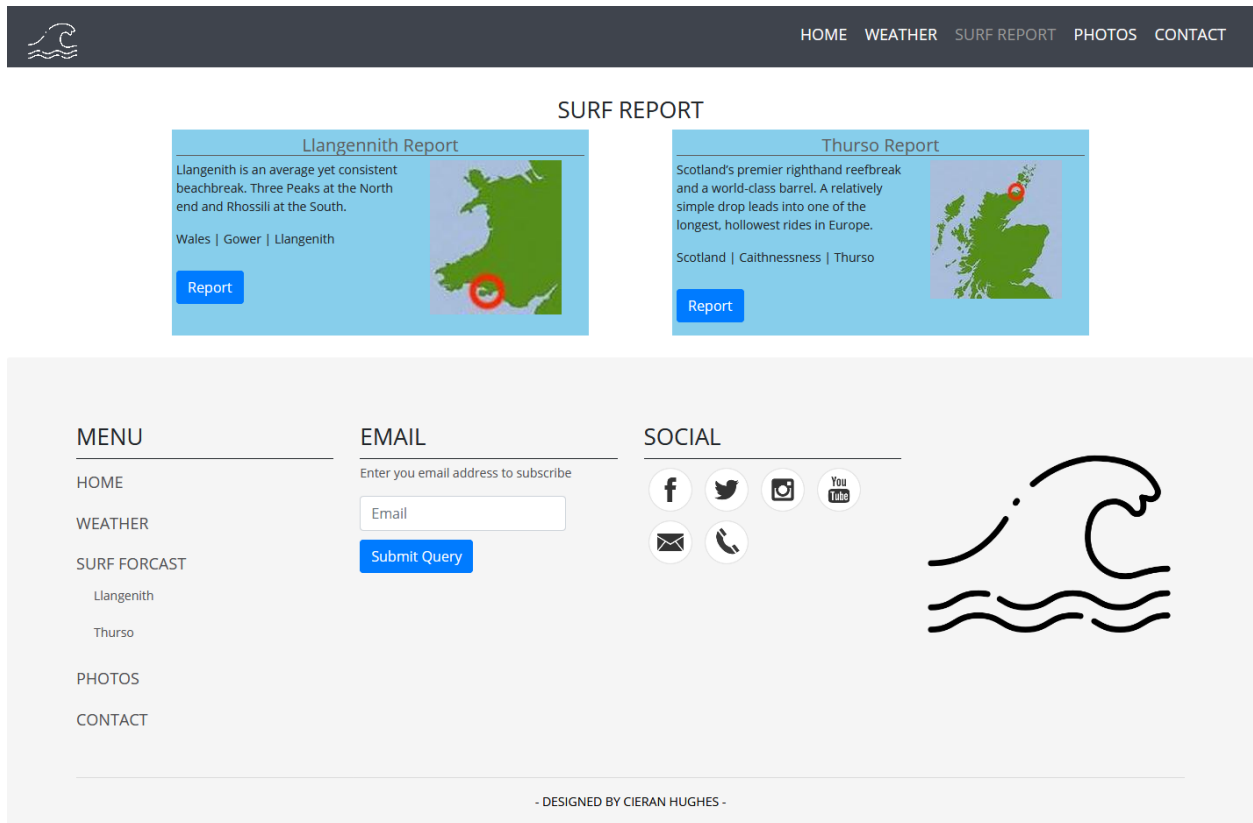
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6.1.3 Surf Report



6.1.4 Surf Report Llangennith

LLANGENNITH SURF REPORT					
16 / 12 / 2019					
Date Time	Surf			Wind	
16 / 12 / 2019	Swell	Dir	Period	Speed	Dir
0:00	6-10ft	WSW	11s	28MPH	SW
3:00	6-10ft	WSW	11s	26MPH	WSW
6:00	5-8ft	WSW	11s	18MPH	WSW
9:00	5-8ft	WSW	11s	13MPH	SSW
12:00	4-7ft	WSW	11s	14MPH	S
15:00	4-6ft	WSW	10s	14MPH	SSW
18:00	4-6ft	WSW	10s	10MPH	SSW
21:00	3-5ft	WSW	10s	9MPH	S
17 / 12 / 2019					
Date Time	Surf			Wind	
17 / 12 / 2019	Swell	Dir	Period	Speed	Dir
0:00	3-5ft	WSW	10s	4MPH	S
3:00	3-4ft	WSW	10s	4MPH	SSE
6:00	3-4ft	WSW	9s	3MPH	ENE
9:00	2-3ft	WSW	9s	5MPH	N
12:00	2-3ft	WSW	9s	3MPH	NNW
15:00	2-3ft	WSW	9s	4MPH	W
18:00	2-3ft	WSW	9s	7MPH	SW
21:00	2-3ft	WSW	8s	11MPH	SSW
18 / 12 / 2019					
Date Time	Surf			Wind	
18 / 12 / 2019	Swell	Dir	Period	Speed	Dir
0:00	2-2ft	WSW	8s	13MPH	S
3:00	2-2ft	SW	11s	16MPH	SSE
6:00	2-3ft	SSW	4s	21MPH	S
9:00	1-2ft	SSW	5s	21MPH	SSE
12:00	1-2ft	SSW	6s	26MPH	SSE
15:00	2-3ft	S	7s	31MPH	SE
18:00	2-3ft	S	8s	35MPH	SE
21:00	4-6ft	SSW	11s	27MPH	SSE
19 / 12 / 2019					
Date Time	Surf			Wind	
19 / 12 / 2019	Swell	Dir	Period	Speed	Dir
0:00	4-7ft	SSW	11s	20MPH	SSE
3:00	4-5ft	SW	11s	21MPH	S
6:00	3-5ft	SW	10s	15MPH	S
9:00	3-5ft	SW	10s	17MPH	SSE
12:00	3-5ft	SW	13s	11MPH	SSE
15:00	4-7ft	WSW	13s	16MPH	SSE
18:00	4-7ft	WSW	12s	15MPH	S
21:00	4-7ft	WSW	12s	14MPH	S

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WEATHER

SURF FORECAST

Llangennith

Thurso

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6.1.5 Surf Report Thurso


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THURSO SURF REPORT

16 / 12 / 2019

Date Time	Swell	Dir	Period	Speed	Wind
16 / 12 / 2019					
0:00	5-8ft	W	14s	8MPH	SSE
3:00	4-7ft	W	13s	7MPH	SE
6:00	4-6ft	W	13s	5MPH	SE
9:00	3-5ft	W	13s	3MPH	SSE
12:00	3-5ft	WNW	13s	2MPH	S
15:00	3-4ft	WNW	13s	2MPH	S
18:00	3-4ft	WNW	13s	3MPH	W
21:00	2-4ft	WNW	13s	2MPH	SE

17 / 12 / 2019

Date Time	Swell	Dir	Period	Speed	Wind
17 / 12 / 2019					
0:00	3-4ft	WNW	13s	5MPH	SE
3:00	3-4ft	WNW	13s	5MPH	SE
6:00	3-4ft	NW	13s	5MPH	SSW
9:00	4-6ft	NW	12s	2MPH	WSW
12:00	4-6ft	NNW	12s	7MPH	WSW
15:00	4-6ft	NNW	11s	12MPH	W
18:00	4-6ft	NNW	11s	11MPH	WSW
21:00	3-5ft	NNW	10s	12MPH	W

18 / 12 / 2019

Date Time	Swell	Dir	Period	Speed	Wind
18 / 12 / 2019					
0:00	3-5ft	NNW	12s	10MPH	WSW
3:00	5-7ft	NNW	11s	9MPH	SW
6:00	4-7ft	NNW	11s	8MPH	SW
9:00	5-7ft	NNW	11s	6MPH	S
12:00	4-7ft	NNW	12s	6MPH	SSE
15:00	4-7ft	NNW	12s	8MPH	SE
18:00	4-7ft	N	12s	14MPH	SSE
21:00	4-7ft	N	12s	17MPH	SE

19 / 12 / 2019

Date Time	Swell	Dir	Period	Speed	Wind
19 / 12 / 2019					
0:00	4-7ft	NE	12s	23MPH	SE
3:00	4-6ft	ENE	12s	27MPH	SE
6:00	4-6ft	E	12s	25MPH	SE
9:00	4-6ft	E	12s	22MPH	SE
12:00	4-6ft	NNE	12s	11MPH	SE
15:00	4-6ft	N	12s	7MPH	SSE
18:00	4-6ft	N	12s	4MPH	S
21:00	3-5ft	NNW	12s	5MPH	SSE

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- CONTACT

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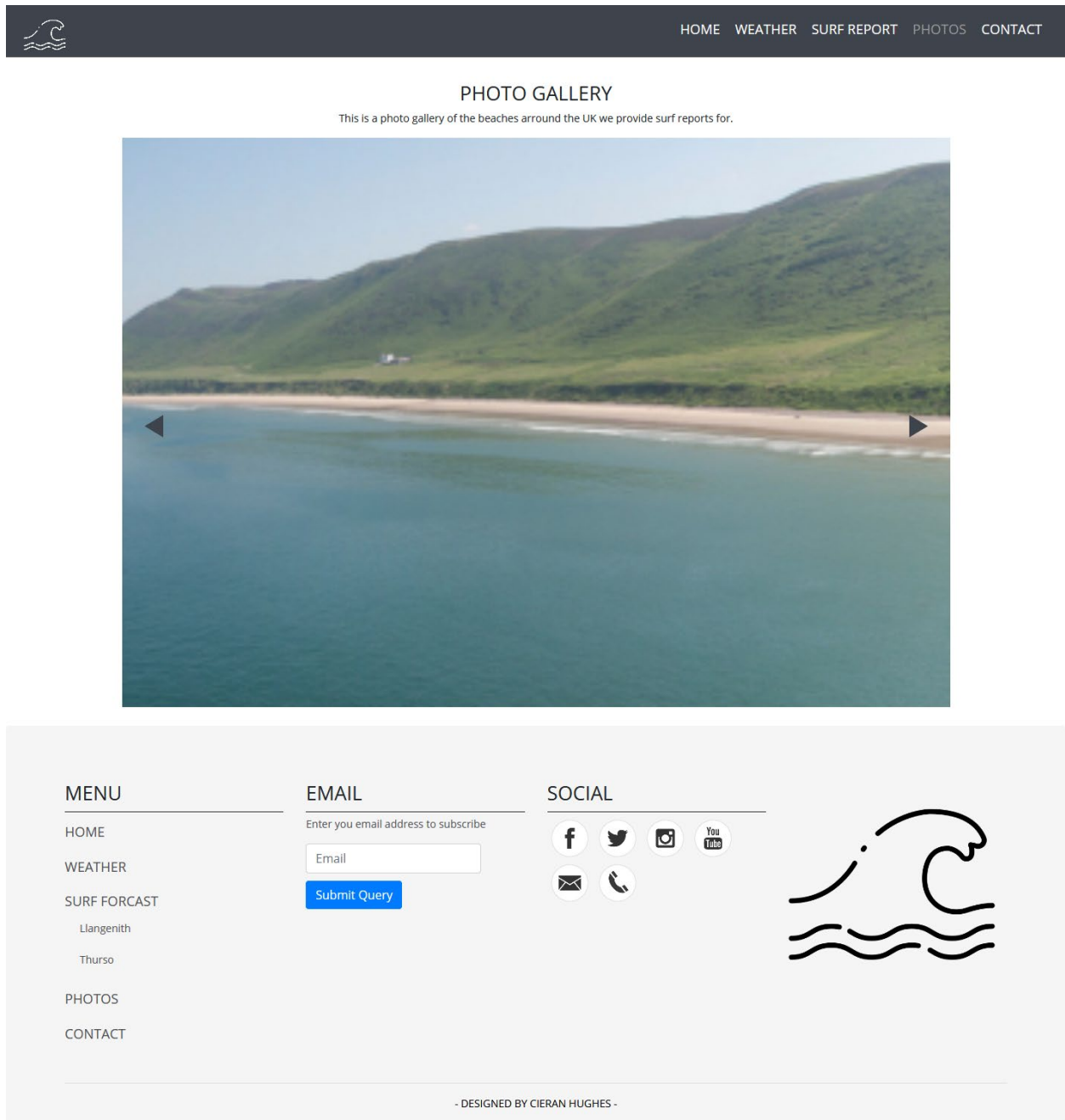






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6.1.6 Photos



6.1.7 Contact



HOMEWEATHERSURF REPORTPHOTOSCONTACT

CONTACT US

Social Media

Contact us using the using below or on any social media platfroms we are on. Let us know of any imporvments you have, or questions you have for us. We'd love to hear from you.

 - Facebook

 - Twitter

 - Instagram

 - Youtube

 - Email

 - Phone

Email Form

Name:

Email address

Subject:

Message:

Submit

MENU

HOME

WEATHER

SURF FORECAST

Llangenith

Thurso

PHOTOS

CONTACT

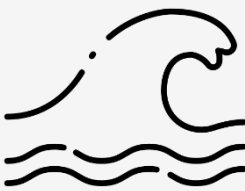
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6.2 Appendix 2 Testing

6.2.1 Enter a location



HOMEWEATHERSURF REPORTPHOTOSCONTACT

LOCAL LIVE WEATHER

Paris

Weather: Clouds

Description: scattered clouds

Cloud Cover: 40%

Submit Query

Min Temperature: 8.89 °C

Max Temperature: 11.11 °C

Wind Speed: 2.1 MPH

Wind Direction: 100 Degrees



MENU

HOME

WEATHER

SURF FORECAST

Llangenith

Thurso

PHOTOS

CONTACT

EMAIL

Enter you email address to subscribe

Submit Query

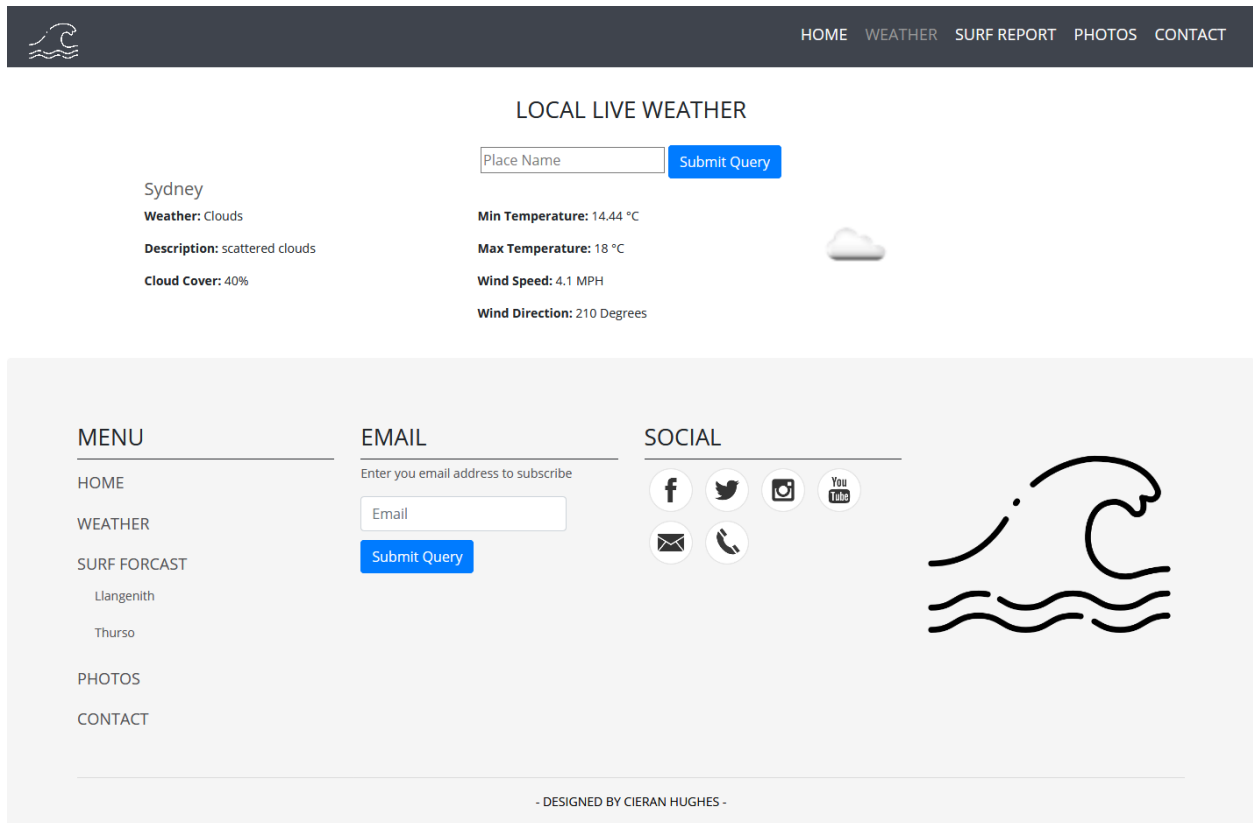
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6.2.2 Re-enter a location



6.2.3 Display Data Llangennith



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LLANGENNITH SURF REPORT

16 / 12 / 2019

Date Time	Swell	Dir	Period	Speed	Dir
16 / 12 / 2019	Swell	Dir	Period	Speed	Dir
0:00	6-10ft	WSW	11s	28MPH	SW
3:00	6-10ft	WSW	11s	26MPH	WSW
6:00	5-8ft	WSW	11s	18MPH	WSW
9:00	5-8ft	WSW	11s	13MPH	SSW
12:00	4-7ft	WSW	11s	14MPH	S
15:00	4-6ft	WSW	10s	14MPH	SSW
18:00	4-6ft	WSW	10s	10MPH	SSW
21:00	3-5ft	WSW	10s	9MPH	S

17 / 12 / 2019

Date Time	Swell	Dir	Period	Speed	Dir
17 / 12 / 2019	Swell	Dir	Period	Speed	Dir
0:00	3-5ft	WSW	10s	4MPH	S
3:00	3-4ft	WSW	10s	4MPH	SSE
6:00	3-4ft	WSW	9s	3MPH	ENE
9:00	2-3ft	WSW	9s	5MPH	N
12:00	2-3ft	WSW	9s	3MPH	NNW
15:00	2-3ft	WSW	9s	4MPH	W
18:00	2-3ft	WSW	9s	7MPH	SW
21:00	2-3ft	WSW	8s	11MPH	SSW

18 / 12 / 2019

Date Time	Swell	Dir	Period	Speed	Dir
18 / 12 / 2019	Swell	Dir	Period	Speed	Dir
0:00	2-2ft	WSW	8s	13MPH	S
3:00	2-2ft	SW	11s	16MPH	SSE
6:00	2-3ft	SSW	4s	21MPH	S
9:00	1-2ft	SSW	5s	21MPH	SSE
12:00	1-2ft	SSW	6s	26MPH	SSE
15:00	2-3ft	S	7s	31MPH	SE
18:00	2-3ft	S	8s	35MPH	SE
21:00	4-6ft	SSW	11s	27MPH	SSE

19 / 12 / 2019

Date Time	Swell	Dir	Period	Speed	Dir
19 / 12 / 2019	Swell	Dir	Period	Speed	Dir
0:00	4-7ft	SSW	11s	20MPH	SSE
3:00	4-5ft	SW	11s	21MPH	S
6:00	3-5ft	SW	10s	15MPH	S
9:00	3-5ft	SW	10s	17MPH	SSE
12:00	3-5ft	SW	13s	11MPH	SSE
15:00	4-7ft	WSW	13s	16MPH	SSE
18:00	4-7ft	WSW	12s	15MPH	S
21:00	4-7ft	WSW	12s	14MPH	S

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6.2.3 Display Data Thurso


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THURSO SURF REPORT

16 / 12 / 2019

Date Time	Swell	Dir	Period	Speed	Wind
16 / 12 / 2019					
0:00	5-8ft	W	14s	8MPH	SSE
3:00	4-7ft	W	13s	7MPH	SE
6:00	4-6ft	W	13s	5MPH	SE
9:00	3-5ft	W	13s	3MPH	SSE
12:00	3-5ft	WNNW	13s	2MPH	S
15:00	3-4ft	WNNW	13s	2MPH	S
18:00	3-4ft	WNNW	13s	3MPH	W
21:00	2-4ft	WNNW	13s	2MPH	SE

17 / 12 / 2019

Date Time	Swell	Dir	Period	Speed	Wind
17 / 12 / 2019					
0:00	3-4ft	WNNW	13s	5MPH	SE
3:00	3-4ft	WNNW	13s	5MPH	SE
6:00	3-4ft	NW	13s	5MPH	SSW
9:00	4-6ft	NW	12s	2MPH	WSW
12:00	4-6ft	NNW	12s	7MPH	WSW
15:00	4-6ft	NNW	11s	12MPH	W
18:00	4-6ft	NNW	11s	11MPH	WSW
21:00	3-5ft	NNW	10s	12MPH	W

18 / 12 / 2019

Date Time	Swell	Dir	Period	Speed	Wind
18 / 12 / 2019					
0:00	3-5ft	NNW	12s	10MPH	WSW
3:00	5-7ft	NNW	11s	9MPH	SW
6:00	4-7ft	NNW	11s	8MPH	SW
9:00	5-7ft	NNW	11s	6MPH	S
12:00	4-7ft	NNW	12s	6MPH	SSE
15:00	4-7ft	NNW	12s	8MPH	SE
18:00	4-7ft	N	12s	14MPH	SSE
21:00	4-7ft	N	12s	17MPH	SE

19 / 12 / 2019

Date Time	Swell	Dir	Period	Speed	Wind
19 / 12 / 2019					
0:00	4-7ft	NE	12s	23MPH	SE
3:00	4-6ft	ENE	12s	27MPH	SE
6:00	4-6ft	E	12s	25MPH	SE
9:00	4-6ft	E	12s	22MPH	SE
12:00	4-6ft	NNE	12s	11MPH	SE
15:00	4-6ft	N	12s	7MPH	SSE
18:00	4-6ft	N	12s	4MPH	S
21:00	3-5ft	NNW	12s	5MPH	SSE

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