

EXPLORE CYMRU

A Development Document

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Abstract

This document follows the development of the application “Explore Cymru” that aims to enlighten the public of Wales to the great beauty, history and cultural heritage the country contains.

The app features modern UI and UX features to making it feel trustworthy and easy to learn. With interactive elements such as ratings, reviews and virtual tours, Explore Cymru makes it easy to plan a day out in Wales from the comfort of your home.

Introduction

My application, “Explore Cymru” has over the past few months been developed for the purpose of aiding both the welsh population, and tourists in learning and exploring our amazing country. The requirements of the client lists specific features such as virtual tours of sites and interactivity but also details more open requirements such as cultural heritage focus, for this requirement I am able to take many different approaches in order to complete it. I also have full control over the UI and design of the application during development.

I plan to design a sleek and modern UI that fits in with apps used by a younger demographic, this way i hope to interest the youth and young adults between the ages of 16-29 to use the app. This decision was made based on the large number of young students brought into Cardiff from the two Universities. Targeting this audience will grow the tourism industry in Wales in young people.

Using API's from companies such as Google allows me to meet some of the requirements efficiently within the time frame, such as accessing Google's reviews of museums and places to allow for interactivity and using google street view APIs to display “virtual tours” of our locations.

Proposed Design and Architecture

UI Design

Before designing my apps user interface (UI) I will first decide on what content and features my app should contain. Most if not all mobile apps use a navbar with icons to flip between pages within the application, I will also be using this approach and so must decide what pages and how many within this section.

Pages

My app will be comprised of three main pages, accessible via the navigation bar at the bottom of the screen. These pages will be:

- **Explore** – This will be the main page of the app where users can discover the wonders of Wales ranging from museums, trails, sights and more.
- **Search** – Here users could find specific locations near them. For example a user could be looking for trails and walks in their area instead of scrolling through everything featured on the explore page.
- **Saved** – Finally, the saved section will display the items the user has saved for later, having a way to quickly find areas you have previously been interested in or plan to do later.

Features

Now its time to decide what features I will have my app to have. Firstly the client lists some required features in their brief, these are:

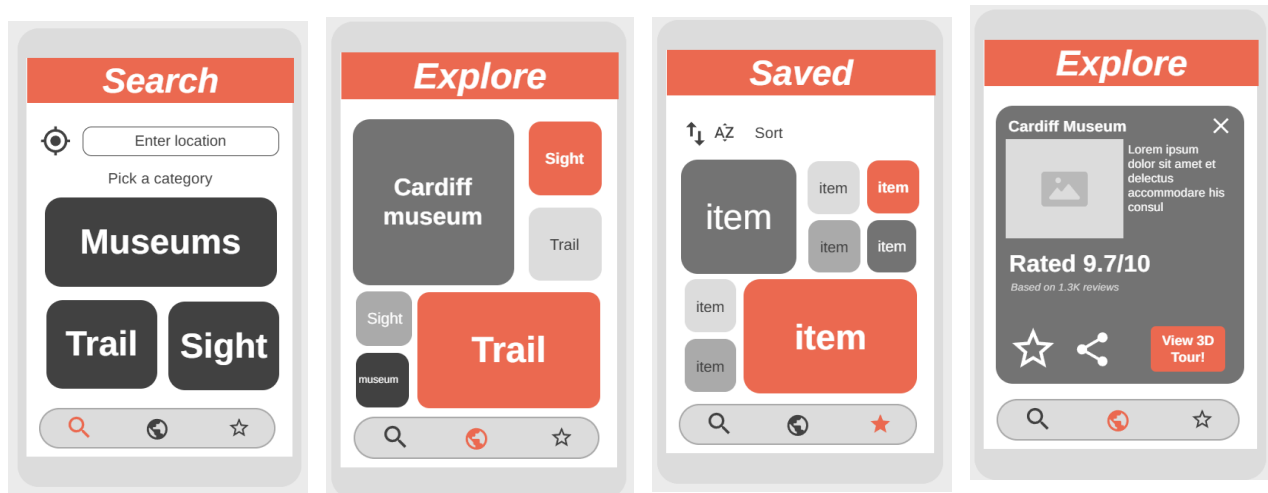
- **Exhibit highlights** - show the most popular / featured exhibits from the museum listings, I plan to have a window enlarged once clicked to show the museums information. The exhibit could be show here
- **Cultural and Heritage Focus** - the app needs to have a heavy focus on Wales and the country's heritage and history
- **Interactive features** - The client requires interactive features, allowing users to engage with content. To implement this I could do a rating system and a share button to allow users to share experiences and share locations on other apps.
- **Events and news** - We can send the users notifications about upcoming events and news.

- **Museum tours** - 3D Virtual museum tours for at least 2 welsh museums. This allows users to explore the history of Wales from the comfort of their home.
- **Translations to welsh** - I plan to have a button perhaps at the top of the screen to change all the English text into the Welsh language, this further enhances the experience to native Welsh speakers and keeps the language alive.
- **Cultural content library** - language, traditions, historical events and more can be featured on the app to allow visitors of Wales to learn more about the country and the people living here.
- **Accessibility features** - Features such as text to speech, colour blind modes, high contrast modes and language translation allows the app to be used comfortably by a larger audience as it adapts for disabilities.

Wireframe

Wireframes are an important first step in any project involving a user interface. They allow the developers and designers to have something to work off of before getting started. This means everyone's work will come together more efficiently and smoothly. To create my wireframes I used an online tool called wireframe.cc as I have experience with it in the past and it allows me to create good looking designs quickly.

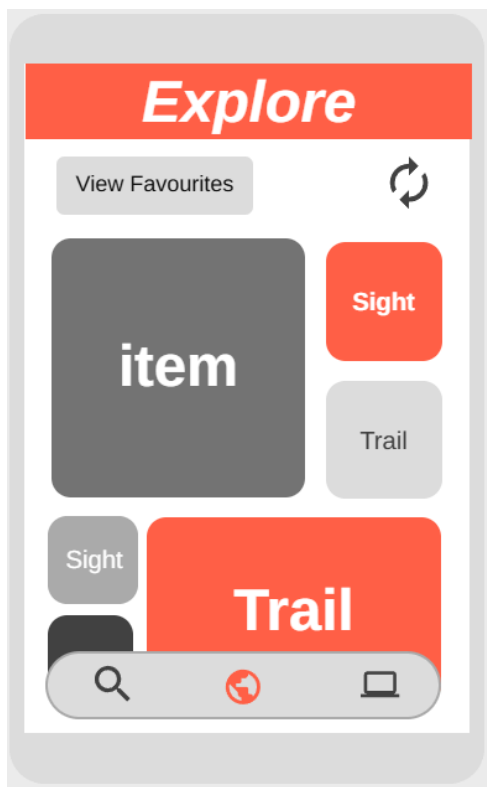
Version 1



Version 2

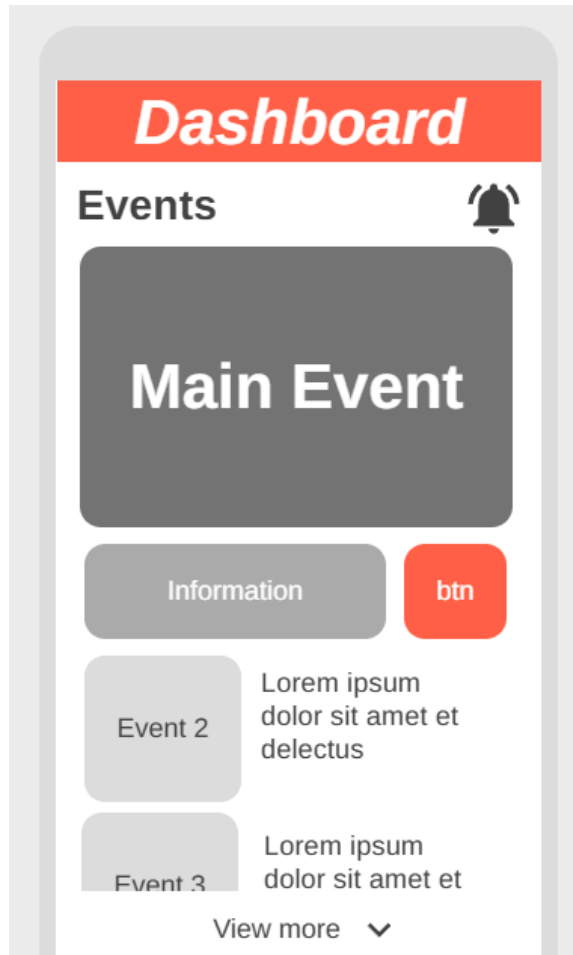
After creating the first wireframes, it became clearer that it would be difficult to fit all the required content within the 3 pages of my app. However, I don't want my navigation bar to have more than 3 options to avoid it getting too full causing users to press the wrong button at times.

I decided to make some changes to wireframe 1 to bring in room for all the features without changing the navbar layout.



The new navbar features a “dashboard” icon, in place of the previous “Saved” icon which can now easily be accessed via the top of the explore page.

The dashboard icon will take the user to a new page featuring 3 planned sections, events, news and learn.

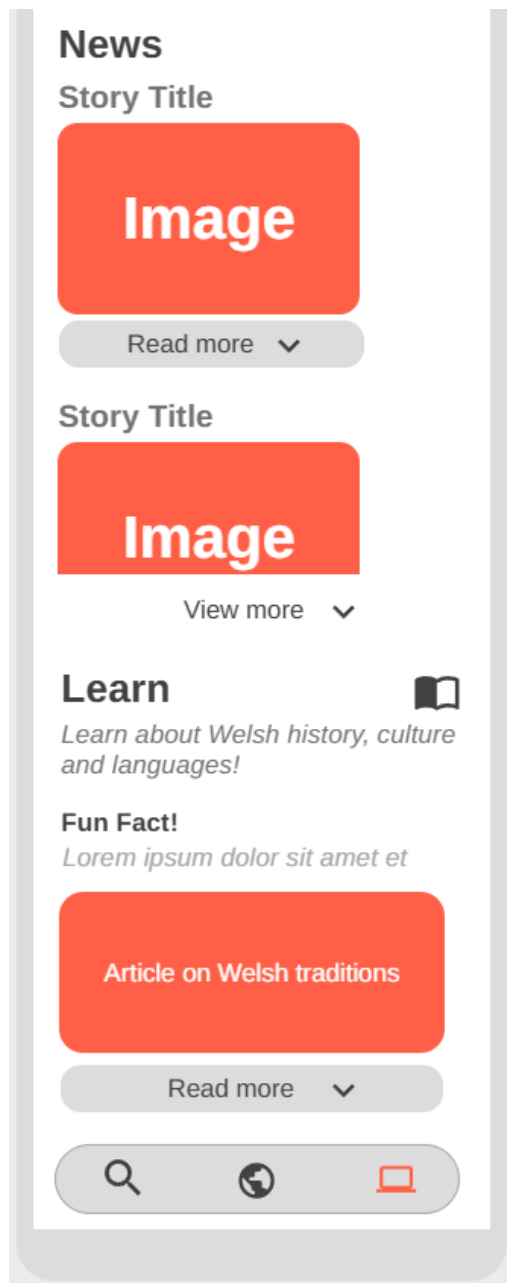


Here is the new dashboard page design, it features a large scrolling page style with 3 main sections that have content that can be expanded when needed.

Firstly we have the events section, here i placed a large featured even area to show either the most popular or interesting current events.

Below are some options and other events that continue in a list.

The list is cut off by the view more button allowing users to scroll to the next section or expand the events section.



Next is the news section

Here we have a simple commonly used format for a news area, with a large captivating title combined with an image and a button to read the article.

This also continues as a list if the user clicks the view more button.

Finally I have the Learn section, here the user can see facts and articles on the country of wales.

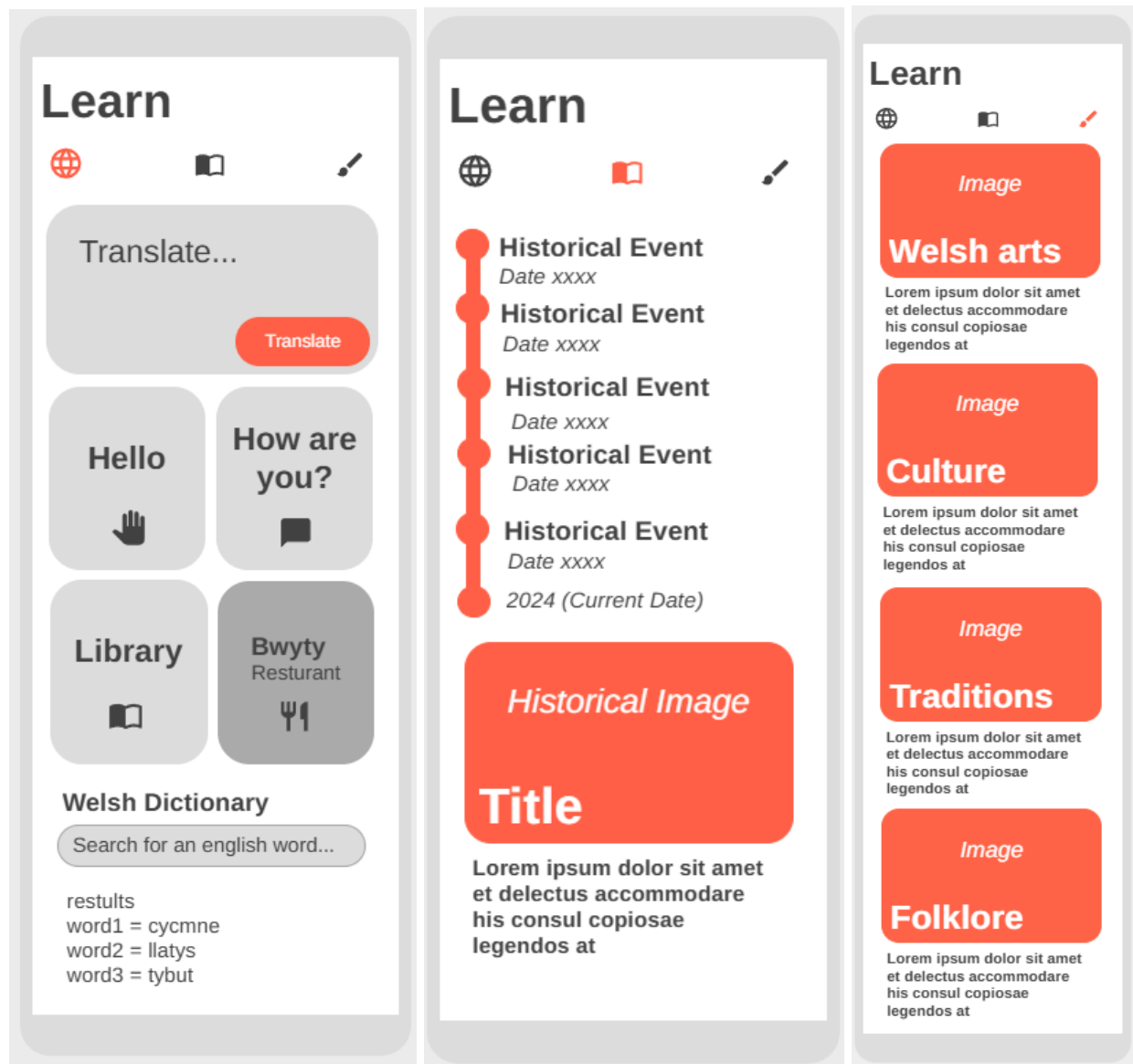
The fun fact section acts as an easy way for a user to learn about Wales without committing to reading a full article.

The articles work as more in depth learning materials on certain subjects, such as traditions or language.

Updated Learn Section

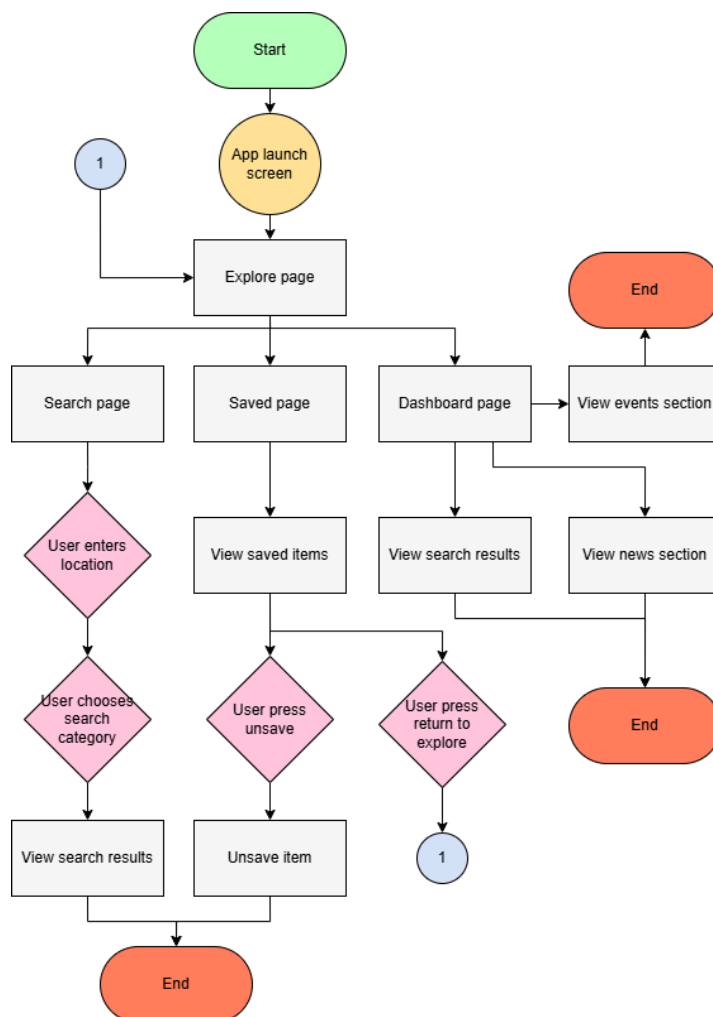
This is the updated wireframe for my Learn section of the application and this stage of development takes place [here](#) *Bottom of page 28*

This includes 3 new wireframes, one for each tab in the learn section. This was done to more closely meet the requirements involving a “Cultural Content Library”



User Flow diagram

A user flow diagram is often made in the pre production stage of development and can be used to show the client, developers, UI designers or any stakeholder of the development project. My flow chart will be used during development to give me a direction to follow and help to reduce scope creep. It will display the route the user can take such as accessing pages and actions within the application.



The app starts with a launch screen while it loads the components, api's libraries etc.

The app will open on the explore page as this is our main/home page of the application.

You can access any of the other pages via the nav bar and also the saved items page from the explore page.

Each page has its own paths you can follow, such as searching for specific types of listings.

Each route ends with an "End" module or returns to the explore page.

Design Choices

Colour scheme

I plan for my colour scheme to feature a similar colour scheme to what is commonly used throughout Welsh application such as transport for wales and the gov.wales website. These examples use a lot of the colour red in accents and buttons as it connects with the welsh flag, it would be a good idea to follow these themes as it will make the app feel trustworthy and professional as users will be used to these colours on trustworth Welsh apps.

Here are some examples of Welsh app using red in their colour schemes

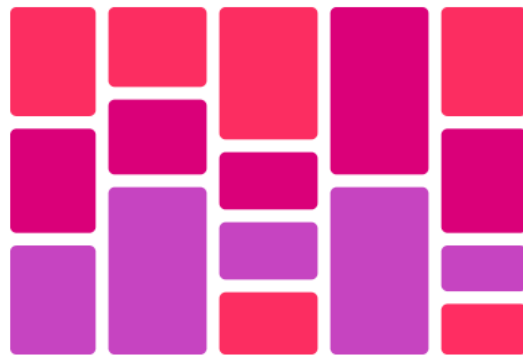
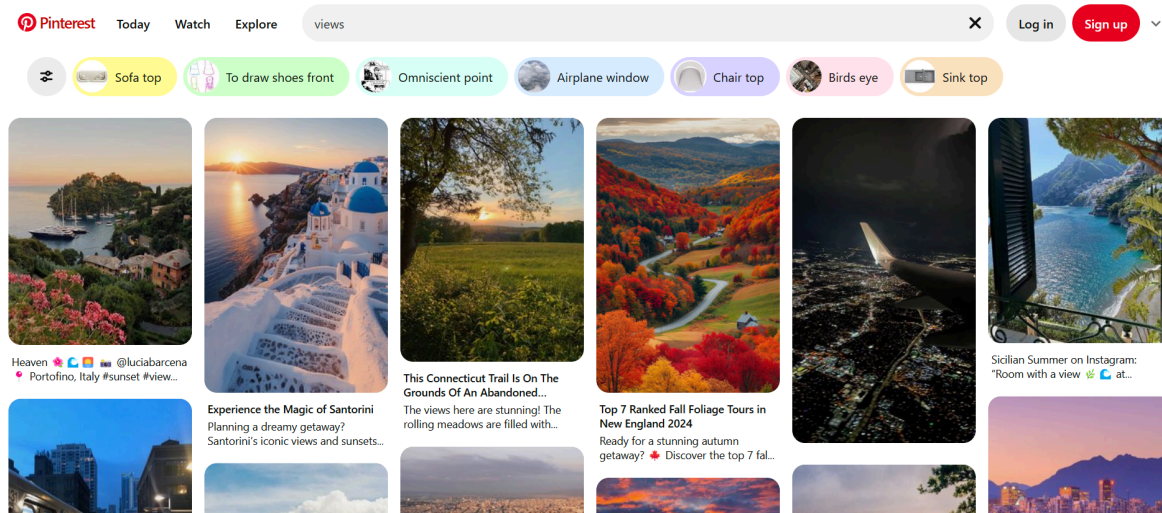
Image sources linked in references section



Here is the colour scheme I plan to use in my project, I created this using colors.co as it's free and displays the hex values which will help during development.

I have used a deeper, less vibrant red in my colour scheme to make it easier on the eyes to reduce fatigue whilst being used, for the same reason I have used a near-white and near-black as this helps the colours fit together as opposed to using pure white and black. However this can affect the contrast and therefore the accessibility but my choices are close enough to the pure values as to minimise or even negate this. I have also included a light gray in my palette for use in miscellaneous places such as buttons or icons.

Inspiration



Masonry grid layout

I plan for my app to use a layout similar to that of pinterest (pictured above). I feel this layout looks attractive but it's also functional as I am able to show a full image while keeping it within the grids overall shape.

Accessibility in design

To make my app as accessible as possible I need to try to make it useable by as many people as possible there are many ways i plan to do this, firstly i will be using a sans serif font through my application, this means the font uses standard letters without additions to the design, for example I may use Open Sans or Apples SF pro.

My colour scheme can also affect my apps accessibility, this is because not all eyes are the same and its likely some users will have difficulty reading from or using an app that uses specific colour combinations, to minimise this risk we should use colours with high contrast to one another, especially on text.

As required from the client brief we will be including an English to Welsh translation option, we could also include other global languages to increase its effectiveness. This would be a good inclusion especially as an app such as this would do well for tourists visiting Wales from non english speaking countries.

Architecture

App Structure

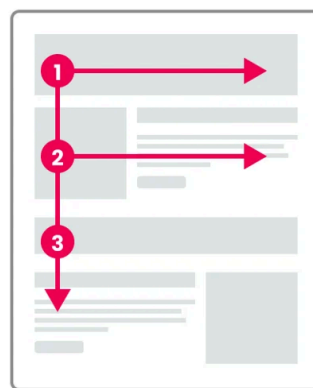
The application will consist of 3 main pages, search, explore and dashboard. To switch between the pages the user will use a nav bar situated at the bottom of the screen. This works by having the app run entirely on one fragment which contains nothing but the nav bar and a `FrameLayout` component. Depending on the selected icon on the navigation menu we can switch the fragment displayed on the frame layout to the matching page. Other pages such as the information page, accessed when a location is clicked will be accessed by changing the activity, meaning it won't have the navbar. This is because this page will have a cross button in order to close it and return to the previous page with the navbar.

Design Patterns

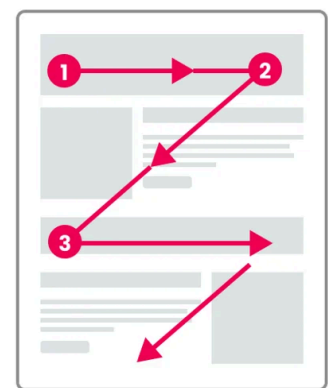
When designing mobile interfaces it is important to think about more than just the looks of the application. Things that usually get forgotten such as reading patterns, visual hierarchy and reach zones can be important.

Reading patterns are based on the way we process visual information. As English readers we read from left to right this means we will process all information in this way whether that's images or text. For my application to be intuitive to use I should place key elements such as headings, icons and buttons along the lines shown in the image.

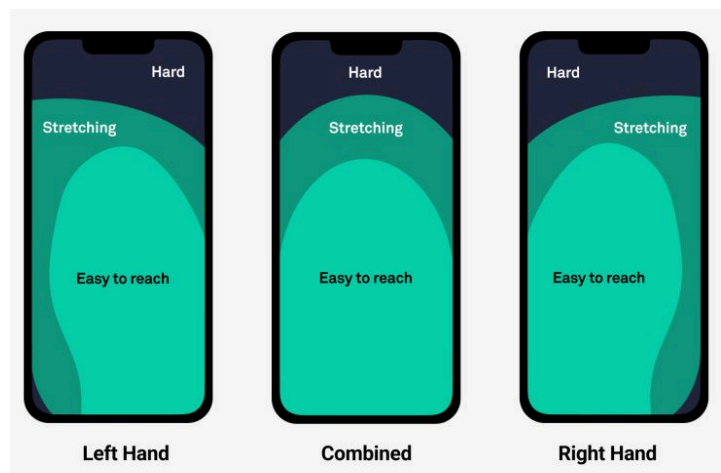
Reach zones reference the thumb's ability to click areas of the screen, this differs between left and right handed users, however it can serve as an important guide when placing buttons and navigation menus.



F-Pattern

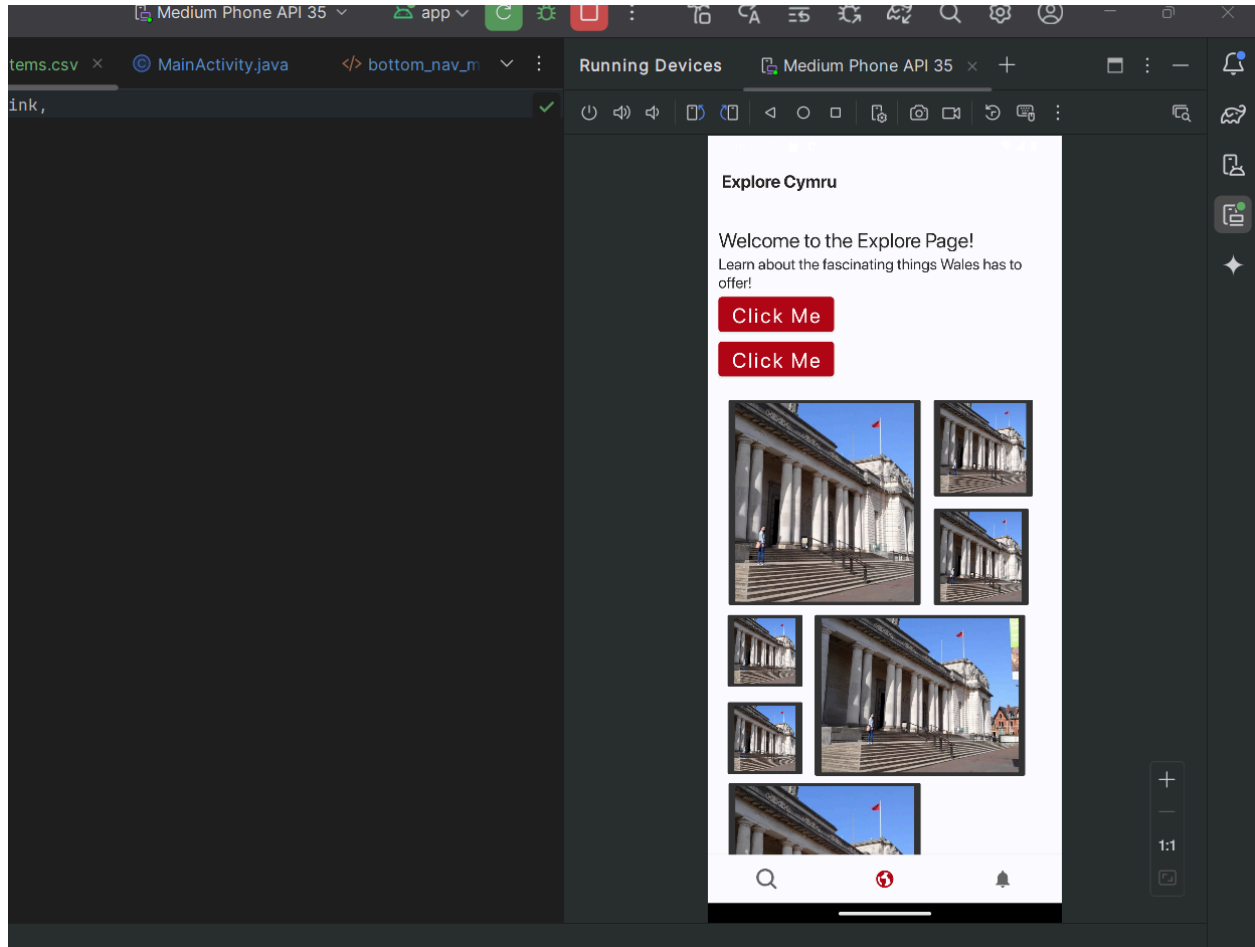


Z-Pattern

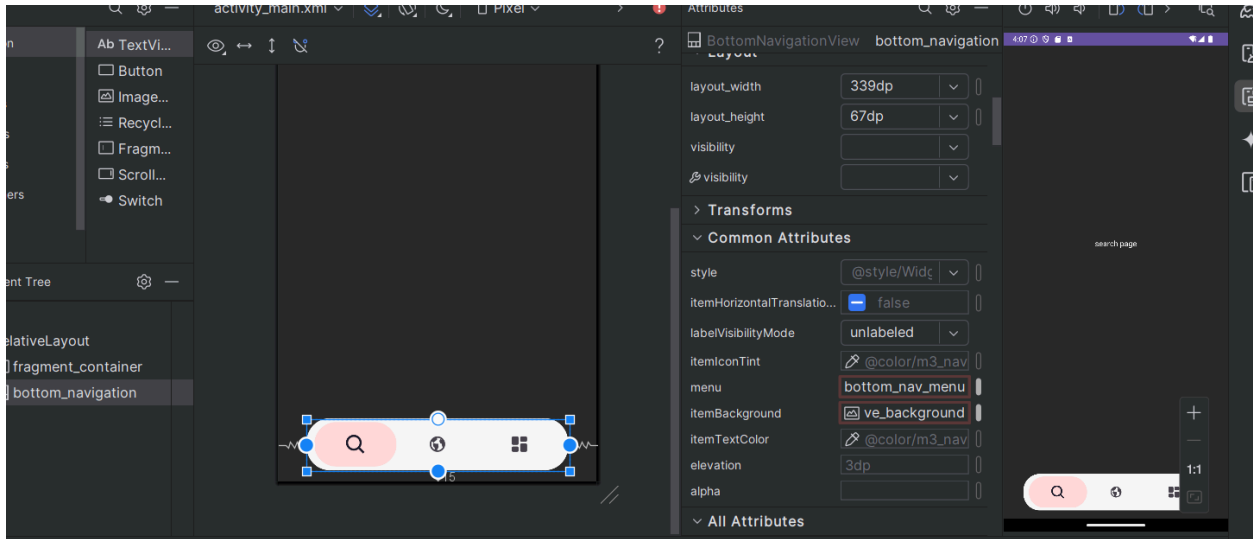


Development Process

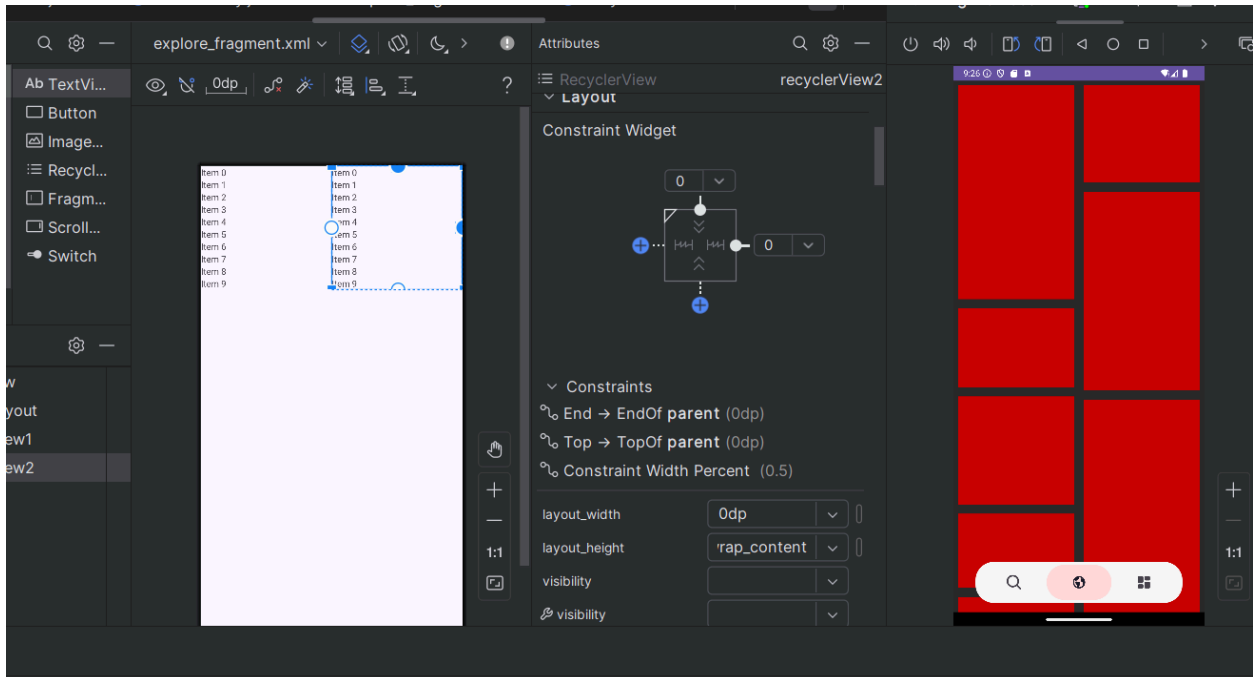
DEV-LOG (implementation)



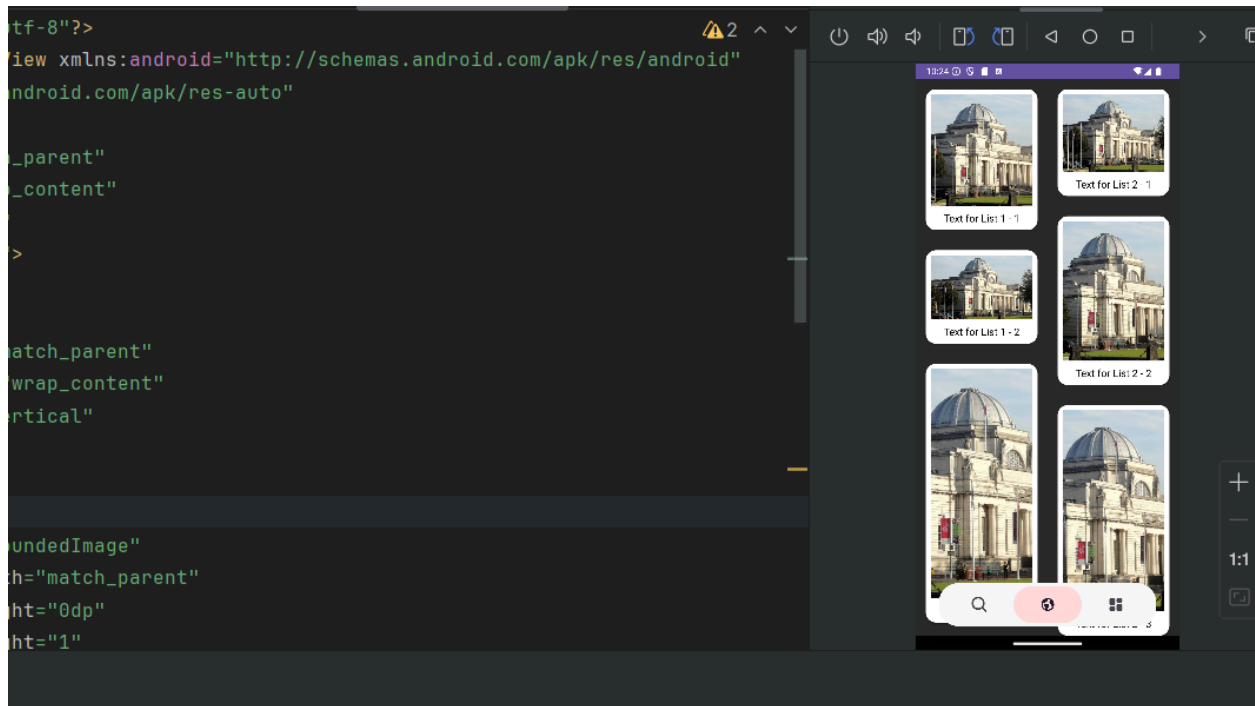
First step I took was starting up android studio and trying to create a basic version of my wireframe and learning android studio along the way.
Ended up restarting on a new project but this was a good practice version.



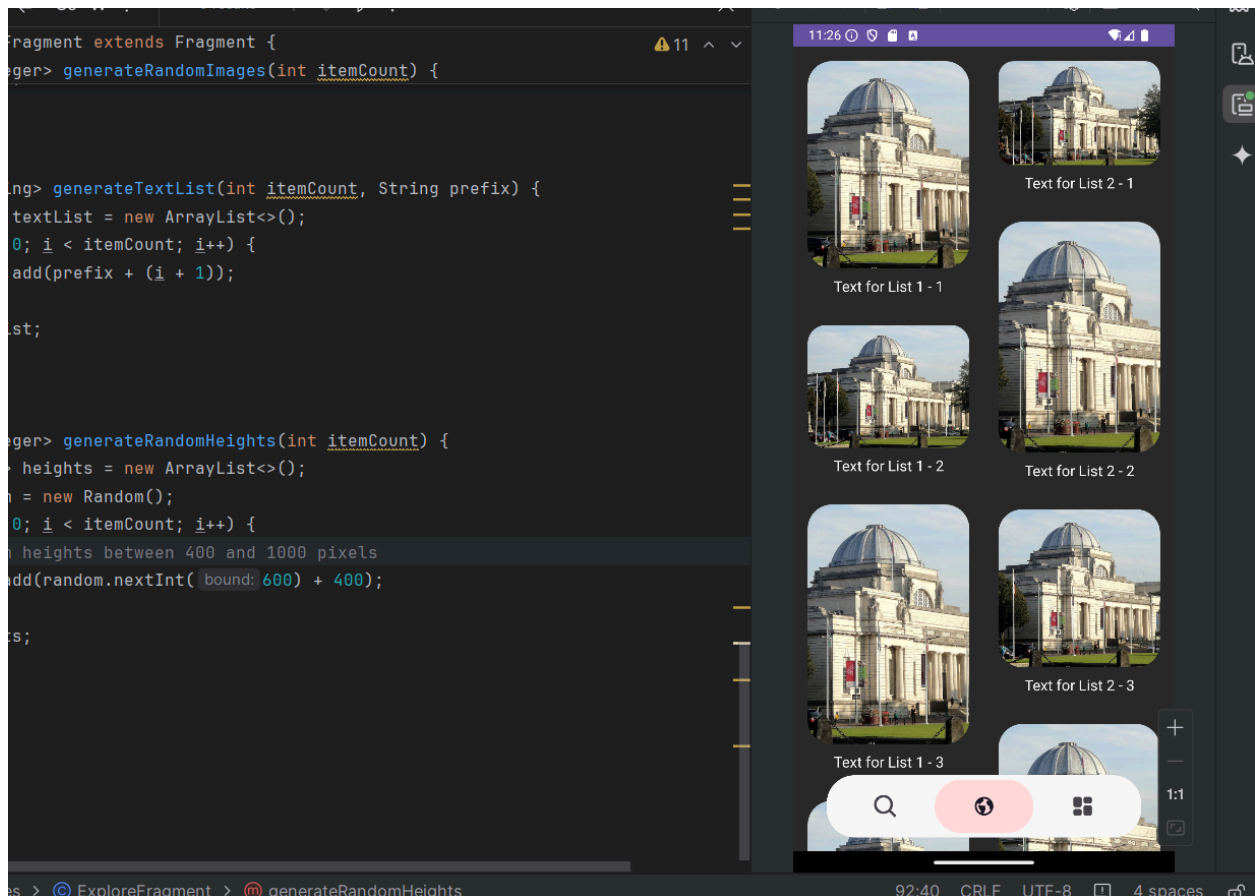
Rounded navbar



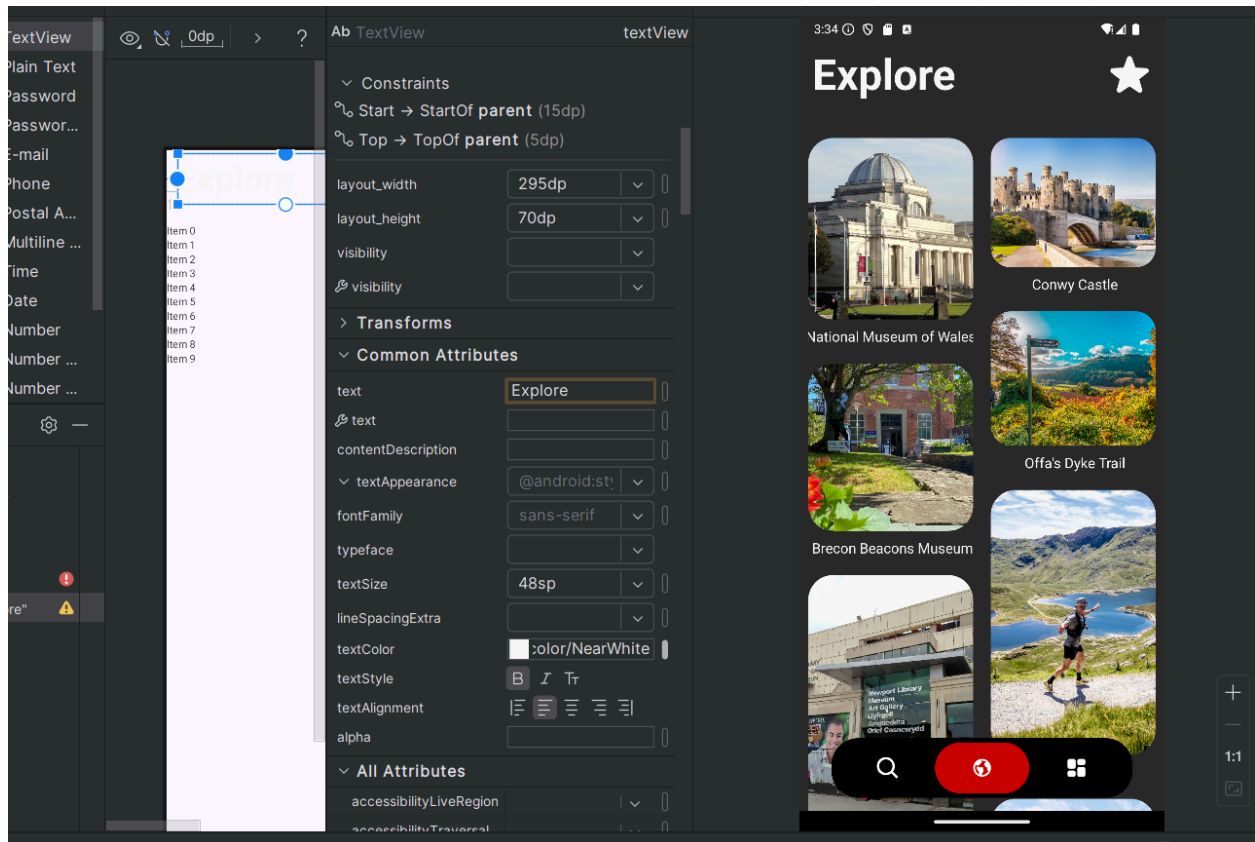
scrolling red masonry boxes



Replaced with cardviews containing an of Cardiff museum and room for some text.



Changed to rounded images instead of cards



Navbar colours, more images, grey status bar
 "Explore" title and favourites button

Set "android.enableOnBackInvokedCallback=true" in the application manifest.

D

tagSocket(118) with statsTag=0xffffffff, statsUid=-1

D

{ "_embedded": { "events": [{ "name": "Cream Classics - Cardiff", "type": "event", "id": "1AdFzbKGkzh9VMU", "test": false, "un

D

Title: Cream Classics - Cardiff

D

Date: 2024-11-16

D

Location: Tramshed, Cardiff, Great Britain

D

Image URL: <https://s1.ticketm.net/uk/dbimages/46002a.jpg>

D

Title: Bollywood Time Machine - Cardiff

D

Date: 2025-01-26

D

Location: Cardiff Glee Club, Cardiff, Great Britain

D

Image URL: https://s1.ticketm.net/dam/c/8cf/a6653880-7899-4f67-8067-1f95f4d158cf_124761_RECOMMENDATION_16_9.jpg

D

Title: Cafe Mambo Ibiza - Cardiff


D

Date: 2025-03-15

ticketmaster

[Explore](#) [Documentation](#) [Partners](#) [Support](#) [My Apps](#)

[Logout](#)

 mattbullen

▼

new

^

mattbullen-App

Approved

Keys

Details

Affiliate IDs

ANALYTICS

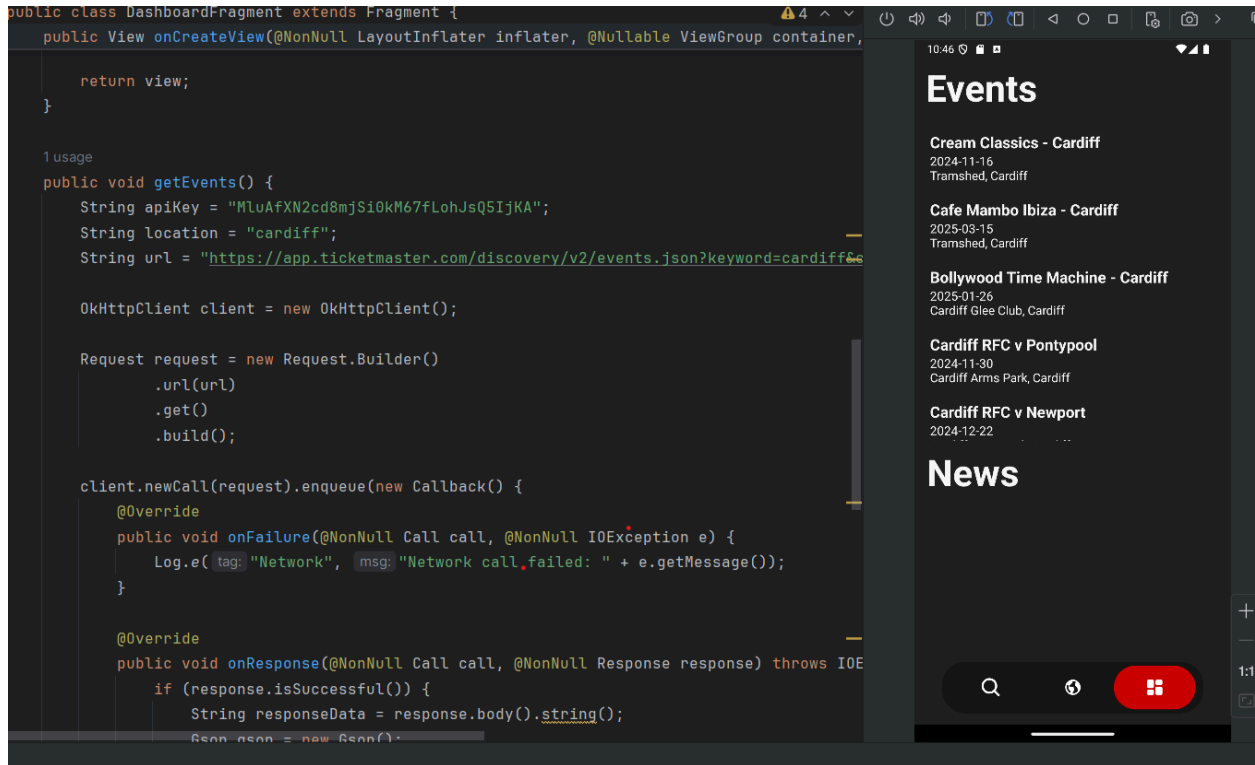
DELETE

EDIT

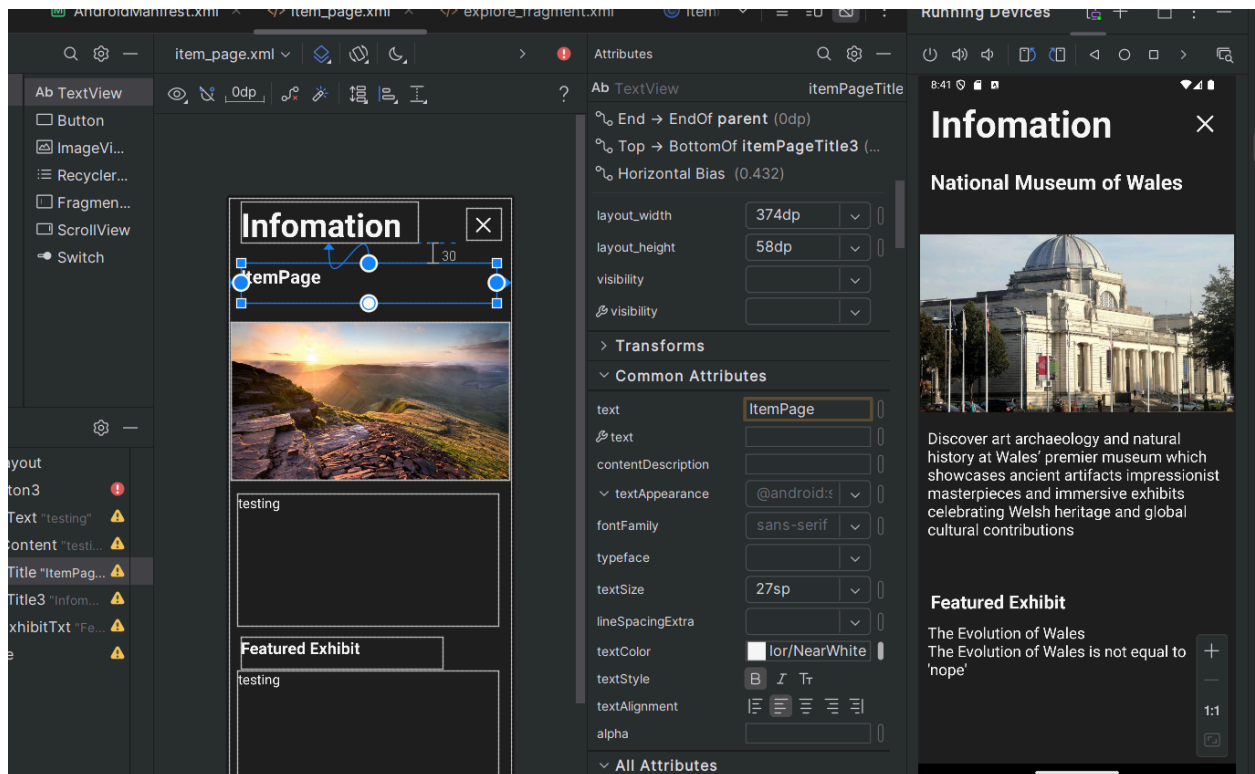
Below are keys you can use to access the API products associated with this application (*mattbullen-App*). The actual keys need to be approved *and* approved for an *API product* to be capable of accessing any of the URIs defined in the API product.

Consumer Key	MluAfXN2cd8mjSiOkM67fLohJsQ5IjKA
Consumer Secret	TFImsJlf6iE9hPnc
Key Issued	Fri, 11/15/2024 - 16:41
Key Expires	Never

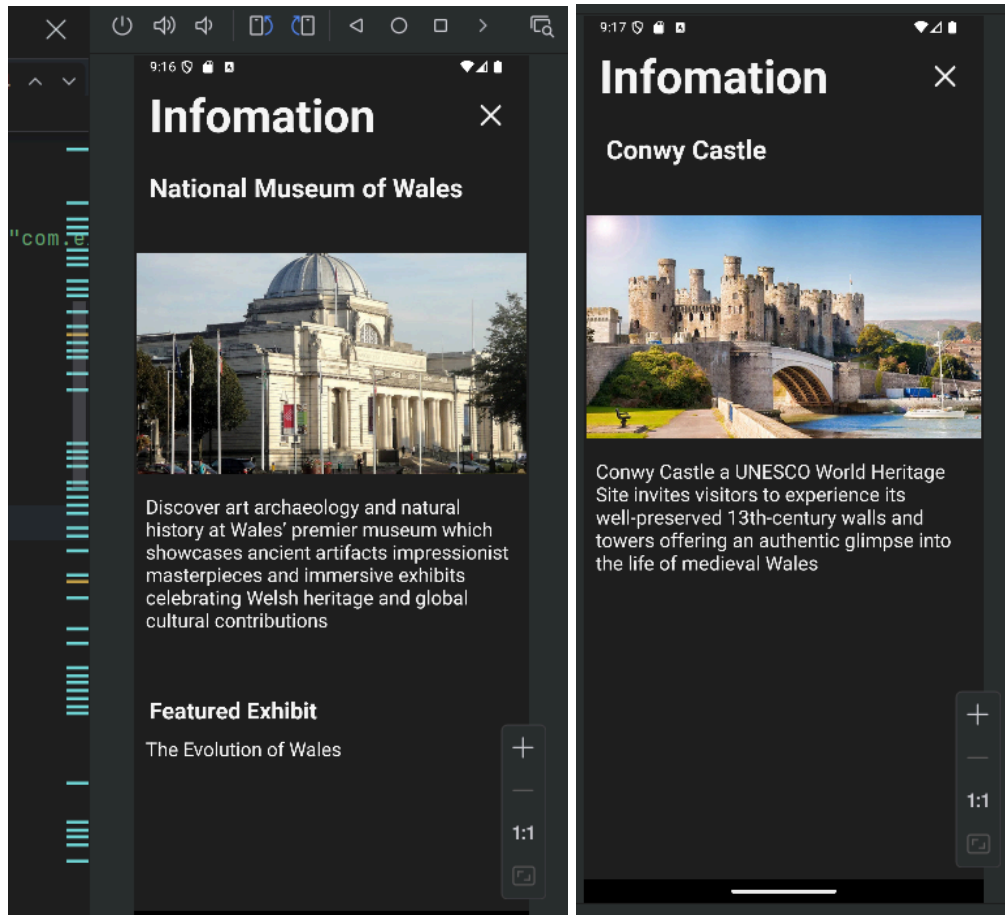
ticket master api searches for local events



Events are printed scrollable, and clickable to bring user to ticketmaster



Designed and added an information page to appear when an item is clicked on the explore page.

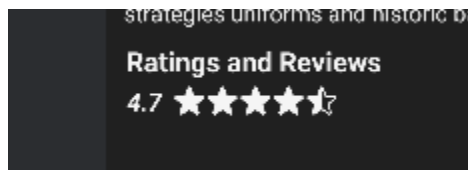


Information page is populated dependant on clicked item

```
Caerphilly Castle
Castell Caerffili / Caerphilly Castle
Rating: 4.7 Based on 7597 Google reviews
Reviews:
- Michelle Hovsepyan (5 stars): Beautiful place. It costs money to see the inside of the castle but you
- Peter Olivier (3 stars): We love this castle, but as it's under essential renovation there are some l
- Kevin Arscott (The Walking Kev) (5 stars): Walk around the castle a lot as when the grounds are open

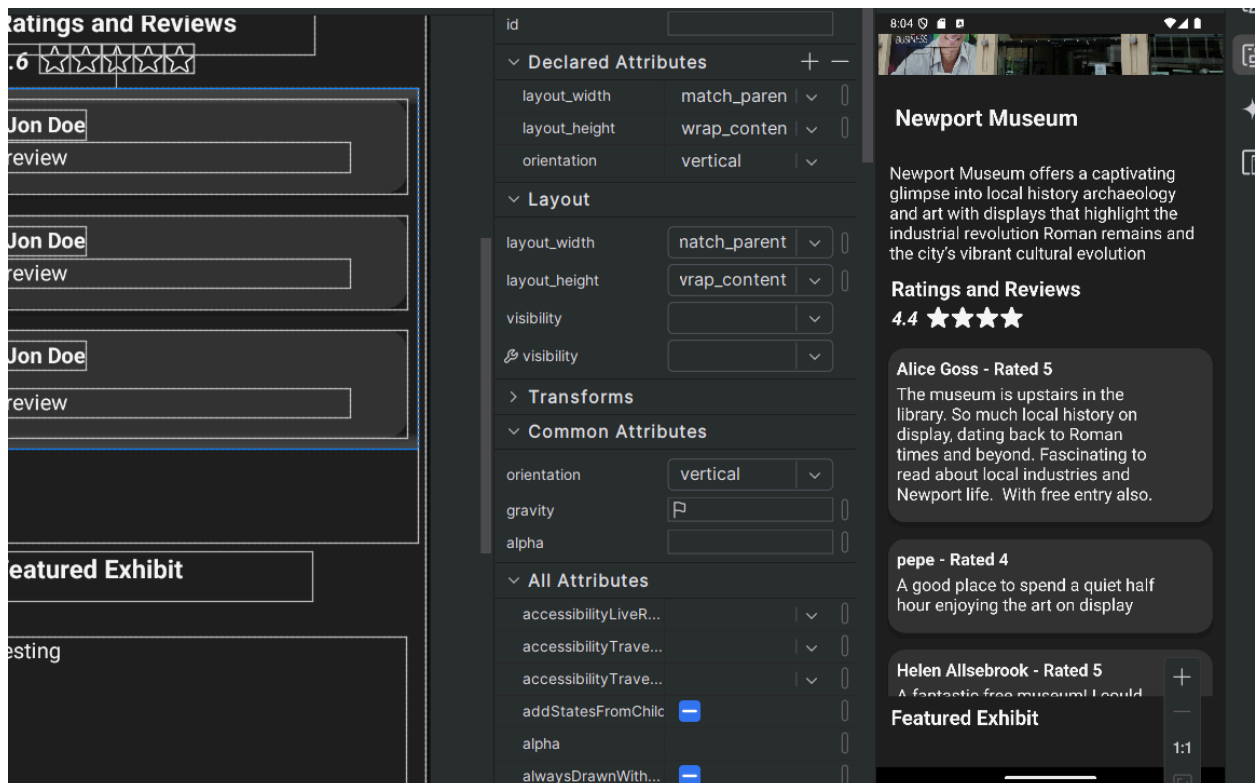
The castle is very impressive, second largest in the UK I believe. Makes for some good photo opportunit
- Mark (5 stars): Great visit to a historic monument, being the UK's second largest castle. Obviously n
Very satisfied, and very interesting!
- Jennifer Mackie (5 stars): Really enjoyed it, well preserved castle, lots of nice touches like the dr
```

Googles places api gets reviews for places on my app



```
for (int i = 0; i < 5; i++) {
    double threshold = i + 1;
    if (rating >= threshold) {
        stars[i].setImageResource(fullStar);
    } else if (rating >= threshold - 0.5) {
        stars[i].setImageResource(halfStar);
    } else {
        stars[i].setImageResource(android.R.color.transparent);
    }
}
```

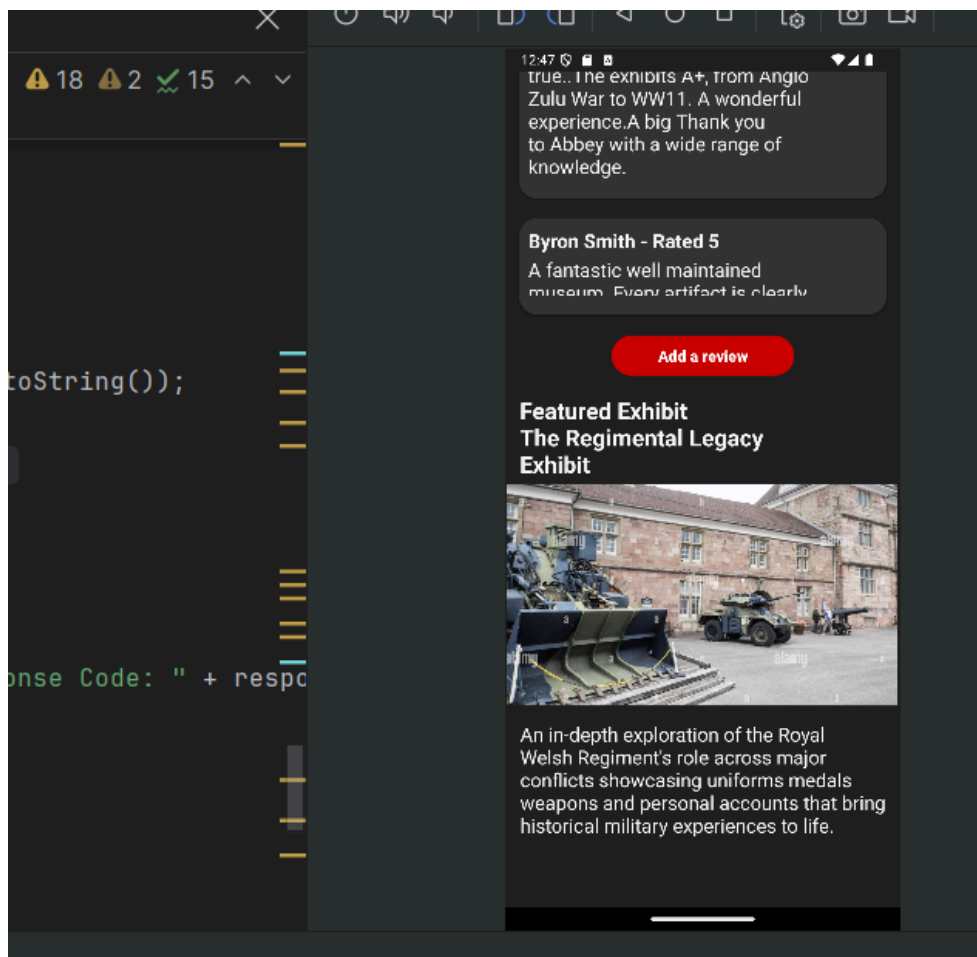
Sets star icons to show visual ratings



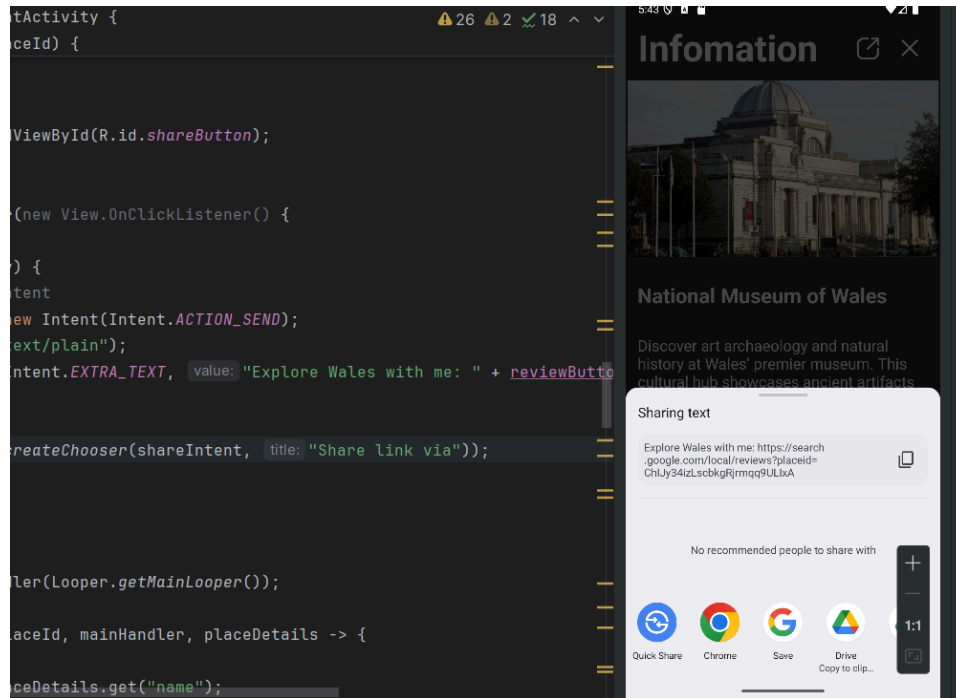
Added 3 reviews per item using google api's



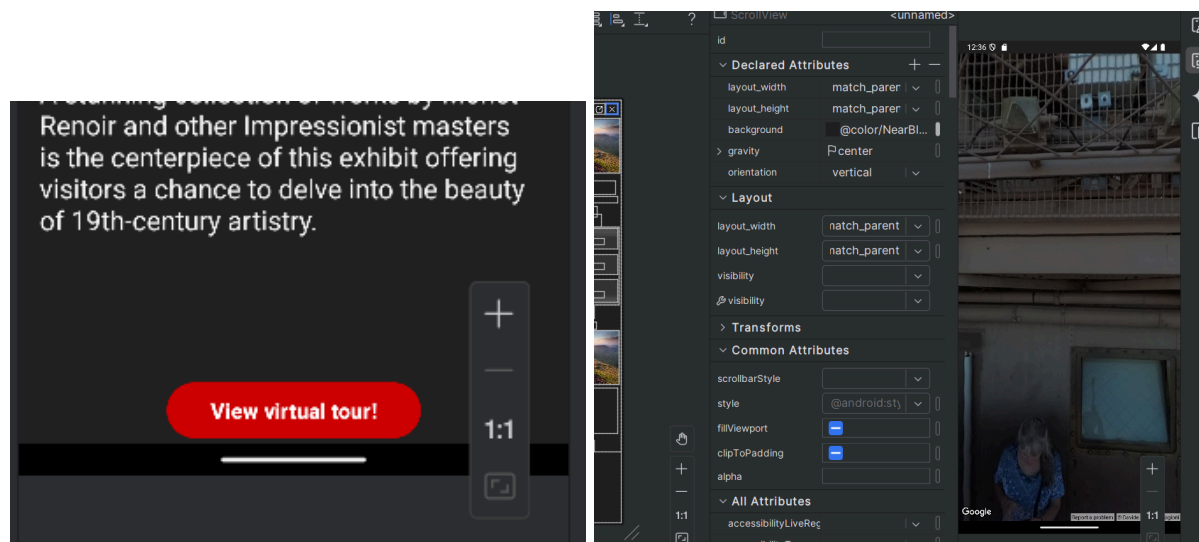
Added a button to take the user to the google review page



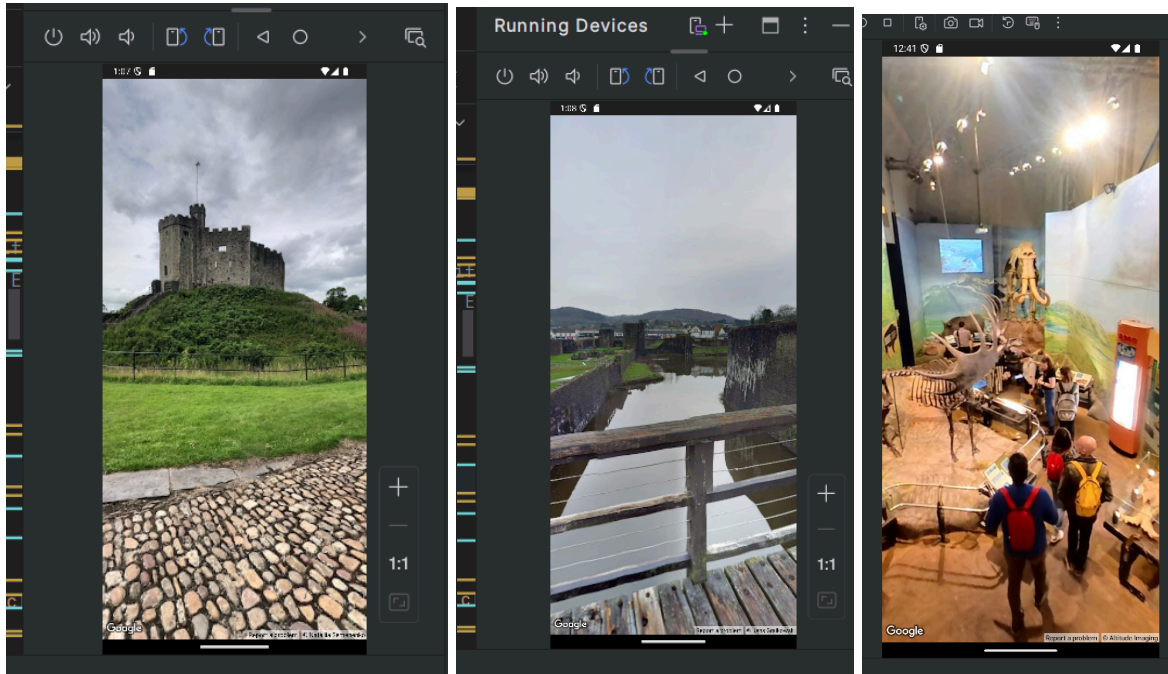
Featured exhibit section with an image and a description



Added functionality to the share button sharing the link of a item to apps



Using an api from Google I can pass in coordinates of a chosen photosphere
This button opens a new activity to view the "virtual tour"



Added the tours to other locations in the app

```
<string-array name="items">

    <!-- Museums -->
    <item>Amgueddfa Genedlaethol Caerdydd,cardiff_museum,museum,1,Darganfyddwch
    <item>Amgueddfa'r Gatrawd Gymreig Frenhinol,royal_welsh,museum,2,Camwch i
    <item>Amgueddfa Casnewydd,newport_museum,museum,3,Mae Amgueddfa Casnewydd i
    <item>Castell Caerdydd,cardiff_castle,museum,4,Profwch daith gyfareddol tr

    <item>Castell Carreg,carreg_castle,sight,5,Mae Castell Carreg yn fan tirono
    <item>Castell Caerffili,caerphilly_castle,sight,6,Archwiliwch ysblander Ca

    <item>Castell Conwy,conwy_castle,sight,7,Mae Castell Conwy, Safle Treftada

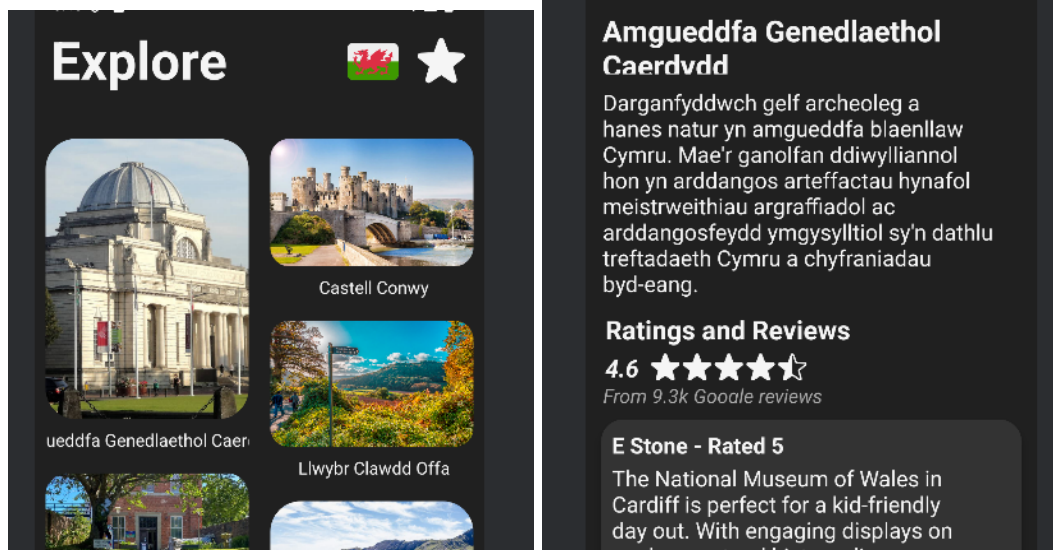
    <item>Llwybr Clawdd Offa,offas_dyke,trail,8,Mae'r llwybr hanesyddol hwn yn

    <item>Llwybr Eryri,snowdon,trail,9,Heriwch eich hun ar Lwybr Eryri lle cew
    <item>Canol Dinas Caerdydd,cardiff_center,trail,10,Treuliwch eich amser yn

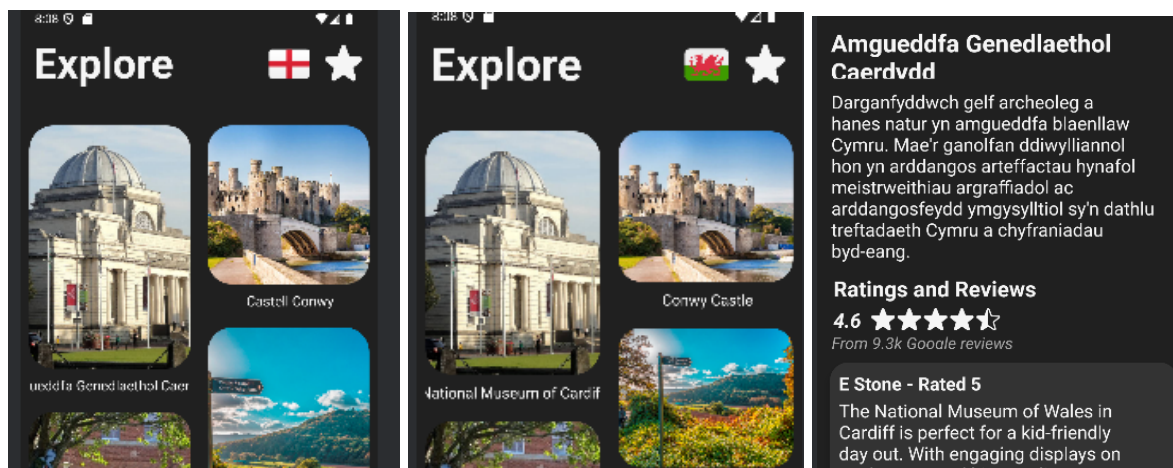
    <item>Llwybr Brycheiniog,brecon,trail,11,Darganfyddwch harddwch naturiol B
    <item>Llwybr Dyffryn Gwy,wey_valley,trail,12,Dilynwch Lwybr Dyffryn Gwy i

</string-array>
```

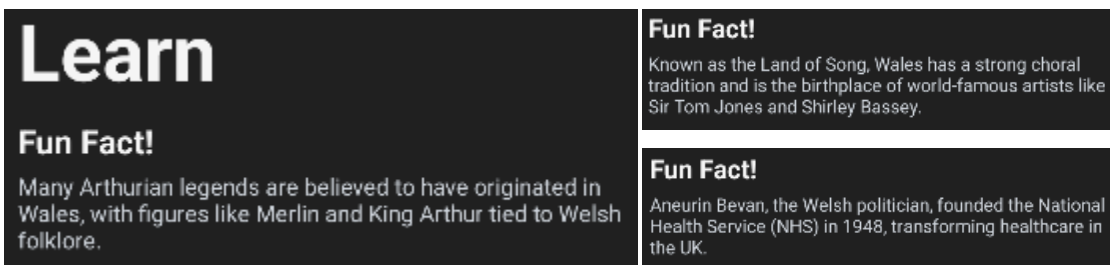
Created a second strings file with welsh translations from google translate



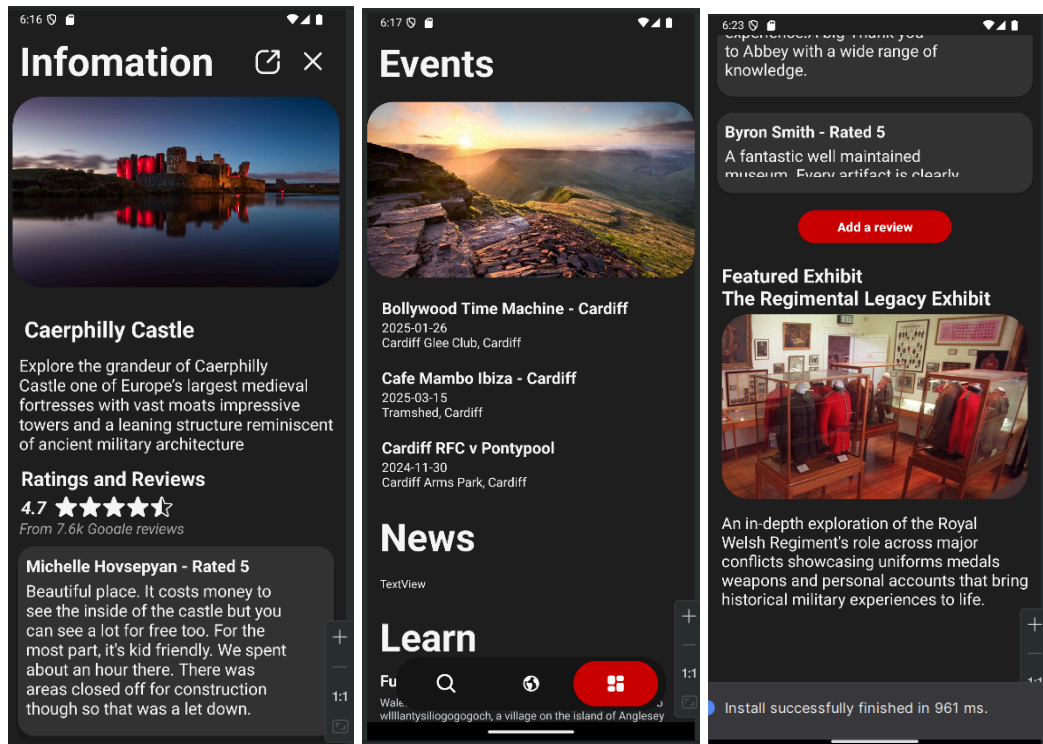
Added welsh translation for all of the items, currently all the other text is hard coded, you also currently can not change back into english



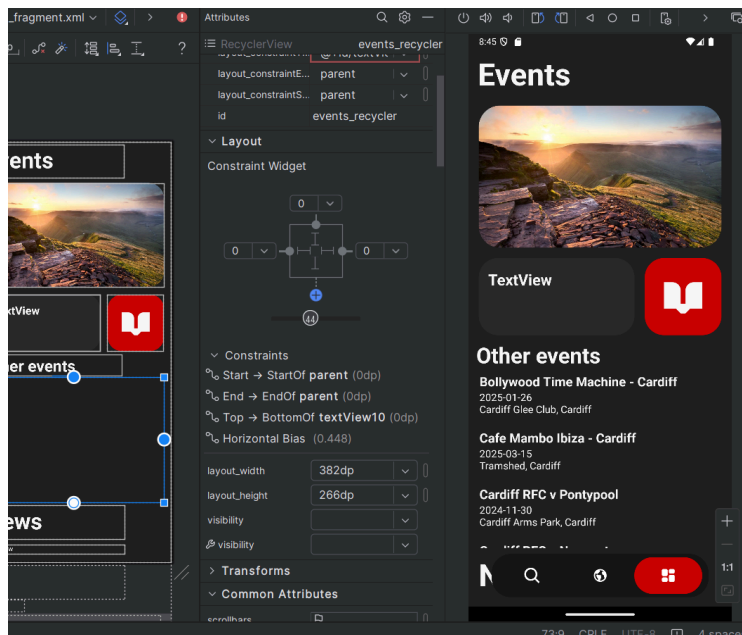
Languages can now be switched between english and welsh using the flag button on the explore page



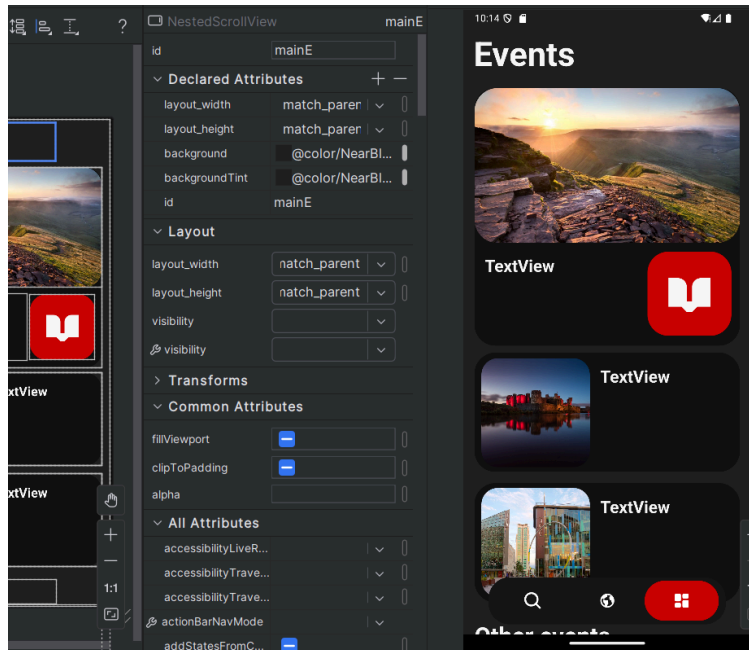
Started the learn section with 10 randomised fun facts



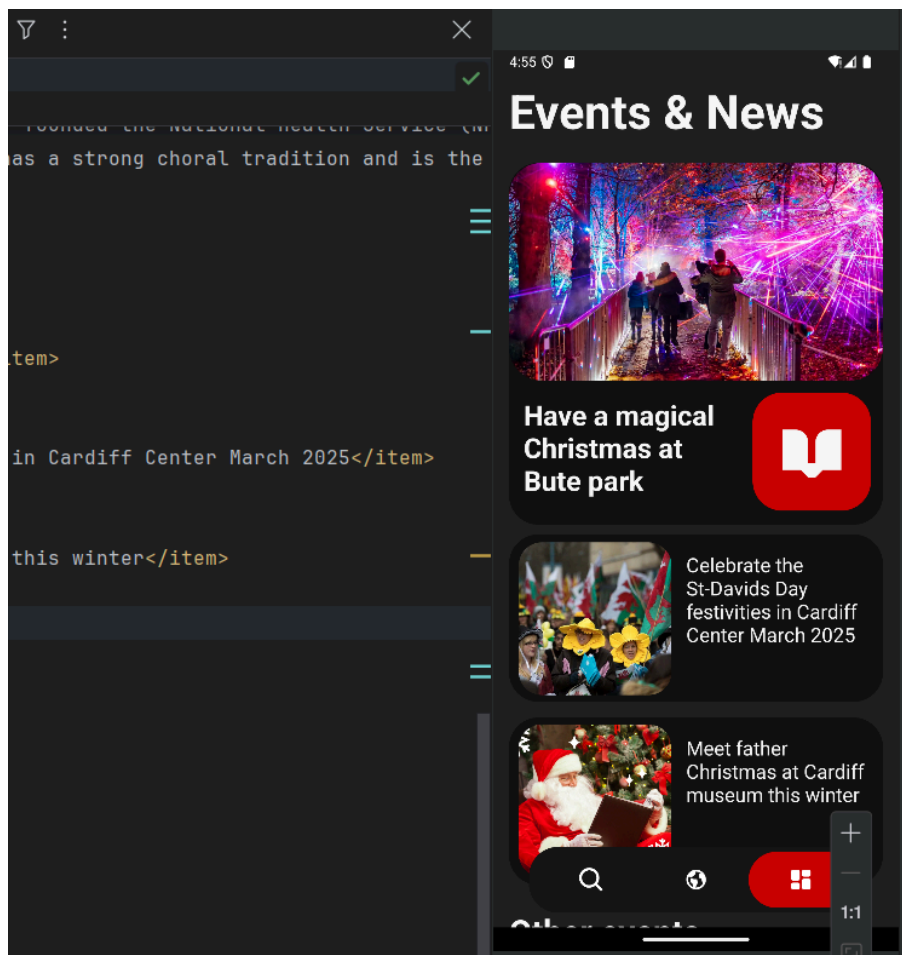
Rounded images on other pages to match



Changing my events section to match my wireframe better

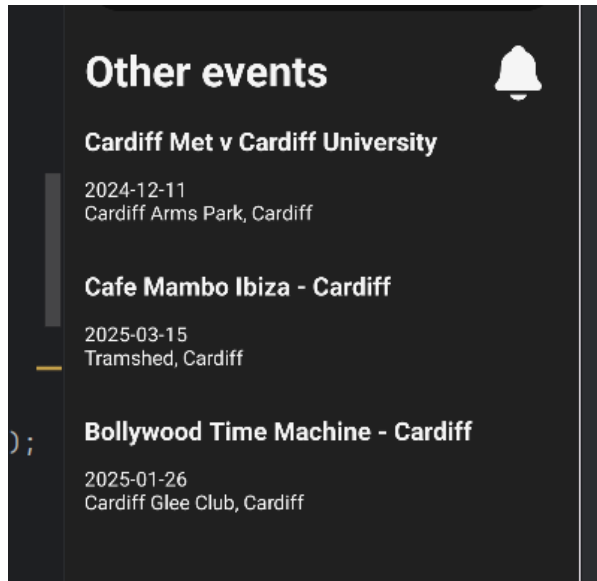


Added two sub-event boxes

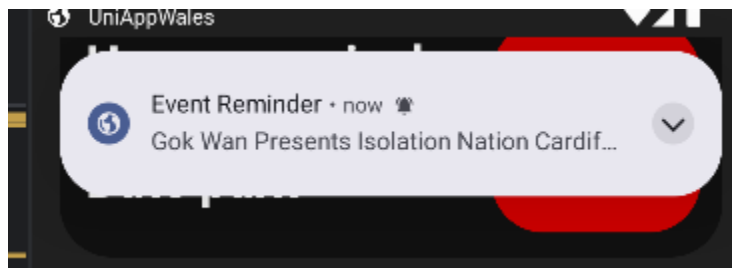


Set title to "events & news" and filled out article titles

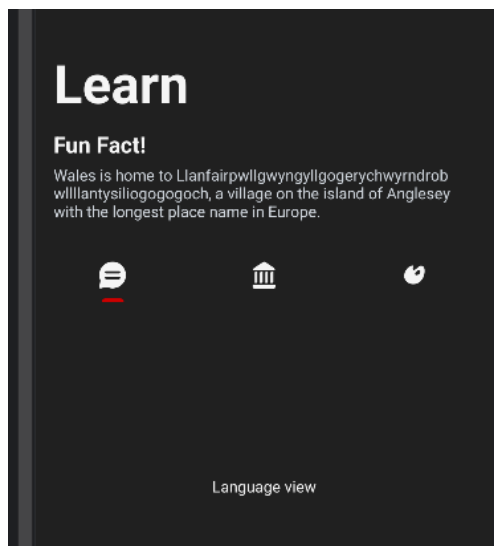
Matt Bullen - ST20287931



Added notification button to the other events section

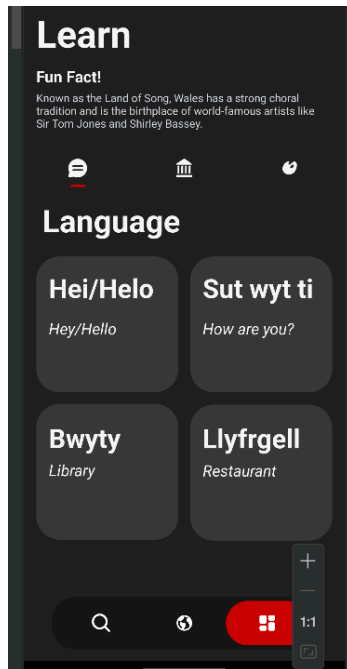


Notifications go off on the day of events to remind users to book tickets

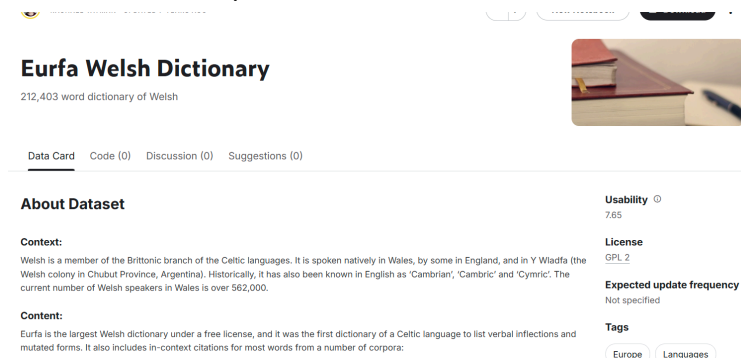


Added 3 tabs to the learn section to fit more content in to meet the “Cultural Content Library” requirement

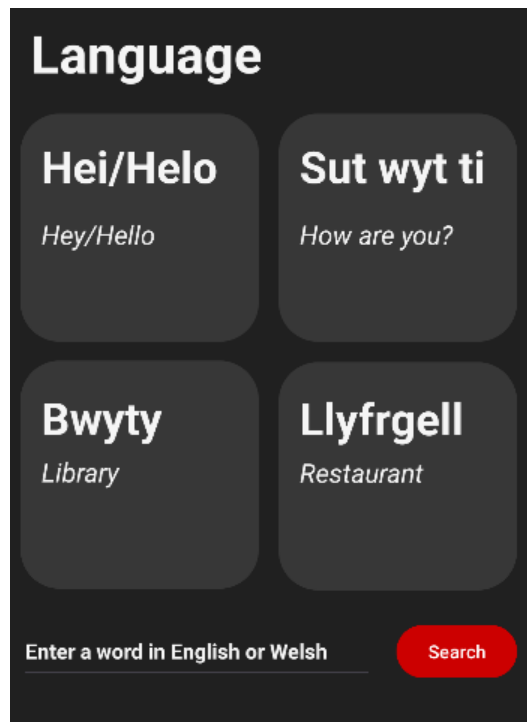
Now with taking a different approach was struggling to continue without a wireframe to go off of so I created another wireframe for each tab.



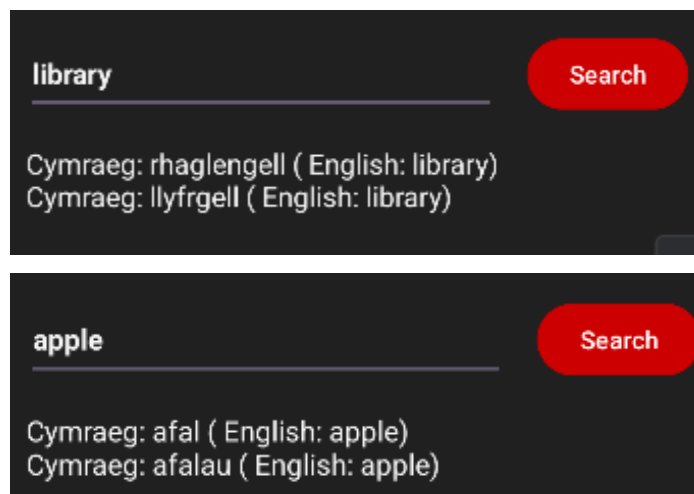
Added some simple translation cards for some basic/common welsh words and phrases



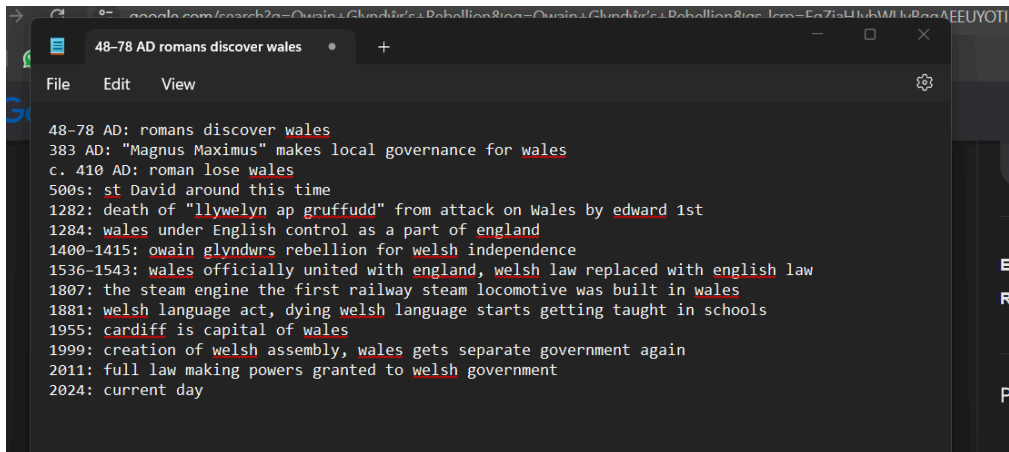
Got a welsh dictionary and converted it from a csv to a json file



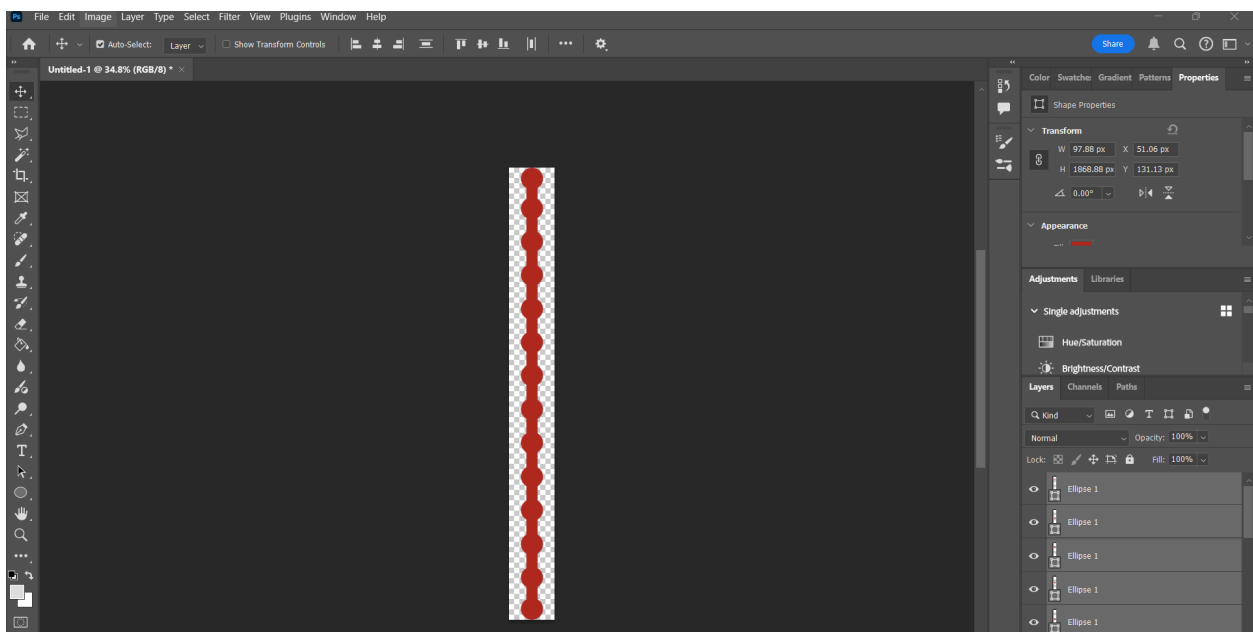
Added a text field and a button to start the search



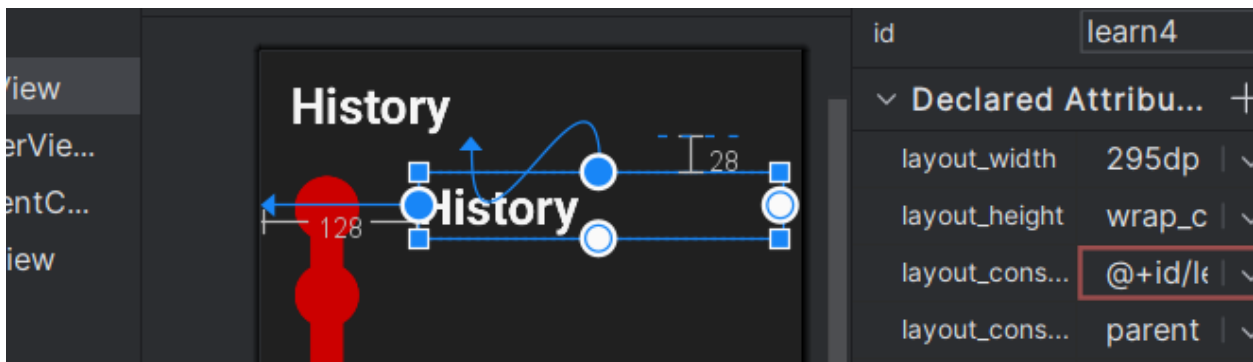
Using my json file I searched for the users key word and set it to the response text view



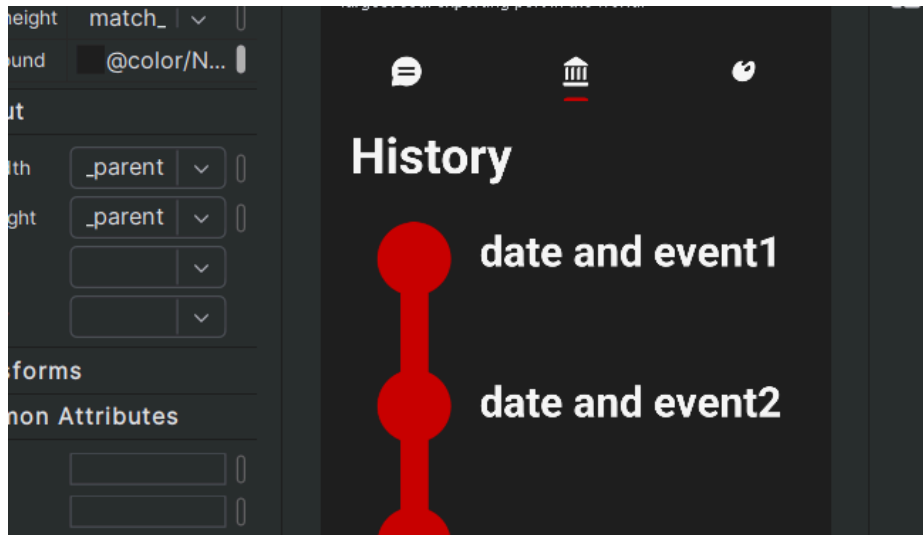
Did some research into welsh history and made some notes for my timeline section of the history tab totalling 14 items



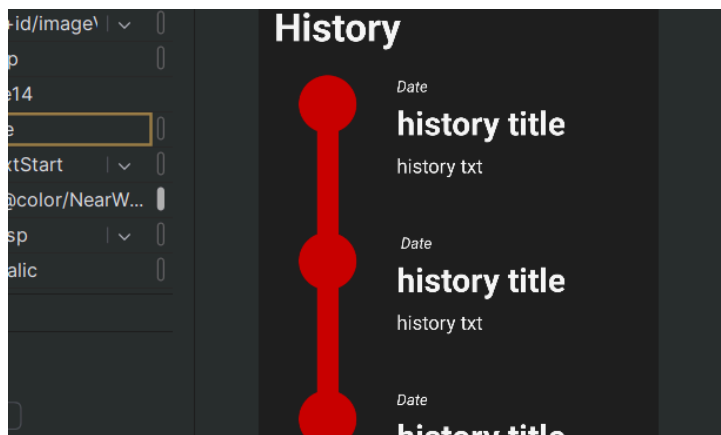
Made a timeline graphic in photoshop



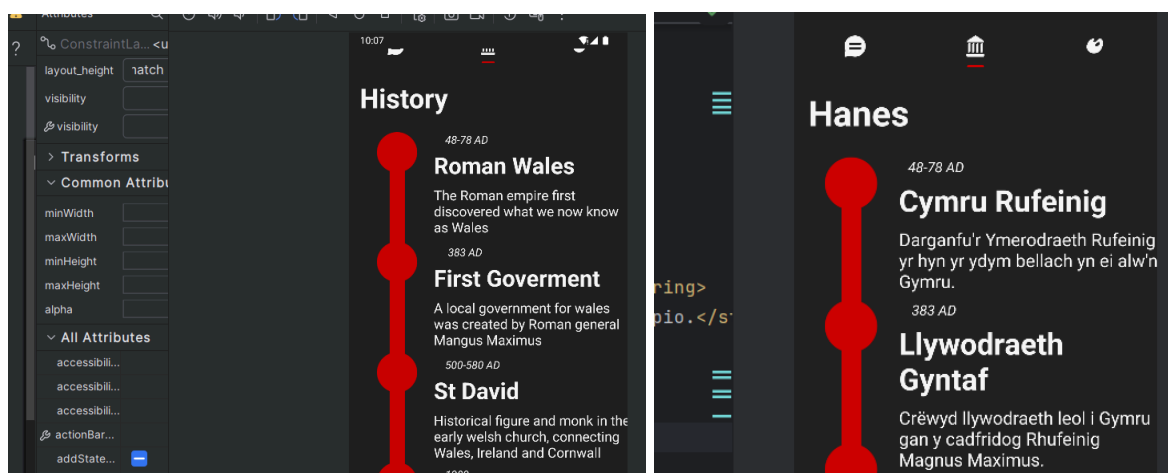
Gaps in the image were not large enough



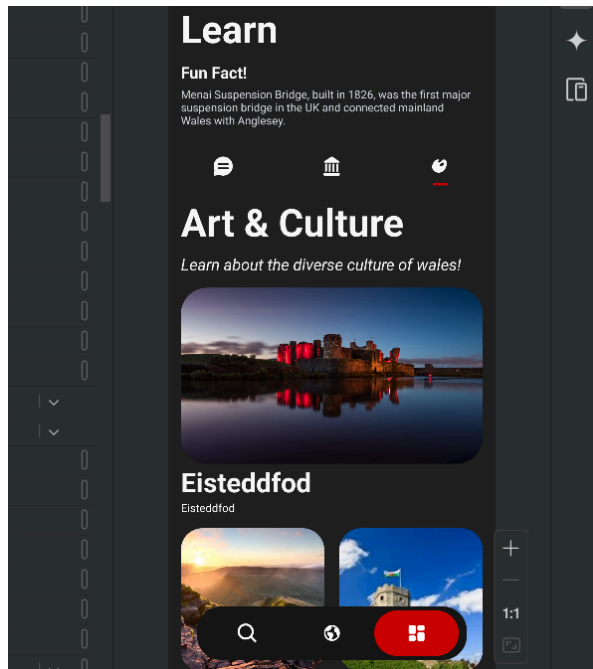
Made some changes to the image and made starts on the history segment



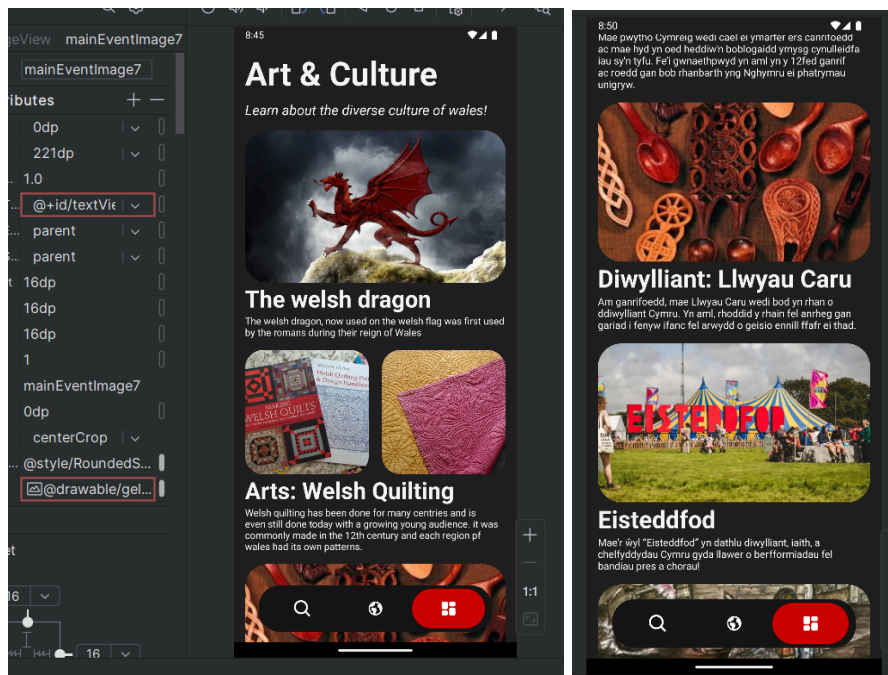
Shortened the list of dates down to 10 and added the date and text sections



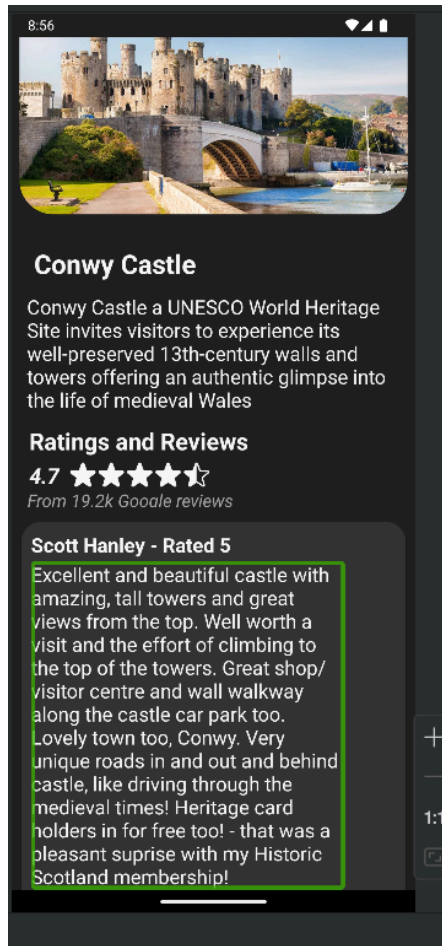
Filled in



Starting the arts and traditions section



Filled in with basic short information and translations



Text size options can screen reader work with android settings

Challenges

Many aspects of his project were new to me, and I enjoyed the process of developing “Explore Cymru”. However, there were some relatively unexpected challenges along the way, as most of my programming experience comes from web development, something that sounds so simple as rounding the corners of an image was surprisingly difficult and confusing. This is partly due to me having less experience using the IDE (android studio) considering I was using a modern UI library made by google I expected there to be a “border-radius” equivalent, especially as the buttons in android studio did have a built in “cornerRadius” option. Although once I had set up rounding images originally it was quite simple to round other images afterwards.

Overall this was a good challenge for me, but a welcome and fun project.

Testing

The method of testing i will be using is called acceptance testing this is where you test your project against the requirements set by the clients brief inorder to make sure it is in working order and ready to be submitted.

Requirements and testing results:

1. Cultural and Heritage Focus

Requirement 1 PASS

Result:

My app has a heavy focus on Welsh culture, language, arts, traditions and heritage. With even the name containing the welsh language, the application its self features many welsh museums with large information pages.

Requirement 2 PASS

Result:

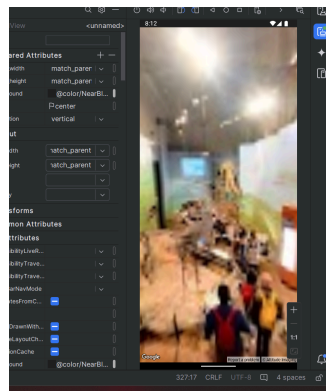
When creating the informational points of the app such as the “fun fact” I researched online to make sure accurate information

2. Virtual Museum Tours

Requirement PASS

Result:

To create my Virtual tours i used google streetview api

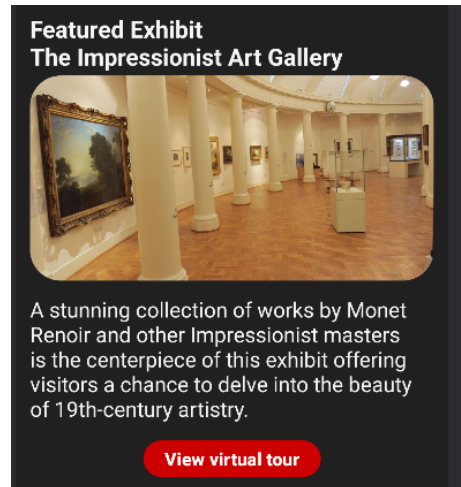


3. Exhibit Highlights

Requirement PASS

Result:

Each museum listed contains a featured exhibit area of the information page.

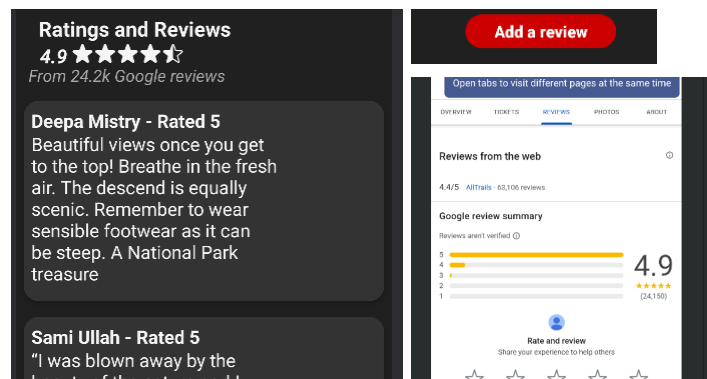


4. Interactive Features

Requirement PASS

Result:

By implementing Googles reviews api i was able to display a rating and reviews from visitors of the locations. I also added a button for users to leave their own review taking them to the google review page

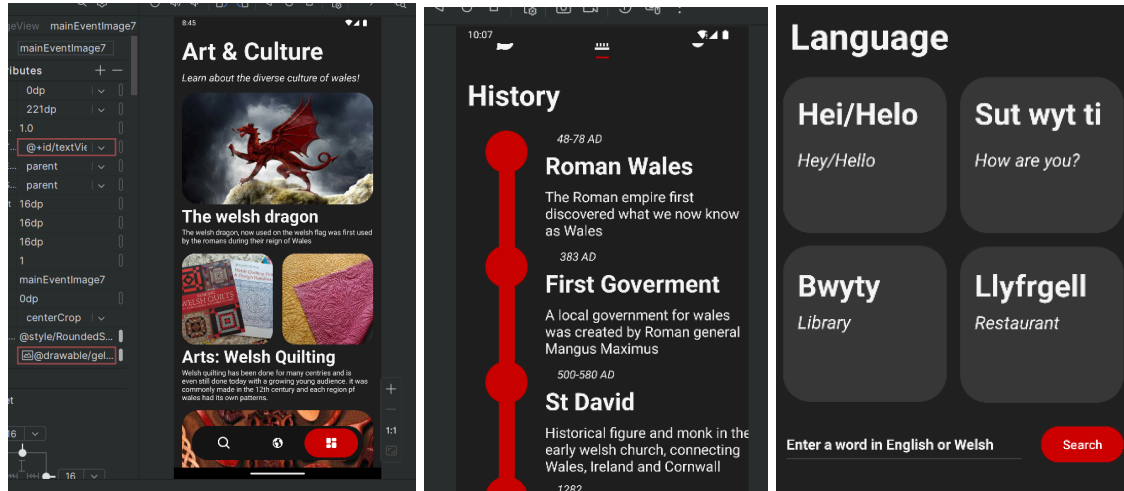


5. Cultural Content Library

Requirement **PASS**

Result:

The “Learn” section was included in order to specifically meet this requirement, including informative sections on language, art, history and culture.



6. Language Support

Requirement **PASS**

Result:

Using two strings.xml files I was able to add a feature to switch between languages with a button on the main page.

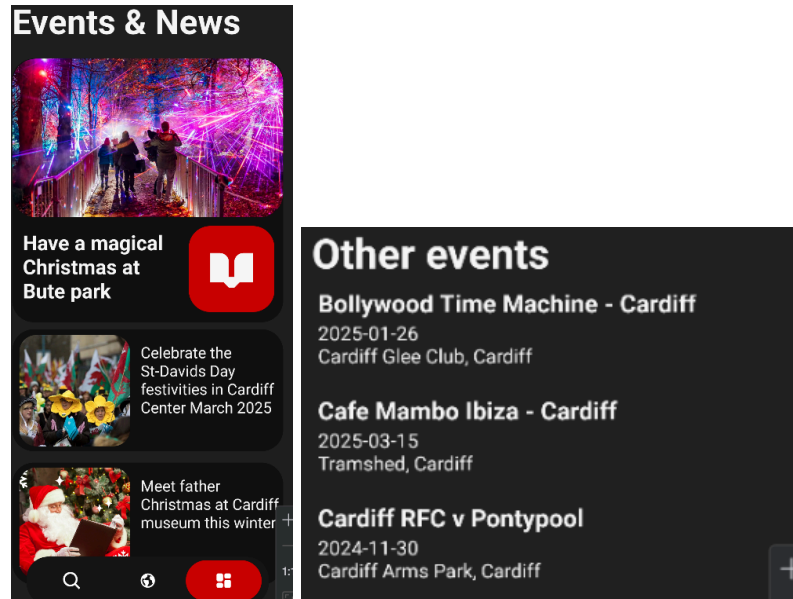


7. Events and News Section

Requirement **PASS**

Result:

Featured on the “dashboard” page is the events and news section, here I have added both real time events and some example articles about both events and current welsh news.



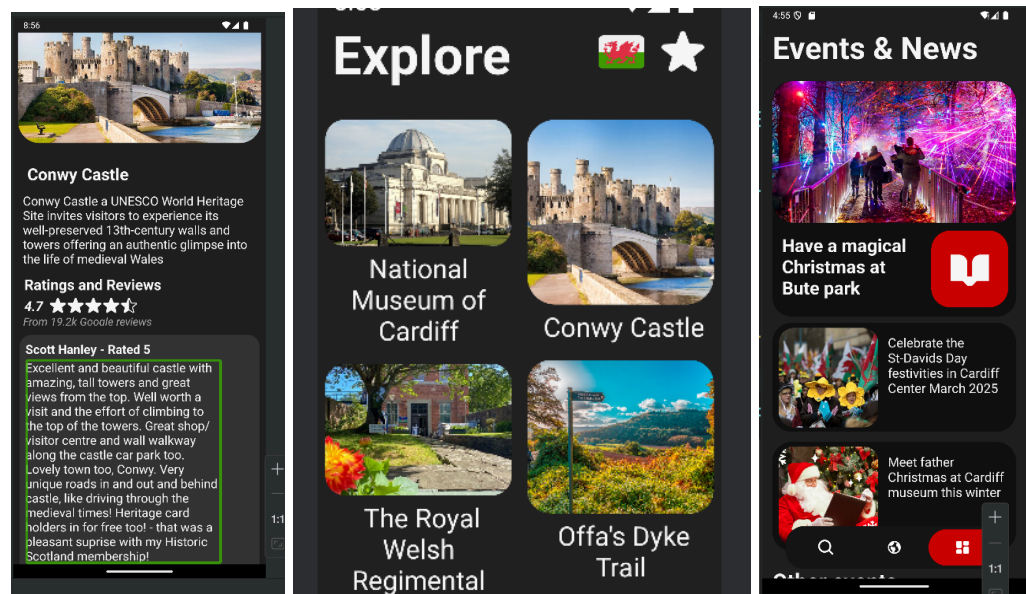
8. Accessibility Features

Requirement **PASS**

Result:

Colours text, contrast, language, screen reader, font size

In order to make the app as accessible as possible I made sure it worked with android's built in accessibility options such as text size options and text to speech screen reading. I also made sure to use high contrast colours in my colour scheme especially with text.



Conclusion and future work

Positives of the project

I focused on meeting the requirements before working on features such as the search page
I managed to make an attractive ui within the given time

I was able to learn many new things throughout this project

The time frame posed a challenge to my organisation and planning skills requiring me to focus on the planning section so that I can work more efficiently during the development.

What I would add if I continued the project

Adding the search page is the obvious next step for the project, but other than that i would like to add user accounts, this would allow users to store information, such as favoredited

places and allow admin accounts a way to add more items and articles to the applications without having to code them into the project.

I would also like to add an in app review system so that users wouldn't need to be redirected to google in order to leave a review. Although I am happy with my current implementation it would benefit the user experience to have this feature.

If it were a real client they would likely provide article content or fund a copywriter for the project, due to this I believed it to be outside of the scope of the assignment to write masses of content for the application. Therefore if I was to continue this project with intention of a release I would quickly have to add more content and make the article buttons clickable.

In conclusion

When starting this project I wanted to treat it as though it was a real world client, this helped me meet the requirements and design the final product to fit in with other real world applications as mentioned in the UI and design segment of this document. Treating it as though this was a task from a client made me more confident in my ability to produce software and I am very happy with the outcome of the project and I have met my own expectations and am confident in meeting the requirements set out by the client's brief.

References

Tools and Resources

- Wireframe Design: Wireframe.cc
<https://www.wirecrafe.cc>
- Free Icons throughout app: SVG Repo
<https://www.svgrepo.com>
- Flow chart tool: Draw.io
<https://www.draw.io>
- Color pallet: Coolors.co
<https://www.coolors.co>

APIs

- Google Places API
<https://console.cloud.google.com>

- Ticketmaster API
<https://developer.ticketmaster.com>
- Google Street View Static API
<https://console.cloud.google.com>
- Google Maps SDK for Android
<https://console.cloud.google.com>

Code help

Masonry Grid Layout: Suleiman's Blog

<https://blog.iamsuleiman.com/pinterest-masonry-layout-staggered-grid>

Image Sources

Safer Schools Wales

https://www.oursaferschools.co.uk/wp-content/uploads/2024/03/Wales_log_in_screen-826x1024.png

TransportforCymru

<https://passenger.tech/wp-content/uploads/2022/10/tfw-app-promo-1024x971.png>

Welsh Government Facebook

<https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcS27v4W7n7MkqViMs2v-4udmA1poyMvOMj72Q&s>

Thumb Reach zones

https://media.licdn.com/dms/image/v2/D4E22AQFfm3DINbLNgw/feedshare-shrink_800/feedshare-shrink_800/0/1699352907782?e=2147483647&v=beta&t=p4FS5QaYYM4AjzCFogkPevrGz_z1y1qH1kHgCLeGp1w

Reading Patterns

<https://www.seerinteractive.com/insights/3-easy-dashboard-design-tips>