Mobile Software Development Report

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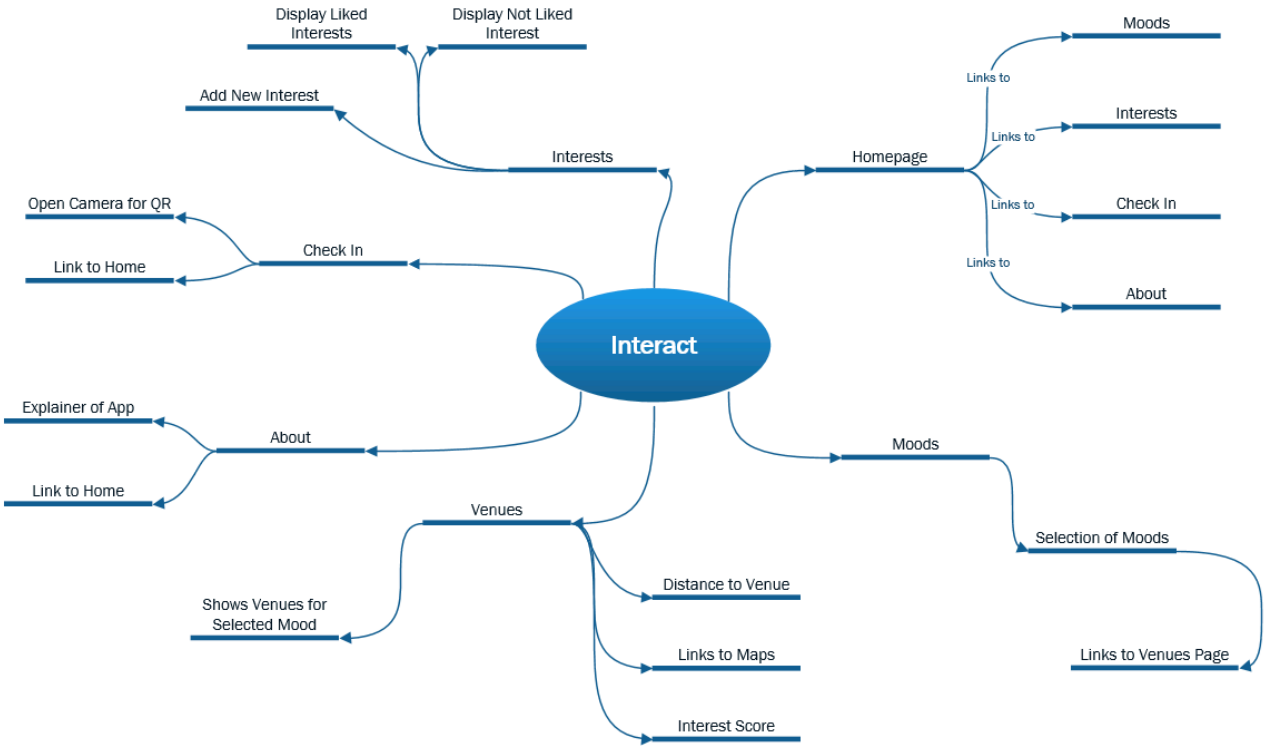
Development Approach and Process

In order to properly plan the creation of this app, this first stage was to brainstorm and to visualise the layout and functionality. This was approached at an overview level to gain perspective of the whole project, looking at the ensuring a consistent design throughout and having a natural flow to the app. Then moving on to focusing in on each component, identifying the technical functionality and linking them all together. This process is outlined in more detail below.

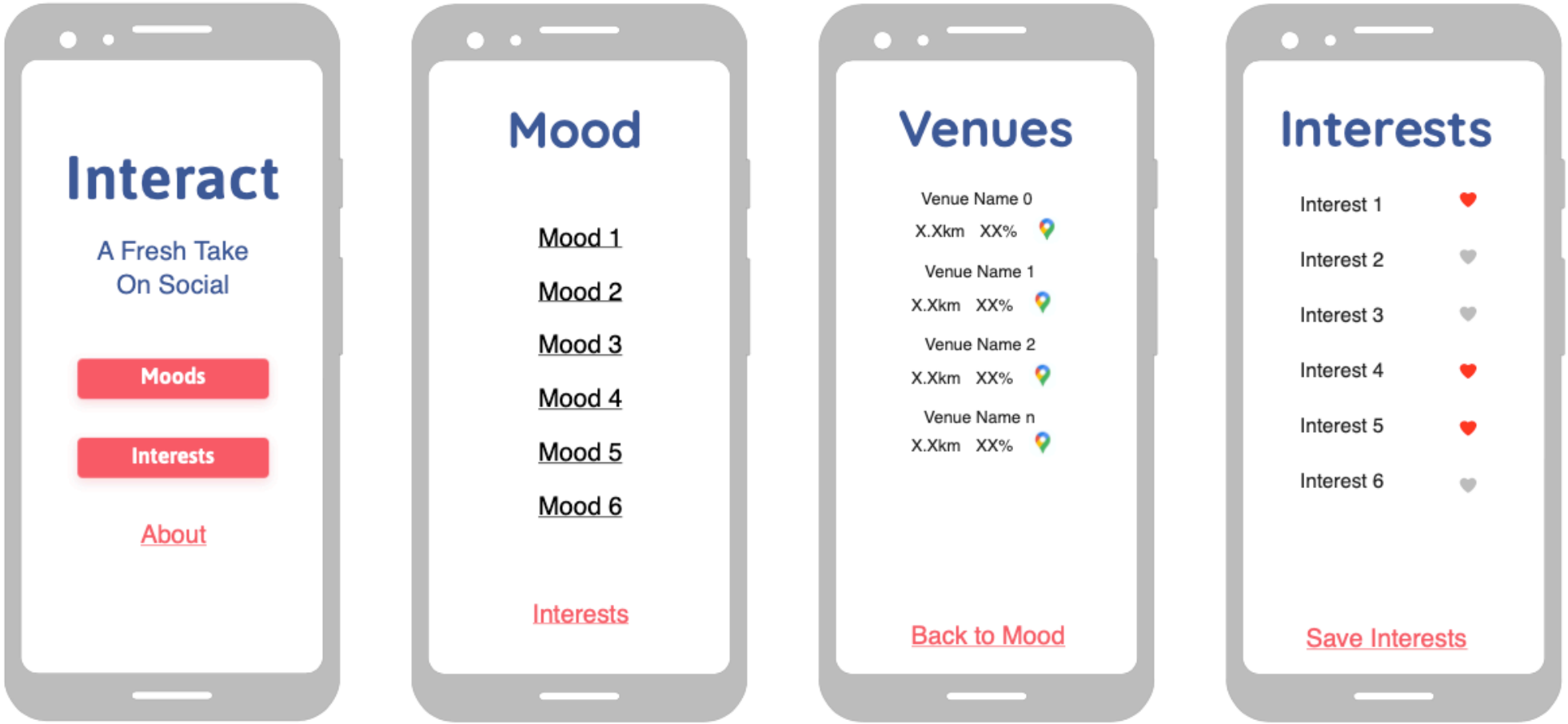
Brainstorming

The brainstorming section of the process was to first and foremost create the idea, this involved using a mind map. Already having a general idea of what the app will be from the get go, allowed for launching straight into deciding on the exact idea and what would be achievable. Mind mapping is best done visually and so I have included the mind map I used, below.



Prototypes

After having deciding on the idea for the app, the next step was to visualise the layout, this stage helps to not only have a visual reference when creating the app, but also helps to see how the pages of the app link together and makes it easier to label functionality. The various prototypes ranged from from simple sketches, moving up to more complete mockups. One of the final mock-ups created using an online tool is shown below.


Interact
A Fresh Take
On Social
Moods
Interests
About
Mood
Mood 1
Mood 2
Mood 3
Mood 4
Mood 5
Mood 6
Interests
Venues
Venue Name 0
X.Xkm XX%
Venue Name 1
X.Xkm XX%
Venue Name 2
X.Xkm XX%
Venue Name n
X.Xkm XX%
Back to Mood
Interests
Interest 1
Interest 2
Interest 3
Interest 4
Interest 5
Interest 6
Save Interests

Creation

These steps give an overview and outline of the basic stages of the creation of the app:

Firstly, creating the necessary number of files, this being the layout files (.xml) and the activity files (.java). This meant they were ready and available to easily link together and fill as and when. Having all these files created also allowed for viewing a quick overview of the project scope at a moments notice as well, this was helpful for context when linking them together. All these files were included in the manifest file too, so that they were all fully available and ready.

Next was to work on the basic functionality of each page. Creating a 'bare bones' structure to work from, including elements such as the TextViews, Buttons, etc., as well as linking the pages together with onClicks and Intents. This gave the project more structure and allowed for navigation around the app. This then gave a solid platform to move onto the next step.

Moving on to more complicated functionality, setup of the database, which could then be queried, inserted to, deleted from. Completion of the recycler views, now being populated from the database. Final work being done on the methods of the venues page - distance and score calculations, explicit map intents.

Once the functionality and behind-the-scenes work was complete, the design, styling and layout processes could really be dived into. This is where the mockups really helped as they gave a great reference when setting up the styles and colours to use across the project.

From here, final testing was performed, however testing is looked at in more detail below.

Design Decisions

User experience was generally the main focus of design decisions. This was done in an effort to keep in line with the message and focus of the app, in trying to reduce time spent on our phones. This meant the user interface was deigned to be minimalistic, intuitive and easy to use, needing little to no technical knowledge to use. Keeping this in mind, the user experience was designed to allow for a natural flow through the app, with all the main features quickly and easily accessible straight from the homepage.

After the app functionality and design features were setup, efficiency came more to the forefront. Going back through all the code, trying to minimise the amount of code and implement the DRY (don't repeat yourself) principle where possible, ensuring no unnecessary method calls, or unused variables.

Testing

Each aspect and activity of the app was tested as thoroughly as time and resources allowed.

After each new element or feature was added, testing was carried out to ensure that it worked as required and expected, as well as any surrounding, dependent or associated features to ensure that the functionality of them was not adversely effected.

This process involved multiple rounds of testing in some instances. This allows for more thorough testing to be carried out, as different aspects can be tested at each stage.

Using the recycler view as an example, the first rounds of testing were to see if the recycler view item and content were set up correctly, and linked to the interests activity correctly. At this stage, they were being tested with local string arrays.The next rounds they were populated from the database to ensure that the database querying was working properly and the returned data was being interpreted correctly. Finally, testing if the layout was displaying all information correctly.

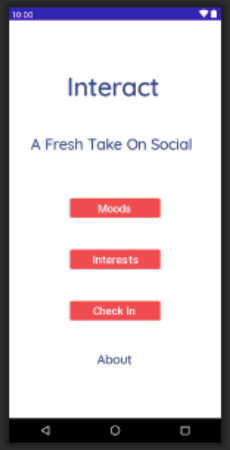
The main form of testing consisted of simply trial and error, loading the emulator, going through the processes and seeing if things didn't work. Logcat was heavily used for this process, as an indicator of what was happening under-the-hood at each stage. Using Logcat allowed to see what was happening with variables, what order methods and statements were being executed in, and any error messages that were thrown up. Again, for the recycler view, this came in very handy, as even if data was not being displayed properly on screen, it was possible to see whether the data was correct and as should be, or not.

It would have been preferable to download and install multiple emulators to test the application on, however due to resource limitations (running an old machine with limited storage), this was not possible. If development of this app will continue in the future, this further testing on multiple devices is something that would be completed.

There was a limited version of this for testing the layout using the Layout Validation in Android Studio, which allows to see how the layout of each page would look on the various Google Pixel devices (as the Pixel 3 emulator was being used). Examples of this can be seen in the screenshots below.

Pixel 3 (1080 ...

Pixel 3 XL (1440 x 2...

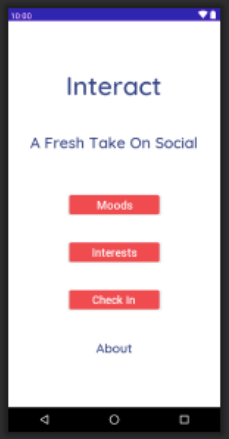


Pixel 3a (1080...

Pixel 3a XL (1...

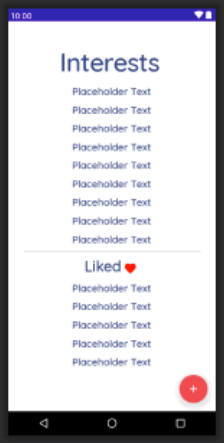
Pixel 2 (1080 ...

Pixel 2 XL (1440 x 2...

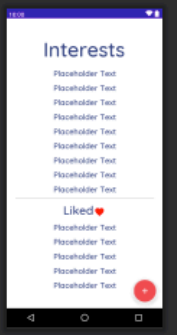


Pixel 3 (1080 ...

Pixel 3 XL (1440 x 2...

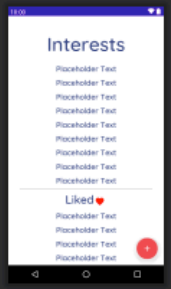


Pixel 3a (1080...

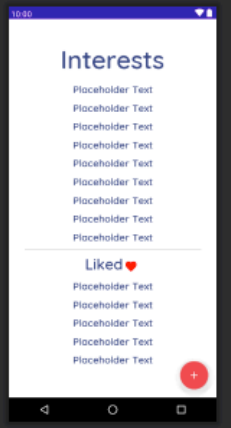


Pixel 3a XL (1...

Pixel 2 (1080 ...



Pixel 2 XL (1440 x 2...



Challenges & Learning

The main challenges faced were acquiring the knowledge necessary to complete the project, his links into what I learned about Android during the course of development.

At the beginning, I would have considered myself a basic beginner still in Android, feeling quite lost at the beginning as to how I would achieve the creation of a full application. However, going through each stage, I learnt more and more about how each element and component worked., both within the coding aspect and in Android Studio. When encountering an aspect that I did not know how to complete, referring to lecture notes, previous labs, as well as various online resources to gain the expertise needed to overcome the hurdle.

Something that I have learnt about Android is that there seems to be a lot of ‘setup’ for each component. By this, I mean you must have various steps, variables, methods, declarations set up for each component. This took some getting used to, especially when encountering errors; trying to figure out at which step the error was occurring. But once you understand what is needed, it became a lot easier to debug and find the root of problems.

As mentioned above, I became a lot more familiar with the tools within Android Studio, discovering more as I went through the development process. These tools can be extremely useful throughout the process, Logcat for testing, Layout Validation for testing layouts, Device File Explorer allowed for the import of a database that I populated using other tools, Database Inspector for live database tracking, TODO for keeping track of tasks to be completed. These were just some of the features of Android Studio that I either discovered, or became more familiar and comfortable with during this process.

Another challenge that was faced was time management, due to external circumstances of college and work, time management was very skewed towards the end of the project. To some degree this was unavoidable, however if this project was to repeat over, I would allow more time for that acquirement of knowledge phase, as that absorbed more time than I had expected.