Course Title:	Capstone Project
Course Stream:	B8RS100 Project
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Interim Report

Student Name
DUBLIN BUSINESS SCHOOL

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Introduction

The project is to create an Android app that can be used to redesign and/or add different features to an Android phone, as well as having a social aspect in where users can interact with each other through posts and comments. Additionally, one of the main aims of the project is to learn and research a new programming language that is used to create Android apps, Kotlin. Java is mostly used within this area but with the rise of Kotlin, it was a choice made that might help in future works.

The Aims of the Project

The aim of this project is to create an Android app in which the user can change the interaction on how they use their android phone. For example, a navigation button could be the default home/recent/back feature of that phone, with the app it can change it to a gesture based navigation system in which the user can swipe up to go back to the home screen similar to the IOS version.

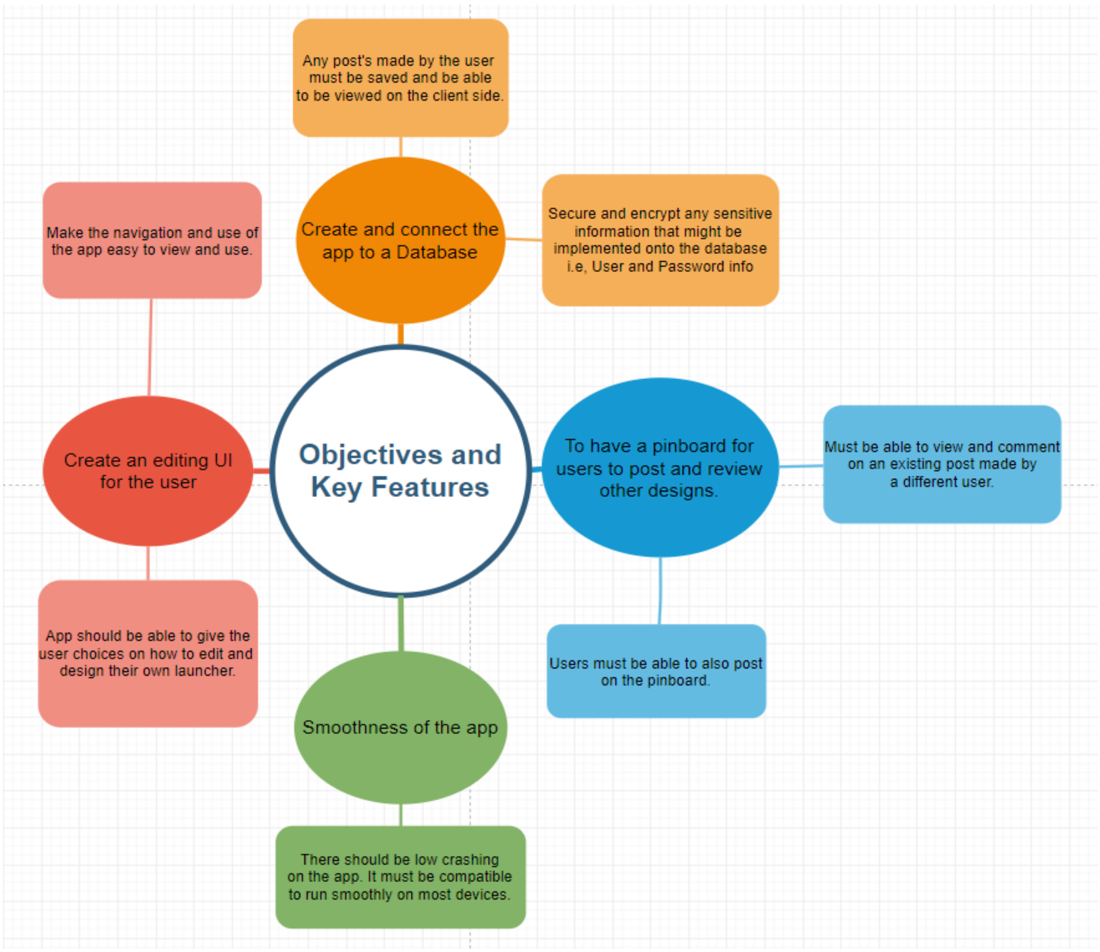
In addition, the app will contain a social feature in which the users can post screenshots of their edits to a 'pinboard'. Similar to reddit, this feature will contain a comment section and a voting system section on the posts.

Furthermore, a log in feature is to be added. Users can register to create an account or sign in with existing ones. By doing this, the app can send news/emails to the connected emails. Also, to create a username basis in which users can distinguish on which user posted a certain post.

The Scope of the Project

Objectives and Key Features

Below is a diagram of the objectives and key features. The objectives are the circle which are initially connected to the heading and the sub connections are the key features of each objective.


Any post's made by the user must be saved and be able to be viewed on the client side.
Make the navigation and use of the app easy to view and use.
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Secure and encrypt any sensitive information that might be implemented onto the database i.e, User and Password info
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Objectives and Key Features
To have a pinboard for users to post and review other designs.
Must be able to view and comment on an existing post made by a different user.
App should be able to give the user choices on how to edit and design their own launcher.
Users must be able to also post on the pinboard.
Smoothness of the app
There should be low crashing on the app. It must be compatible to run smoothly on most devices.

Expectation and Acceptance

The app is ambitious to the extent of having everything to work with little to no bugs for the time frame which is given and to also consider researching and learning a new programming language.

What to expect:

- The main and basic mechanics of the app should have no worries in working in whatever condition. Trying to at least edit a feature of the phone to any of the user's liking.
- The app should be expected to also connect to the database and be able to store the data that the user inputs.
- The pinboard should be expected to show information of a post by the user.
- Having a comment section within the post for users to interact.

Acceptance:

- It is accepted that not all the implementations of editing feature can be coded to the app. Some features may be easy to understand but difficult to carry out within the making of it.

- As mentioned, bugs may surface, and it could cause a few problems that may lead to the app crashing. Also, it may be difficult to make the app run on every device as the limitations of memory may be a case that needs to be considered in terms of running the app. In addition, Android phones have different OS' (Operating System) placed on them and this can cause incompatibility with the app.

The approach used in carrying the project

When approaching this project, there were several ways to implement the central premise. The decision to make a mobile application was due to the overwhelming popularity of social media applications on mobile devices as opposed to desktop. Projections for mobile only social network users will be 53.1% in 2020, being already well over 50% when the article was written (Droesch, 2019). Looking at US website visit statistics shows mobile devices made up 63% in 2017 and 58% in 2018 respectively (Enge, 2019).

Android Studio is the GUI in which the app is being created. There were different options to use but Android Studio seemed to be the most popular as it was developed by Google and has an easy way of integrating with other resources such as Firebase. There is also an option to create the app with either Java or Kotlin and in this project, Kotlin was the selected language. After researching the differences between them, Kotlin deemed to be the better choice as it is a newly developed language and a better choice than Java. In a recent journal, Jangid (2017, p.256) iterates the benefits of Kotlin over Java by the convenience of the language as well as a more capable language to code in present day.

Background

Context

Android phones have been a favour to use as they offer a lot of customisable means. An iPhone would be set to a default look and its design would be locked for all users. Having an option and apps to reformat a user's interface can be a big factor to the satisfaction result of their experience. With the freedom of Android, this app will have a take on enhancing the users experience with their Android phone.

The anticipated benefits of the system

The app is anticipated to create a better and comfortable experience in interacting with their Android as well as trying new and different designs through the social aspect.

The benefit of an Android is to give a sense of uniqueness to a user's mobile and with this app it gives more options in customising it to their own liking.

Typical users of the project product

A typical user would be one in which they pay close attention to their mobile phones for example the way the animations occur, the transitioning from app to another etc. There is no specific age group but more on those who would be interested in changing their perspective of mobile interaction.

Any theory associated with the project

The UI matters a lot in how a user chooses a phone. Why Apple phones are well received is because IOS uses smooth and attractive animations and transitions. Fluidity and the added convenience of the UI is one of the things in which IOS is popular if compared to other operating systems. A study was made and concluded that several users had an easier time handling an app through IOS as it was of similar experience to previous iPhone use (Barea et al., 2013, p.4).

Android on the other hand, depending on your phone, will have different skins on top of the operating system. For example, all androids will be under an operating system (Android 10) with Huawei: EMUI, Samsung: One UI 2.0 etc. Some of these skins are not well received since some of them tend to be developed badly or does not appeal to a customer and with that in mind cross back to IOS.

The software development methods used

The software development method used would be the Agile model. Each phase is developed and tested thoroughly until satisfied and the process is iterated with each feature to be added. If any new ideas were to arise it would be looked back on and modified.

Any relevant existing software/hardware

Android Studio: Android studio is the platform being used to create this android app. It houses a variety of features which make it convenient to integrate different resources.

Firebase: This is a cloud storage platform developed by Google. Firebase is open source and is mostly used for storage and database use in terms of this project. Extra features such as Analytics can be used to view extra data on the app.

Relevant app: Nova Launcher is an app in the Google Play store. It’s uses is to customise the home front of a phone. It has numerous features since it has been around for a while.

Literature Review

The project focuses on enhancing the experience of a user by interchanging the different features of their Android smartphone. With the different researches done, it is to be stated that having control of the appearance and mechanics of a device can strongly change the perspective of a user in how they see and use their mobile device (Zamzami and Mahmud, 2012, p.79).

It is also important to mention that changing of the UI does not necessarily mean a positive. Other users can be set on the idea of a default design which in turn leads to an ease of handling the functionality of the device.

In conclusion, having more freedom of your own phone sounds better in theory but future research would need to take place in order to close the argument of which is the better option to have, the freedom of customising but dealing with intense amounts of options to understand or the default of having an equal view to other users (Novac et al., 2017, p.159).

Specification and Design

**Consider starting with a paragraph that outlines what the app will do. **

The project will have a set of functional and non-functional requirements to which will fully understand the behaviour of the app:

Functional Requirements

1. Must be able to open and load the app in a timely manner.
2. App must be able to connect to the database to make sure all information input and output is displayed properly.
3. All buttons must be fully functional.
4. The pinboard should be able to display the posts entered by the users.
5. A notification to be displayed to which lets the user know the connection status. Though the user must still be able to use the editing features of the app.
6. Creating and editing comments or posts should be functioning.
7. Must be able to configure the editing feature to which changes the way a user interacts with the phone i.e. originally a notification panel appearing after scrolling down from the top of the phone. Now user can change it so that it may appear after scrolling to the inwards from the side or bottom of the phone.

Non-Functional Requirements

1. Smooth transitions or app usability should be seen to enhance the users experience of the app.
2. If the user opted in to logging in, app must be able to keep them logged in until they wish to log out or give the option of logging out once exiting the app.
3. Refreshing the pinboard view as it will keep the user updated to any recent posts. This should be able to give an option of turning it off as well.
4. Backups to the database must be put in place in the event of any system failures.

Testing and Evaluation

Testing

As testing is concerned, after a piece of code is inserted it is built often and ran onto an emulator or a plugged device. Initially, an emulator was used but became inconvenient as it took a while to open. It slowed down the laptop as it eats a lot of resources for it to work. Eventually plugging a device and letting the app be installed and ran there became the faster alternative in testing the app. *[This paragraph on testing doesn't give enough detail, whereas the example below (from a different project) gives better detail]. Talk about what type of testing you are currently doing and testing you will do in the future – this will vary depending on the development methodology you are following.*

Unit testing has been implemented in the Register, Login and Messaging modules of the application thus far, this has involved using Black Box testing. This testing can be broken down further into functional and non-functional requirements of the module.

Functionally, the register and login modules can get users created and have their credentials verified before allowing access to the main application. The messaging module was scrutinized to ensure messages sent correctly to other users and were handled appropriately on the backend. Logs were utilized throughout the code for these modules in order to track and inform the state of the application while it ran.

Non-functional testing ensured that the code was efficient in ways of accessing the database for login and registration in the least lines possible. Latency on the messaging module proved reliable and fast on wireless internet connection, proving a satisfactory level of fault tolerance.

Evaluation

The project is currently in the midway point in terms of its progress, the GUI theme has been determined and development of three key modules has taken place. The user can successfully login or create an account which can message others, this is being handled by Firebase and stored accordingly. The progress made so far is substantial and will act as the foundation for the complexity in upcoming modules which will deal a lot with the Firebase backend when requesting searches for user IDs. *[This evaluation reads better than the one below. It clearly outlines what has been done.]*

A database is set up called Firebase. Firebase is an open source database by Google in which can connect to the app. This handles the requests of inputting the registered users and outputting the information onto the app. Firebase also handles the security side of things. When the user registers, the included password would automatically be encrypted.

As of now, the app has:

- A register screen.
    - In this section, a user can input their details (Email, Username, Password, Confirming Password) and if all inputs are accepted, they are saved onto Firebase.
- A login screen.

    - This section has two inputs, an email and password. Once the user tries to login with the inputs they have set, Firebase will check to see if the values are saved in it.
- A toast method.
    - A toast method is set to display a message to give feedback to the user of any wrong inputs.
- Log feature.
    - There are small log methods implemented. This would write data and out put it on a screen which shows all that is happening after running the app. This is implemented to help in debugging.

[This evaluation talks about specifics but it's not clear how much of the overall project this accounts for – it just needs to be refined a little bit.]

Future Work

The app currently has a login/register phase and connectivity to a database. There is still a lot of work to be done in terms of the barebones of the app, which is the editing and customisable features. As of now it has not been implemented yet as more research needs to be done on the matter. After polishing the login and register part, the project will move on to implement the customisable features and social aspects.

Furthermore, if enough time is presented and results are satisfying, the app would be added extra features such as:

- Add more features in terms of UI for editing.
    - It would be ideal to integrate more editing features to entice more users to experiment a variety of combinations.
- Better transitions and animations from one activity to the other.
    - This is more of additionally enhancing the user experience. Keeping everything consistent and bug free as much as possible.
- Implement a dark mode feature.
    - A dark mode feature would be ideal to have, recently within apps would have dark mode features and this would lessen the strain in the eyes when using the app at low lit places.
- Suggestion feature.
    - Users could be able to suggest different features they had in mind. This could be quality of life on the app or having more editing features to be added

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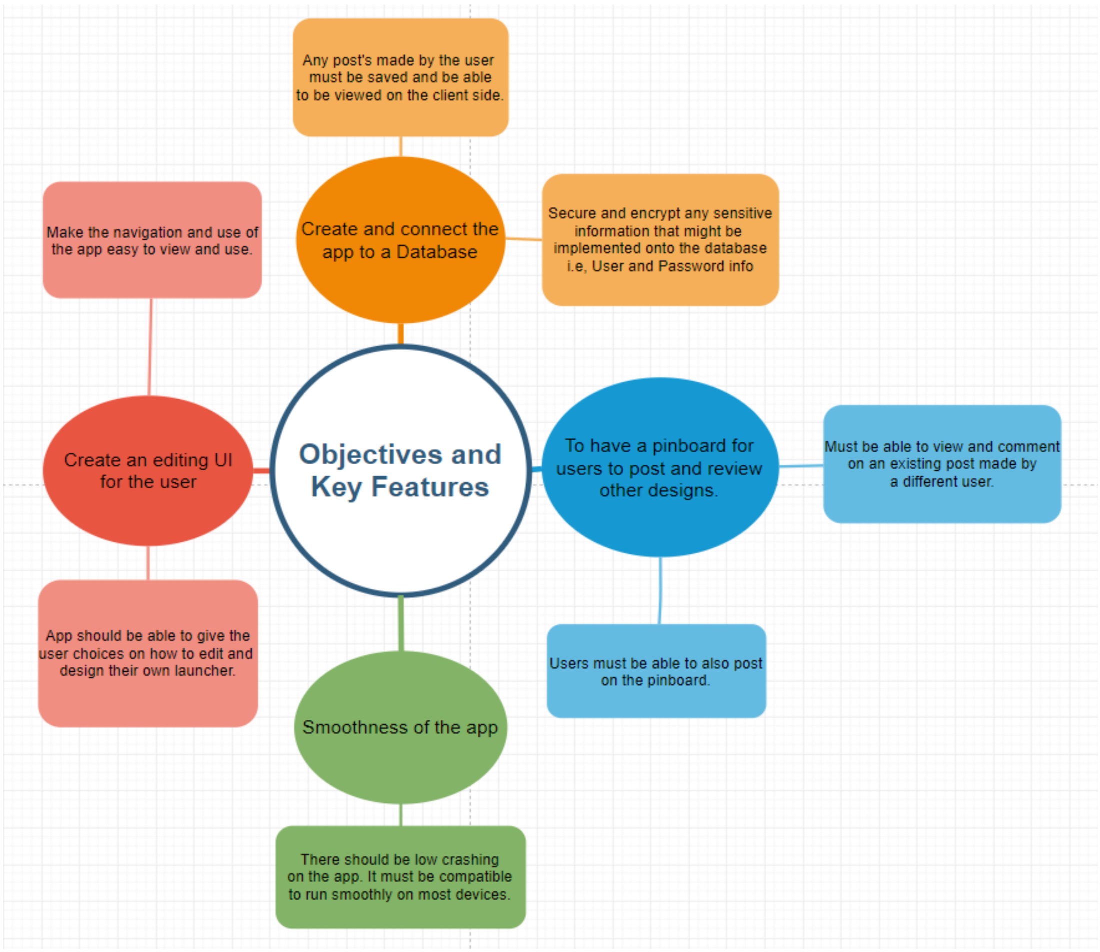
Appendix

Diagram of the Objectives and Key Features.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Smoothness of the app
There should be low crashing on the app. It must be compatible to run smoothly on most devices.

**Another project included this table in the appendices: **

Figure 3. Module table of functional and non-functional requirements

Module	**Functional**	**Non-Functional**
Login	User can login to a registered account	Login latency must not exceed 30 seconds
	User must be able to access the main module after successful login	Failure handled consistently and user informed
Register	User can create an account	Login latency must not exceed 30 seconds
	User must be able to access the main module after successful login	Failure handled consistently and user informed

Messaging	Messages must go to the desired user went sent	Messaging latency must not exceed 15 seconds
	Messages should be permanent to the chat and be accessed in a new login session	Failure handled consistently and user informed
	When a post reply is engaged with, a unique private chat should be created between the relevant users	
	Users can reveal their personal information to a user which they have a private chat with	
Create Post	User must be able to create a post which upon submission, is available for users to find in search modules	Post latency must not exceed 30 seconds
	Post must be able to be engaged with via replies from other users	Failure handled consistently and user informed
	Posts should delete after 24 hours	
	Replies to a post must only be visible to the post creator and replier	
Shuffle Search	Must display posts to a user	Failure handled consistently and user informed
	Must be able to engage with a post or dismiss it	Posts displayed should appeared 'shuffled' or random when appearing
	Dismissing a post must make another post appear from the database	
Hashtag Search	Must display all posts that match the hashtag typed by the user	Failure handled consistently and user informed
	Must be able to engage with a post	