Mobile App Development (CIS4034-N)

Assignment Specification

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# Introduction

You will design, plan and build a mobile app for a smartphone or tablet device using an industry-standard agile development method. Assessment will take the form of a presentation slide deck, supporting Android Emulator/Device screen recordings, with a 1000-word supplemental document.

Students will submit their presentation materials, recordings and project artefacts (e.g. design, source code, app, documentation) as evidence.

# The Android App

You will produce a single Android app using Java and the Android SDK. The app can be for any purpose, although you will need to discuss the size and scope of the app with your tutors. Unless otherwise agreed by the tutor, your app should aim to demonstrate the following:

## Technical Expectations

1. Multiple screens (Android Activities/Fragments)

Your app should consist of multiple connected screens that respond suitably to the device screen size and orientation. You should include a splash screen as well. Data should be transmitted from one screen to another.

1. Mobile features

Your app should make good use of mobile device features (e.g. location, camera, motion, fingerprint, etc.). Suitable consideration should be given to the user experience, device performance and device battery life.

1. Data persistence

Your app should make use of one or more of the data persistence mechanisms available. If web/backend services (see next bullet) are used for primary data persistence, other local mechanisms should be used to cache data for the app’s offline experience.

1. Use of web/backend services

Your app should use one or more web/backend services. These can be existing third-party services not created by yourself, including cloud-based data persistence services. If services are developed as part of this project, their code must be included in the submission.

1. Privacy, security, and permissions

Your app must not expose personal information about the user and should not be vulnerable to trivial attacks. Communications should be ciphered. Your application should not ask for more permissions than are needed.

## **Checklist**

* Using a Place Autocomplete (from Google’s Places API), get some details of a “Place” once the user has confirmed the place, they’re interested in.
* Use the device’s GPS capabilities and a Google MapView to display the user’s current location.
* All data collected, including place information, must be passed and presented in another Activity.
* Demonstrate creating an event that is observed by one or more other apps that are declared as Broadcast Receivers.
* Use SQLite3 and/or the Room Persistence Library to store information captured by your application; this will be used to store data between app uses.
* Consume a 3rd party API using the Volley library. The consumed data must contain at least three items of related data, which are reconstructed in the Android application as Plain Old Java Objects (POJOs).
  + You can find loads of APIs here: <https://www.programmableweb.com/> - although you are welcome to investigate others.
* Provide custom LinearLayout(s) or other Layouts as you see appropriate to provide a list of this data consumed by the app.
* Use Google’s Custom Search JSON API to retrieve images that are relevant to the information returned by the 3rd party API previously mentioned.
* Register your app as a Broadcast Receiver to respond to one or more events, such as receiving a text message.
* Allow Android Assistant to interact with your app.

# The Documentation

You must submit supporting documentation up to 1000 words. This documentation should:

* State what the app will do and describe the target users.
* Discuss any social, legal, ethical and security issues relevant to your app and its development and use.
* Provide evidence of professional tool used to support development.
* Provide evidence of agile project planning, management, and development activities. If using ‘sprints’ this could include;
  + Prioritised feature list (including those not achieved and those dropped);
  + Task list for each iteration (sprint);
  + Burndown chart for each iteration (sprint);
  + Records of iteration (sprint) evaluation (lessons learned).
* Justify choice of professional tools and agile development method.

This document must be prepared and formatted in a professional manner. You may refer to the documentation during the presentation (see below).

# The Milestone

From week 4 onward and every other week after that, you will have to show progress on your code in class to your tutor. That has to include some form of source code version control, some code and some documentation. Every week, your tutor will mark your work as being done/progressing or not based on what you show them. This will count towards your final mark.

# The Presentation

You must prepare a 15-minute presentation about your app idea and working prototype – the resources for this will comprise of a small slide deck along with supporting product demonstration media (i.e. screenshots and short recordings).

The presentation must be aimed at subject experts who have not previously been involved with your app development. You must demonstrate that you have considered the various professional, social, legal and ethical implications of the app, its development and its ultimate use.

A *substantial* portion of the presentation should be a demonstration of the working prototype. You will be expected to show the app running on an emulator or device through a screen recording.

## Suggested Format

* Introduction of the App and target audience.
* App demonstration. Refer to screen recordings (see below), ideally embedded within the presentation or at least clearly labelled on submission.
* Justification of software design decisions (design and layout, hardware usage, user experience, data persistence, usage of 3rd party libraries etc.).
* Discuss any social, legal, ethical and security issues relevant to your app and its development and use.
  + For example, are you complying with the licensing requirements of the various Android and 3rd party libraries that you may be using?
  + Are you capturing and storing any personal/sensitive data? If so, are you complying with GDPR?
* The selection, use, and evaluation of an agile development method.
* The use of digital environments and tools for the management and execution of the project.
  + Project management tools, for example Trello.
  + Source code versioning management tools, for example Git.

## Screen Recordings

Take multiple, short Android Emulator/Device screen recordings that each demonstrate a unique feature within your app. The idea here is to build evidence that your app behaves and functions as it should.

# Deliverables

You must submit your work as a ZIP file via *Blackboard* with the following directory structure:

* ***Source***: this directory should contain the entire source code for the project (i.e. the Android app and any web/backend services), including any necessary project configuration files and third-party libraries.
* ***Documentation***: this directory should contain the supporting document (*DOCX* or *PDF*), the presentation slide deck (*MS* PowerPoint format), Android Emulator/Device screen recordings, and any documentation of the product (e.g. design diagrams).

Include a *readme* file in the root directory containing any necessary setup or configuration instructions.

# Guidance

Embrace and follow the chosen agile development method - this is how professionals develop applications, and it is easier to follow it than to fake it.

Use a standard format for the package name of your application **uk.ac.tees.aad.*b1923274.appname (This should be the package name)***

Use source control (e.g. Git) and other appropriate development/planning tools (Bitbucket or Trello). Use source control formally (i.e. branch, merge, and tag) as appropriate to your development method.

Ensure that the documentation is in a suitable format for presentation and discussion at the presentations. Have diagrams and summary descriptors backed by more thorough explanatory text.

# Marking Criteria

|  |  |  |
| --- | --- | --- |
| Presentation | [10] | The app’s purpose is explained clearly and its major features are stated. The target user is identified and described.  The app is presented clearly and concisely and includes all the required information. Visual aids were used effectively during the presentation.  Demonstration of the product is comprehensive. |
| Milestone | [5] | Evidence of design and development using agile. |
| Android app with source | [45] | The app builds successfully from source and can be deployed to an emulator or device. The app executes and functions correctly without causing uncaught exception. The technical expectations have been successfully demonstrated. The Android SDK has been used efficiently and effectively. |
| Tools usage | [10] | Demonstrable use of software development digital environments and tools in a professional and sophisticated manner covering version control and project planning. Evidence of tool evaluation and comparison also present. |
| Justification of software design decisions | [10] | Justification of software design decisions taken and defence of them in an academic and respectful manner covering design and layout, hardware usage, user experience, data persistence, and usage of 3rd party libraries. |
| Social, legal, ethical and security addressed | [10] | Appropriate consideration is given to the social, economic, legal, ethical and security issues associated with developing and using the proposed app. |
| Project management supporting documentation | [10] | It is clear that an agile development method has been applied. There is plausible evidence of an appropriate number of successful development iterations (i.e. sprints). |