Irish Made Simple

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CA326 Project

Functional Specification

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1: Introduction

1.1 Overview

Our product is an Android app to aid primary school children in completing their language homework. It will be designed to take text input in a language and intelligently generate exercises based on this. In this functional specification we have used Irish as the example language. The final product will be generic and could easily be used for other languages. Children will have a clearer understanding of exactly what is expected of them after their first attempt at each exercise.

Teachers, kids and parents have requested product such as this to help primary schools nation wide. The product will have all the different categories of exercises such as

- Word searches
- Fill the blanks
- Storytelling for relevant chapters and exercises
- Spellings

The app will assist kids in coming up with the correct answers by giving clearer understanding of exercises through audio pronunciations, phonetics, translation to English and visuals.

1.2 Business Context

This app will be used by primary school children, their parents and teachers

1.3 Glossary of Terms

- SQLite:

SQLite is an in-process library that implements a self-contained, serverless,zero-configuration, transactional SQL database engine.

- Android: An open source operating system for smartphones and tablets.
- SDK: Software developer kit is a set of tools that allow the creation of applications for a specific software framework, in our case Android.
- Android Studio: The official integrated development environment for developing Android applications.
- GUI: Graphical User Interface, allows communication between users and the application through graphics.

2. General Description

2.1 Product/System Functions

The app will function as follows:

- **Selections**
  - Main section (books)
- **Extras**
  - External links
  - Feedback
- **Select type of exercise to be completed**
  - Word Search
  - Fill the blanks
  - Spellings

2.2 User Characteristics and Objectives

The targeted audience for the app are primary school kids, teachers and parents and users will need internet access and portable devices such as mobile phones and tablets to be able to utilise the application.

The application will be user friendly because human computer interaction principles are part of the guidelines in the development process. Navigation will be very easy considering that our targeted audience includes kids.

2.3 Operational Scenarios

The same use cases apply to both books in use, Bun go Barr and Ceartlitriu

USE CASE	A person decides to use the application	
Goal in Context	A person needs help with Irish homework	
Scope & Level	Application, Core.	
Preconditions	Must first download the application	
Success End Condition	User will have access to all available services provided by the application	
Failed End Condition	User will not have access	
Primary, Secondary Actors	User, application	
Trigger	A person decides to use the application	
DESCRIPTION	Step	Action
	1	A person downloads the application
	2	Application download completes successfully
	3	User can begin to use application as desired
EXTENSIONS	Step	Branching Action
		N/A
VARIATIONS		Branching Action
		User launches the application and take to the home screen
USE CASE	User wants to hear how a word is pronounced	
Goal in Context	A user would like to hear how to correctly pronounce an Irish word	
Preconditions	The user is in the Bun go Barr or Ceartlitriu section	
Success End Condition	The user hears how to pronounce their chosen word	

USE CASE	A person decides to use the application	
Failed End Condition	The user is unable to hear the correct pronunciation	
Primary, Secondary Actors	Player Server, GUI	
Trigger	The player selects the word they wish to translate	
DESCRIPTION	**Step**	**Action**
	1	The user presses on their word
	2	A popup box gives them options
	3	The user selects hear pronunciation
	4	The app finds the correct audio to play
	5	The app ¨checks if the phone is muted
	6a	The user is prompted to turn up their volume
	6b	The app plays the audio pronunciation

USE CASE	User wants to leave feedback to the developers	
Goal in Context	A user wishes to leave some form of feedback to the developers, possibly a bug report	
Preconditions	The user is at the main menu of the app	
Success End Condition	The user successfully leaves feedback to the developers	
Failed End Condition	The user is unable to deliver the feedback they wanted to send to the developers	
Primary, Secondary Actors	Player Server, GUI	
Trigger	The player clicks on the extras button	
DESCRIPTION	**Step**	**Action**
	1	The user clicks on the extras button
	2	The screen changes to the extras area of the app
	3	The user is shown a selection of extra features
	4	The user chooses the button for "Feedback"
	5	The display updates to show the feedback options i.e. email developer or leave Play Store review

USE CASE	**A person decides to use the application**	
	6	The user presses on the link they wish to view
	7a	The user is brought to their email client with the developer's email in the "to:" area
	7b	The user is brought to the Play Store page of the application

USE CASE	User wants to translate word	
Goal in Context	A user would like to see the English translation of an Irish word in one of the exercises	
Preconditions	The user is in the Bun go Barr or Ceartlitriu section	
Success End Condition	The user is given the correct English translation	
Failed End Condition	The user is not given the translation	
Primary, Secondary Actors	Player Server, GUI	
Trigger	The player selects the word they wish to translate	
DESCRIPTION	**Step**	**Action**
	1	The user presses on the word
	2	A popup box gives them options
	3	The user selects translate
	4	The app displays the English translation of the word

USE CASE	Adult user wants information on external resources	
Goal in Context	An adult(e.g. Parent of the child) wants to learn Irish and would like more information on where they could do this	
Scope & Level	System, Core.	
Preconditions	The user is at the main menu of the app	
Success End Condition	The user finds the links and resources they were looking for	
Failed End Condition	The app crashes or the user is not brought to the correct screen within the app	
Trigger	The player clicks on the extras button	
DESCRIPTION	**Step**	**Action**
	1	The user clicks on the extras button
	2	The screen changes to the extras area of the app

USE CASE	A person decides to use the application	
	3	The user is shown a selection of extra features
	4	The user chooses the button for "Extra Irish Assistance"
	5	The display updates to show the links to these sites etc
	6	The user presses on the link they wish to view
	7	The link is opened successfully in the Android browser of their choosing

USE CASE	User decides to complete exercise with Bun go Barr Irish book	
Goal in Context	User wants to complete Bun go Barr exercise	
Scope & Level	Application, Core.	
Preconditions	Application downloaded	
Success End Condition	exercise successfully completed	
Failed End Condition	No help received, exercise not completed	
Primary, Secondary Actors	User, application	
Trigger	Bun go Barr exercise completion	
DESCRIPTION	Step	Action
	1	On the homescreen user clicks on Bun go Barr book
	2	User selects a category of exercise to be completed from the different categories
	3	Help is given and exercise is online after which hard copy must be completed
EXTENSIONS	Step	Branching Action
		N/A
VARIATIONS		Branching Action
		User chooses to complete exercise in Ceartlitriu

USE CASE	User chooses to complete "Word search" category exercise in Bun go Barr
Goal in Context	complete Word search category exercise
Scope & Level	Application, Bun go Barr.
Preconditions	Bun go Barr book selected
Success End Condition	Search for appropriate words completed, user can complete hard copy version of exercise

USE CASE	A person decides to use the application	
Failed End Condition	Words could not be found	
Primary, Secondary Actors	User, application	
Trigger	Bun go Barr word search category exercise	
DESCRIPTION	Step	Action
	1	In exercise categories user clicks word search
	2	Grid is drawn
	3	Appropriate words are searched for by clicking on the right letters to form a word
EXTENSIONS	Step	Branching Action
		N/A
VARIATIONS		Branching Action
		User chooses Fill the blanks category within Bun go Barr
USE CASE	User chooses to complete "Fill the blanks" category exercise in Bun go Barr	
Goal in Context	Complete Fill the blanks category exercise	
Scope & Level	Application, Bun go Barr.	
Preconditions	Bun go Barr book selected	
Success End Condition	Blanks are filled, score given and user can complete exercise in hard copy	
Failed End Condition	User inputs incorrect words and tries again	
Primary, Secondary Actors	User, application	
Trigger	Bun go Barr Fill the blanks category exercise	
DESCRIPTION	Step	Action
	1	In exercise categories user clicks fill the blanks
	2	User is presented with appropriate sentences with blanks
	3	User fills in blanks with correct words from a pool of words with visuals, phonetics and pronunciation availabilities
	4	Score is given
EXTENSIONS	Step	Branching Action
		N/A
VARIATIONS		Branching Action

USE CASE	A person decides to use the application	
		User chooses Story category within Bun go Barr
USE CASE	User chooses "Story" category exercise in Bun go Barr	
Goal in Context	Get tutorials on all different categories of exercise as appropriate	
Scope & Level	Application, Bun go Barr.	
Preconditions	Bun go Barr book selected	
Success End Condition	Tutorials are given, user understands better, relevant exercise completed and score is given	
Failed End Condition	User does not understand and replays tutorials	
Primary, Secondary Actors	User, application	
Trigger	Bun go Barr story category exercise	
DESCRIPTION	Step	Action
	1	In exercise categories user clicks "story"
	2	User selects which chapter tutorials needed
	3	Clicks the play button begin tutorials
	4	Replays or goes back to complete exercise under the relevant tutorial
EXTENSIONS	Step	Branching Action
		N/A
VARIATIONS		Branching Action
		User chooses spellings category within Bun go Barr
USE CASE	User chooses to complete "Spellings" category exercise in Bun go Barr	
Goal in Context	Complete Spellings category exercise	
Scope & Level	Application, Bun go Barr.	
Preconditions	Bun go Barr book selected	
Success End Condition	User spells words correctly and scored	
Failed End Condition	User inputs incorrect words and have to re-spell words	
Primary, Secondary Actors	User, application	
Trigger	Bun go Barr Spellings category exercise	
DESCRIPTION	Step	Action

USE CASE		A person decides to use the application
	1	In exercise categories user clicks "Spellings"
	2	User is presented with words spelt in wrong order to give the correct spellings
	3	User spells words correctly
	4	Score is given
EXTENSIONS	Step	Branching Action
		N/A
VARIATIONS		Branching Action
		N/A

2.4 Constraints

• **Android OS Version**

We need to design to target Android versions 4.2 upwards. This means our app will be compatible with almost 90% of devices currently in use(as of November 7th 2016.).

• **RAM**

We will aim for our app to be optimised on devices with 2GB and upwards

• **Screen Size**

We will implement scalability in our app so it will run on as many screen sizes as possible i.e. from phones to tablets

• **ROM**

We intend to store our data locally. This means we have to consider how much storage the user has free on their device

• **Internet Connection**

As we will be using data from abair.ie for our audio the app will require an internet connection in order for the user to use this feature

• **Battery Life:**

Efficiency of data transmission must be ensured for batteries to last longer

3. Functional Requirements

Download

- Description:

This is where it all starts, during download users will get to know all the system requirement specifications of the application and see if their device qualifies or not. It is during this time that users also get to read the description of the application

- Criticality:

The app cannot be used without first downloading it and while downloading you get all the necessary information about the app.

- Technical Issues:

Internet connectivity is essential for this phase to be completed. It is also necessary to make sure that the device in use is not in Airplane Mode and the system requirements must be met otherwise the download would fail.

- Dependencies:

N/A

Pronunciations

• Description

The app should be able to provide the user with audio pronunciations for any Irish word they choose within the app.

• Criticality

This feature is essential for students using the app. Without this feature they would be left to work out the correct pronunciation on their own which could prove difficult.

• Technical Issues

We will be using audio from an external source(abair.ie) so we will have to ensure the user has an internet connection to make use of this feature.

• Dependencies

N/A

Feedback

• Description

Users of the app should be able to give feedback about it. This could be a review on the Play Store or an email to the developers e.g. a bug report

• Criticality

The app could function without this feature so it is nonessential. However we feel it would be beneficial if we implemented it.

• Technical Issues

We will have to make sure the app has the correct permissions to access the email functions of the phone

• Dependencies

External resources

• Description

The app will feature a section that contains links to external resources associated with the chosen language e.g. videos, links to lessons for adults

• Criticality

This is not a critical feature of the app. However we feel the addition of these resources would be useful for adults using the app.

• Technical Issues

As the links will not be under our control we will have to find resources that are unlikely to change or be taken down

• Dependencies

N/A

Translation

• Description

The app should have the ability to translate words from Irish to English. Users should easily be able to switch words between the 2 languages.

• Criticality

This is a critical feature of our app. It is a key feature for both children and parents using the app, particularly those with little to no Irish

• Technical Issues

We will need a database of the translations and the translation will have to be correct

• Dependencies

The translation feature relies on the text being implemented correctly in the Bun go Barr/Ceartlitriu sections

Choose Book Type

• Description:

After download the user is presented with the home screen which has three categories to choose from, two of which belong to the Book Type category namely Bun go barr and Ceartlitriu. Users chooses their preferred book for homework completion

• Criticality:

It is very important that users choose the correct book as the tasks / homework differ in each book.

• Technical Issues:

N/A

• Dependencies:

This requirement is dependent on whether or not the application was successfully downloaded.

Homework - Word Search

• Description:

This is a category of homework in both books (Bun go barr and Ceartlitriu), upon clicking on this category a grid is drawn, words to be searched for are listed and user is required to click on the letters in the grid to match the relevant words they are suppose to search for.

• Criticality:

This function is essential as it is part of the academic homework structure of primary school Irish homework

• Technical Issues:

Internet connectivity is essential as the audio and pronunciations data is from an external source

• Dependencies:

Relevant book type must first be selected.

Homework - Fill the Blanks

• Description:

In this category there are sentences with blanks to be filled out, user fills out the blanks by selecting the correct word from a list of words.

• Criticality:

It is essential in the sense that it is a category of homework

• Technical Issues:

Internet connectivity is essential as the audio and pronunciations data is from an external source

• Dependencies:

Relevant book type must first be selected.

Homework -Story

• Description:

Stories section of either of the books can be found here. This serves as a form of tutorials section to render help before completion of homework.

• Criticality:

This is not essential as the kids must have first read the story in the hard copy version or teacher must have narrated the story in class

• Technical Issues:

N/A

• Dependencies:

Relevant book type must first be selected.

Homework - Spellings

• Description:

There is a list of words, each word has been spelt in the wrong order and needs to be rearranged in the right order.

• Criticality:

This part is essential due to the fact that it is an exercise to be completed.

• Technical Issues:

N/A

• Dependencies:

Relevant book type must first be selected.

4. System Architecture
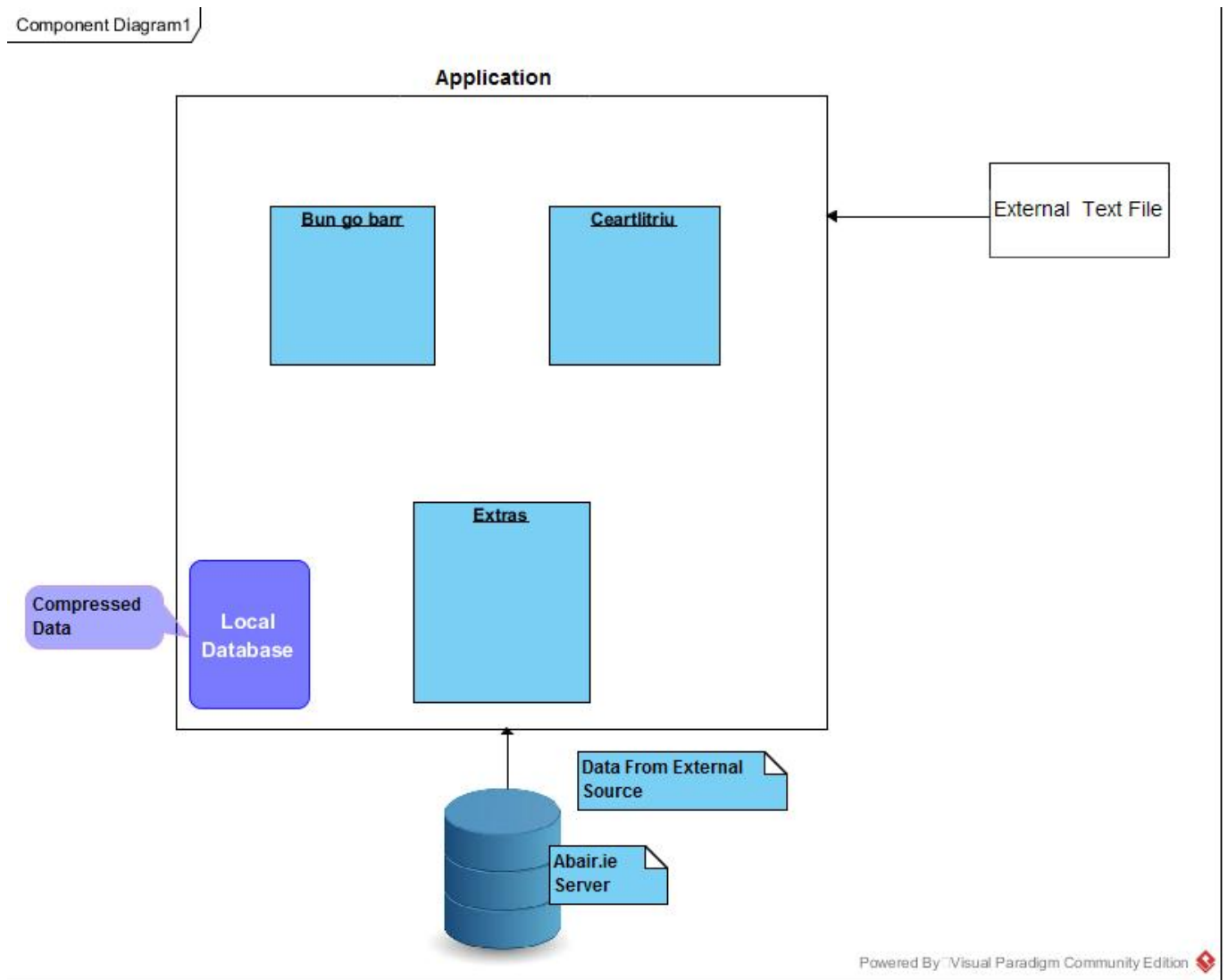
Figure 1 shows the architectural layout of the app

Figure 1

5. High Level Design

5.1 The following data flow diagram(DFD) shows where the data needed for our app to function will be coming from.
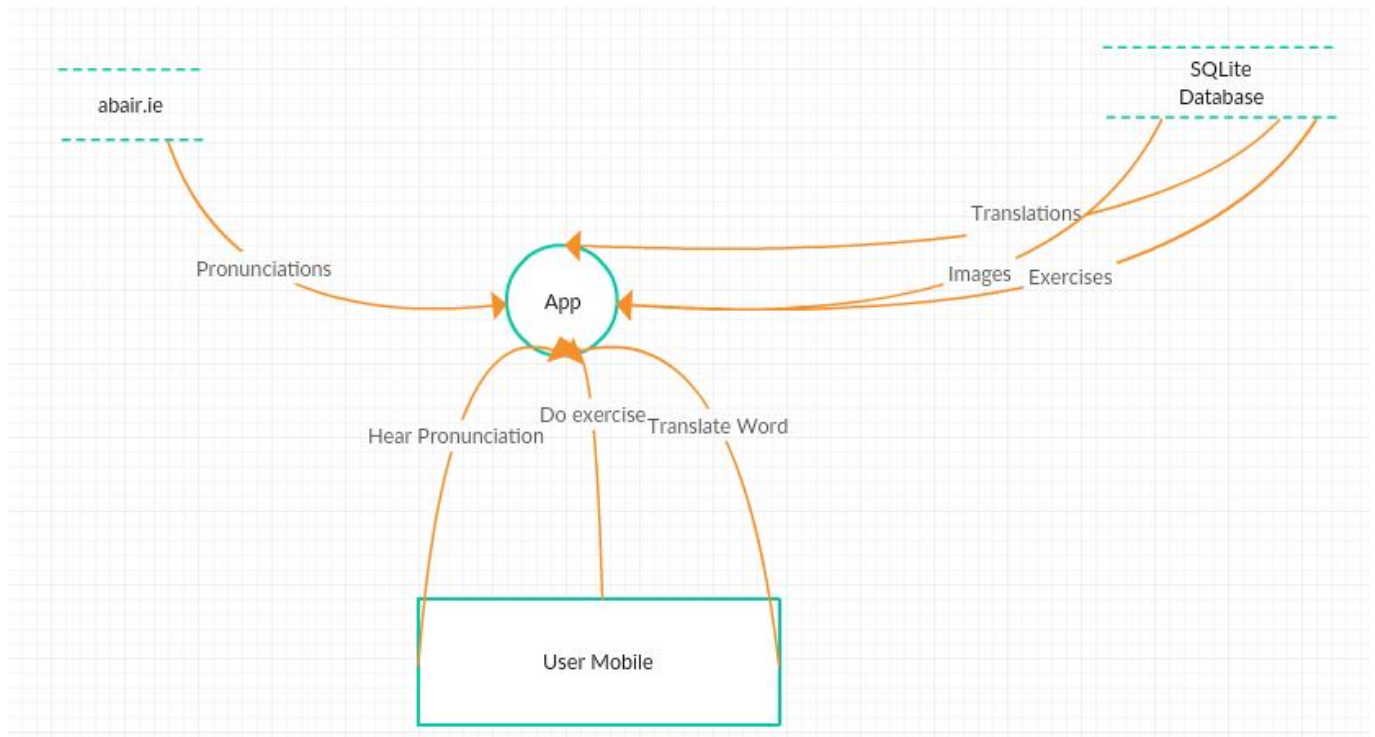
Figure 2

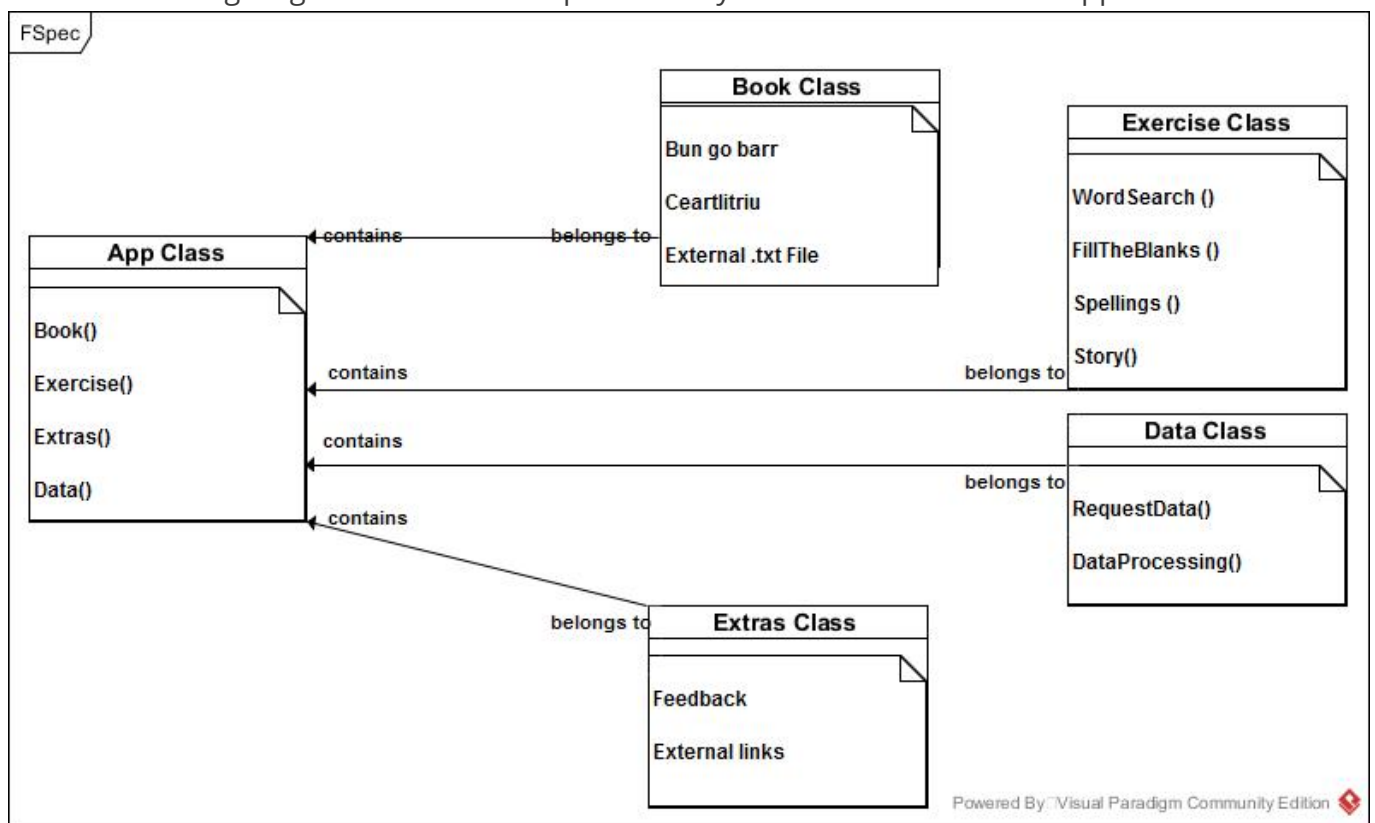**5.2** The following diagram illustrates the potential layout of the classes in our application

Figure 3

6. Preliminary Schedule

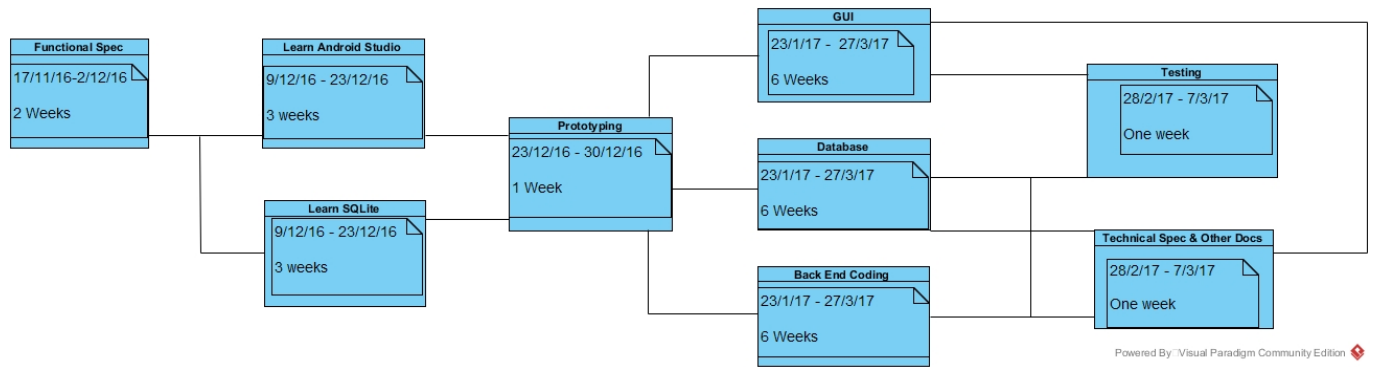We have outlined our preliminary schedule in the PERT diagram seen below in figure 4.

Figure 4

7. Appendices

Sources

- https://developer.android.com/about/dashboards/index.html

Resources

- https://developer.android.com/studio/index.html
- https://sqlite.org/https://sqlite.org/
- http://www.abair.tcd.ie/?lang=eng
- https://www.visualstudio.com
- https://www.visual-paradigm.com/