Edinburgh Napier UNIVERSITY

Mobile Applications Development Coursework Report

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Abstract

This report contains information relating to the coursework for Mobile Application Development, it will contain information such as software design, implementation and critical evaluations as well as personal reflections.

Keywords – Android, Application, Mobile, Development, Java, XML, Design

Contents

1 Introduction

This piece of coursework was part of the module SET08114 which is a compulsory module on the BSc(Hons) Web Design and Development degree course.

The aim of this coursework is to demonstrate use of appropriate code, coding techniques within the development of mobile applications on the android platform.

The application that has been developed for this coursework is a storytelling application where the user will be presented with a number of scenarios and options for each scenario that will tailor the story and give the user a different outcome depending on what options they selected and how they dealt with a scenario that was presented to them.

When deciding which application to develop, there were a number of already publish storytelling applications which were investigated, as well as some online games and even console games in order to gauge the similarities of all these different storytelling games.

Some of the games I looked at were:

- The Aether - Android Game[1]
- The Walking Dead - XboxOne [2]
- Batman: The Telltale Series - Android Game [3]

One thing I noticed from any game regardless of the extent of graphics was the amount of dialogue and giving the user clear and easy options to choose from without influencing their decision, so it was their true decision on the path they choose.

2 Software Design

The software design section compromises of several different elements including requirements of the application(goals and objectives) and methodologies and the applications life cycle.

2.1 Requirements, goals and objectives

The requirements for the application are split into two categories; Functional and Non-functional.

2.1.1 Requirements

Functional Requirements are described as a requirement that the application must have.

Non-functional requirements are described as something that isn't necessarily seen but can aid the application in its operation.

Functional Requirements

- Simple and modern interface.
- Contain multiple endings to the story.
- Be easy to read and use.
- Clear and definitive contents. including options for the user.

Non-functional Requirements

- Have a splash screen which introduces the application before the user begins using it.
- Images optimized for the application
- Well laid out design.
- Must be stable i.e. Doesn't crash.

- Useful descriptions on images for increased accessibility features.

2.1.2 Goals and objectives

Identifying goals and objectives for the application is important as it allows the developer to set themselves SMART targets and achievable steps whilst both assessing the initial requirements specification as well as evaluating the project once it has been completed.

SMART Targets are targets which are:
Specfic
Measurable
Achievable
Realistic
Time-bound

The goals and objectives identified for this project have been identified by assessing the given brief for this piece of coursework[4].

Coursework Goals The coursework goals have been set out by Dr Simon Wells, lecturer within the School of Computing at Edinburgh Napier University, within the coursework brief[4]. These have been identified and are to create a mobile application for the Android platform by using android studio.

User Goals The goal for the user is to be able to have an error free user experience and a easily usable application.

Interactivity Goals The interactivity objectives for this application is to have an accessible application that is easy to use and will have a clean design. The application should be intuitive and not need any heavy instructions for the user to be able to use the application.

2.2 Methodology

When developing any piece of software it is important to have a software development methodology in place.

Software development methodologies are used to structure the development process, each methodology has a different pattern or process but ultimately contain the same steps, such as the Planning, Development and Testing.

An article by Visual Studio on the learn section of the website describes the methodology as a mindset rather than a tool[5]. This is a valid and useful quote, as to introduce a methodology and put it in place is more of a mindset than a physical tool to implement.

Two methodologies that appear to be fairly popular is the Agile and Waterfall methodology.

2.2.1 Waterfall Methodology

The Waterfall Methodology is a common and well structured methodology. Within this methodology *"in order to continue with each phase the phase previous must be complete and signed off"*[6].

The Waterfall methodology as stated above is well structured and simple to use, it allows development teams to easy manage projects and the requirements within those projects. Due

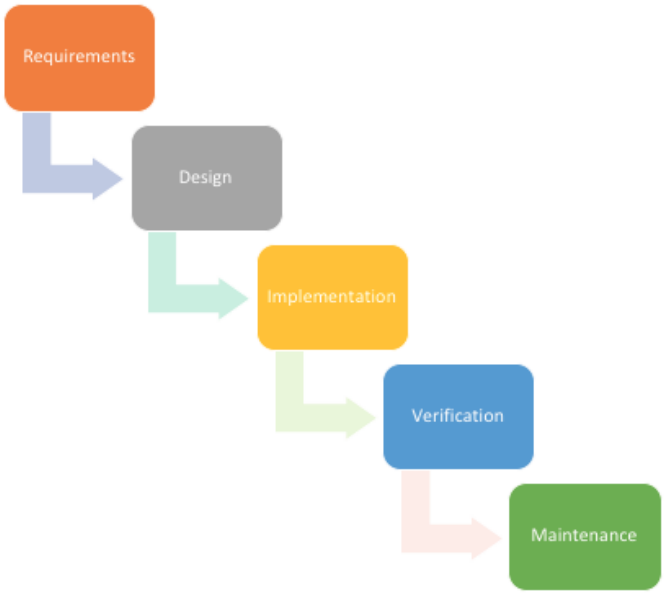

Figure 1: **Waterfall Methodology**Example of the basic methods of the Waterfall Methodology

to the simplicity and clear goals at each phase within the Waterfall Methodology it is easy to outsource the project at any given time.

However, although the Waterfall Methodology is simple it does lead so some more complex issues if requirements were to be changed or adapted during the design/development phase. It is also a fairly paperwork heavy methodology and the success of the project heavily relies on the documentation and successful of each individual phase.

2.2.2 Agile Methodology

The Agile Methodology is great for an ever changing piece of software, where requirements or extra features need to be added quickly and efficiently. It is a continuous process and is extremely flexible through all phases of the methodology. Its other advantage can be that it works very well when requirements are not very clear or there is no set guidelines.

However, the Agile Methodology is not full proof, it doesn't have a necessity for clear and concise requirements, therefore it can make outsourcing within a project difficult and can be difficult to make this methodology efficient for a large working team.

For this current project, the chosen methodology is the Agile methodology, this is for the reasons of it being an individual project, with minimal requirements. Therefore, it allowed for more flexibility and greater development.

2.3 Application Life Cycle

The Application Life Cycle is one which explains the activities and services which are activated by the intents set out in the manifest.

The various activities contain the code needed for the activation of the next/previous activities. Such as the onCreate() methods when an activities starts and its intents are ran.

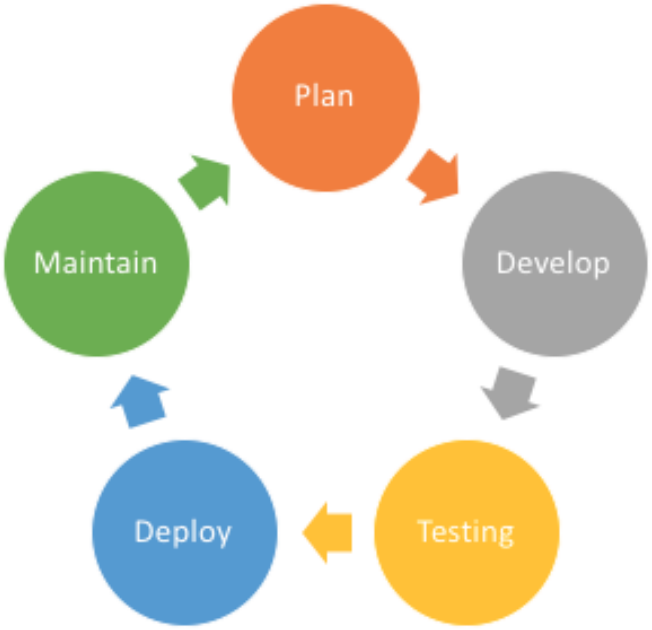

Figure 2: **Agile Methodology**Example of the basic process of the Agile Methodology

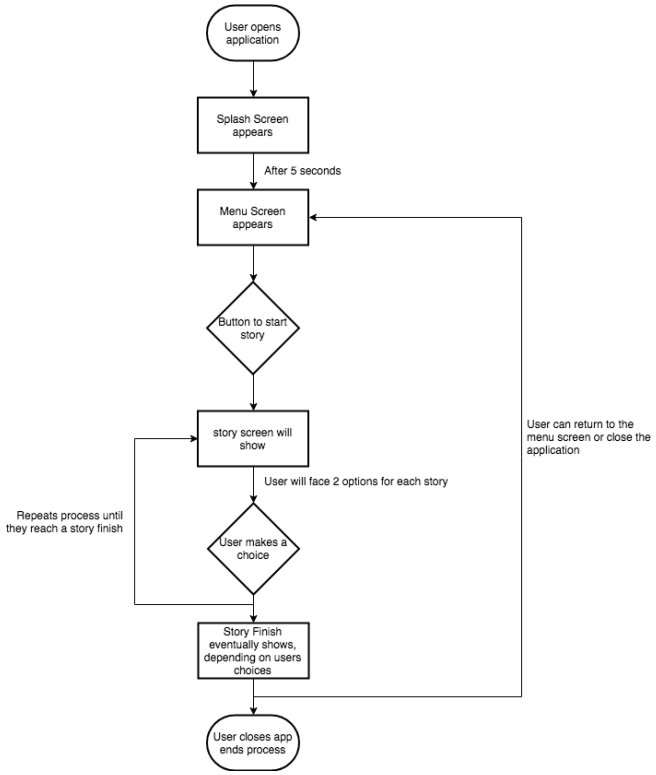

Figure 3: **Application Life Cycle**

For the application which has been developed for this project, a brief activity life cycle has been produced which shows the basic life cycle of the application.

The main story 'life cycle' or flow is slightly more complicated due to the user being able to make the decisions that influence which ending they reach when playing the story.

In the below figure below it is possible to see the flow of the story and choices that the user faces, the naming conventions are those which are used by the strings within the application.

This was useful during the planning stage of this project as it allowed us to easily set out and visually see how we could code the application to follow the story, it also meant it was easy to spot any mistakes within the if/else statements.

2.4 Design

The design of the application will be simple and intuitive for the user. As smart phones are so popular with four out of five adults(around 37 million people) own them[7], people have set ideas and expectations as to how applications are laid out and designed.

2.4.1 Layout

The layout within the application will be kept simple and easy to follow, the layout will follow the design principal of horizontal lines.

Horizontal lines within design theory are popular as these are the most common within the western world. Horizontal lines encourage the user to start from top to bottom and left to right which means there is a natural flow to the layout.

2.4.2 Use of colour

The use of colour within the website, is kept minimal and appropriate alongside the colours within the logo. The colours used can be seen within the figure 5 below.

2.4.3 Images

The logo was created by editing the original NASA(National Aeronautics and Space Administration) logo, once the theme of the app was decided and the purpose of it the name Napier University Space Administration was decided upon.

The NUSA logo was to be similar to NASAs logo except that the letters would change and the red wish bone that NASA has would be changed to the Big Red Triangle that Napier University is known for.

The NUSA logo was created in Adobe Photoshop and can be view below:

The background image shown within the splash screen was found from IPhone backgrounds at http://iphonebackgrounds.org/background-13212-space-fantasy/.

The background image shown within the menu screen and story screen was found at https://wall.alphacoders.com/big.php?i=69261.

These backgrounds were chosen as they create a great atmosphere within the application that fits well within the story line, the backgrounds are also not too distracting or overly colourful, so the content is clear to see.

2.4.4 Wireframes

The wireframes were developed prior to development in order for the coding layout within the views layout xml pages to be clear and concise.

The wireframes can be viewed at Imgur https://imgur.

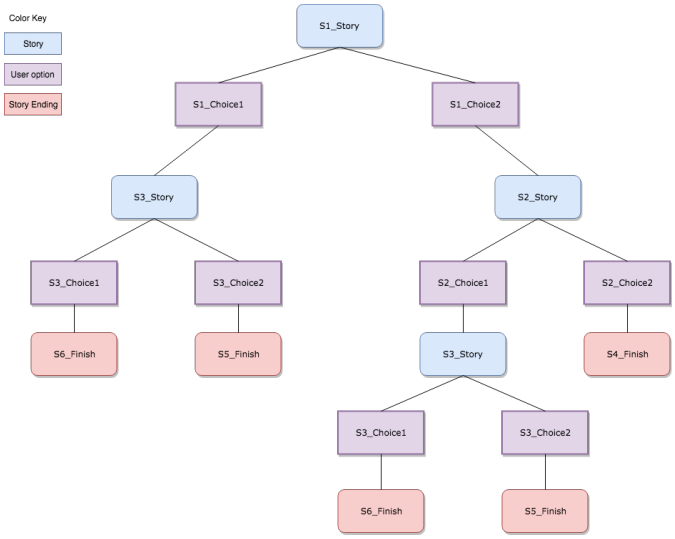

Figure 4: **Story flow**Flowchart that shows the choices users have when playing the story

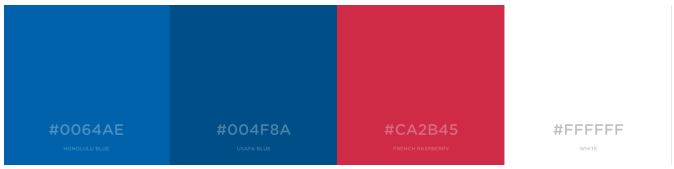

Figure 5: **Colour Scheme**Palette created at coolors.co

com/a/hgJA5 due to issues with styling within this report.

The first wireframe is the splash screen, it will be a simple screen that lasts for 5 seconds, an image in the background, the NUSA logo within the middle, the title at the top and a short sentence underneath the logo.

The second wireframe describes the menu screen, the menu screen will have the NUSA logo at the top with a short introduction text below, there will also be a button which allows the user to have control of when they start the story.

The third wireframe describes the story screen, each is the same, there is a paragraph then two buttons, these buttons allow the user to choose the option for the story path.

The layout is simple and intuative which matches the aims for the application.

2.5 Evaluation

Within this section of the report, a evaluation will be discussed, this will include a critical evaluation on the comparison of the requirements that were identified and effectiveness of the design. There will also be a personal evaluation where I discuss things such as what has been learned and challenges that have been identified during development

2.5.1 Critical Evaluation

As discussed in 2.1.1 and 2.2.2 there were various requirements set out within the coursework brief that have been given with this project, alongside requirements that I have identified.

Figure 6: **NUSA logo**The logo that has been created for the app

The application contains a simple and modern interface that is aesthetically pleasing and easy to read. An issue that was identified during the design phase was ensuring that the text was easy to read on top of a background image, due to the diversity of colours. The solution of this was to find a black background, however the use of just a black coloured background was not so appropriate therefore a black space background with the earth at the side was deemed appropriate and helped add to the atmosphere of the application.

The application story contains multiple endings which can be seen within section 2.3 of this report, each option that a user chooses will take them a different path. The buttons that give them the options are clear and definitive which means users aren't confused by any of the options shown.

Whilst looking at other applications which were mentioned and cited in the introduction, section 1 of this report, there were key components that were identified from all of those various games; this was that they were very heavily dialogue surrounded with clear and easy to understand options given to the users. The other apps I viewed besides, The Aether, were quite graphically heavy with lots of images and visual cues.

During the final process of writing this report I asked several people for feedback and any ideas for future improvements. Some of the key feedback that was provided was as below:

- Good looking application, that was easy to use
- Splash screen lasted too long
- Want more options within the story
- Perhaps expand on the applications capabilities

From that key feedback, future improvements would include things such as expanding on the story and giving the user options which expand the stories capability.

2.5.2 Personal Evaluation

In this section of the evaluation I will discuss what I have learned, challenges I have faced and how I feel I performed during this project.

When this coursework brief was released I was initially quite reluctant and not confident in application development due to inexperience and being new to Java.

However, I am very proud of the application that I have managed to create, although simple, it is functional and cleanly designed.

The largest challenge I faced was one of probably the easiest, which was going between activities. This was something that took me a little longer to figure out. Although I was not confident with java at the beginning I soon realised how close it was to C which I have quite a lot of experience and knowledge with.

References

[1] C. O. Games, "The aether: Life as a god." [Digital Download], 2018.

[2] T. Games, "The walking dead." [CD-ROM], 2018.

[3] T. Games, "Batman: The telltale series." [Digital Download], 2016.

[4] S. Wells, "Coursework assignment - mobile applications development."

[5] A. Bjork, "What is agile?," March 2018.

[6] A. Oswal, "Software development methodolgies comparison," 2013.

[7] K. Hope, "Uk 'has never been more addicted to smartphones'," Sep 2016.