

UNIVERSITY OF BRIGHTON

COMPUTER SCIENCE (GAMES)

INDIVIDUAL PROJECT - CI301

Interim Planning and Investigation Report

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1 Project Scope

1.1 Aims and objectives

What I will be developing over the upcoming months is an app to help users get out of bed easier in the morning in a useful and information rich way. By introducing Smartbulb functionality the users can be gently woken in the mornings and provide a more natural and pleasant awakening. I will develop the app using the knowledge and methodologies I have gained over my past years of learning to produce a fully functional and well developed app. I will be ensuring functionality and good user interface.

My aims are:

- Produce an alarm app with all the functionality users are used to.
- Integrate Smartbulb functionality into the app to turn the light on in the morning with the alarm.
- To turn off the lights at night without having to get out of bed.
- Provide weather information for the day.
- Inform the user of their schedule for the day and upcoming events.
- Publish the application to the play store for download and use by others.

1.2 Stakeholders

I do not have a client that I am developing my application for and so do not have a pre-defined user base or stakeholders however, I have identified the following stakeholders:

- Myself - Not only am I developing the application making me a stakeholder, I am also very interested in home automation and waking up happy.
- My supervisor, Marcus Winter - By accepting to be my supervisor Marcus is also a stakeholder for my application, he will be providing

feedback and assistance through out development and will ultimately be grading me on my efforts.

- An expanding user base of smartbulbs - Although the market currently is small the cost of smartbulbs is decreasing making them more available to users.
- Anyone that uses an alarm - The largest stakeholder I have is anyone that uses an alarm, many use the alarm that comes on their phone and others use stand-alone alarm clocks. By investigating the most popular alarms used by people I will be able to get vital information on what makes for a good alarm and what I should avoid.

1.3 Communications

I will maintain contact with my project supervisor with monthly meetings where I intend to measure my progress against deadlines and goals, reflect on what progress has been made and address issues, challenges and for development advice to assist me successfully complete my project as planned.

Regular emails will also be used between meetings to keep in contact and keep my supervisor informed of what I intend to talk about and on my progress made.

1.4 Installation Process

By developing for Android I will be able to make the app installation process very simple by publishing it to the Play store. Apps published to the Play store must adhere to guidelines and a certain level of quality or potentially be rejected. To install an app from the Play store you can simply select the option to install the app and it will be downloaded and installed seamlessly.

I will be ensuring to develop to a high standard and ensure there are no issues, bugs or flaws with my application. By developing for the KitKat version I will be able to support over an 80% market share. Android 2016a By supporting versions KitKat 4.4 and greater a majority of people will be able to use my

application and version 4.4 should have all the features I will require making it unnecessary to omit users on older versions of the Android platform.

1.5 Quality checks

During development I will ensure to maintain my code and follow the principles that have been taught to me and that I have learnt and will learn, in doing so my code should be easily maintainable, readable and extendable for possible extensions and stretch goals.

Testing will be very important and by using the Android emulator to test on KitKat and my own physical device for a physical and faster testing experience I will be able to test features as I implement them to ensure they function correctly before continuing.

I will develop a test plan as I continue to develop my application to allow me to note issues and ensure previous functionality has not been effected by further developments.

1.6 How will I measure success?

Due to the relatively short time frame for planning, design, development and refinement my main means of measuring the success of my project will be key performance indicators. My key performance indicators are outlined below:

- Alarm functionality
- Smartbulb integration
- Weather functionality
- Design
- Calendar Integration (Stretch)
- Text to speech (Stretch)
- Publishing to the Play store (Stretch)

If I am unable to produce a working alarm app with smartbulb functionality I will have failed to achieve what I intended to develop and so these are

my highest priority. Weather functionality would expand my application into more than just an alarm app and so is a key aspect of my project goal. Design can be adapted and refined independent of the core functionality of my application and will be progressively worked upon, provided I follow the design guidelines set out by the Android development team Android 2016b the design should be fully functional and fit within the platform and should only require minor usage adjustments such as colour scheme for colour blind users and button placement to improve upon usability.

2 Specification

2.1 Deliverables

- activities must be associated with products
- products may be intermediate or end deliverables
- products may be technical, management or quality
- products will form a hierarchy – some MUST be accomplished before others can be undertaken

2.1.1 Stages

- A schedule of activities

2.1.2 Risk Analysis

There are many risks present with any kind of project, I will be identifying the most relevant and predictable risks and assessing the impact that could be caused. By identifying the risks posed I can attempt to avoid and mitigate these risks and plan for those that I can't control.

Table 1: List of risks.

Risks	Impact level	Reaction
Sickness	Low	Avoid getting ill. I
Data loss	Low	Mitigate risk with multiple backups and version control.
Project complexity	Medium	Avoid making it too complex, or too simple.
Scope creep	Low	Avoid implementing features not outlined.
Communication with supervisor	Low	Mitigate by keeping in regular contact.
Learning curve	Medium	Mitigation by working with what I know

Sickness Besides avoiding getting colds and flu which pose little risk to the project, the only other form of impact would be broken bones etc.. This would impact my learning however I would continue

Data Loss I have my data backed up on two devices, a local NAS and the online service MEGA sync MEGA Sync 2016

Project complexity My project has been agreed by my supervisor and so I believe it is neither too complex or too simple for the grade I would like to obtain. I feel I have made my project achievable and would like to add more functionality as time permitted.

Scope Creep It is very possible for scope creep to occur with my project however I will be ensuring I complete all the features and functionality outlined within my project proposal before attempting to expand/improve upon the application to ensure I have a fully working project.

Communication By keeping in regular contact with my supervisor I intend to be able to get regular feedback on my performance and assistance if I need help. Lack of communication could easily lead to a gap in what I produce and the expectations of my supervisor and could negatively impact my final grade.

Learning Curve I will be developing in the Java language and for a device that I am familiar with. Although it can be tempting to work on a project in a new language or try to implement too many features in an attempt to gain a high mark, I feel it is more important to finalise the application and have a fully working demonstration for submission.

3 Product Description

3.1 Name and Identity

3.2 Purpose

- derivation of the product
- the composition of the product
- the form of the product
- the relevant standards
- the quality criteria that define whether the product is acceptable

4 Methodology

4.1 Overview of types of methodology

4.1.1 Development Styles

Rapid Applications Development (RAD) By producing prototypes of the software quickly customers are able to test and provide feedback as the software is developed. This is useful as often requirements change and it's common for developers to produce software that isn't actually what the customer wanted, by providing them with quickly developed prototypes if the software isn't what they wanted or they would like to make changes the time impact has been reduced. This is especially compared to other methodologies such as waterfall where the entire project is completed start to finish with the aim of providing the completed software at the end.

RAD I feel is not suited to my project as I am developing software that I know the requirements for and so will have no issues with changes to the requirements. RAD however is more of an encompassing methodology which is built upon fast paced development strategies.

Agile Is not a methodology but instead seeks for alternative project management style. Originally project management was slow to adapt to changes with user review coming in late stages of development. Agile however aims for incremental development with regular feedback. Admin 2008

The most popular form of agile development is the Scrum Admin 2008 scrum is suited towards small teams and requires close involvement by the product owner to provide regular feedback and review. There are other forms such as; - Extreme Programming, this a more disciplined approach to develop high-quality software quickly and involves continuous testing and planning - Crystal, aims to be lightweight and a highly adaptable methodology and encompasses variants that can be better suited for different team sizes, project priorities and on system criticality. *What Is Agile Methodology?* - Dynamic Systems Development Method (DSDM), is a very early methodology to come from the RAD movement in the early 90's and it focuses on the 80/20 model where the useful 80% of the system that can be produced in 20% of the time, essentially leaving more complex aspects to the later stages of development. *What Is Agile Methodology?*

Agile and the use of scrum development would appear to be very well suited to my project as it will allow for rapid development of features in my application, by quickly developing the base functionality and being able to obtain feedback

from my supervisor before expanding to the other features would be extremely helpful and would prevent wasted time if I need to make changes.

Lean Much like scrum and other agile methodologies aims to produce software quickly and involves close coordination with the product owner, where lean varies is that it wants to reduce waste by selecting the most valuable features required. Lean also works well for groups of small teams or individuals as it has a focus on decision making authority which has been shown to be more efficient than hierarchical flow control *What Is Agile Methodology?*

Waterfall Is not an RAD strategy and instead focuses on phases such as; requirement gathering, analyses, development and testing. Each phase is completed entirely before moving onto the next phase and is often depicted by the phases flowing steadily downwards resembling a waterfall.

Waterfall is slow to changes and delays in early phases can have a large impact on later phases and can easily end up missing the deadline. Waterfall is often easier to understand as it's a linear process and due to phases being performed to completion documentation is often more thorough than in agile methodologies Bowes 2014.

Due to the slower nature of waterfall I don't feel it would be ideal for my project, although it's easier to plan and performing agile development will lead to a greater challenge in documentation, the flexibility provided by agile would suit my needs greater than such a rigid method like waterfall.

Spiral The spiral model is based on the incremental model and consists of four phases; Planning, risk analysis, engineering and evaluation *What is Spiral model- advantages, disadvantages and when to use it?* A project will go through each phase multiple times in an iterative process or spirals. This is very well illustrated in the figure below.

Each spiral builds upon the previous spirals and due to the repetition of the four stages risk analysis is more rigorous compared to other methodologies.

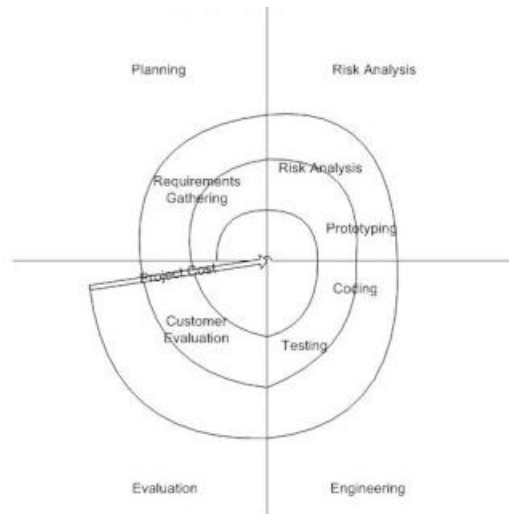


Figure 1: Spiral model diagram *What is Spiral model- advantages, disadvantages and when to use it?*

Due to how the spiral method works I don't feel it would be suited for my project as it requires multiple passes through each phase and as my project is relatively small and has a limited deadline I feel too much time would be spent on planning and risk analysis reducing my time developing and testing my application.

Time Boxing Involves strict deadlines rather than goals. By developing up to the agreed upon time and evaluating progress this can allow for steadier development and a set time in mind which provides a deadline for development.

Evaluating at the end of the time frame can show struggles in the development process and provides the ability to address them rather than simply spending more time to complete the goal.

There are issues with this method of development as it is difficult to estimate the time required to complete a task and so underestimating the time box will regularly involve assessing unfinished work. Potentially worse however is over estimating as this would allow adequate time to complete goals but will not help in identifying issues with development and will also result in a more

relaxed time scale that could easily miss deadlines.

This would be very useful in my project as it will allow me to estimate a time frame for each feature of my application, allowing me to reflect on my progress as well as for my scheduled meeting with my supervisor.

4.2 Choice of methodology

After assessing the various forms of project methodologies I have decided to use an agile methodology most notably the Lean methodology as this will provide me the ability to develop core functionality in a fast pace and add other features time permitting. To assist my development I will also be using time boxing to allocate time for my applications functions and allow me to perform regular performance reviews so I can identify time sinks and other issues to allow me to manage them.

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