

Honours Year Project

COMP390 Detailed Proposal

studyplanet

The all in one planner, which automatically makes personalised study routines.

Name: Jordan Clewlow

Student ID: 201357370

Primary Supervisor: Phil Jimmieson

Second Marker: Keith Dures

Project Description

StudyPlanet will automate the process of producing a personalised revision planner. Its intended demographics are university students but it is appropriate for people at any level of education. Revising, studying and doing university work has become more independent as a result of COVID. So, this app aims to help students keep on top of their university work.

The planner will adhere to the parameters set by the user, which outlines their modules and availability. The frequency that each module is displayed on the planner depends on its priority, this is determined by the user or changed automatically depending on upcoming deadlines. Deadlines for tasks (like exams and assignments) and work sessions can be manually entered. Deadlines may affect its module's workload by suggesting an increase in priority. This will adjust the planner accordingly, such that the module appears more frequently. Points will be awarded when sticks to the planner, and these will be used to track progress.

Aims

- Produce a daily planner displaying sessions using users set parameters.
- Users can adjust the times they have set at any given time, and the planner will change to reflect that.
- Allow manual adjustments to planner
- Make automatic adjustments to the planner.
- Use gamification.
- Intuitive user interface

Objectives

- Implement a scene where the user sets parameters for the planner.
- Generate and display the daily planner
- Use priority to dictate the frequency of each module.
- Users can adjust parameters and add tasks
- Priority adjustments suggestions when user adds tasks
- Notify users when the session is activated. (toggleable)
- Gamify using progressions bars and badges, award points for completing sessions on time.

Key Literature & Background Reading

I have decided to research how gamification could improve my project and consider how I can incorporate a points system, with badges marking their accomplishments, to improve the user experience. I started by reading an article, ““Do badges increase user activity?’ A field experiment on effects of gamification”. The paper aimed to provide a coherent and ample body of “empirical evidence” that could confirm that gamification is connected to “increased user engagement” and “goal commitment”. It reports the results of a two year field experiment on a service after incorporating a badge system to gamify it. Results showed that “users in the gamified condition were significantly more likely to post trade proposals, carry out transactions, comment on proposals and generally use the service in a more active way”. Hence, gamification increased user activity. Also, Microsoft discovered through investigations that there was “4x improvement in participation” and “16x more feedback” after implementing gamification. After my research and deliberating with my project manager, I have concluded that gamifying my application would be very effective.

I also researched other applications that tackled similar ideas as my project; study timetabling and scheduling. For example, Adapt is a timetable application for iOS and google play. Its website opens with “the study planner that does it all for you”, which is essentially the idea that drives my project. Similarly to my program, Adapt features an algorithm that organizes users tasks into “one clear plan”. Though my program is focused on organising general work sessions rather than limiting them to certain tasks, this application served as inspiration and it allowed me to see scheduling done well on iOS devices.

Adapt also features an attractive way of presenting their application. It’s minimal and the theme is simple, intuitive and accessible. Adapt displays the users progress through circular progression bars. Opting for visual representation of information is an effective way of presenting data to the user without it becoming cluttered and confusing. It also avoids the need to display too much text on screen. Though, It is important to consider disabilities like colour blindness when relying on visual cues. This research has helped me establish an idea of how I will develop the user interface.

I also conducted researching different frameworks and classes that could be relevant to my application, for example the calendar display. I found an existing calendar framework which I believe could be implemented (JTAppleCalender). This framework will be useful as it is highly customisable which will be very useful for when I am designing the user interface. For example it allows for just a row of weekdays - which coincides with how I want my application to look.

Users can adjust the priority of modules through sliders. I think this will be a more intuitive and accessible way as opposed to using numbers or percentages. Luckily, Swift already features a slider class (UISlider) in its framework (UIKit) in swift. This is very useful for my projects development, as using Apples frameworks are customisable and easy to implement. I also researched the steps needed to implement the UISlider class (using the website [codewithchris](#)).

After discussing it with my project manager, I concluded it would not be optimal to feature a login system. We discussed how signing up/logging in can be a barrier and can

reduce its usability. Also, a login system is an unnecessary complication and would mean I would have to feature online functionality and consider online storage. To learn about data local storage I read “iOS Data Persistence in Swift”. This outlined the different options (e.g UserDefaults, SQLite and core data) to store the user’s data, such that their information is maintained when the application is closed reopened. This site was effective as it also gives examples and explains how to implement the various methods.

Though I have used gitHub previously, I felt it was necessary to revise its uses and features. I read an article from the website “Using GitHub and Xcode Together”. This article was very helpful. It outlines how to initialize a Git repository, and how to use remotes (for example; setting up a remote repository) and then connecting the GitHub account to Xcode. I have learned to use Source Control Pane in Xcode to do actions like commit, push and pull to the Git. Learning these steps is going to increase the efficiency of my project’s development.

Development Process & Method

My project will be developed using the waterfall methodology. I have opted to use this because I am setting out the deliverables and it is being produced solely by me, and - so the requirements are unambiguous. The methodology also allows me to get a good understanding of the project before implementation through its linear sequential flow through the phases. I am going to use a modular approach through the implementation phase using the Swift programming language in macOS’ Xcode 12. Making my application for use on iOs devices is effective as it appeals to my target demographic. I will use core data, so that data can be stored locally. If necessary I will be using MySQL workbench the additional reading and writing of data at database level. For version control I will be using GitHub. This will allow me to keep versions and backups of and track my progression through the project's development. I decided to use gitHub alternatives because it is free, reliable and I have prior experience using it.

Data Sources

My app will not require external data sources. All data in the application will be applied through the user's inputs. Examples of data that will be stored is the perimeters they have set for their planner, their planner and points and badges. All the information will be voluntary inputted by the user and will be stored locally.

Testing & Evaluation

I intend to do thorough testing of each module and component of my application. I will do this by making sure each aspect of the program works effectively. I plan on doing functional tests such as integration testing, system testing, boundary value testing and compatibility testing. When I have completed an initial build of the program, I plan on issuing beta versions of the program to people so they can test its functionality and provide feedback using a questionnaire. Then, I will use this to evaluate different areas of the program. This will be done ethically as I will elaborate on in the next section.

Ethical Considerations

I will be referring to the ethical conduct provided by the university and its policy on Research Ethics. Though my project does not require any existing datasets or information, there are still areas of my project where it's necessary to refer to the ethical guidelines. This is evident in areas like the calendar where I will use a framework. In congruence with the ethical guidelines, the framework is free to use and does not require permission. I also intend to produce all the iconography myself, so will not have to consider copyright laws. My program will be carried out in the UK and all participants (beta testers) will be from the UK. It is important that my testing phase is in agreement with the policy. So, I will be issuing beta builds to voluntary friends and family who are of age and know it is for university; my project will not use any covert research, and no money, prizes or financial inducements will be used to encourage others to take part. My program does not include a login system so I will not have to consider ethical issues like storing their password or sensitive information.

BCS Project Criteria

My project will display my ability to apply practical and analytical skills gained during the degree programme. There are a multitude of software engineering skills I will implement to produce the application, covering a wide range of areas from the course, such as: object oriented programming, app development, database management and software development. This is already evident as I have already used knowledge gained from software development to assess which software programming methodology is most appropriate.

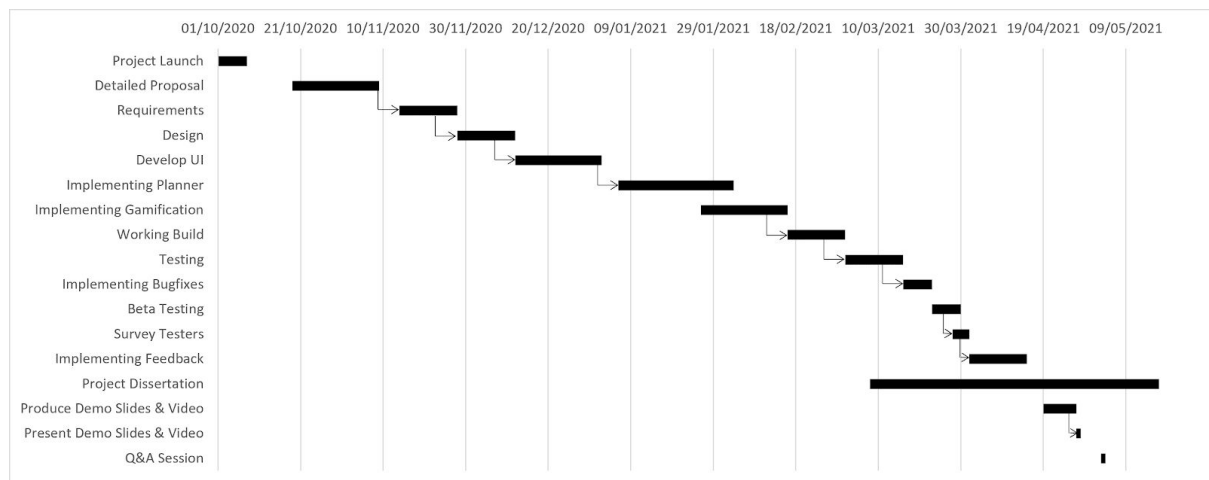
My application is predominately new and unique. It tackles current issues by helping university students with scheduling their work - an issue highlighted recently through this current COVID crisis. This shows the need of my project in a wider context. I aim to synthesise all the information, research and planning in requirements to produce a quality solution. I am going to ensure its quality through maintaining a high level of organisation; the completion of my specification requirements and thorough testing.

I intend to self manage, using the gantt chart, to ensure I meet deadlines and keep the project progressing. I will manage organisation, version control and backups using Github. My project's requirements demonstrate creativity and complexity. I will also be assessing myself through critical self evaluation throughout the process. I will do this using testing and beta testing. Also, through the documentation I produce, as I will display the project's strengths and weaknesses along with what worked and what didn't.

Software & Hardware Resources

As I am developing my app for iOS will require a Mac to use Xcode and Swift. A peer has given me permission to use their Mac device (2017 MacBook Air). I am considering the risk of failure of downtime as I also plan on using virtual machines to connect to the iMacs in the University of Liverpool lab rooms if I will be unable to access a computer. The software I am using is Xcode and MySQL workbench (a license is not necessary as they are free) . I also plan on using my own iPhone 6S to test the program, this will allow me to see how the app looks and feels on an actual phone. Beta testing will be done on other peoples iOS devices - hopefully a mixture of models and devices so its compatibility can be tested too.

Project Plan



Risks & Contingency Plans

Risks	Contingencies	Likelihood	Impact
Hardware failure	If hardware fails will have access to different macOS devices. I can also use the University macs at the lab - or access them virtually.	LOW	MEDIUM
Software failure	I will be regularly backing up my project. I have access to University computers if software doesn't work on my machines.	LOW	LOW
Time	I will try to stick to my project timeline. I will account for the project overrunning by adjusting the time allocated to each section or removing features.	HIGH	HIGH
Programming Problems	I will use the internet for help and do research on any issues I encounter. If necessary I can remove features.	MEDIUM	HIGH
Losing my backups	I am using Github (which is trusted and reliable). I won't lose anything that I have committed to the repository.	LOW	HIGH
Unable to get beta testers	If I cannot get people to test my program, I will be able to do sufficient testing independently.	VERY LOW	LOW
Inaccurate Estimations	If my gantt chart is inaccurate, it will mean I will have to adjust my estimations as I go. Allocating time differently depending on how complex the issue is. I will try to stay within the timeline.	MEDIUM	MEDIUM

References

web.archive.org. (2014). Facts & Figures - Enterprise Gamification Wiki. [online] Available at: https://web.archive.org/web/20140809033417/http://www.enterprise-gamification.com/mediawiki/index.php?title=Facts_%26_Figures [Accessed 9 Nov. 2020].

helloadapt (n.d.). Adapt - free Revision Timetable App for A-level & GCSE. [online] Adapt - the smart study planner designed for students. Available at: <https://getadapt.co.uk/> [Accessed 9 Nov. 2020].

JayT (n.d.). JTAppleCalendar. [online] CocoaPods. Available at: <https://cocoapods.org/pods/JTAppleCalendar> [Accessed 9 Nov. 2020].

The Leader in iOS Foundations Training. (2014). UISlider Tutorial and Example (Updated for 2018). [online] Available at: <https://codewithchris.com/uislider-tutorial-ios-slider/> [Accessed 9 Nov. 2020].

Chris Hannah. (2019). Using GitHub and Xcode Together. [online] Available at: <https://chrishannah.me/using-github-and-xcode-together/> [Accessed 9 Nov. 2020].

iOS App Templates. 2020. Data Persistence In Ios Apps With Swift - Overview - Swift Tutorial. [online] Available at: <https://www.iosapptemplates.com/blog/ios-development/data-persistence-ios-swift> [Accessed 10 November 2020].

Developer.apple.com. 2020. *Apple Developer Documentation*. [online] Available at: <https://developer.apple.com/documentation/uikit/uislider> [Accessed 11 November 2020].

En.wikipedia.org. 2020. *Gamification*. [online] Available at: <https://en.wikipedia.org/wiki/Gamification> [Accessed 11 November 2020].