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Learning Aim B & C

Carry out project initiation for an IT project and carry out the planning, execution, monitoring, and controlling an IT project, using an appropriate methodology

UNIT 9 IT PROJECT MANAGEMENT

Assignment 2

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# Introduction

# Project idea generation and solution creation

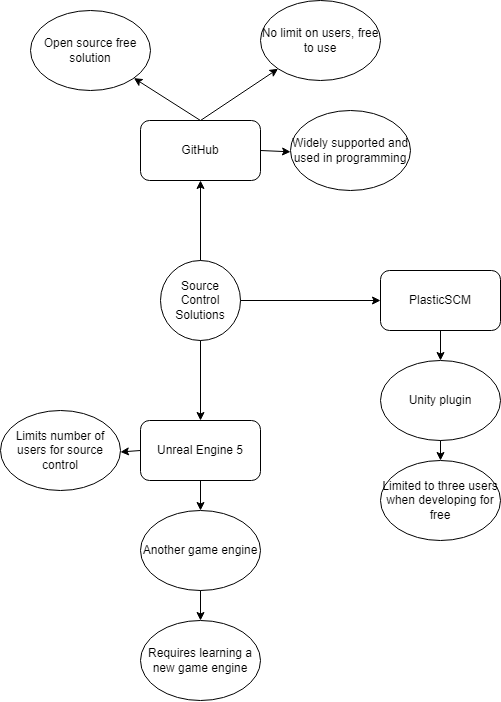
## Project IT Problem

In my IT project where I am designing a traffic light mobile application, I have chosen to use the Unity game engine in order to successfully complete this and achieve an adequate outcome with my application. This means that all of the interfacing and coding will be done in C# and Unity respectively, and through this I will eventually be able to make my application successfully meet the criteria that was required.

Unfortunately, Unity is lacking in any kind of version control or cloud back up software. Version control, also known as source control, is the practice of managing and tracking different changes to software. This can either be things like code or interactive elements in some choice scenarios like a game engine. The ability to track changes and keep a log of when they happened is an integral part of developing code, as it allows efficient troubleshooting and crucial rollbacks to working versions of the code if a bug is introduced that has devastating effects. This also allows programmers/developers to track when changes are introduced and potentially identify and bugs like this, further proving that version control/source control software is crucial when developing.

This presents the final issue that has to be resolved. Due to the fact that there is no version control that comes with Unity, I will have to look at other software that enables me to do this. Fortunately, there are many solutions available, ranging from extensions to Unity or switching software completely, and this will be adequately researched and discussed below.

### Creativity tools to solve problems



### Solution

Due to the nature of creating an application in Unity, I plan to implement source control to allow multiple members of the team to work on the project without having to rely on a convoluted way of tracking progress and giving each other the most updated version of the project.

My first and most likely solution that I have chosen for this is to use GitHub as my source control software. GitHub is a version control software, that “helps developers track and manage changes to the software projects code.” (Kinsta, 2022) It is widely used in software development as a way to manage source control, and is perfect for this small project that has an even smaller team to develop it.

Furthermore, GitHub is completely free and getting setup and started with it is relatively simple as it offers both GUI application options and CLI terminal based operations which allows the user to fully optimise their experience and use GitHub to the best of their abilities.

### First alternative solution

An alternative to GitHub could be to use PlasticSCM. PlasticSCM is “Plastic SCM is a version control system optimized for game development and 3D projects, and as such, it supports separate workflows within the same repo.” (Unity, 2023)

This means that PlasticSCM is used with Unity in order to allow for version control software. On the other hand, while this means that the version control software will be all inside of Unity, it is likely that developers will have to expand and learn new skills in order to be able to use this, which is not favourable when considering deadlines and timescales.

Finally, PlasticSCM limits it’s free options to just three free members, before charging for each additional member, meaning that it could become very expensive for such a small scale project that will likely not generate much revenue.

### Second alternative solution

Finally, the third alternative solution to using GitHub and PlasticSCM, is to use another game engine called Unreal Engine, and develop the mobile application for the traffic light in there.

The source control for Unreal Engine is built into the program, and can be activated by going through the content browser or the level editor’s preference window. Within Unreal Engine (UE), “Source control is used to manage changes over time to code and data and enables teams to coordinate their game development efforts.” (Unreal Engine, 2023)

Unreal engine source control is free to use for users although it does require some setup and therefore might require some time and assistance when establishing, and therefore is an effective alternative solution to the above mentioned two source control options.

# Feasibility study for solution

I will be performing a feasibility study for the first solution I chose, GitHub.

## Technical assessment

A technical assessment for my feasibility study means that I have to ensure that Git is able to fulfil its role as a source control software. GitHub has an extensive number of resources that enable it to perform a large number of functions, such as testing a deploying applications.

Furthermore, it offers a comprehensive API that enables the developers and programmers to interact with GitHub programmatically. One of the crucial advantages of GitHub is its scalability. GitHub is designed to inherently work with a large group of developers and therefore it can be used for many different applications such as a traffic light application.

Finally, GitHub is also very secure due to it’s need for two factor authentication, HTTPS encryption and other access controls, meaning that it is suitable for this project as there is minimal risk of there being a leak in the work.

## Economic assessment

GitHub offers many pricing plans that can be used by my team when development, however it is likely that given the smaller nature of our team and applications.

GitHub offers many plans, but these are some of the most common. These are:

Free plan;

This plan offers unlimited private and public repositories, however it limits the users to only 3 for the repository, among other features which are listed below:

* Unlimited public and private repositories
* Up to 3 collaborators
* 500MB of storage per repository
* Issue tracking and project management tools
* Code review tools
* Integrations with third-party services

Team plan;

This offers all the features of the free plan, but it adds additional features, most notably the option of up to 10 collaborators, and additional permissions, which are all listed below.

* All features of the Free plan
* Up to 10 collaborators
* 2GB of storage per repository
* Access controls and permissions
* Advanced project management tools
* SAML single sign-on (SSO) support
* Priority support

This costs 4$ per person per month and is very viable as an option.

All in all, this means that the options for GitHub enable the team that I will create to develop the mobile application and successfully use source control.

## Legal assessment

GitHub has various legal requirements that it must follow as a web based application that holds sensitive data such as passwords and financial information. This means that it adheres to many laws such as GDPR, and intellectual property laws. GitHub complies with these through data protection features, code of conducts for reporting users, and things like license templates to ensure that users are not take advantage of.

## Operational assessment

Due to the issue being source control and not being able to do it with Unity inherently, I have looked to outside software to solve this issue. This means that in order for GitHub to be able to pass an operational assessment adequately, it has to excel primarily in source control, and this happens to be the case.

Alongside having many features available to help with the issue of source control, such as Git version control system, code review tools, issue tracking and project management, and integrations, it is clear to see, once going to a remote repository on Git, that Git is highly equipped to deal with source control and has a number of features available that do not need to be explained to be noticed.

## Scheduling assessment

The scheduling assessment determines the likelihood of the project being successful when using GitHub, provided that it is successful *and* on time.

This factor depends largely on the complexity of the project, the number of developers and the resources available for the project, such as hardware, software, and documentation.

GitHub does include tracking tools that allow progress to be checked and assigning tasks, meaning that using GitHub within the assignment seems like a logical solution and likely to help advance due to this built in feature.

## Sustainability assessment

For the sustainability assessment of GitHub, while using GitHub itself does not expend much technology beyond setting it up, using the website and possibly a GUI application or terminal based application for Git, GitHub as a service does do its part for the environment.

This is made apparent through the sustainability of initiatives that GitHub is taking part in, and these include;

* Investing in renewable energy, which means that GitHub uses renewable energy for its servers and data centres.
* Optimising energy efficiency, this means that GitHub optimises its energy usage to be as efficient as possible and reduce any unnecessary consumption, helping them be more sustainable.
* Carbon neutrality since 2019, which means that GitHub has produced no more carbon than they have used since July 2019. (Brescia, 2021)

## Security assessment

There are a number of features that GitHub employs to ensure the security of its website and services, and these include:

* Secure servers, GitHub employs a secure server system to prevent any unauthorised access and potential leaks.
* Two factor authentication, GitHub offers 2FA to users that wish to enable it, providing their account with more information.
* Software source control, GitHub offers source control that has access permissions to prevent unauthorised users from making changes to the software and pushing those changes.
* Penetration testing, GitHub performs regular testing on its own services and website to ensure that nothing can be breached, and the website remain secure, alongside the services it offers.
* Bug Bounties, GitHub also offers bug bounties, which are a way of incentivising users to alert them of bugs as they will provide them with compensation if they do so.

## Usability assessment

GitHub offers both a GUI application and a CLI terminal based option that will enable my developers to choose what they are comfortable with, ensuring that there is maximum productivity and work done. Furthermore, there are also a number of other features that allow the development to be enhanced. These include:

* Documentation, GitHub has an extensive documentation of its features that allow anyone to learn it and troubleshoot any issues.
* Integration with other systems, GitHub has a range of other systems that it integrates with, such as CI/CD tools.
* User testing, GitHub tests any usability issues and addresses those issues in case they might affect the users, which in my case would be the developers.

# Feasibility study for alternative solution

For my most likely alternative solution, I have chosen to use PlasticSCM as this way I am able to continue using Unity which my developers are experienced in and PlasticSCM expands on this.

## Technical assessment

For the technical assessment, PlasticSCM also provides source control features that mirror that of GitHub, such as branches, merging, and general version control. Additionally, PlasticCM integrates with Unity as it is supported by Unity, (Unity, 2023) and was picked up by Unity to become an official part of the software. Finally, it also provides the option to manage binary assets which allows developers to modify scenes from inside of PlasticSCM.

## Economic assessment

Similarly to GitHub, PlasticSCM has several pricing plan options the enable developers and our team to choose between the options that are available and those that work well for us.

The prices available range from $7.50 per person per month for the small team edition, this includes up to 10 users and includes all of the standard features like merge tracking, code review, and branch visualisation.

There is also the professional edition that includes up to 50 users, however this costs up to $45 per user per month, and therefore this is a very pricy option for our small project that likely will not need this many users or features that come with it. The extra features include, audit logs, automated testing, and integration with external tools.

## Legal assessment

Just like GitHub, PlasticSCM has to follow a number of laws and regulations like GDPR. The list of requirements that PlasticSCM has to follow include:

* Data Protection.
* Health and Safety for the employees of PlasticSCM.
* Intellectual Property, meaning that the project is properly managed and that PlasticSCM will help in managing this.

## Operational assessment

PlasticSCM is easy to integrate into Unity as it is now apart of the software and simply has to be enabled and installed. Furthermore, there are a number of features of PlasticSCM that enable its operations to a higher level, and these include:

* Different features that allow the streamlining of development, such as branching, merging, and source control.
* Integration where PlasticSCM is able to integrate with a wide variety of other tools, like Visual Studio, Unity, Jenkins, and many more. This will enable my developers to work with the tools they wish to and that make them more comfortable.
* Ease of Use because PlasticSCM has a user friendly interface, enabling my developers to quickly pick up on it and expand on their skillset.
* Scalability where PlasticSCM is able to scale up and down depending on the size of the team and needs, and the complexity of the project.
* Finally support, where PlasticSCM offers a range of support options that enable developers to receive assistance if they need it.

## Scheduling assessment

The time taken to establish and maintain PlasticSCM, specifically the setup time, will not be long at all, and this means that getting it established and involved into the project will likely not take away from the project being able to complete successfully.

Given that PlasticSCM is a part of Unity, it will not be difficult to enable it and make it work for the project and the developers will be able to use it for the traffic light software.

## Sustainability assessment

Compared to a large scale software like GitHub that is used all over the world, PlasticSCM is a lot smaller and more niche to access and use, and therefore it has a much smaller environmental impact.

Furthermore, due to the wide variety of source control software options, this means that the chance of PlasticSCM being used is lower and this lowers the environmental impact of it. Finally, despite this, PlasticSCM is committed to sustainability practices, which includes renewable energy.

## Security assessment

PlasticSCM uses a number of features in order to ensure that the security of the software is high. These features includes:

* PlasticSCM uses HTTPS, similarly to GitHub, and also supports SSL (secure sockets layer)
* PlasticSCM also uses

## Usability assessment

# Project Requirements

# Project Phasing

## Functional and non-functional requirements

## Requirement specification documentation

# Typical project management process

## Planning project management processes

Hiring people etc

Gantt chart

Communication platform

## Risk and issue processes

## Execution and management processes

## Monitoring project management processes

# Conclusion