Forklift Frenzy Video Game Project Initiation Document

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1 Project Goals

This group project module provides the perfect opportunity to allow a group of students keen to work on games in their future careers to create a portfolio piece, whilst gaining some insight and experience in working in a small team to publish a game created from scratch. As such, the aim of this project will be to develop a game for use on Windows PC, suitable for an audience of all ages, to be released on Steam Greenlight as a public demo.

The main goals involved include:

- Establishing a production pipeline appropriate for this type of software project, by means of creating and adhering to workflows that enable smooth interactions between the different disciplines of the team.
- Ensuring work done by all team members is standardised, and finished to a polished state considered suitable for public release. This includes thorough testing and evaluation of each piece of work.
- Arrange funds necessary for project success, to cover such things as server & Steam submission fees.

The game itself, named Forklift Frenzy, lets the player take command of a number of forklifts with which they must navigate the map to retrieve certain packages against the clock. A single player mode provides this gameplay offline, whilst an online multiplayer mode puts players in teams, with the friendly team collaborating together to gain as many points as possible by retrieving packages whilst the enemy team competes to fulfil the same task.

2 Approach

2.1 Methodology

2.1.1 MoSCoW

The MoSCoW method groups all project features into four categories; must have, should have, could have and won't have. It will be relied upon to aid with determining the priority of certain tasks, and afford a clear view of the project goals. This is not an exhaustive list of features, but a higher level view of what is required for the project.

2.1.2 Agile Software Development Methodologies

Certain characteristics of the agile methodology will be adopted throughout the project –

- Close communication and collaboration between all team members throughout, to ensure any problems that arise are dealt with swiftly and with greater efficiency
- Iterative development by means of working in weekly sprints, with clear goals per sprint, including stand-ups and retrospectives at each weekly meeting come sprint end
- Ensuring flexibility by adjusting to changes in task deadlines and requirements

By following this agile approach, the group will ensure there is always a working and up to date product relative to the current project deadlines and requirements. This will be versioned through the use of a master Git branch, in which only production ready code will be pushed. Every new feature will be developed on separate branches and merged into the master project when finalised.

2.1.3 Agile Client Communication

The project manager/programmer serves as the client for this project, allowing such benefits as direct communication with team members, more immediate decisions on any product changes and a technical understanding of the development process. This is beneficial as having a technically aware client means more flexibility on the overall project aims and goals. It is easier to understand and communicate to the client if the project scope becomes too large as they are directly involved in the development tasks.

2.2 Technology

2.2.1 Developer Environment

The project will be developed and built using the game engine Unity. Unity is an industry standard game development software that certain team members have experience with. Unity allows for the code base to be written in C#, using Visual Studio as the main IDE removes the need for the developers to learn an entirely new programming language or development environment. Unity is also useful as it comes with its own physics engine and rendering API which means that iterations of the project can be developed quickly and easily without the added difficulty of creating our own game engine.

2.2.2 Asset Creation

For the digital media assets the artist team will be using Auto Desk Maya 2016 to create the 3D models. Maya was chosen as the artists all have experience in using the software and the models can be imported into Unity with little effort. Adobe Creative Cloud will be used for other assets; including Photoshop for texturing and After Effects for video animation assets.

2.2.3 Version Control

Following industry standard software practises, the project will be stored using the version control system Git. This means that each team member can work collaboratively on the same Unity project by working on separate branches and issuing pull requests to the lead developer to merge and fix conflicts within the work. In using git, each commit of the project can be pushed to remote servers at GitHub.com and Bitbucket.org. The team are also researching into using university resources to set up a private git server so the large binary files can be stored. If a private git server is not available, GitHub will be used to version the code and google drive will be used to store the larger files. The GitHub web interface will also be used to log issues and create milestones for the project.

3 Scope

The main goal of this project is to develop an original game. The game is to be aimed at Windows PC users with possible Mac/Linux support. The game should be functional and ready to be released as an alpha development build, which will be uploaded to Steam Greenlight in the form of videos and screenshots of gameplay. The game should feature both offline and online modes: a single player repeatable free run mode; and an online multiplayer versus mode.

3.1 MoSCoW Format

The following are the deliverables of the game in the MoSCoW format:

3.1.1 Must Have

- Single Player mode
- Multiplayer mode
- Menu system
- Local Player Data Save/Load Capability (Game persistence)
- Server to host multiplayer games
- Four different forklift classes

3.1.2 Should Have

- Multiplayer: leader boards of top scores
- Controller support
- Multiplayer: matchmaking system
- Server database to store online player statistics
- Forklift damage system
- Point-based system
- Steam SDK integration for release on Steam platform
- Steam Greenlight submission (screenshots & gameplay video)

3.1.3 Could Have

- Multiplayer: leader board system (shows friends scores)
- Different types of missions in either/both game modes
- Game e-manual: includes concept art, descriptions and instructions
- Mac support
- Teaser for further levels & models
- User defined key bindings
- Steam achievements
- Unlockable character skins

3.1.4 Won't Have

- More than one map
- Multiple game modes within single or multiplayer
- Micro-transactions

4 Organization

4.1 Management team structure

4.1.1 Team roles

Project Manager & Programmer – Matt Newbigging – responsible for managing documentation, organising tasks, ensuring the project is developed to specification and by the module deadline. Alongside this, perform some programming tasks.

Lead Developer – Zoe Wall – setting up version control method and upkeep, developing the majority of the code base required for the game.

Artists – Marie Pearson, Alex Haining, David MacGruer – creation of all game assets; models, animations, textures and video material.

Sound Designer – Matias Malmivaara – recording, mixing and implementation of all sound assets in game; background music/ambience and sound effects.

5 Business Case

5.1 Benefits

The approach chosen involves using the Unity game engine, since some members of the team have existing experience in using it, it comes with it's own physics engine and provides a simple interface for new learners whilst providing advanced functionality. This affords a major benefit to the project, in contrast to other approaches which would involve learning how to use a new game engine, or even building our own game engine from scratch, which would put this project out of scope from the offset.

Expected Outcomes:

Provide experience working on a published title – This project provides an opportunity unique to university by allowing the team to work on a game that will be made commercially available. As such, should the game be accepted to Steam, it will generate a small amount of income.

Fills a niche in the market – There exist forklift simulations which are very true to nature. There are not, however, any games that use this theme to bring something lighter in nature to the market – this is very much a silly game that does not take itself seriously.

Provide experience working with and managing different team member's skills and needs – This project provides an excellent opportunity for both artists and programmers to collaborate as if they were working within the industry. With every team member having to understand and appreciate one another's background by making sacrifices or changing the way they work to suit everyone.

6 Constraints

6.1 Project Limitations

The project will be limited with regards to the following:

- Time limit imposed by the module length means project must be complete by 03/04/2017
- Limited time available due to other module commitments during project period
- Developer teams current knowledge of Unity
- Financial requirements – whilst a grant may be available for this project, there are certain costs associated with publishing the game to Steam, and in server costs necessary for making the game available for online play
- Artists current knowledge of how their assets affect how the developers work
- Possible limitation due to Project Manager having a dual technical role, some aspects of development may be out of scope due to having a sole developer
- Work-flow changes for team members to be collaborative.

6.2 Iteration Tolerances

Factors to be considered during every project iteration:

- Possible risks
- Time constraints
- Scope of current tasks
- Quality controls

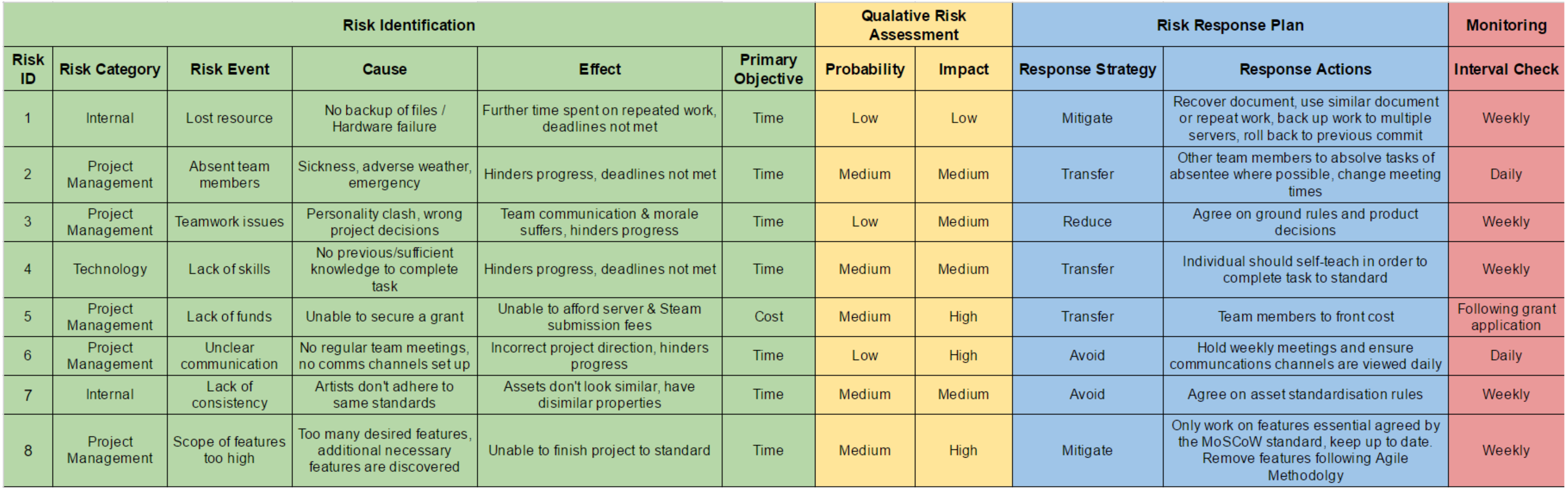
6.3 Assumptions

- Development team's knowledge of Unity will meet requirements of application
- Timeframe will be sufficient for completion of the project
- Team members will hit individual deadlines
- Work will be performed in accordance with agreed team rules

7 Stakeholders

As the project has an internal client, the team are the main stakeholders of this project. This is useful as overall project goals and features can be flexible to suit any unforeseen issues or technical requirements. One goal of this project is that the game be submitted to Steam Greenlight, therefore the end users are also stakeholders in the sense that the public must vote if they believe the game should be a released title, which could help with the redesign of the project if it proves to be unpopular.

8 Risks



Risk Identification						Qualative Risk Assessment		Risk Response Plan		Monitoring
Risk ID	**Risk Category**	**Risk Event**	**Cause**	**Effect**	**Primary Objective**	**Probability**	**Impact**	**Response Strategy**	**Response Actions**	**Interval Check**
1	Internal	Lost resource	No backup of files / Hardware failure	Further time spent on repeated work, deadlines not met	Time	Low	Low	Mitigate	Recover document, use similar document or repeat work, back up work to multiple servers, roll back to previous commit	Weekly
2	Project Management	Absent team members	Sickness, adverse weather, emergency	Hinders progress, deadlines not met	Time	Medium	Medium	Transfer	Other team members to absolve tasks of absentee where possible, change meeting times	Daily
3	Project Management	Teamwork issues	Personality clash, wrong project decisions	Team communication & morale suffers, hinders progress	Time	Low	Medium	Reduce	Agree on ground rules and product decisions	Weekly
4	Technology	Lack of skills	No previous/sufficient knowledge to complete task	Hinders progress, deadlines not met	Time	Medium	Medium	Transfer	Individual should self-teach in order to complete task to standard	Weekly
5	Project Management	Lack of funds	Unable to secure a grant	Unable to afford server & Steam submission fees	Cost	Medium	High	Transfer	Team members to front cost	Following grant application
6	Project Management	Unclear communication	No regular team meetings, no comms channels set up	Incorrect project direction, hinders progress	Time	Low	High	Avoid	Hold weekly meetings and ensure communcations channels are viewed daily	Daily
7	Internal	Lack of consistency	Artists don't adhere to same standards	Assets don't look similar, have disimilar properties	Time	Medium	Medium	Avoid	Agree on asset standardisation rules	Weekly
8	Project Management	Scope of features too high	Too many desired features, additional necessary features are discovered	Unable to finish project to standard	Time	Medium	High	Mitigate	Only work on features essential agreed by the MoSCoW standard, keep up to date. Remove features following Agile Methodolgy	Weekly

9 Project Control

9.1 Team Ground Rules

- Check Slack regularly, be responsive
- Task review in each weekly meeting
- Give notice of absence from meetings
- Make PM aware of anything that would disturb progress on weekly tasks
- Master branch in version control must be production ready at all times

9.2 Team Communication plan

Group meetings to take place every Tuesday between 11:00 and 13:00, wherein:

- Team members perform a stand-up; detailing their progress on their most recent task, any problems faced and any questions they need ask.
- New tasks with associated deadlines assigned to team members where necessary.
- Minutes taken by PM to appear in Group Meetings document on Google Drive.

The team will make use of Slack to allow for easy communication between individual team members and as a group. Google Drive will be used to store all assets created for the project, including concept art, models, sound files etc. Mural will provide a means of illustrating storyboards, final designs and brainstorming remotely. Project version control will be achieved through the use of Git. The project will be pushed to a remote repository on the GitHub server.

9.3 Communication Summary

- Project manager to arrange weekly group meetings.
- Project manager to check in with supervisor and module leader where necessary.
- Project manager to present the assessment documents to the module leader.
- Project manager to meet with other project managers weekly at the project manager's forum.
- Project team will show a project presentation to module leader at the end of the project.

9.4 Maintenance and Control Documents

Issue Log – Used to track issues on GitHub when they arise during the project. Team members should create issues using the GitHub interface with as much detail as possible for things that need to be rectified at a later date. Not exclusively used for bugs when testing the game, the issues can be to further improve a feature. This can be used to keep track of features needing extra work when the time allows later in the project. Once an issue has been opened, any member of the development team can then include the issue ID within the commit that fixes it to keep track of the iterative improvement process. Any issues that arise that are not related to bugs or improvements to the game should be communicated through Slack, if a suitable solution can be found immediately it will be carried out by the team member. If a solution cannot be found immediately, the issue will be discussed in the following group meeting.

Risk Register – Used to log all possible risks during the project along with the probability of occurrence and their impact on the project should they occur. This will be updated as new risks become apparent. This document will be controlled by the project manager.

Git Commit Statements – These are short statements which go alongside a commit to the version control repository. Each statement provides a description of the changes made by the commit and any further work to be carried out. They are written by the individual team developer making the commit. These are to be descriptive and contain the Issue or Milestone ID if the change is relevant to an open case on GitHub.

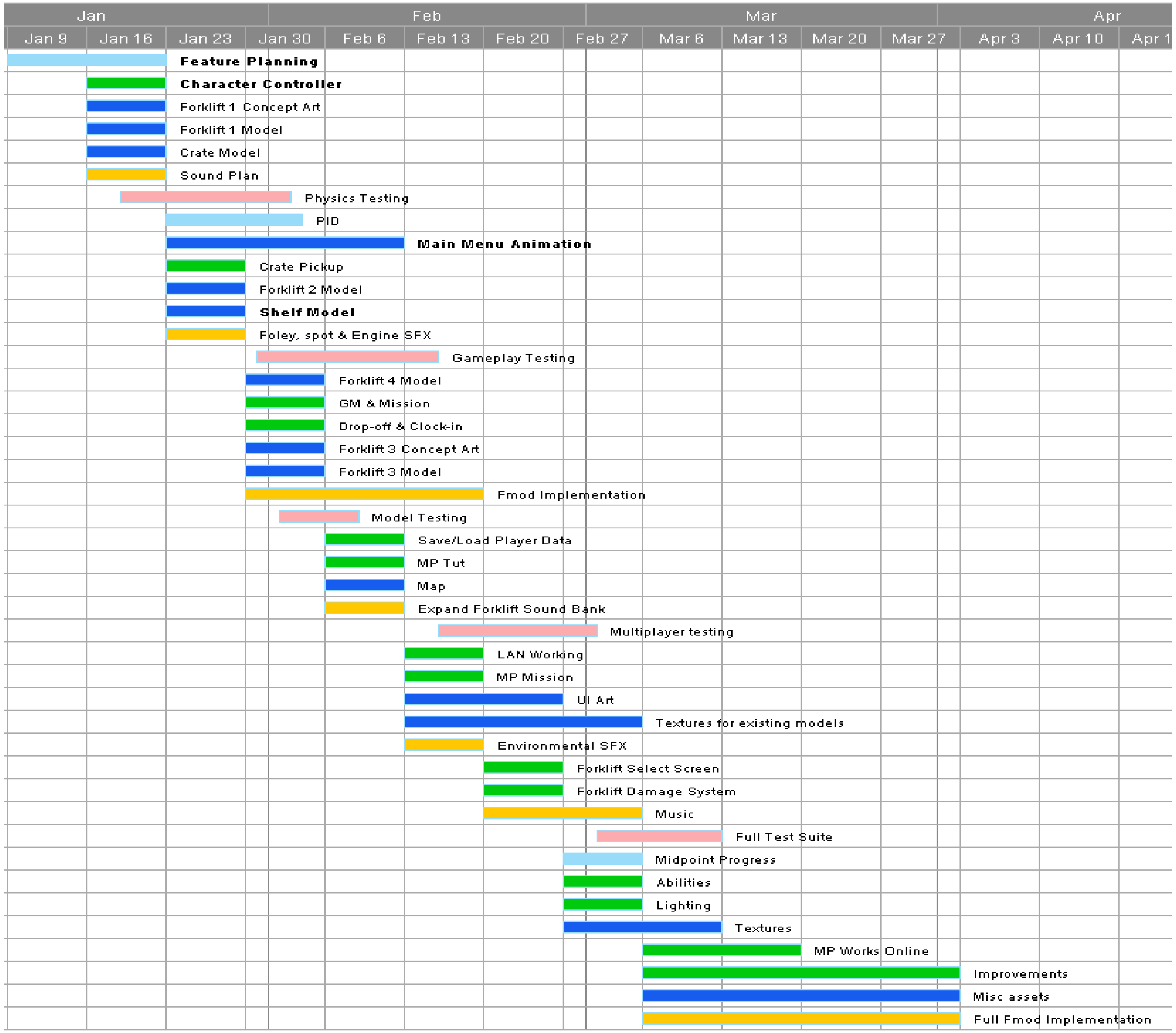
10 Reporting Frameworks

The following are all forms of documentation required to be produced during the lifecycle of the project.

Report	Recipient	Date Expected
Project Initiation Document	Module Leader	03/02/2017
Work-in-progress	Module Leader	10/03/2017
Project Report	Module Leader	03/04/2017
Project Presentation	Module Leader	24/05/2017
Individual Reflective Report	Module Leader	03/04/2017
Individual Project Diary	Module Leader	03/04/2017

11 Schedule

The following Gantt chart shows an outline for the schedule of the project.



12 Sign Off

I confirm that this project initiation document accurately describes the scope of the work proposed as of the current date and ask for the project to commence.

Any changes to the scope above will be subject to change control. This project initiation document is valid for five months after issue.

1st Authorising signatory

Project Manager & Client

X M. Newbigging

Date - 03/02/2017

13 Appendices

13.1 Appendix A: Personal Learning Outcomes

13.1.1 Alex Haining

I hope to take my skills from my 3D module last trimester and develop my talents further in my group, by creating a game in the unity engine. My contribution within the group is valuable and will push my skills forward by producing optimized game ready 3D assets for my team. I have been given the task of creating assets partly from my own creativity and following 2D concept drawings. I will broaden my abilities in Autodesk Maya and improve my team workflow by understanding production pipeline involved.

Main learning outcomes:

- Create Low poly assets.
- Optimize assets to game standards.
- Learning how to export 3D Maya files into the unity game engine.
- Working close and collaborating with other artist to ensure the work produced is within the accepted same standard and style.
- Learning basic mechanics of the Unity Game engine allowing me to integrate the modelled assets before handing over.
- Creating Normal maps and hand painting via photoshop to create the texturing in the desired style.
- Learn and use the basic understanding of GIT Hub to transfer files between the Game developers

- Giving a full professional breakdown and evaluation of my work that can be presented towards the client.

13.1.2 David MacGruer

Following on from trimester one where I studied the ‘Introduction to 3d modelling’ module, I plan to utilize many of the skills I learned to produce game ready assets for integration into the Unity game development engine.

I have been tasked with producing a range of 3d assets that will populate the game, bringing 2d concept drawings to life in the 3d realm.

Using Autodesk Maya 2016 to model the assets, I will expand my knowledge of the game production pipeline.

Main Learning Outcomes:

These outcomes will be achieved through self-directed study.

- Low polygon modelling techniques for optimum performance in game.
- Creating hand painted texture maps for the 3d assets using Adobe Photoshop.
- Working closely with other artists and game developers to ensure my work is presented to them in a professional fashion to avoid any glitches with regard best practice for integration with the Unity game development engine.
- To attain a basic understanding of Unity, to enable me to test my 3d assets within the game engine before sending them on to the Lead Developer.
- Take part in a weekly meeting with my group to discuss progress on the project and any outstanding tasks to complete for each production stage.
- Complete a detailed breakdown of all the game assets I have produced including a critical evaluation of my work for consideration by the client.

13.1.3 Matias Nilla Matias Rafael Malmivaara - 40286188

This group project gives me the opportunity to further advance my knowledge and ability in interactive audio and sound design for video games. I’m required to create all audio assets to the game myself, as well as the music, so there is a whole aspect of the game depending on me. I’ve been given almost full creative control over the audio and sound design, which should be both challenging and rewarding, though the setting of the game is rather specific and thus gives helpful boundaries to work within. I hope to be able to use what I already know, push myself a bit further, and learn a whole lot of new things that will help me professionally in the future. The knowledge gained in modules last trimester, such as “interactive audio”, is directly linked to this line of work and will be extremely helpful. The project will also give me an opportunity to further familiarize myself with game development related audio software / middleware.

Main learning outcomes:

- Learn about and gain basic understanding of coding based game development, specifically in relation to audio

- Further develop skills in manipulation of sound through the use of recording, layering, and processing the audio, using appropriate microphone techniques and tools such as Pro Tools.
- Get better at data organisation, file organisation, asset organisation
- Further develop understanding and features of audio middleware, in this case FMOD Studio
- Develop further skills in implementation of audio in video games
- Be able to create a balanced and dynamic sound mix for a game
- Further develop in music implementation in games
- Learn to use and understand the basics of GitHub
- Learn the basics of a new game engine (Unity), specifically audio implementation
- Develop group working and communicational skills, being able to communicate and develop ideas from others and myself to a unified standard
- Provide a full breakdown of the audio assets and sound design elements I've created for the project
- Critical evaluation of my own work

The outcomes will be achieved through self-directed study and collaboration with other group members.

13.1.4 Matthew Newbigging

I aim to improve upon existing project management skills through working with team members of different disciplines to my own, understanding the production pipeline in developing a game, and ensuring work is completed to specification by the deadline . Furthermore, I plan to better my knowledge of Unity, Git and code structure via my programming contribution to the project.

Main Learning Outcomes:

- Create accurate, readable & easily accessible documentation for the project.
- Able to successfully manage the team's schedule throughout the module.
- Use Git effectively, to safely work simultaneously with others and provide a means to access my work remotely.
- Write various code files for the game, to specification.
- Better knowledge of using Unity to develop publishable games.
- Understand pipeline and all requirements involved in developing a game across a multi-disciplined team.

13.1.5 Marie Pearson

I intend to develop my existing skills further within the game creation project through working within the team as a Concept Designer and 2D Animator, producing pieces that will aid the 3D artists in the production of in game assets and also to produce an opening 2D animation sequence which shall contribute to the overall character of the game. By building upon knowledge gained from previous modules such as 2D animation and Introduction to 3D, I will gain experience of integrating concept design into the production workflow and enhance my team working abilities through cooperation and understanding of the overall creation process of the project.

Main Learning Outcomes:

- Utilise existing skills in Concept Design and refining skills to a greater degree
- Creating designs and art work that may be utilised in game and by fellow artists.
- Gaining a basic understanding the Unity engine in relation to my role
- Contributing to team meetings through discussion and implementing ideas into concept designs
- Working within the team to ensure that concept ideas meet the overall expectations of the project, particularly in relation to design implementation by other team members, providing additional art work when required.
- Producing a short 2D animation sequence for initial menu through use of Adobe CC
- Providing a portfolio breakdown of Concept Designs and rational for presenting to the client

13.1.6 Zoe Wall - 40182161

During this project I intend to build on previous knowledge of Unity. In particular learn more about its physics engine to create interesting physics simulations of vehicles, crates affected by force and how to apply this to models effectively without hindering application performance.

Having no prior knowledge into how online games work, this project is an opportunity to research and implement simple networked code, crucial for the multiplayer aspect to games development. I would like to learn how to develop a game where at least two users can successfully interact within the same level in real-time.

I also wish to gain a better understanding of Git by fixing merge conflicts and creating branches to follow a standardised git-flow used within the industry. Previously I have only ever used version control for solo projects, so this project is a perfect opportunity to learn how to effectively use git to work collaboratively with others.

Main learning outcomes for the project:

- Develop further understanding of version control and its proper use in a collaborative project: branching, pull requests, merging, fixing conflicts.
- Find a solution for large file storage for the binary assets that may need to be versioned.
- Gain a more in depth knowledge of the Unity engine with regards to the physics engine: rigid bodies and accurate collision detection.
- Learn how to integrate data serialisation to create a game which is data persistent between executions.
- Build on prior knowledge of game development patterns and techniques to create a fully functional game with interesting mechanics.
- Working closely with artists to further an understanding of asset creation and how to integrate it correctly with the development work.
- Learn and implement the basics of networking for online multiplayer games: servers, clients and hosts.