Project Contract

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3.Programme: Computer Games Programming BSc

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5.Project Title: Procedural Level Generation and VR

6.Project Proposer: George Hanks

7.Supervisor: Khawla Alhasan

8.Introduction (max. 100 words): Researching procedural level generation and using it within game development for making environments, using a VR dungeon crawler made using the Unity game engine as a case study. The game is set in a fantasy style dungeon where the player will have to kill all the enemies in the environment to win the game. The layout of the dungeons will be random every time the game is played so there is theoretically endless playability within the game.

9.Project Background (max. 300 words): I decided to make a VR Dungeon Crawler because I wanted to further my skills and knowledge in multiple areas. This project will require me to have a good understanding of procedural level generation, the Unity engine's architecture, and software engineering techniques.

I chose procedural generation over hand made to make my levels as it is technically more interesting to me and will provide more of a challenge during development, I am also less artistically inclined so letting the levels be generated by code will remove that part of the process from me. It is also a benefit for a solo developer as they can produced much more content for the game, in a reality short amount of time, which could not be done using traditional methods.

I also chose to incorporate VR because it is a relatively new field of development for games, providing lots of opportunities to innovate. The VR market is also not very competitive as the number of people with VR headset is relatively low compared to the number of people with consoles/PC, this means many games companies do not want to dedicate resources to developing a game which is limited to a smaller part of the market. VR will also make the game more immersive, which can add to the enjoyability of the game.

My game will take inspiration from similar games in the genre, such as the 'Diablo' series, but instead of a third person isometric view, my game will be played in the first person. Having experienced this game before I felt it would make an excellent product to draw inspiration from.

10.Aims (max. 100 words):

The goal of this project is to develop functional prototype of the game. The game will Feature procedurally generated environments, this includes rooms, corridors, and props, an objective to complete to win the game, this begin killing all the enemies within the level. The player is a mage, so they will have to kill the enemies using varying spells. If the player dies, they lose, they can then choose to replay the level or play a new one. The game is played using a VR headset in a first-person perspective.

11.Objectives (max. 200 words):

- In order to complete the project, I need to set some measurable objective to be completed. Most importantly the game must function as intended, this includes,
    - Movement Mechanics
    - Enemy Interaction
    - Level Generation.
- However, the game is only a functional prototype, it is only demonstrating the technologies used, therefore the game will not be fully feature complete, only the basics required for gameplay will be functional.
- The project must be able to run on the intended platform, therefore it needs to be compatible with the latest version of SteamVR (1.8) and Windows (1903) as of 11/11/19.
- A robust test plan will also need to be implemented in order to make sure the game works as planned. Tests will be added to the test plan when new features are implemented.

12.Deliverables (max. 100 words):

- Literature Review based around VR, Procedural Level Generation and Game Design
- Design Documentation on the game systems and architecture
- Test Plan and Test Cases
- Unity Project (Code and Assets)
- Windows Executable (.exe) / Game
- Final Report

13.Resources and Constraints (max. 100 words):

- Windows Computer with Unity Engine and Visual Studio
- HTC Vive (VR Headset)
- GitHub (Version Control and Source Code Management)

- Asset Authoring Tools (Blender, Photoshop, Substance Desginer)

14.Sources of Information (max. 100 words):

- Unity Documentation/ User Manuel
- Internet Forums
- YouTube Videos
- DMU Library

15. Risk Analysis (max. 100 words):

- Time Constraints – I may fall behind on work, in this case I would have to dedicate more time to the project to make sure I would finish on time.
- Limited Access – I may have limited access to a VR headset, which could cause delays with development, I should plan as best as I can for the limited time.
- Data Loss – Data loss of any kind would put a time delay on the project, risking not finishing on time, to reduce the risk of this occurring I will use software management tools to back up data to the internet.

16.Schedule of Activities (max. 300 words):

Planning - First stage of software development is planning, I will need to plan how I want to structure the game, how I want the game to look, any assets I will need, and how the player should interact with the systems in the game. (Circa October - November)

Development – During the development stage I will be implementing the features to the game making use of the work I did in the planning stage. I will also be authoring assets for the game, this includes, Textures, models, Particles FX, and sounds. (Circa November - February)

Post Development – After most of the work in the development stage has been completed, I can start polishing parts of the software, and begin looking for bugs. This acts like a small review of all the work that has been completed up to this point. (Circa February- March)

Testing Phase – In this stage I will be making sure all the features of the game work as intended, recording the test I complete, and fixing any bugs I find. (Circa March- April)

Production – This is stage where I would be building a Windows executable and running on the target platform, whilst running I would be carrying out extra test. (Circa March- April)

17.Student Signature: George Hanks

18.Supervisor Signature:

19.Date: 16/11/19