Reign (Game demo)

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CST-451 Capstone Project Proposal

Grand Canyon University

Instructor: Professor Mark Reha

Revision: 3

Date: 9/13/19

**ABSTRACT**

Reign is a first person hack and slash game that allows the player to walk around an amazing 3D forest environment, run, jump, and crouch. The player will also be pitted against a terrifying enemy that will attack on sight. The player must block every attack and try and defeat the enemy.

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| History and Signoff Sheet |

**Change Record**

|  |  |  |
| --- | --- | --- |
| **Date** | **Author** | **Revision Notes** |
| 9/14/19 | Lewis Brown | Updated high-level solution |
| 9/13/19 | Lewis Brown | Updated Abstract |
| 9/13/19 | Lewis Brown | Updated project overview and Project objectives |
| 9/13/19 | Lewis Brown | Updated Project Scope |
| 9/14/19 | Lewis Brown | Updated Schedule |
| 9/14/19 | Lewis Brown | Updated challenges |
| 9/14/19 | Lewis Brown | Updated Objective |
| 4/15/20 | Lewis Brown | Revised Background |
| 4/15/20 | Lewis Brown | Revised Title |
| 4/15/20 | Lewis Brown | Revised Christian worldview |
| 4/15/20 | Lewis Brown | Revised abstract |
| 4/15/20 | Lewis Brown | Revised Project objective |
| 4/15/20 | Lewis Brown | Revised Project Scope |
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| **Overall Instructor Feedback/Comments** |

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| **Overall Instructor Feedback/Comments** |

**Integrated Instructor Feedback into Project Documentation**

Yes  No

**Project Approval**

Professor Mark Reha

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Project Overview and Project Objectives

**State the Problem and Background**

Reign was inspired by some colleagues Dungeons and Dragons (D&D) campaign. D&D is a role-playing game where players can create their own characters, decide their own weapons and items are in the game, and create what sort of enemies and objectives they can go through. Those colleagues thought it would be an incredible idea if their ideas were from their D&D campaign were in a video game. So the concept of reign is based and inspired by D&D. There are very little video games that capture the spirit of D&D and that’s what reign is set out to do. The only problem with D&D is that it takes too long to set up, needs at least three people to play, is most of the time open ended, everything you do is dependent on a dice roll which sometimes causes the player to become frustrated, and most D&D games extremely unbalanced which usually makes the created character more powerful than enemies which provides little or no challenge to the player. The only problem is that being brand new to making games making something smaller first will be beneficial such as making a demo based off the combat mechanics that will be revised sometime in the future.

**Christian Worldview**

As well as the classic David vs goliath story where a weaker opponent defeats a stronger one which relates to reign because most of the time the player is at a disadvantage.

**Project Objectives**

The object of the game is to defeat the enemy before he defeats you. There is also a big open forest area for the player to explore.

**Challenges**

* a lot of bugs and glitches can occur if the inventory system is implemented improperly
* bugs and glitches can occur if save game is implemented improperly
* bugs and glitches can occur if exit game is implemented improperly
* visual glitches will occur if the player models are done improperly
* matching the textures (2d images on 3d models (i.e. hair color, skin color, wrinkles in skin))
* character leveling
* creating a skeleton for the player models
* collision (two objects hitting each other)
* 3d model measurements (the size of player models, equipment and environment)

**Benefits and Opportunities**

This project will provide skills necessary for many different fields. In Steve Sanders article, “6 Industries that Use 3D Modeling Software” 3d modeling and animation are not just used for video games it can be used in other areas like entertainment, science, and advertising. .In the entertainment industry there is a lot uses of modeling and animation in T.V. shows and movies. Some people in film go to work on video games such as Guillermo Del Toro working on the visual effects and art for the now canceled video game Silent Hills. In the field of science 3d modeling and animation can be used for a variety of purposes, two major examples are earth quake simulations and the movement and mapping of the human body. In the article, “8 Industries that 3d modeling has revolutionized” they state for advertising that many car companies use 3d models of their cars for commercials because it often looks more appealing than the actual products itself and the same goes for many advertised products. other benefits will be learning an entirely new framework that can be used for future projects.

Project Scope

1. Give a clear, concise statement that states the scope of the project. This should also include items that are to be out of scope.

In Scope:

* On the main menu players should be able to select new game to start a new game, select controls to view the controls and exit which exits out of the application.
* Users will be able to traverse the 3d created world by using the WASD keys on the keyboard
* Users will be able to attack enemies using the left mouse button (LMB)
* Users will be able to block enemies attacks using the right mouse button (RMB)
* The ability to pause and open a new menu with the option to go back to main menu or exit the game by pressing the “Esc” key. Selecting exit will close the application. While in the menu and pressing “Esc” again will close the menu and resume the game.
* Enemy NPC’s that will attack you on site
* Players character will lose hit points if the player is hit by an enemy NPC and doesn’t block with shield by pressing RMB.
* Basic animations such as blocking, attacking, and walking
* Character will die if all hit points are lost. Once the character dies the game over screen will pop up.

Out of Scope:

* Each character will have these available equipment: swords, shields, and armor. This includes the character the player plays as and the enemy NPC’s
* A complete town map design in the style of middle-earth kingdoms
* Mini map at the bottom of the screen that tells the player where their character is on the map and where they need to go.
* Character selection which gives the player the ability to select different characters
* Different weapons such as bows, staffs, knives, etc.
* Spells such as the ability to throw fire
* Different equipment such as helmets, pants, arm guards
* Ability to have the players character run by pressing the “SHIFT” key
* Ability to have the players character jump by pressing the “ SPACE” key
* Potions such as drinking a health potion that will give the character extra hit points

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| Stakeholder Name | Role(s) | Responsibilities |
| Lewis Brown | Project owner | Documentation, coding, 3d modeling, animation |
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| Work Breakdown Structure | | | | | | | | | | |
| ID | Task | Dependencies | Status | Effort Hours | Cost | Start Date | Planned Completion | Estimate to Completion | Actual Completion | Resource |
| 1 | 3d modeling | Model the characters of the game and objects to interact with | ongoing | 10 | 0 | N/A | 1/10/2019 |  |  | Blender for Dummies |
| 2 | World design | Creating a world around you which you can explore | ongoing | 10 | 0 | N/A | 2/10/2019 |  |  | Blender for Dummies |
| 3 | animation | Animate the characters movement and actions | ongoing | 10 | 0 | N/A | 3/10/2019 |  |  | Blender for Dummies |
| 4 | coding | Using items, moving, inventory tec. | ongoing | 10 | 0 | N/A | 4/10/2019 |  |  | Coding and Prototyping |
| 5 |  |  |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |  |  |

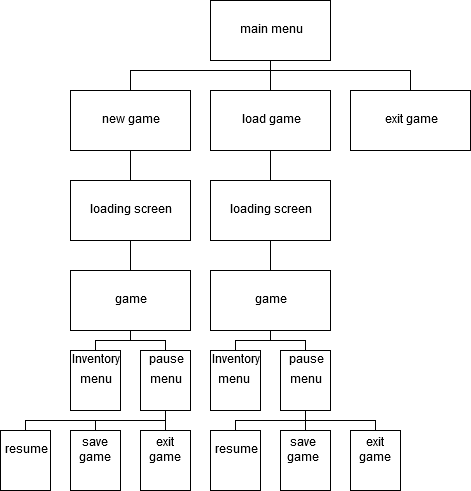
Project Success Measures

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| Project Completion Criteria |
| 1 – Playable (making sure the game is bug/crash free |
| 2 – friends and family like it |

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| Assumptions and Constraints | | | | | |
| ID | Description | Comments | Type | Status | Date Entered |
| 1 | Knowledge | No knowledge of game design | A |  | 9/9/2019 |
| 2 | Money | Has to be made free because I have no money | C |  | 9/9/2019 |
| 3 | Time | I have 4 classes and looking for a job | C |  | 9/9/2019 |
| 4 | Free software | Unity has something that annoys you to buy it | C |  | 9/9/2019 |
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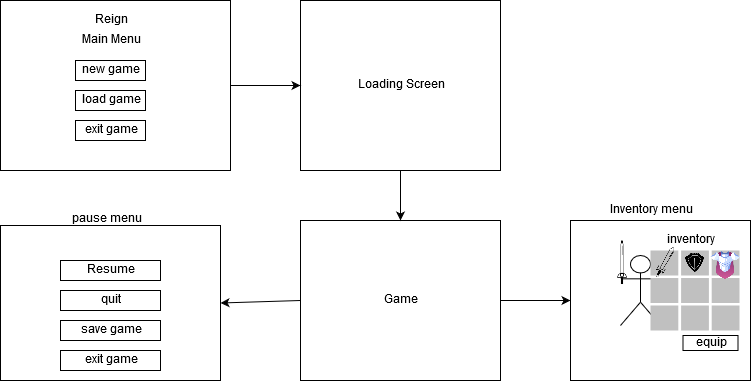
Project High-Level Solution

Site-Map



This is a site-map of how the player will interact with the menu. The player may select new game, load game, and exit game. If the player selects new game or load game it will take them to a loading screen where all the game data, assets, characters, scenes, levels etc are being loaded to the memory. When that is done the player is finally able to play the game. The player is able to open up the inventory menu to select different equipment. The player is also able to interact with the pause menu to just pause the game and take a break, save their progress, resume where the player has left off, or exit the game.

**UI Diagrams**



This is a the original concept for the game that depict a UI Diagram of how the player will interact with the menu. The player may select new game, load game, and exit game. If the player selects new game or load game it will take them to a loading screen where all the game data, assets, characters, scenes, levels etc are being loaded to the memory. When that is done the player is finally able to play the game. The player is able to open up the inventory menu by pressing the “I” key on the keyboard to select different equipment. As well as showing off what the inventory system will look like. The player is also able to interact with the pause menu by pressing the Esc key on the keyboard to just pause the game and take a break, save their progress, resume where the player has left off, or exit the game.

**Technical Requirements**

Unity: 2018.4.8f1

The Unity game engine is capable of rendering full 3D environments, handling complex animations, and uses C# as a programming language. Also has a store for various 3d models. This engine will be responsible for the following task:

* Rendering the 3d world the player will walk on
* Rendering the character that the player will play as
* Rendering the NPCs
* Rendering the equipment
* Mapping actions to buttons such as walking around by using the WASD keys
* Video game physics

Visual studio 2019: 16.2

Microsoft’s IDE that is able to create classes that are written in C#. It also supports integration to Unity. This IDE will be used to create these components:

* Used for combat such as hit points and damage
* Save and load game
* Additional damage and hit points to equipment items
* Basic ai for Enemy NPCs
* Collision between two objects

Blender: 2.8

Blender is a 3dmodeling software that does 3d modeling and animation. Blender such as unity has its own 3d model store that may be used for this project, but 3d models will most likely be self-made. Animation taken form the store my include models of equipment and character prefabs. Blender will be used to complete these tasks:

* Walking animation
* Attacking animation
* Blocking animation
* 3d models of equipment such as armor, sword, and shield
* 3d rendering of the entire world the player can explore
* 3d model of character the player plays as
* 3d model of NPCs

Project Controls

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| Risk Management | | | | |
|  | **Risk Probability** | **Risk Impact** |  |  |
| **Event Risk** | **(high, medium, low)** | **Risk Mitigation** | **Contingency Plan** |
| What is the risk? | What is the probability? | What is the impact if the risk occurs? | What can be done to minimize the risk? | What can be done to minimize the impact of the risk? |
| No knowledge of 3d modeling | High | If done incorrectly the visuals will look weird | Practice 3d modeling | Practice 3d modeling |
| No knowledge of 3d animation | med | Game will look stiff and will be floating around without animations | Practice some basic animation | Use some basic animation |
| No knowledge of world building | low | Game will feel small and empty | Add ai and look up some stuff on environment and interior design |  |
| No knowledge of coding a game | low | Game may be broken, unusable, glitchy, buggy, or crashes every 15 minutes | Read the book I bought for programming in games |  |
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| Issues Log | | | | | | | | |
| **ID** | **Description** | **Project Impact** | **Action Plan/Resolution** | **Owner** | **Importance** | **Date Entered** | **Date to Review** | **Date Resolved** |
| 1 | What is the issue? | How will this impact scope, schedule & cost? | How do you intend to deal with this issue? | Who manages this issue? |  |  |  |  |
| 2 | money | cost | Getting free tools and hopefully making everything myself | lewis brown |  | 9/9/19 |  |  |
| 3 | Time | schedule | other classes that will take up time | lewis brown |  | 9/9/19 |  |  |
| 4 | knowledge | scedule | Need take time off other work to learn how to make the game work | Lewis brown |  | 9/9/19 |  |  |

Project Schedule

Topic 1: Planning Phase

Start date: 8/26/2019

End date: 9/1/2019

Objectives:

* Identify the purpose of the project.
* Outline the work to be done.
* Design a timeline for completing the work.
* Create a project proposal.

Task:

* Weekly status report

Topic 2: Planning Phase (cont.)

Start date: 9/2/2019

End date: 9/8/19

Objectives:

* Identify the purpose of the project.
* Outline the work to be done.
* Design a timeline for completing the work.
* Create a project proposal.

Task:

* Capstone Project Proposal Plan

Topic 3: Requirements Analysis

Start date: 9/9/2019

End date: 9/15/2019

Objectives:

* Review project requirement components.
* Address project requirement components, such as report definitions, layouts, output deliverables, and data elements.
* Create workflow diagrams.
* Create security matrices.
* Produce a requirements analysis document.

Task:

* Weekly status report

Topic 4: Requirements Analysis (cont.)

Start date: 9/16/2019

End date: 9/29/2019

Objectives:

* Review project requirement components.
* Address project requirement components, such as report definitions, layouts, output deliverables, and data elements.
* Create workflow diagrams.
* Create security matrices.
* Produce a requirements analysis document

Tasks:

* Project Requirements Document

Topic 5: Design Phase

Start date: 9/30/2019

End date: 10/27/2019

Objectives:

* Transform requirements into system design specifications.
* Translate logical models into physical models.
* Create an architectural plan.

Tasks:

* None

Topic 6: Design Phase (cont.)

Start date: 10/28/2019

End date: 11/3/2019

Objectives:

* Transform requirements into system design specifications.
* Translate logical models into physical models.
* Create an architectural plan.

Tasks:

* Final Architectural Plan

Topic 7: Development Phase I

Start date: 11/4/2019

End date: 12/1/2019

Objectives:

* Create documentation based on a requirements analysis.
* Transform a design document into an executable program or other form as appropriate to the project.

Tasks:

* None

Topic 8: Development Phase I (cont.)

Start date: 12/2/2019

End date: 12/15/2019

Objectives:

* Create documentation based on a requirements analysis.
* Transform a design document into an executable program or other form as appropriate to the project.

Tasks:

* Project development

Appendix A – References

N.A. (2019). 8 Industries That 3d Modeling Has Revolutionized. *Cad / Cam Services.* Retrieved from

https://www.cadcam.org/blog/8-industries-3d-modeling-revolutionized/

Sanders, S. (N.D.). 6 Industries That Use 3d Modeling Software. *Steve's Digicams.* Retrieved from

http://www.steves-digicams.com/knowledge-center/how-tos/video-software/6-industries-that-use-3d-modeling-software.html

Appendix B – Copyright Compliance

For each external technical tool or code used, provide a reference to its copyright policy, clearly showing your right to use it. For each external technical tool or code used, detail how you used it, how you adapted it, how you modified it (if permitted), and why did you use it as opposed to write your own. Only a small portion of your project may rely on external code. When code libraries/packages are used, explain why this was necessary/required/recommended. Seek instructor approval for using external resources prior to beginning to work on the project.