# Change Report

Due to the nature of Assessment 3, changes had to be made to the product we received. With the project, we inherited a substantial amount of technical debt. It was incomplete and as such, additional features needed to be added, in order to comply fully with the requirements laid out in Assessment 1. Some changes were also made to the existing codebase, in most cases to increase efficiency, but occasionally to support new features.

Before changes could be made, as a team we needed to establish a firm grasp of the design decisions made in the development process so far, so as to know how to approach adding new functionality. For this reason, at the beginning of this stage of the project, all members of the team evaluated the project as a whole, before producing any work.

A large part of the initial evaluation process was the analysis of the requirements. The correct final product cannot be produced without knowledge of what was envisioned by its designers and the client. All team members began the development process with a strong understanding of the requirements, and all proposed changes were scrutinised using this information.

Before major changes were made, a group discussion, chaired by the product owner, took place. During this discussion two points were covered, the validity of the change and, the implications of the change:

- The first point ensured that the proposed change existed within the scope that the original game design laid out, so as not to deviate from the requirements.
- The second point ensured that the proposed change had been thoroughly thought out. During this time, any other changes implied by the aforementioned change were discussed, and (if the approved) added to the project backlog.

These discussions often made use of demonstrative resources, such as printed diagrams and prototypes, to aid in the understanding of the topic.

In order to monitor what documentation changes were required, a spreadsheet of tasks was created with the following columns: ID, task name, task description and the name of the document that needs updating. Columns identifying which team member was responsible for the completion of this task and whether or not the task has been completed were added so that team members could be liable for completing tasks and so that the workload could be distributed amongst the team.

For managing changes to the project's code, commits and issues in GitHub were used as they allow for any small changes to the code to be be traced. This means that any change, no matter how small is recorded and is then able to be written about in the project's documentation if required. This also allows the the coding department of the team to focus on making changes to the project code whilst letting the documentation department focus on reporting about them.

## URLs for modified products / documents:

**GUI Report:** https://drive.google.com/file/d/0B_5gEYND4-F4U1FQMTJueHBFaDg/view?usp=sharing
**Testing:** https://drive.google.com/file/d/0B_5gEYND4-F4Rm90LUIxNDNXVWM/view?usp=sharing
**Methods and Planning:**
https://drive.google.com/file/d/0B_5gEYND4-F4SjdtTWJUcndOTlk/view?usp=sharing
**Risks:** https://drive.google.com/file/d/0B_5gEYND4-F4Skc0UXNZVklRWUE/view?usp=sharing

# Change Log

This table logs all changes made to the software. Each change has GitHub commits related to it (each commit links to its GitHub page), showing the files edited, and how they were edited.

| ID | Description | Related Requirement(s) | Responsible | Date(s) / GitHub Commit(s) | Architectural Changes | Justification |
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| IM1 | Tests replaced by ones which run with changes made | N/A | AD | 25/01/16 - 106cf76<br>- bff3e21<br>- 498b1cc<br><br>01/02/16 - aa94e11<br>- 3aa3839<br>- 061dbac<br><br>02/02/16 - b4eba1a | N/A | When the product was received, the tests did not run, nor were they appropriate to the tools use. This meant new tests had to be written. |
| IM2 | Existing physics replaced with box2D physics | N/A | JH | 26/01/16 - 294bc82<br><br>27/01/16 - 57261e7<br>- 83d3b72<br>- f1300f5<br>- 1709d9f<br><br>01/02/16 - 8b05b23<br>- 69d68e8 | PhysicsEntity introduced as a subclass of Entity, containing behaviour common to all physics experiencing Entities. | Physics were initially made from scratch, meaning new features would require a great deal of extra work (would require more physics functionality). Instead, a popular, well tested and fully featured alternative was added, box2D. |
| IM3 | Add a time based objective | G2 | TA | 28/01/16 - 3744a28<br>- 4a16b4f | Additional class, SurviveObjective, was created inside the Objective class | Requirement G2 describes the need for at least two types of objective |
| IM4 | Add a minimap | I4 | JH | 11/02/16 - eddee67<br>- 2a32041<br><br>12/02/16 - ae6baa5<br>- 88ba6f5 | N/A | Requirement I4 describes the need for a minimap |
| IM5 | Water and Swimming Added | C2, C4 | JH | 09/02/16 - 841be06<br>- 9a4a63e<br>- 3379e47<br><br>10/02/16 - 7284f6e<br>- 6d16984 | New entity, WaterEntity, was added | Requirements C2 and C4 describe the need for water and the ability to swim |

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| IM6 | Add ranged enemies | G7, G8 | JH | 28/01/16 - 58902ee<br>- 160fdec<br><br>08/02/16 - 4436296 | New mob subclass, RangedMob | Added in order to add more obstacles, needed according to requirements G7 and G8 |
| IM7 | Add map screen/level select | G1, G6 | TA | 09/02/16 - a1e882f<br>- 9881c17 | Added MapScreen class | Required in order to support multiple levels and locations as described in G1 and G6. |
| IM8 | Level progression. Levels are unlocked when the previous level has been completed. | G2 | TA | 09/02/16 - 9881c17<br>- a1e882f<br><br>11/02/16 - f59b662 | Added Session as a nested static class within DuckGame | Allows the objectives described in requirement G2 to have a purpose upon completion. |
| IM9 | Levels Added each with at least one objective | G1, G2 | TA | 09/02/16 - 7e06148<br><br>11/02/16 - 6393c63 | N/A | Implements the multiple levels needed to fulfill requirements G1 and G2 |
| IM10 | AI pathfinding improvements | G8 | JH | 27/01/16 - f63a4a4 | Introduced new subclass of AI, PathfindingAI, and removed ZombieAI | AI is very important in the player experience. The improvements made make the AI smarter and more aggressive (requirement G8), which in turn improves the player experience. |
| IM11 | Melee attacks implemented, using a lightsaber pickup. | G8, G9 | JH | 13/02/16 - 40b8ab8<br><br>07/02/16 - a0b79bf | Upgrades and Weapons combined into a single class, Pickup | This change both improves the combat experience (requirement G8) as well as adding a new pickup (requirement G9) |
| IM12 | Mobs can now be stunned (can't move/attack for a time period after being hit) | G8 | JH | 12/02/16 - 02a1157 | N/A | When playtesting the game, we found that enemy mobs can kill the player very quickly, making melee attacks very difficult, therefore making them pointless. Stunning mobs allows melee attacks to be a viable method of combat, improving combat as a whole (requirement G8). |
| IM13 | Implemented bullet deflection using melee attack against bullet | G8 | JH | 12/02/16 - 40b8ab8 | N/A | This is another improvement the combat system needed by requirement G8 |

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| IM15 | Music and sound effects added | N/A | TA | 16/02/16 - bbf9685 | N/A | Adding music improves player enjoyment. |
| IM16 | Add a kill based objective where player is required to kill all enemies. | G2 | JH | 07/02/16 - 3db5526 | Additional class, KillObjective, was created inside the Objective class | Requirement G2 describes the need for at least two types of objective |