Requirements

Requirements were elicited through an iterative process of customer consultation and requirement refinement. First the provided project specification was studied in depth and all identified requirements were recorded, as well as any questions and points of requirement ambiguity. This was done hand in hand with the early design planning as to understand what the system might eventually be like. Identifying the stakeholders was done at this point, since each had distinct wants for the system, which would influence the requirements. The customer (**S1**) was then consulted on these query points, after which the requirements were revised with these new requirement details. This process was repeated until the requirements had been constructed to a satisfactory level to specify the project. It was felt that a use of scenarios or use-cases would not be helpful in developing requirements, since the game would be a single-user system, with no real interaction with external systems.

This iterative consult/revise methodology was selected primarily because the customer was available throughout the elicitation process, which allowed regular consultation. This allowed for a back and forth during the elicitation process, making clarifications of, and changes to, requirements to be performed with confidence. A single large consultation would not allow for longer term clarifications, this was especially important during the later design and architecture planning stages, where emerging requirement needs were identified. The fast consultation allowed the requirements to be developed over time as the understanding of the system changes. After this a final requirements validation occurred, where the client was led through the key requirements and approved them.

Requirements are organised into three sections; gameplay, interface/visuals, and control/movement. These sections allowed for an easier organisation of requirements, since each group held related requirements, making understanding the different requirements and the relationships between similar requirements easier. For the same reason, within a group related requirements are listed together. Each requirement has a description, justification, and test criteria. Sources for justification are either quoted from the scenario(“ ”), or paraphrased from client interviews([ ]). Environmental risks and how to deal with them are also discussed in the justification. This overall structure makes it clear what a requirement is, and how it was decided on, as well as allowing easy changing, adding and removing of requirements. There are some general risks which are not tied to a specific objective. If requirements change then adaptations need to be made for these new specifications. If the hardware being run on is not powerfull then the system must be redesigned with this in mind, by removing objects, or decreasing the visual requirements..

In order to maintain consistency across the development period the names used to refer to key game concepts, such as ‘objectives’, ‘points’, and ‘enemies’ are defined in the relevant requirements, in order to set a clear term-precedence for the rest of the development stages. This was done to maintain developmental consistency and prevent confusion.

In addition to specific requirements there are general requirements expected of the game, which **S2**, **S4**, and **S5** are interested in, such as being enjoyable, easy to understand, and challenging. To summarise the needs for the system:

A challenging single player game in which the player plays a duck and progresses through, finding out about the game and how to play. They build on their experiences over time progressing further each time.

ID	Requirement	Justification	Test Criteria
Gameplay Systems			
G1	The game is split into at least distinct 8 **'rounds'** (levels) where an objective is obtained at the beginning of each. Rounds progress in a linear fashion one after the other.	**Scenario:** *"At the start of each round of the game, the player needs to acquire an objective"* **Interview:** *[Either continuous or discrete, would depend on narrative context]* **&** *[Okayed this approach]* It was decided to use 8 rounds since tying objectives rounds allowed for an easy to understand game structure. Using a linear progression was chosen since it was felt to allow the game a better sense of direction and progress than random rounds. It also allowed the easy ramping up of difficulty as rounds progress and allows for a more structured than disjointed narrative.	**-There are 8+ rounds.** **-Rounds follow each other in a consistent order one after the other.**
G2	The game will include at least eight different **'objectives'** (goals), of which there are at least two distinct types. Objectives can be either be failed or succeeded by the player.	**Scenario:** *"Ducks have objectives..."* **&** *"...must support at least eight different objectives".* **&** *"support at least two different types of objectives"* **&** *"Failing to achieve objectives"* Objectives provide an easy way to both motivate and direct the play, allowing the rest of the game to be based around them. The success or lack thereof provides the driving force for the player actions.	**-There are 8+ objectives.** **-There are 2+ types of objective** **-Each objectives has a fail and success state..**
G3	Objectives will be are achievable within a reasonably short amount of time. (5 minutes) This does not disallow times longer, merely imposing a minimum.	**Scenario:** *"...using your game for its own promotional activities, e.g., at Open Days, UCAS Days."* **Interview:** *[Okayed this approach.]* This allows achievements to be made in a short time. This assumes that in these situations there will be a short play time, and that **S4** remains. If this audience is to change then making objectives harder to complete would extend a round. Another factor is that this does not impact other audiences as much as it may seem, since longer play times can be achieved by playing several rounds.	**-Each objective is achievable in under 5 minutes.**
G4	There is a **'point'** (score) tracking system. Points are given when an objective is completed and may be affected by other factors, such as time. Points are cumulative between rounds, but lost in a fail state.	**Scenario:** *"When an objective is completed, the duck is awarded points."* Points provide a simple incentive for re-playability and progress tracking. It also allows indirect competition between different players.	**-Points are given when an objective is completed.** **-Points lost on an objective fail..**
G5	There is a **'health'** system, represented to the player in hearts. Players lose health from some obstacles, and gain it when an objective is completed or by picking up resources.	Provides a challenge to the player as they progress and encounter danger. Inst-kills can feel cheap and annoying, a health system providing a more interesting combat / damage system. Assumes that the combat aspect of the game is not changed by any new requirements. Could be easily mitigated by removing such a system (since removing a system is easier than adding one).	**-Some obstacles damage health.** **-Success increases health.** **-Some resources increase health.**
G6	The game will feature eight different **'locations'** from around the University of York.	**Scenario:** *"...must take place at the University of York"* **&** *"...must include at least eight locations..."* Provides the backdrop for the game and the context.	**-There are 8+ locations from the UoY.**
G7	There will be present at least five different types of '**obstacle**' for the player to overcome. Obstacles will be objects in a location that impede player progress. At least one obstacle will be generated at random and at least one is tied to an objective.	**Scenario:** *"The game must support at least five different types of obstacles..."* **&** *"obstacles in the game to make it challenging"* **&** *"...at least one randomly allocated obstacle..."* **&** *"...at least one objective-specific obstacle..."* Provides the main mean of challenge in the game, directly countering player objective progress. (See **S2**, **S4**, and **S5**)	**-There are 5+ type of obstacle.** **-There is 1+ random obstacle.** **-There is 1+ objective specific obstacle.**
G8	A portion of the obstacles will be '**enemies**', which are aggressive, and actively impede progress. Enemies are capable of	**Scenario:** *"e.g., a Guard Swan ..."* **Interview:** *[Okayed enemies]* Enemies provide a direct threat to the player. Just passive obstacles would result in a slow pace of game. Enemy use assumes the fast combat remains relevant. Since enemies would be heavy	**-Some enemies decrease health.** **-Enemies are defeatable.**

	decreasing player health and are defeatable. They occasionally drop resources.	developmentally (movement, combat, health, graphics) a specific feature approval was sought and received.	**-Enemies drop resources.**
G9	The player should be able to obtain **'resources'**. Resources aid the objective progress of players, through upgrades or directly to achieve the objective. Some are maintained across rounds.	**Scenario:** *"The ability for the duck to acquire … resources"* **&** *"The objectives should be achievable … by acquiring resources…"* As well as further expanding gameplay it provides a longer term planning aspect, since players can decide on resource use cross-round.	**-(Relevant) resources are maintained between rounds.**
G10	The player will be able to acquire **'weapons'** in the game, which allow the player to damage enemies.	Gives the player a method to deal with enemies, providing the main player interaction besides movement. due to **I1** including weapons does not conflict with the requirements of **S4**.	**-The player can obtain weapons.** **-Weapons damage enemies.**
G11	The player should be able to obtain at least three distinct **'powers'** (abilities). Powers provide the player character with new abilities, which aid their progress. Powers are obtainable from pick-ups which are dropped by enemies when they are defeated.	**Scenario:** *"The ability for the duck to acquire special powers..."* **&** *"The objectives should be achievable … by acquiring special powers…"* **&** *"...at least three different Duck Special Powers"* **&** *"... can be acquired as a round of the game progresses."* Provides a way to change up gameplay and keep it interesting.	**-There are 3+ powers.** **-Pickups exist for powers.**
G12	A fail state is reached when an objective has been failed or if the player runs out of health.	**Scenario:** *"...a game ends"* Due to the relatively short round playtimes and the want for a challenge, having a complete reset on objective failure is not overly hard, but does provide an incentive for re-playability. This has the risk of being potentially annoying for a more casual audience, but making the difficulty ramp up slowly will allow early rounds to be easy enough.	**-Game fails when an objective fails.** **-Game fails when player dies.**
G13	The game has a win state obtainable when the final round has been completed.	**Scenario:** *"...a game ends"* Since the round ordering is linear rather than random it is natural to have the win state be at the end of the round.	**-Game wins when final round is finished.**
Interface / Visuals			
I1	The game will use a cartoony / arcady design style.	This style is simple to work with and create images for, as well as allowing combat and enemy mechanics without conflicting with **S4**.	**-Consistent graphical style.**
I2	The obtained points will be displayed at all times.	**Scenario:** *"The GUI must always show the points that the duck has acquired"*	**-Points always on-screen.**
I3	The game will use a flat looking background, but characters and obstacles will appear from a side perspective.	This was decided to be the preferable choice since it allows graphics to be produced in a more systematic way, as well as allowing map design to be done in a more discrete manner.	**-Consistent graphics implementation.**
I4	There will be a minimap which will show the location of the duck character and its location in the round. It will use a fog system (unveiled during exploration)	**Scenario:** *"The GUI must always show … the location of the duck"* **Interview:** *[Could show location within the wider world or just an idea of where you are in the round/land.]* It was decided to use a minimap since this fit with the perspective choice (by convention), and provided an easy way to display the map as a whole without providing too much information.	**-Duck position displayed constantly.** **-Map updates on exploration.**
I5	The current objective will be displayed at all times on screen.	This ensures that the player is aware of what the need to do and how to progress, keeping them informed.	**-Objective always on-screen.**
Control / Movement			

C1	The game will allow the player to move the duck through the use of the keyboard.	**Scenario:** *"The ability for the duck to move throughout the...University."* The keyboard was selected since it is a standard input device most conventionally used for movement.	**-WASD/Arrows move the duck up/right/down/left.**
C2	There are three distinct movement modes; waddling (slow), swimming (moderate), and flying (fast).	**Scenario:** *"Ducks innately have the ability to waddle (fairly slowly), swim (fairly briskly), and fly (quickly)."*	**-Waddle,swim, and fly modes exist.**
C3	Waddling is the default movement type allowing movement across solid ground.	Assumed to be standard movement type from the name and the fact default movement should be slowest unless introducing a slowdown mechanic/	**-Waddle is slow.** **-Waddle is default movement.**
C4	Swimming is a contextual movement type, which automatically happens when moving onto water in a map.	Since swimming requires water and would eliminate the ability to walk, this movement type is merely used as an alternate default movement. This requirement means some maps must be designed for water, but this should not take too much development time.	**-Swim is medium speed.** **-Swim is contextual.**
C5	Flying will be a player activated movement mode, where the player can move quickly for a short period of time.	If constantly available there would be no reason to use any other movement. Allowing it to be activated instead of just contextual allows movement and gameplay to be more interesting and interactive for the player.	**-Flying is faster.** **-Flying can be activated.** **-Flying has a cooldown period.**

ID	Stakeholder	Sources
Stakeholders		
S1	The main customer (Richard Paige) is the core Stakeholder deciding on the development of the game. Their interest is in the marketability and selling potential of the game. Interested in the satisfaction of **S2**.	**Scenario:** *"... customer who is interested in eventually trying to market and sell your game."*
S2	The game should be attractive enough to potential customers to be sold. This encompases many general requirements, being easy to understand, fun to play, and challenging. The potential customers are a general audience with no demographic in particular being targeted for sale.	**Scenario:** *"... customer who is interested in eventually trying to market and sell your game."* **Interview:** *[General audience target]*
S3	The York Communications Office, whilst not directly involved with the game, is interested in the promotional uses of the game, as such there are more interested in game polish, and demonstrability of technical knowledge the game can provide. Interested in the satisfaction of **S4**.	**Scenario:** "The University of York Communications Office, who is interested in using your game for its own promotional activities, e.g., at Open Days, UCAS Days."
S4	Visitors present at UCAS days and open days will or observe the game. Will include prospective students (~16 - 18) and accompanying adults as the key subsections. This audience will play for only short periods of time and not have a longer play session. They are primarily concerned with enjoyment and gameplay satisfaction. The game content should be suitable for such an audience.	**Scenario:** "The University of York Communications Office, who is interested in using your game for its own promotional activities, e.g., at Open Days, UCAS Days." **Interview:** *[Nothing unsuitable graphicly, cartoon violence is acceptable]*
S5	The SEPR Cohort / Fellow teams will both be experiencing the game, and considering it for code swapping. Other teams are looking for things which make the project easy to continue. As such, neat code, sensible code structuring , and an easy to follow architecture plan are all of interest.	**Scenario:** *"a game that should be playable and enjoyable by your SEPR cohort"*