**Games Design and Development**

**Team Project & Group Dynamics Module**

***Submarine Mayhem***

Proposal, Technical Project

to be presented on  *presentation date*

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Project Supervisor(s): Project Supervisor’s Name or ‘Unknown’

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# **INTRODUction**

## **PURPOSE**

*The purpose of the project is to create a game in which you control a small submarine that is piloted though an underwater cave while fighting a number of enemy submarines. As you progress through the level, you unlock upgrades and better equipment for your submarine. The game fits the theme of “Start from nothing” as you initially have very little in the way of offence or defense, but steadily improve and become stronger as you progress.*

## **Background**

*The game could be considered to be a linear dungeon crawler, with the objective being to make it from the start to the finish while defeating enemies and gathering upgrades. The cave in which the game takes place will have turns, but will ultimately have one relatively clear path to the end, which differentiates this game from games of the dungeon crawler genre. Similar games that come to mind include Dead Cells, a 2017 game in which the player progresses through a series of levels in a similar manner, though the levels in Dead Cells are procedurally generated and maze-like.*

## **Needs STATEMENT**

*Provide a brief statement of the business or system needs, and state short-comings apparent in current organization/systems/products available in the marketplace which will be addressed by the project.*

*In the current market, games are trending towards more complicated systems, and large, open-world environments. This leaves fewer products filling the need for smaller scale, closed environment games. We aim to create a game that fits into this category and fills the gap left open by the trend towards games that have a very broad, high-budget scope.*

## **scope**

*In the project we aim to create a relatively straightforward game that remains engaging and fun for the player, without being overly complex. As such, we hope to create core features of the game that can support the gameplay on their own, without requiring a number of additional features to act as padding. As such, we have deemed several potential features to be beyond the scope of the project. These include multiplayer, as well as a level creator. After discussion, we believe that the potential benefit of these features, though they would be nice to have, is outweighed by the added complexity during development. The time spent developing these features could be better spent creating an engaging core game.*

## **Project Members**

*In a table provide information on the team members and their agreed roles within the project. The list should contain any information that properly identifies the person, their role within the project, how to reach them and what are their responsibilities.*

| **Team Member** | **Role** | **Contact Information** | **Responsibilities** |
| --- | --- | --- | --- |
| Luke Courtney | Developer,  Team leader | K00267879@student.lit.ie | Game development |
| Adam Sheedy | Developer | *K00266925*@student.lit.ie | Game development |
| Ishka Yao | Developer | *K00270402*@student.lit.ie | Game development |
| Cillian Murphy | Developer | *K00271399*@student.lit.ie | Game development |

# **Proposed TECHNICAL APPROACH**

## **Requirements**

*The primary features to be implemented to the game are as follows:*

* *Movement*
  + *The ability for the player to move around the level.*
* *Level loading*
  + *The ability for levels to be loaded from a text file, and to be changed between. This will allow for the levels to not be hard-coded, and for easier creation and editing of the levels*
* *Shooting*
  + *The ability for the player and enemies to fire at one another. This will be a key element in the gameplay, as avoiding being shot is one of the core challenges for the player*
* *Enemies*
  + *Enemy submarines to provide a challenge for the player. These enemies will be placed around the level and will fire at the player when in range. When destroyed, they will drop upgrades or pickups for the player.*
* *Pickups*
  + *Pickups that are dropped by enemies when destroyed. These pickups will have various functions, including but not limited to granting the player more health, or upgrading their abilities such as their gun or engine.*

***Use Case Diagram***

*The user starts the game on the main menu. They have options to start the game, view high scores, view the instructions, and to quit the game. If they start the game, they will be able to move through the level, shoot enemies and collect powerups. If they select view high scores they will be able to see previous scores, and have the option to return to the main menu. If the user selects view instructions, they will be able to view a guide on how to play, and will have an option to return to the menu. If the user selects quit game, the game will close.*

*A diagram of a person

Description automatically generated*

Figure 1 - Use Case Diagram

## **game mechanics (GAMES pROJECTs onLY)**

*Outline the constructs of rules or methods designed for interaction with the game state, thus providing gameplay.*

***Movement***

*The player will be able to move freely around the level. The level will be set in an underwater cave, with progress being made by moving forward.*

***Shooting***

*The player will have the ability to shoot enemies. This will be done with a small gun initially, but will be upgraded over time as the player collects powerups. The enemies will also try to shoot the player, dealing damage.*

***Health***

*The player will have a limited amount of health. If they are shot or otherwise damaged, the amount of health remaining will decrease. The player may find powerups that allow them to recover health.*

***Upgrades/Powerups***

*Enemies destroyed in the level may drop powerups. These will grant the player various bonuses, such as an upgraded gun, or additional health. As the difficulty of the enemies increases, upgrades will be increasingly necessary to survive.*

***Increasing difficulty***

*As the player progresses through the level, the enemies that the player encounters will become increasingly difficult. Both the damage dealt by, and the health of the enemies will be greater as the player continues.*

## **prototype/storyboard**

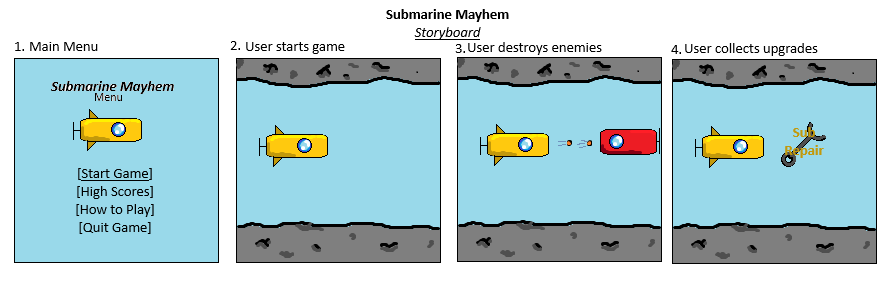
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Figure 2 – Storyboard

***Storyboard***

***1:*** *The user is on the main menu. They have options of “Start Game”, “High Scores”, “How to play”, and “Quit Game”.*

***2:*** *The user has selected “Start Game”. The game begins with the user controlled submarine in an underwater cave. The user can move the submarine around, and moves it to the right.*

***3:*** *The user encounters an enemy. They shoot the enemy and destroy it. The enemy drops an upgrade or powerup when destroyed.*

***4:*** *The user collects the powerup dropped by the enemy. They are given the appropriate bonus or upgrade. In this case, they are repaired to full health.*

## **Architecture Design**

*Explain the technology to be used in the project. Describe hardware, software, or network components as relevant and as understood at this time. Draw a high-level architecture diagram to illustrate the proposed system components and the relationships between them. Outline any alternatives considered, and state your reasons for choosing these particular components*

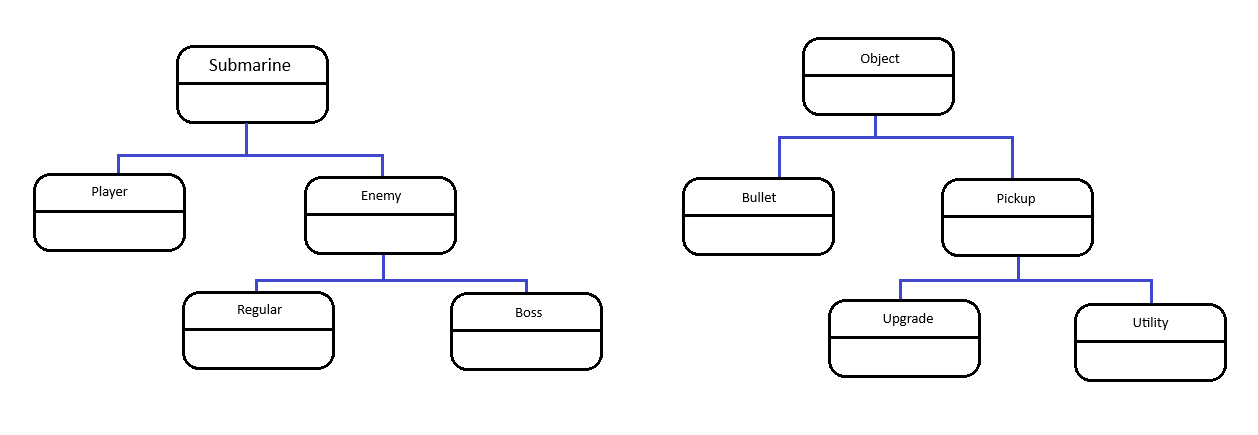
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Figure 3 - Architecture Diagram

*We intend to create our game in C++ using the SFML library. This is something we are already familiar with as a result of our use of both C++ and SFML in past projects. We aim to create a lightweight game that can run on lower end hardware. The game will not include any online features, and as such will have no networking components.*

## **Implementation**

*We have decided on working with an Agile methodology as we believe that it is what will suit our team the best. We will be continuously testing and will be ready to tackle new features as they come up. We feel that this is a favorable methodology over working from start to finish without being open to changes, as per the waterfall methodology.*

## **Quality Assurance Plan**

*The risks associated with the project are primarily the risk of bugs and unfinished features not being completed in time. We plan to mitigate these risk through thorough and frequent testing. We will ensure that any new additions to the project are checked by team members whenever possible to make sure that they are of a good standard.*

# **Expected Project Results**

**List deliverables expected to be produced for the project**

* One-page initial proposal
* Technical Project Proposal document
* Presentation on formal proposal
* Technical Review & Design document
* Coding Week
* Demo of the Prototype
* Individual assessment of team based on group dynamics theory and best practice
* Demo of the Prototype
* E-copy of documentation

## **MEASURES of SUCCESS**

*Our primary measure of success will be the completeness of the core features and how engaging the game is with them. We aim to have a game that is enjoyable without overcomplicating the gameplay. A successful project will be enjoyable with its core features, and have a suitable number of additional gameplay elements without becoming overly complicated.*

# **project management**

## **DEVELOPMENT METHODOLOGY**

*We have chosen the Agile methodology as it is the most suitable style for are team. We will be meeting at the campus and will be communicating online when off the campus. This will allow us to work effectively using the methodology.*

## **schedule**

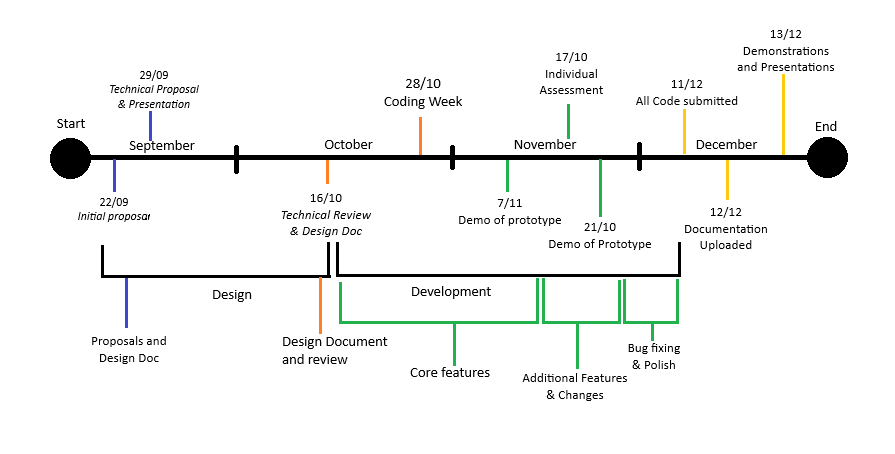
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Figure 4 - Project Timeline

## **Budget**

*No budget required*

## **communication & collaboration plan**

*We plan to communicate both in person and online. We have arranged for weekly team meetings every Tuesday, but will be in person on campus Monday to Thursday each week. Additionally, we plan to communicate online through use of a Discord group chat. This will allow us to have discussions in writing, and to share resources. In order to share files, and for version control, we will be using git, and have a repo set up on GitHub.*

*We aim to distribute tasks in such a manner that each team member is able to complete their tasks effectively and in good time. We hope that this will prevent situations where one team member is waiting for another to finish a part of the project that they are relying on for their own work.*

# **References**

Laoyan, S. (2022) *What is agile methodology? (a beginner’s guide) [2023] • asana*, *Asana*. Available at: https://asana.com/resources/agile-methodology (Accessed: 03 October 2023).

*UML use case diagram tutorial* *Lucidchart*. Available at: https://www.lucidchart.com/pages/uml-use-case-diagram (Accessed: 03 October 2023).