**Team 11 Clue Game Report**

**Team Members**

* Anson Wong (215743)
* Abdullah Al-Hiyarat(231043)
* Tomasz Czarnecki (220569)
* Daniel Newsom (215851)
* Mohammad Jallad (?)

Table of Contents

[Introduction 2](#_Toc70538874)

[Links 2](#_Toc70538875)

[Work distribution 3](#_Toc70538876)

[Danny 3](#_Toc70538877)

[Anson 3](#_Toc70538878)

[Tomasz 3](#_Toc70538879)

[Abdullah 3](#_Toc70538880)

[Mohammad 3](#_Toc70538881)

[Highlights 3](#_Toc70538882)

[Lowlights 4](#_Toc70538883)

[Self-Reflection 4](#_Toc70538884)

[What We Learned 4](#_Toc70538885)

[Improvements 4](#_Toc70538886)

[Things to be aware of 5](#_Toc70538887)

[Bugs 5](#_Toc70538888)

[Future plans 5](#_Toc70538889)

[Peer Review 5](#_Toc70538890)

# Introduction

The purpose of this report is to document our experience of working on a software engineering group project. The task set was to create a digital version of the classic board game Clue, whilst following the agile method and working alongside our customer Mr. Raffles of Watson games.

# Links

* Itch.io page for all builds: <https://nudalzmith.itch.io/clue-courswork>
* Github: <https://github.com/PsychoNudalz/ClueGame>
* AI Test Lost video: <https://www.youtube.com/watch?v=F9cSKJZw6G8&list=PLZ49MVq3djssktaCkrDesFQvPUi0MtiDn&index=2&ab_channel=NudalZmith>
* AI Test Win Video: <https://www.youtube.com/watch?v=5xJPYbjGbas&list=PLZ49MVq3djssktaCkrDesFQvPUi0MtiDn&index=2&ab_channel=NudalZmith>
* Full Clue! Game demo: <https://www.youtube.com/watch?v=XyDN5AmRa_8&ab_channel=GroupEleven>
* Demo of Shortcut, suggestion, double roll (missing from demo video): https://www.youtube.com/watch?v=6JYgELZwsJ0&ab\_channel=GroupEleven

# Work distribution

## Danny

* Dice
* Board generation from .xl file
* Board manager
* Enter Room movements and handling
* Shortcuts movement
* Modelling Board Items (rooms, doors, board tiles, furniture, etc…)
* Modelling Player tokens and Weapon tokens.
* Animate Doors on player room entry
* Card images/layout.
* Player notepad and UI
* Add Bonus tile generation (late in development change)

## Anson

* Player cursor selection
* Player movement
* Player controller
* Player deck
  + Adding non-duplicate cards
  + Finding selected cards from the player’s deck
* Board tile effects
* Refactoring User Controller
* Refactoring UI Handler
* Designing much of the system
* Designing all the UML graphs except for board generation
* Developing the AI
  + Behaviour design
  + Implementation
* Helping others in general
* Researching documentation generation (Doxygen)

## Tomasz

* UI
* Cards
* Cards Manager

## Abdullah

* Suggestions
* Suggestion Test scene + Script
* Accusations
* Round & Turn manager

## Mohammad

* Followed several Unity Tutorials

# Highlights

We have managed to create a prototype that in Mr. Raffles’ eyes, “captures the spirit of the original game” with stunning 3D and 2D visual elements including the modelled rooms and furniture, physics simulated dice, and authentic cards like the original game.

The prototype includes all required functionality to be a Clue board game but digital, including player movements for tiles, rooms, shortcuts, the ability to make suggestions and accusations, and also a detective notebook to have players note down which cards were shown or not.

The AI players are also very impressive and able to act like a normal player and making educated guesses instead of randomly performing actions. The AIs can also play a game against each other with no issues (freezing or crashing) and can win or lose (All the AIs made the wrong accusation) the game depending on their educated guess. We showed this to Mr. Raffles, and he comments that “seeing the AIs play is mesmerizing”.

# Lowlights

Unfortunately, we have lost contact with Mohammod as he was quite keen to learn Unity at the start of the project.

Due to our lack of planning, lack of confirmation of working components, and lack of pressuring members to work, we have resulted in surging/ crunching for the last week or so, which could have been easily avoided. We also have multiple situations where some components had to be on hold due to a critical component not being completed or malfunctioned. It could have been easily avoided if a risk assessment or critical path was performed when the Gantt chart was formed.

We overestimated the complexity for the UI, as we have assigned that task to Tomasz who has never used Unity or C# before, and we thought it would be a relatively simple and straightforward task. But turns out it was a lot more complicated than we initially planned.

# Self-Reflection

As for the team, we worked well with no arguments or unpleasant conversations. We managed to help each other especially helping members that are new to Unity.

Although we did generally follow the agile method, we did not plan out and design each sprint enough to start with and as such ran into several issues towards the early part of development. We did however learn from these very quickly and started to plan out each sprint more thoroughly, which led to a much smoother development process in the latter stages of development.

# What We Learned

We have learned to develop software as a team using Git and following the agile method.

All of us have deepened our understanding of C# and Unity.

We have learned to design UML graphs and implement the code based on that design.

We have learned to write and generate documentation with the help of Doxygen and the importance of good documentation.

The benefits, oversights, problems, and problem solving come from planning over-optimistically, beforehand.

# Improvements

Next time, we will spend more time and effort in designing the overall high-level systems first. The initial class and logic design were made with the best intentions of dividing the needed scripts, however, in the actual implementation, some workarounds needed to be made to have the scripts interact properly with one another.

We will also have meetings more often mid sprint to check on everyone’s progress through out the sprint and make sure everyone can complete their work before the sprint deadline.

# Things to be aware of

## Bugs

* Camera bug when ending a turn quickly.
* The player can select to move while a different menu is opened (e.g. The notebook or make suggestions).
* The player can select both the suggestion and accusation and the suggestion screen will block the accusation screen.
* Ending a turn early while the dice are still rolling, causes the dice behaviour for the next player to be abnormal.

## Future plans

* The basis of board customizations is there, we would just need to create different room prefabs to change the look of the board. We could also change the layout if required.
* We have plans to implement online play, but we didn’t have time to implement it.
* We will get a functional local build on to Mac after getting approval from Apple, as the current Mac version will not open on the new Mac OS, as Apple has become more restrictive to what apps can run on the machine. Currently, Mac users will have to play the Web version of the game on itch.io
* We can also build the game for Linux if required as it is a built-in feature for Unity
* We can port the game to mobile as well since it is a UI-heavy game, so controls will be somewhat straightforward.

# Peer Review

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| --- | --- | --- | --- | --- | --- | --- |
|  | **Team 11** | | | | |  |
|  | **Peer Review (Averages from google form)** | | | | |  |
| **Score** | **Daniel Newsom** | **Anson Wong** | **Tom Czarnecki** | **Abdullah Al-Hiyarat** | **Mohammad JALLAD** | **Total** |
| **Average** | **32** | **30** | **20** | **17** | **1** | 100 |
| **1** | 25 | 25 | 25 | 24 | 1 | 100 |
| **2** | 36 | 35 | 14 | 14 | 1 | 100 |
| **3** | 34 | 30 | 20 | 15 | 1 | 100 |
| **4** | 34 | 30 | 20 | 15 | 1 | 100 |
| **5** |  |  |  |  |  | 0 |