Implementation Report

For the final assessment, all features specified in the new requirements were implemented, and some changes were made to the existing features, within the bounds of the requirements. The details of the implementation of these changes are described below, with references to their related requirement(s).

The requirements for the project can be found here. The code and Unity files for the project can be found on our GitHub repository.

Undergraduate/Postgraduate Units: (N13)

Part of the changes to the project specification required that the game contain more than one type of unit, diliminating units into Undergraduates and Postgraduates. While never formally specified in our requirements, our design for the game included the concept of units having different “levels” which affected their combat strength.

With the new requirement for multiple types of units, we saw an opportunity to adapt our existing mechanic of unit levels to fit the new requirement (N13). This would allow us to minimise the impact of the new requirement on the software. Our original mechanic had unit levels expressed as a number from 1 to 5. We kept this representation internally and instead changed the GUI to map the integer level to a representation consistent with the requirement: “1st Year,” “2nd Year,” “3rd Year,” “4th Year,” and “Postgrad” (see Updated Unit GUI section)

Punishment Cards: (N14, F8)

The other part of the new requirements involved the addition of Punishment Cards. These are cards that a player could activate during their turn to penalize other players. In keeping with the established architecture and design, a majority of the functionality of Punishment Cards was implemented in a new class. It was decided that Punishment Cards should spawn on the map and be captured by players, thus giving players “mini-objectives” that players could fight over, in addition to landmarks. Punishment Card spawning was constrained so that they would only appear in sectors that did not contain a unit, landmark, or the PVC. Also, the map was given a parameter constraining the maximum number of punishment cards that could be on the map at once.

The new requirement specified that there must be at least 3 different Punishment Card effects (N14). The effects that we designed and implemented are as follows:

1. Goose a Unit - Temporarily makes a unit of the player’s choice unable to move
2. Hangover - Skips the next turn of another player
3. Industrial Action - Temporary nullifies another player’s resource bonus

To select the target unit for Effect 1, we added a new clause to the code that handles selecting units to move them. Selecting the target player for Effects 2 & 3 was implemented through an extension of the inherited Dialog system. Effect 2 was implemented using a simple boolean indicating if a player was to be skipped. Both Effects 1 & 3 are temporary effects, and both were implemented in a similar way. We added a boolean indicating whether or not the effect was active on the given unit/player, and a counter that represents the number of turns left until the effect wears off.

New GUI elements were added to indicate the locations of Punishment Cards on the map, indicate what effects are active at any time, and allow players to select the cards they want to use (F8).

Updated GUI: (N13)

As a result of the new requirement involving how unit level was represented, it was deemed necessary to overhaul the graphical representation of units (N13). Since unit level could no longer be represented using simple numbered icons, a more robust representation of units was developed to give the game more polish. In keeping with the theming of the game, unit icons were changed to doodle-style sprites which are randomly generated from a set of body, head, and hat components. Units were also assigned names to compound this new individuality. The names are randomly generated from lists of common first and last names.

Since unit level was no longer communicated through the unit icons alone, a simple pop-up was implemented to display a unit's name and level (i.e "1st Year," "2nd Year," etc.) when the mouse hovers over it. This pop-up also indicates when a unit is unable to move due to a Punishment Card effect (the text of the pop-up turns blue while the unit is unable to move).

Updated PVC Mechanics: (F4)

In the inherited implementation of the PVC minigame, the bonus for playing the minigame was a permanent increase to the player's resources. We determined that this reward was much too powerful and severely damaged game balance, as the risk associated with requirement F4 warns. We thought that a resource bonus was a good reward in theory, but it required additional balancing. To this end, we made the bonus to resources temporary, so that it diminishes over time. The only difficulty in doing this was that it necessitated storing the players' resource bonus from the minigame separate from their bonus from landmarks, and summing the two bonuses when resolving conflicts.

We also changed the reward progression for playing the minigame. In the inherited implementation, players received a +1 bonus for collecting 0-9 coins and a +4 bonus for collecting 10 coins. We changed this to a more gradual progression: 0-4 coins = +1 bonus, 5-6 coins = +2 bonus, 7-9 coins = +3 bonus, and 10 coins = +4 bonus.

The final change made to the PVC was to make the PVC move to a different sector after being captured, to give other players a chance at receiving a bonus from the minigame.