Çankaya University Department of Computer Engineering

CENG 408

Innovative System Design and Development II

Project Report

Clash of Honor

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Abstract

Nowadays, it is the truth that video games are the best of one beloved merriment industries in the world. Even though video games are frequently acted by the kids and youth, there are many other aged people who also play those games. Moreover, video games progressively becoming even as a part of our acculturate. Today's kids and human beings are laying their time on technological devices by playing video games. This examination is planned as an entrance to present thought as regards turn-based RPG strategy style video games' role. In this literature appearance, we study, wrangle, and write down concerning turn-based RPG strategy games, Singleplayer gaming, computer networks, algorithms, data structures, etc. This literature has a look at also goals to inform you about computer games, game engines, turn-based RPG strategy games.

Key Words: Video Games, RPG, Strategy, Mobile and PC Games, Game Engines, Unity, Blender, Singleplayer Gaming, Game Server, Effects, Animations, UI/UX, Sounds FXs, Controllers, Assets, C# Language, etc.

1. LR

1.1 Introduction

The turn-based strategy game is a strategy game that players play in turn (usually a sort of war game, especially a strategic-level war game). Before computer games came out, people were able to play turn-based games such as chess and checkers on board. This trend continued with games such as battleship and monopoly after computer games came out, and these games are now being played on computers. This is different from real-time strategy in which all players play at the same time, just like chess, players can think for a certain amount of time before making their moves. While turn-based games prefer more strategic and transparent play, it can be a bit boring for players who are used to action-oriented games. The moves made in turn-based games can cause trade-offs and thus the game can go to different stages.

1.2 Game Engines

The game engine ensures game originators withal the obligatory characteristics to construct games rapidly, influentially, and yieldingly. Game engines are too momentous for developing video games and muster numerous primaries structs. It is kind of a spine for game development.

1.3 Choosing the Right Game Engine

For a game developer, this part is the most crucial decision. Game engine choice is able to repulse the standard of the game advanced or back in whichever facet. The most important familiar game engines own their own ways and characteristics. There are any inquiries and responses your necessity to do your selection any of them the size of your squad, your warrant on the game engine, the structure of your project, your license the estimates, your choice of many details, such as 2D, 3D, mobile, console, and PC.

Several Popular Game Engines:

- Unity
- Euphoria
- Blender
- MonoGame/XNA
- Unreal Engine

1.4 Turn-Based Games

How does it work?

In a turn-based game, the flow of the game is divided into sections called turns, moves or games. Player in turn-based games has time to think before or during the game, which can lead to better choices. When player turn ends, this round ends and rights pass to enemy. Player tries to win by completing the game within the specified rules.

Popular Turn-Based Strategy Games for Android Platform

We started playing strategy games long before we had computers. In mankind's date, the turn-based strategy is one of the oldest game kinds. The promotion of Android has altered the whole script of strategy games, however, these-ones turn-based strategy games for Android calls for cautious planning and steadiness. Usually, turn-based strategy games are too long. The underlying aim of the game is to let the player feel the real power when finishing the objective. In those types of games, a player inclines to focalize more on big strategies. The turn-based strategy game has a wealthy story, and the game pace is faster.

- UniWar
- Clash of Clans (Real Time Online Turn-Based Strategy Game)
- The Battle of Polytopia

1.5 Conclusion

The game engines comprise the required utensils for game developers. Game engines are the bones of the game. The software you be in want of is supported by game engines. This software fastens to layouts, colour, sound, physics, and animation. Today's contemporary game engines supply realistic graphics. Game engine choice could repulse the standard of the game advanced or back in any facet. Entire well-known game engines own their own techniques and attributes. We will plan and develop the game over Unity.

2 SRS

2.1 INTRODUCTION

The subsequent subdivisions are a conspectus of the overall Software Requirements Specification (SRS) document. The subsequent subdivisions are a conspectus of the overall Software Requirements Specification (SRS) document.

2.1.1 Purpose

This document contains a software requirement specification for the Turn-Based RPG Mobile Strategy Game project which will be run on Android, iOS. The master aim of this testimonial is to grant elaborated knowledge regarding the functionalities, limitations, and software requirements of the project. The goal of this document is defining the game project what is named Clash of Honor. The leading objective of the project is to develop a superior standard Turn-Based RPG Strategy game, which available on Android, iOS platforms. The game has one singleplayer mode.

2.1.2 Scope of Project

Clash of Honor is a turn-based RPG mobile strategy game available on Android and iOS platforms. The scope of this project is to create a high-quality game that consists of singleplayer game mode, which are controlled on a touchscreen. Clash of Honor includes many features where the objectives of gameplay include characters armed with primitive weapons such as swords, maces, arrows, horsemen, and other weapons, trying to beat characters controlled by opposing players. There are plenty of kinds of layouts in this game in which every layout has its own diversity of hassle, and game themes such as sunlit, snowy, and rainy, etc. Players are trying to beat rivals by handling the in-game characters while clashing. There are withal numerous obstructions in the dissimilar layouts, each layout has its own and specialized hurdle such as rocks (for hiding) and swamps (if the character sink into it will die) be possible has in jungle-themed layout. Since the number of rounds enhancement playing time and event, the player with which lose all characters loses the game. The rivaleries intend to connect to the same layout and play at the in-rem time and server so that they complete each other.

2.1.3 Definitions, Acronyms and Abbreviations

SRS	Software Requirements Specification
Player/User	The person Who plays the game
Unity 3D	A game engine developed by Unity Technologies
Singleplayer	One person can play in the game environment.
Game Engine	Software framework designed for the development of video games
iOS	iPhone Operating System which is used by Apple's phones
Android	The operating system developed by Google is used by Samsung, Huawei, Xiaomi, etc. phone brands

2.1.4 Overview

This document has 3 main parts. The first portion, “Introduction” usually clarifies the primary aim, content, and definitions, Acronyms, and Abbreviations of this project. The second portion, “Overall Description” demonstrates the tract surrounding and all-duty requirements on together use case diagrams. The third portion, “Specification of Requirements” has an overelaborate clarification of necessities, nonfunctional necessities with use cases and interfaces.

2.2 Overall Description

2.2.1 Product Perspective

Clash of Honor is a smartphone that will be made in Unity Game Engine. The has an only a singleplayer mode. When the player launches the game, the main menu will be displayed. Players can select singleplayer, options, and exit. When the player selects singleplayer mode, players will see the choosing character classes menu. Each player can choose only 4-character classes out of 8 main character classes. Each character class has different characteristics, characters are determined to complement each other, and players try to beat enemy. The aim of the singleplayer mode is to win the game by determining a better strategy than the opponent.

2.2.2 Memory Constraints

Because of the Unity Game Engine, a lot of data will be used. The mobile devices should give at least 250 MB internal storage and 2 GB RAM.

2.2.3 Operations

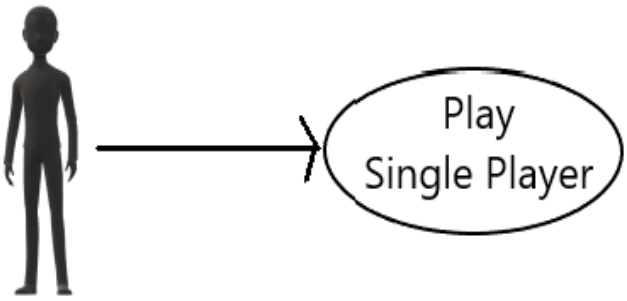
Players will see some operations like tutorial, singleplayer, and countdown.

Tutorial: Most of the turn-based RPG games start with game tutorials. Game tutorial exercises can be a critical part of the game in sight, however again and again they become prominent for experienced players or overpowering for new players. We will provide players with information as they needed. We will design a video tutorial for the game.

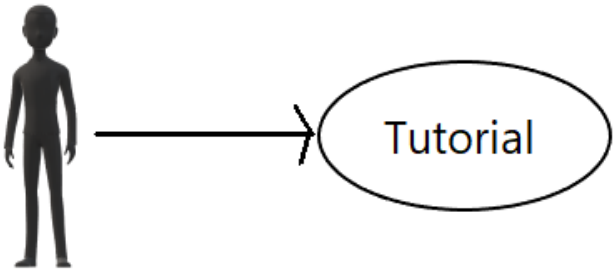
Singleplayer mode: The type of game in which players interact with NPC and play together and try to destroy each other.

Countdown: The competition of player against both player and time forces player even more and leads the player to different strategies. This can improve the player mindset.

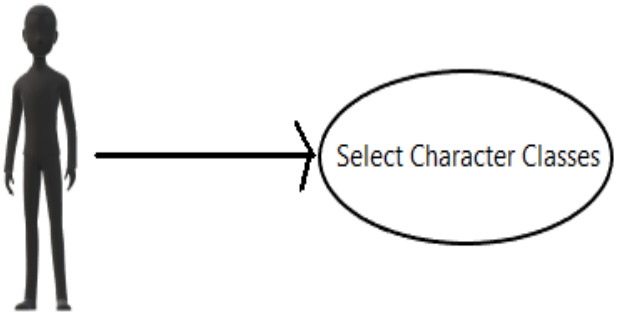
2.2.4 Product Functions



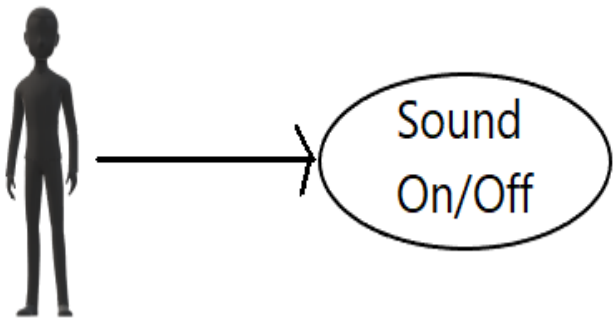
Play Singleplayer: In the singleplayer mode, players set critical strategies for each other.



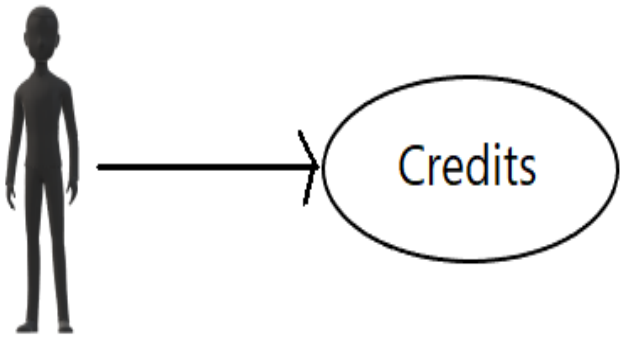
Tutorial: Explains how the game is played.



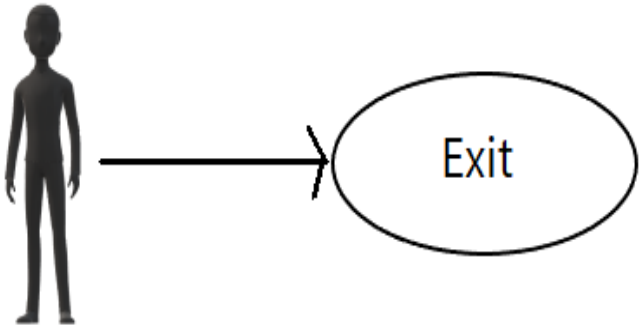
Select Character Classes: Players create their strategies by choosing from different characters.



Sound On/Off: Game sounds can be turned off and on.



Credits: Every role in the production of the game



Exit: Player can quit from the game.

2.2.5 User Characteristics

The player must be acquainted with iOS, and Android platforms. Players also ought to comprehend to recognize English.

2.2.6 Constraints

We are planning to get going our product on mobile devices compatible with Android and iOS. We aim to support Android 5.0+ and at least iOS 9. Singleplayer way works without internet.

2.2.7 Assumptions and Dependencies

The Unity game engine intends to be our platform because this is where we make the game and transfer it to the mobile devices.

2.3 Specific Requirements

2.3.1 External Interface Requirements

2.3.1.1 User Interfaces

The game has a GUI it can be run on iOS and Android devices.

2.3.1.2 Hardware Interfaces

The game want, iOS, and Android phone or iPadOS and Android tablet for running the game. The constituents inscribed in this project will be used.

- iOS Phones or iPadOS iPads
- Android Phones or Androids Tablets

2.3.1.3 Software Interfaces

Onwards this game is developed for mobile devices, the devices should run on iOS, iPadOS, and Android are the most important requirements. Unity is used for building the user interface and staging in-game vitalizations. Clash of Honor will use the Unity game engine for controlling object impacting and mutual effects.

2.3.1.4 Communication Interfaces

Playing the game on iOS, iPadOs, and Android needs an internet connection wireless or cellular to provide a linkage among devices.

2.3.1.5 Performance Requirements

The frame rate of the game must be 60 per second at least. If the user playing on a phones or tablets user should have at least iOS 9, iPadOS 9, Android 5, and 64-bits architecture processor.

2.3.2 Software System Attributes

2.3.2.1 Portability

- The game will be contrived in a genre to running on iOS, iPadOS, and Android operating system, The current OS must be 9 at least for the Apple environments for Android must be 5 at least.
- They will be developed in 64-bit CPU architecture.
- The many devices on the market can run the game.

2.3.2.2 Performance

- The game should give the frame rate at least 60 frames per second.
- Objects must be rendered during they get into the sight of players.
- The specific animations of layouts should be played when the player sees the object.
- The quality of detail of objects must be changed with respect to the distance between the object and the participant, and the mobile device's hardware.

2.3.2.3 Usability

- The game should be playable for every person who able to use mobile devices.
- The game must have good quality, aesthetic design to compete with its opponents, and plenty of characters.
- The application must be easy to install, play.
- While the player in the pause menu, the game must give appropriate audio and visual feedback.

2.3.2.4 Safety Requirements

The user should be mindful with the cinematics and light effects these may cause the photosynthetic epilepsy. Phone screens close the user, it may cause eye damage if used long.

3 SDD

3.1 Introduction

The Software Design Document contains instructions about how the software should be bodied. Elaborations of the system contain some graphical demonstrations like class diagrams, use case odels, etc. The aim of this document is to conduct a scheme that can be with ease understood by any relevant user reading this paper.

3.1.1 Scope

Sketched on the areas of map and objects in it,Clash of Honor aims to develop a computer game by Unity and Mixamo for graphics.In the Software Design Document, all constituents and planning of the system are clarified for each model. This documentation can be used as a guide for implementation.

3.1.2 Purpose

The theme of Clash of Honor provides experience based on RPG games and some types of a turn-based game. The goal of this document is leading to users throughout the development phase of the Clash of Honor the other objective is to identify the software system designed to fulfill the requirements of the Software Requirements Specifications document.

3.1.3 Definitions, Acronyms and Abbreviations

SDD	Software Design Document
Player/User	The person who plays the game
Unity 3D	A cross-platform game engine developed by Unity Technologies
Singleplayer	One person can play in the game environment
Game Engine	Software framework designed for the development of video games
iOS	iPhone Operating System which is used by Apple's phones
Android	The operating system developed by Google is used by Samsung, Huawei, Xiaomi, etc. phone brands

3.1.4 Motivation

We are students in the senior year of the computer engineering department and we are interested in the game. As a crew, our aim in this project to make a turn-based RPG game. We intention to it run on smartphones and tablets. We also use unity and blender. We need to use C# programming language for Unity.

3.1.5 Overview

This part ensures to us that get knowledge regarding the substances of the rest of the document as follows: First, Part 1 acquaints us to get common information about The Software Design Document and grants information about how the software is bodied. Secondly, Part 2 describes the problems and shows the elaborations of the construction of protection alongside class architecture. Thirdly, Part 3 symbolizes and clarifies the use-case diagram of the system that is designed with situations in the SRS document. Finally, Part 4 provides informations of how we do modeling and mentions which modeling we used.

3.2 Design Overview

3.2.1 System Design Approach

In our game project, we decided to use SCRUM to build successful project plan. SCRUM is used to administrate complicated software processes. It ensures us to succeed the aim with regular feedback and planning. In this sense, it has a need-oriented and elastic structure. Since it is shaped pursuant to the needs of the game, it also provides us with structuring pursuant to the feedback. Our communication and teamwork are important. In this way, we have online meetings in every week, and with those meetings we improve ourselves to get less errors and more efficiency from our project. Thus, it motivates our project team to make continuous improvements by resolving the problems that arise.

3.2.2 Used Tools

Our game will be developed with Unity. Our game will be released on Android, iOS and iPadOS platforms. We will develop our game mostly with C# programming language.

3.2.3 Architecture Design of Simulation

Players will see “Single player”, “Options”, “Credits”, “Tutorial”, “Scoreboard” operations in the game.

3.2.3.1 Class Diagram

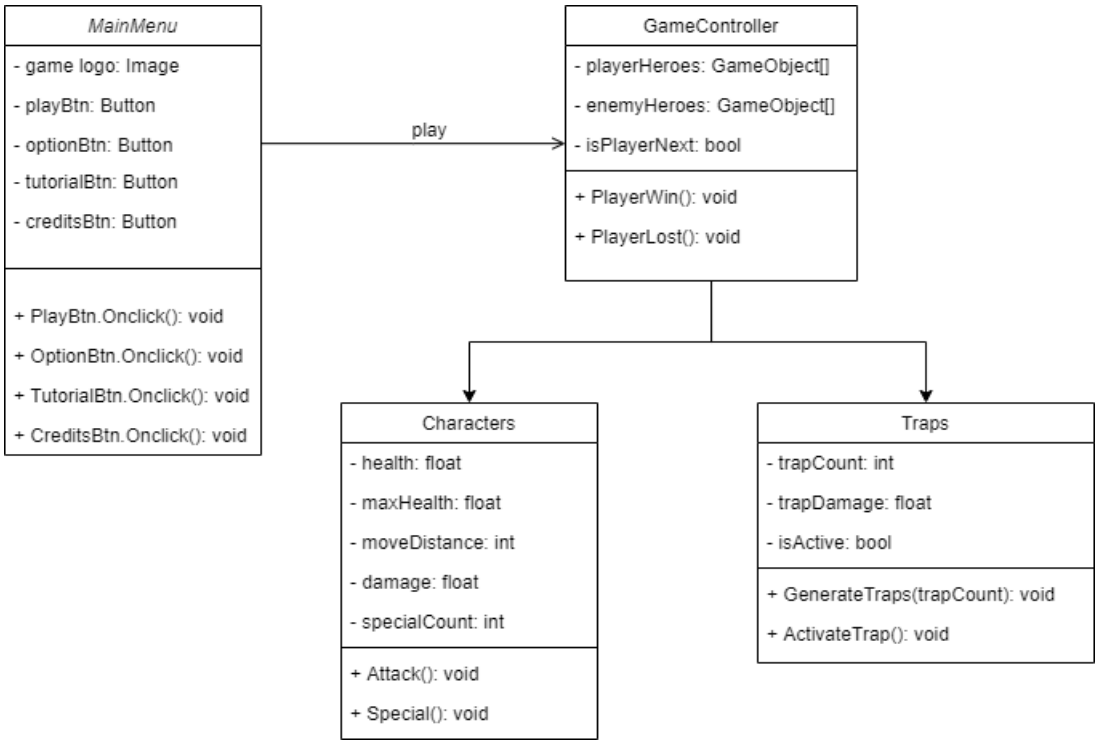


Figure 1: Class Diagram of Game

3.2.3.2 Activity Diagram

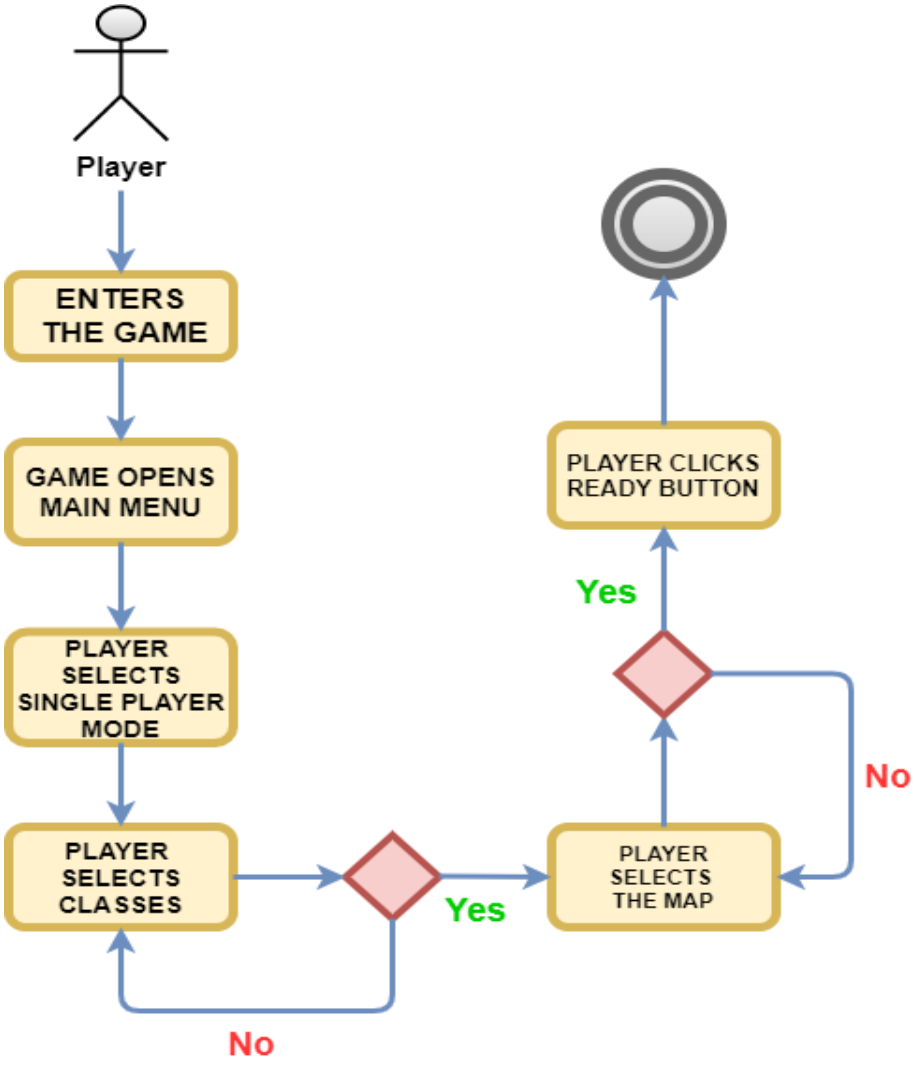


Figure 2: Activity Diagram of Game

Figure 2 shows how we created the game scenario as an activity diagram. The player enters the game, sees the character class selection screen. If the player tries to move to the next stage without selecting character classes, he sees the character class selection screen again. After the player has chosen the character classes, he/she must select the map. Then game starts.

3.2.4 Play Menu

Summary: This game system is used by player. The player can select character classes, and the map.

Actor: Player

Precondition: Player must launch the game.

BASIC SEQUENCE:

1. The player clicks on “Singleplayer Mode” button.
2. The player can choose character classes.
3. The player can choose the map.
4. The player can return to game’s main menu before clicks “Ready” button.

Exception:
Post Conditions: None
Priority: High

2.3.4 Options Menu

Summary: The player can take a break for 1-minute during the match. Then continue or exit the game. Also, the player can change sound settings.

Actor: Player

Precondition: The user must start the game

1. The user can take 1-minute break in the game by selecting the options menu.
2. The user can continue the game by selecting the return button from the options menu.
3. The user can change volume of sound by selecting the options menu.
4. The user can quit the game by selecting the exit button from the options menu.

Exception:
- None

Post Conditions: None
Priority: Medium

3.4 Use Case Realizations

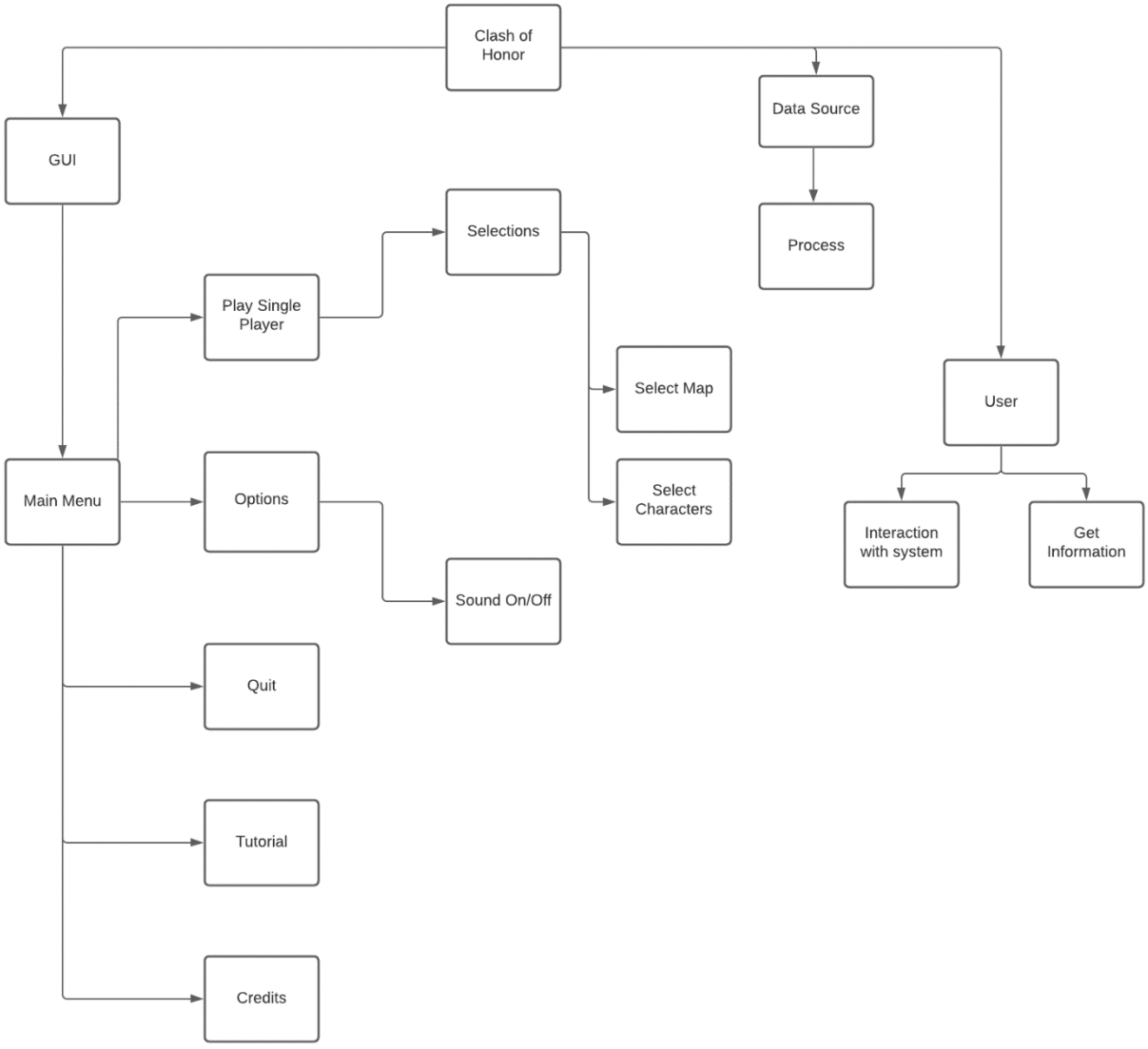


Figure 3: Use Case Realizations of Game

3.4.1 Brief Description of Figure

The figure shows the Clash of Honor with its information. The system we designed is shown in the diagram above. The system consists of 3 main topics and their sub-topics.

3.4.2 Graphical User Interface (GUI)

GUI module shows the common design of the system. It controls and manages the interaction of users. Main Menu is only one sub-module of the system. Main Menu has five submodules. These are Play single player, options, Quit, Tutorial, and Credits. Play single player model has an elections module. That has some submodules. These are Select Map, Select Characters. Finally, the Main Menu guides the user in the system.

3.4.3 Data Source

The data source module includes the data that the system receives from servers to use in the system. This has Clash of Honor Data.

3.4.4 User

The user module is listed according to what the user can do. Users could get information regarding the game and he system.

3.5 Environment

In our game project, we will use Mixamo, Unity Engine tools and Unity Asset Store. We will get characters and their animations from Mixamo. We will use Particle System that is Unity Engine tool for creating effects to increase the feeling of gameplay. We will also get the environment designs from the asset store. These ready-made models we will buy will speed up our development of the project. The most important details when choosing these models are that the game is suitable for the era and high poly.