The Effects of Simplifying First-Person Shooter Controls

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Project Proposal

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Introduction

In first-person shooter games, gameplay generally involves shooting enemies or targets through the eyes of a weapon wielding avatar that the player controls in order to complete missions. First-person shooters are hugely popular in today's society with yearly releases of new Call of Duty (Activision) games and an entirely new genre popularised by Fortnite and Player Unknown's Battlegrounds called "Battle Royale" (*Hornshaw, 2018*). They are also vastly lucrative, Call of Duty: Modern Warfare 3 made $1 billion within the first 16 days following its release (*Reisinger, 2011*) and the franchise in whole has earned over $15 billion since its first instalment in 2003 (*Bhat, 2016*). The crucial element to this success is player engagement and satisfaction.

Throughout the history of first-person shooters, the control schemes these games have used have stayed relatively the same. Typically, they have many things to cover such as; movement, viewing / camera-rotation and other actions that their character may use. These controls can range from the press of a button to pick up an item, to a timed and precise combination of key presses to eliminate a target. First-person shooter games mostly require fine motor control with the player moving around in generally a non-linear fashion, inspecting the environment and dodging or covering from enemy fire all while having to accurately take aim and take into consideration the games physical factors. Some players however, can sometimes find these tasks daunting; diminishing their experience and resulting in them discarding the game as they no longer wish to play it. The bar for mastery is often very high and largely relies on players getting their knowledge of the in-game physics and control schemes down to perfection.

Taking this into account, I propose to investigate the consequences of simplifying first-person shooter control schemes to allow players an easier way of grasping game mechanics and experience the game as it should be played. The project itself will involve developing two identical games. The first will have the controls that you would commonly find in any first-person shooter and the second will have its controls simplified. The games will be developed for use on PC devices, as initial research shows this is the easiest and most common platform for first-person shooters.

To do this I will be using literatures that aid me in designing, implementing and testing a First-Person Shooter. To assist with the simplifying of controls, the literature by *Cummings A.H.* will be used to acquire a deeper understanding in both controllers and their control schemes by looking into the past for simplifying game pads. In some cases these controllers have been simplified by reducing the number of buttons on a game pad, however in other cases the number of buttons have been increased. Which raises the question as to whether less is necessarily simpler?

Aims and Objectives

The aim of the project is to investigate the effects of simplifying first-person shooter controls within a game.

The objectives for this aim are as follows:

Objective 1: Research

Before anything can begin, research must take place to properly plan the most effective medium for the project. Below are the questions that need to be answered and the topics of research:

- Game Engine reliability.
  - Will Unity be reliable for research purposes?
  - Does it have enough learning resources?
- Research the evolution of first-person shooter games.
  - How have control schemes changed since the first game?
- Research the most popular first-person shooter games.
  - How do they differ from those in the past?
  - What makes them the best?
  - What are their limitations and restrictions?
  - Have they simplified any controls?
- Research existing game genres that have been simplified.
  - Do the control schemes have anything in common?

Objective 2: Design & Implementation

As the research comes to an end, the design and implementation of the game must be considered:

- Models and Environment.
- Mechanics, Dynamics and Aesthetics.
- Design Lo-Fi prototype with sketches.
- Decide the controls of the first game.
- Decide enemy type.
- Design controls for the second game
- Create a design flowchart.
- Goal of the game.
- Implement both games.

Objective 3: Evaluation and Conclusion

Once the design and implementation of the application is finished, a minor-testing stage will begin to ensure the application has no bugs and meets the requirements to fulfil the aim. If the aim is not met, adjustments to the game will continue.

Once the artefact is complete, the project will proceed to the evaluation stage in which user testing will be performed to investigate the effects of simplified controls on the two versions of the game. Three groups of people will be tested; people who play first-person shooter games frequently, people who play games but don't play first-person shooters, and finally those who don't play games at all. This will be done to ensure that it is still engaging for those who play first-person shooters regularly and yet not too difficult for those who don't.

The data gathered will be analysed and an attempt to answer the aim of the project will be made.

Academic Literature

The 5 pieces of academic literature identified are:

The effectiveness of aim-assist techniques in first-person shooter games

(Vicencio-Moreira et al., 2015)

This piece can be used to gain knowledge of existing methods to simplify first-person shooter controls. The aim-assist is a technique used in many first-person shooters. When the player is aiming near an "agent" that is a target or enemy the game will slowly assist the player by moving the reticle towards that target. In this study they attempt to balance a player's expertise and enjoyment by adding the aim assist technology into their first-person shooter game.

GameFlow: a model for evaluating player enjoyment in games

(Sweetser et al., 2005)

This item will greatly assist in the creation of user feedback, questionnaires, and with its eight elements; concentration, challenge, skills, control, clear goals, feedback, immersion, and social interaction, I can determine user engagement and gather further statistical data from the player.

I Have No Words & I Must Design

(Costikyan, G., 1994)

This piece of literature may be old, however it still holds strong to this day. This will assist in the design of the first-person shooter game by improving the technical quality of the game. Costikyan summarises the key elements and theory of Game Design, including its aesthetics and its functionality to deliver positive player experience.

On the Validity of Using First-Person Shooters for Fitts' Law Studies

(Looser et al., 1998)

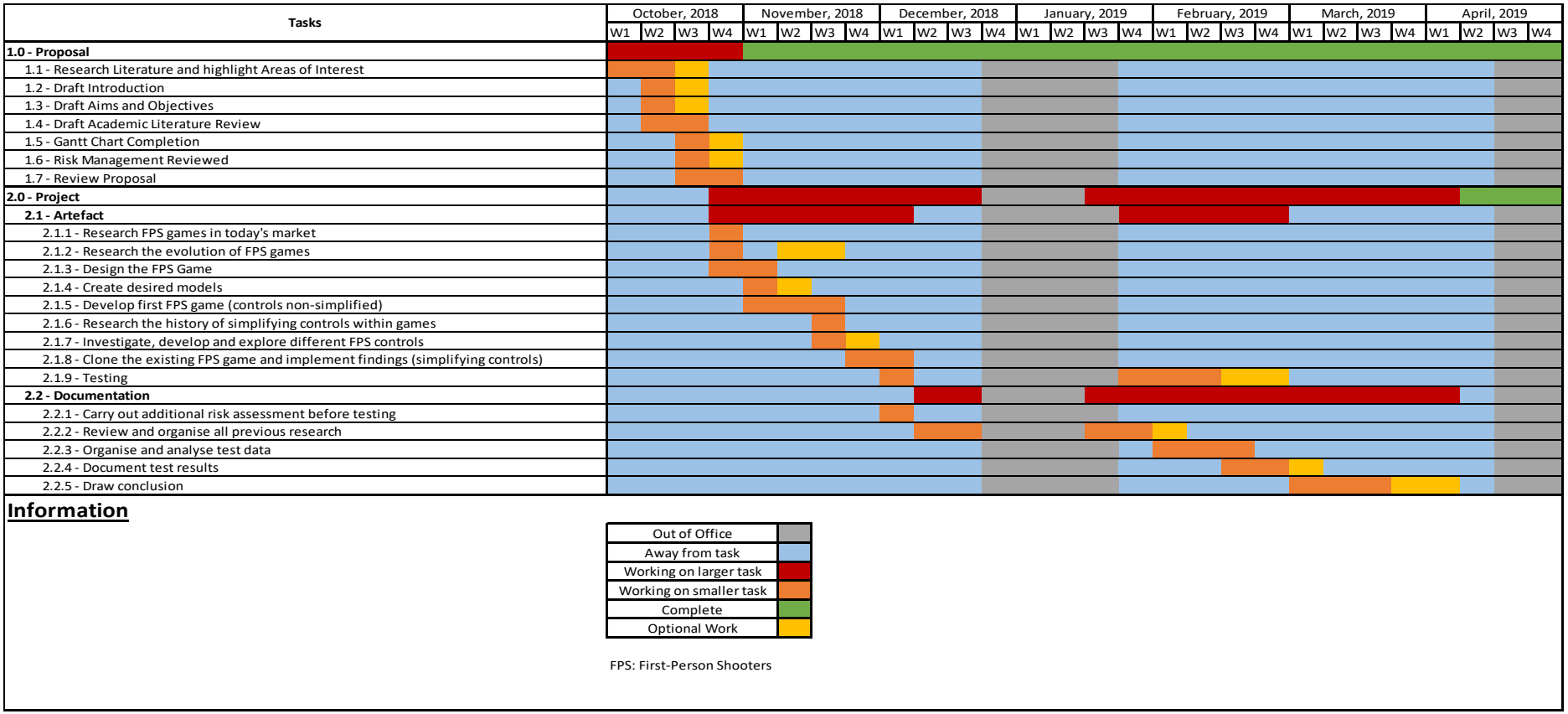
This is a study that will assist me when it comes to the placement of the enemies or targets within my artefact. Fitt's Law demonstrates that there is a difference to the distance of the target and the size of the target when it comes to accuracy. This can affect the time that it takes to aim; placing the reticle to a target, can be measured by the distance and size that the target is away from the player. Thus, the longer the distance and the smaller that target is, the longer it will take the player to aim.

The Evolution of Game Controllers and Control Schemes and their Effect on their games

(Cummings, A.H., 2007)

This article describes the evolution of game controllers and how they effect games. This will give me a deeper understanding on how controls have evolved in general as well as certain areas of adaptivity such as gamepads and joysticks which slowly simplified control schemes and made them much more user friendly. In addition this study allows me to identify key aspects where the adaptions didn't function as ideally as intended. This will help gain perspective in how to rectify such controls during the project.

Project Planning



A Gantt chart has been used for the planning of the project to visualise the time frame of the project. In addition to the Gantt chart, Github (Microsoft) will be used to provide assistance with version control, storage and ease of access. Most of all, the use of Github will provide security, avoiding the loss of material in the case of a USB Stick being lost.

The project plan has been split into two pieces: the proposal, and the project which has also been split into two sub-objectives: the artefact and the documentation.

The red colour is used to show which higher section of the Gantt chart is currently being worked on. For example to find what is being worked on in the second week of December, the red colour is followed first and then the orange is found below. The task to review and organise all previous research will be in progress during that period of time and will end after the third week of December. Tasks where given very generous time frames as this makes the overall plan of the project relatively stress free.

The project makes use of an evolutionary methodology, this allows me to complete iterations of the artefact and do further testing after each iteration. Following this methodology, the artefact has been set in to stages: planning, design, implementation and finally the testing.

Below are the stages:

- During the planning stages, research will take place to discover what makes first-person shooters popular and what are the most relevant features that helped them achieve success. The evolution of first-person shooters will also be researched, looking into how they evolved, adding features, actions, and user interface elements that are needed in every game today.

- During the design stages, the features needed will be documented, diagrams will be drawn, maps will be sketched, enemies and their abilities will be designed, and models will be created.

- During the testing stages, the test participant will be required to play through the first game and once finished, they will be asked to complete a questionnaire. Once complete, the same process will be completed for the second game with simplified controls. As the testing period is nearing an end, the test results will be documented and a conclusion will be drawn and all questionnaires will be destroyed along with any personal information that may have accidentally been acquired.

The documentation for the project will take place during and after the testing stage. An additional risk assessment will be carried out just before the testing is due to commence as additional risks may appear after the creation of the game. Following this, a review of all previous research will be conducted to ensure organisation. Near the end of the testing stage, all the data collected from test participants will be organised and analysed and the results will be documented. The conclusion will be drawn immediately after documenting the test results and an especially generous time frame has also been given to this task to review the project in total.

Risk Assessment

General Hazard & Risk Assessment

Assessed by: Christopher Ross	**Date of Assessment:** 08/10/2018

Time-Loss Classification [s]	Likelihood of Occurance [p]	Criticality Number [c/no]	
1 - Negligible	**1** - Extremely Unlikely	**L** - Low	**1 - 7**
2- Minor	**2** - Very Unlikely	**M** - Medium	**8 - 16**
3 - Major	**3** - Unlikely	**H** - High	**17- 25**
4 - Hazardous	**4** - Likely		
5 - Catastrophic	**5** - Very Likely		

Potential Risk	Result of Occurance	Mitigation	S	P	C/No	Risk Level
Lack of test participants	Inaccurate data readings	Perform user tests with questionaires where ever and when ever possible, inside and outside of university.	3	2	6	L
Strain/headaches caused by gaming or looking at a screen for an excessive amount of time	Possible incompletetion of test due to the participant leaving before finishing	Allowing a five to ten minute break when switching games	2	4	8	M
Themes presented in the artefact such as violence and death may cause discomfort to testers	Distress to users	Ensure the user knows what they will be testing before proceeding and replace enemies with human silhouette targets.	2	4	8	M
Not retaining the same participants for the duration of the project	This will skew the data, participant must complete both game tests.	Allow testing to be ran on different days. So that if one participant is not able to turn up, they may turn up on another day.	4	2	8	M
Unreliable Game Engine insufficient Resources/Material	Game development would not able to continue	Research and choose a game engine that has sufficient recourses	3	4	12	M
Disinterested test participants / making a mockery of test questionaire	Skewed/Inaccurate data readings	Before taking the questionaire, I should allow myself a time to ensure that the user is interested in the partaking of the test	3	5	15	M
Delays or set backs in designing/developing either version of the game	Loss of time	Use every resource available on the game engine website, youtube or google	4	5	20	H
Game may lag due to graphics being to demanding on the system	User discomfort / unable to complete test	Create a settings menu that allows me or the user to set the graphics to either low, medium or high.	4	5	20	H

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