ASE Project: Mario Attack

1.Project Description

In this section, we will outline the details of our project in a clear and correct understanding format covering all information about the project.

1.1. Project Overview

Stability is essential for our wrists. We should move through the regular planes of movement while keeping correct alignment and support when loads are applied. We all shoot videos with our smart devices, and you can make sure the video you shoot with your smartphone is something worth sharing.

We have got you covered by developing an effective hand stabilization and yet entertaining game that will help you improve your aim and stabilize your hand movements. MARIO is an augmented reality (AR) shooting game system based on IOS devices and runs in real-time. While playing the game, some monster will appear on your device's monitor, and the user is equipped with multiple options of guns. The user has to open fire and shoot at the monster within the allocated time to move on to the next level. Section

1.2. Project Purpose

Our project seeks to determine the influence of AR mobile games on fine motor skills in young adults, an area of incomplete result and verification. With MARIO, we aim to positively influence the basic motor skills of individuals, such as precision, aiming, speed, agility, or tremor. Our game players will perform significantly better in the accuracy of arm-hand movements with lower time and error rates.

The game is developed to provide users with an immersive and surprising experience to aim, target, and shoot with AR technology, seamlessly combining reality and the entertainment experience. This game can be regarded as your private. It is straightforward to use even by young children or the old and brings you excellent game experience.

1.3. Project Scope

Although AR provides a futuristic vision or may sound like a revolutionary technology, the facts say that it has been around for more than five decades now. As an AR game, MARIO brings your

digital environment to reality by identifying virtual objects in the real world. Our game recreates the movements of a human hand in remarkable detail, giving it an entertainment angle, too.

2.Market Analysis

According to our research, Augmented Reality (AR) is thriving in almost all sectors of Information Technology. Nowadays, everyone has access to smartphones to operate Augmented Reality (AR) technology. This is an opportunity that most companies are currently interested in. "According to Infoholic Research,' the "**AR Gaming Market" is expected to reach $284.93 billion by 2023′ growing at a CAGR of 152.7% during the forecast period 2017-2023.**" The most important contributing factor is easy to access to the internet and powerful computing tools.

2.1 Target Users

Our target user base is anyone aged more than 12 years old. This is a hyper-casual game. This game is meant for entertainment and includes fantasy characters.

2.2 Unique Selling Points

This game uses cutting-edge technologies like the Augmented Reality (AR) Unity game engine. Augmented Reality (AR) games use a smartphone camera. This can help people with shaky hands take better photos. This is because shooting in AR needs hands to be stable.

2.3 Market Risks

There are a lot of big and small-scale companies offering games with the help of Augmented Reality (AR). Adding features and updating the application helps in capturing a significant market share. This helps us in tackling the risks from a market perspective.

3.Functional Requirements

3.1 Description of Features

- Game Loading Screen: After launching the game, the player is introduced to a screen. They can see the game title, play button, menu, and options that they can click to experience different functions.

- Different enemy characters: The player can experience several other enemy characters worldwide for a more immersive experience.
- Background Music: A music track is playing in the background during the gameplay to keep the player motivated and interested in playing the game.
- Different Levels: The player can experience different levels in the game. This makes gameplay more enjoyable and challenging for the player and keeps him interested in playing the game.
- Timer: We have included a timer in our game that goes off after a certain period. This will change according to the level at which the player is in. This makes the game challenging for the player and will keep him immersed.
- Game over Popup: The player will receive a game over popup animation after failing to complete his objective. This makes the player completely immersed in the game and try playing that level again.
- Sounds: The player can experience different sounds in different interactions; for example, if they shoot, there will be a sound coming from the gun, etc. This makes it a lot more fun and interactive to play.

3.2 Use-Case Diagram

3.3 Flow-Chart

4.Non-Functional Requirements

Non-functional requirements serve as the rules on the system's design across various features and usability of the entire software.

4.1 Privacy & Security

- We follow the CIA standard to maintain the integrity privacy of the target users.
- Authentication will be achieved right after the game starts.
- No data phishing can be done using our app, as this game does not access the user's private data.

4.2 Performance & Scalability

- The performance of our game is supported with good FPS (frames-per-second) to deliver more reality.
- We will maintain the code quality, code length, graphics, and features of our game to provide the best experience to users.

- The game's overall quality will be checked for performance during the testing phase.

4.3 Compatibility & Quality

- The user interface is clean, compatible, and interactive with all IOS devices.
- Features of the games can be handled using touch screens.
- AR is the bridges the gap of the primary functionality of this game. It shows the best of the natural world to the players to feel everything they see.
- The supported IOS devices (iOS 11 & above) can quickly render the game frames without buffering or dropping frames.
- AR does not cause any kind of harm to players' eyes or health.
- Our game has high-end 3D graphics with interactive objects and items, as seen throughout the game.

4.4 Accessibility

- An easy-to-use and straightforward user interface and game options.
- Functional visual representation of the data to all users.
- Our application can stand against the different sorts of errors.

5.Technical Constraints

5.1 Software Requirements

5.2 Hardware Requirements

5.3 Project Management Tools

6.Quality Assurance Plan

This section will discuss how our finished product will meet all the criteria to deliver the best possible quality product.

6.1Procedure

6.2 Testing

6.3 Roles & Responsibilities

6.4 Deployment

6.5 Standards

6.6 Validation & verification

7.Prototype/ Mock-Up

8.Cost & Risk Analysis

Various professionals from different sectors are required in our project. As per the requirements, the professionals, along with their salaries, are as follows:

1. Game Developer

We will require 4 game developers in the project for game development. The approximate salary of a game developer in Canada is 80000 CAD/year. In general, a developer works for 40 hours a week, which is 41.03$ per hour. A total of 4 game developers will work 20 hours a week for 10 weeks on our project. So, the total cost of 4 game developers would be 32,824 CAD.

2. Project Manager

We will need a project manager for our project. The mean annual pay of a project manager is 82000 CAD/year. In short, a manager works for 40 hours per week, making it 42.05$ per hour. The project manager will work for 20 hours a week for 10 weeks. So, the cost of a manager is 8010 CAD.

3. Quality Assurance Engineer

We will need 3 Quality Assurance Engineers for the project. The mean annual pay of a Quality Assurance Engineer is 40,000 Canadian Dollars. In general, a tester works for 40 hours a week, which is 20.51$ per hour. A total of 3 quality assurance engineers will work for 20 hours a week for 10 weeks on the project. So, the total cost of 3 quality assurance engineers would be 12306 CAD.

Various chargeable tools and software were used in the development of the project. They are:

a. *Unity license*
b. *JIRA license*
c. *Git Hub license*

d. *Apple AR Kit*

The approximate cost of all the software licenses and tools are -

Incidental cost for the whole project development will be -

So, the total price of the project will be -

9.Future Objectives

10.References & Citation

- https://www.marketwatch.com/press-release/augmented-reality-ar-gaming-market-2021-demand-analysis-industry-size-share-estimation-top-leading-companies-future-strategies-business-opportunities-growth-statistics-covid-19-outbreaks-revenue-and-forecast-to-2027-2021-11-18