Department of Electronic & Telecommunication Engineering (EN)
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Project Proposal- Team Y

EN3350 - Software Design Competition

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1. Team Introduction

Name	Index Number	Background
D.P.C.L.Dombawala	200148M	I am currently working as a research intern at SUTD, I am using c++ as a basic programming language. Also I have experience on building a flower trading platform.
G.K.M.I.D.Rajarathna	200500L	I am currently working as a trainee Product validation Engineer at Synopsys. I am using C++ and python as basic programming languages.
R.M.S.Madhushan	200363R	I am currently working as a robotics research intern at SUTD. I am using C++ and python as basic programming languages.
S.V. Ranaraja	200506K	I am currently working as a robotics research intern at SUTD, I am using C++ and python as basic programming languages.

2. Game Concept Overview

2.1. Concept Summary [EcoEx]

EcoEx" is a compelling 2D game designed to drive user engagement in energy-saving activities and resource management. EcoEx aims to enhance players' cognitive skills. Navigating the maze while saving energy, solving puzzles, and managing resources require critical thinking, problem-solving, and decision-making abilities.

Key Features:

Complex Maze Exploration: Players navigate a challenging maze structure with a runner character.

Dynamic Energy Management: Players need to collect energy sources and minimize energy-wasting processes to maintain their health, influenced by a pre-game questionnaire-based booster.

Strategic Gate Opening: Players can use saved energy to unlock gates within the maze, offering shortcuts or access to new areas, adding a puzzle-solving element.

Time-Based Challenge: Players have a limited time to navigate the maze, adding pressure and requiring strategic decision-making.

Unique Selling Points:

Gamified Sustainability: The game mechanics encourage energy conservation, reflecting real-world eco-conscious practices.

Personalized Gameplay Experience: The pre-game questionnaire personalizes the player's starting health and potential regeneration, making the experience unique for each individual.

Balance of Skill and Strategy: Players need to combine quick reflexes with strategic energy management and gate opening to succeed.

2.2. Educational Objectives

EcoEx encourages players to adopt eco-friendly behaviors in the game, translating lessons into real-life sustainable practices. Also EcoEx develops critical thinking, problem-solving, and decision-making abilities through maze navigation and resource management.

3. Development Plan

3.1. Phase 0 - Player Authentication/Registration

Player authentication is seamlessly achieved through individual API keys. Upon launching the game, a simple "verify" button triggers a swift background check using this code. Once verified, the game

generates a secure token (JWT) that efficiently stores player information, allowing for seamless access to their profiles throughout their gameplay experience.

3.2. Phase 1 - Player Profile

Once a player successfully logs in, players are directed to their personalized profile within the Unity environment. This page displays editable text boxes pre-populated with the player's existing information like username, email, mobile number and profile picture URL. A "Submit" button allows saving any modifications. To ensure data consistency, incomplete profiles prevent players from proceeding further.

Our mock API integration empowers Unity to interact with player data. When the profile scene loads, Unity retrieves player information by sending a GET request to the "View Player Profile" endpoint, including the user's JWT in the header for authentication. The response populates the text boxes with the received data. Submitting any changes triggers a PUT request to the "Update Player Profile" endpoint. The request includes the JWT for authorization and the updated profile information as a JSON object in the request body.

3.3. Phase 2 - Questionnaire

EcoEX integrates a pre-game questionnaire. After creating their profile, players will be directed to a page containing some description about a questionnaire. After having an idea of the questionnaire, players can use the "continue" button to answer multiple-choice questions which will evaluate some energy saving related knowledge. Their score, based on correct answers, determines the booster factor of the player's health. This rewards players for their eco-awareness.

3.4. Phase 3 - Game Environment

The game environment has a complex maze structure with a runner. Inside the maze there are some energy producing sources and energy wasting processes running on. The player needs to maintain some certain energy level inside the maze otherwise player health(amount of health will depend on the booster which,according to the results of the player questionnaire) reduces some rate and leads to death. If the player can save more energy within the maze, then the player can spend some amount and open some gates in the maze. After the game begins, a player has limited time(player lifetime) in order to solve the maze.

3.5. Phase 4 - Leaderboard

EcoEX's leaderboard ranks players based on real-time energy data from the provided API service, with the most energy-efficient player claiming the top spot. This gamified approach encourages competition while promoting sustainability within the game. Players are motivated to minimize their environmental impact, fostering awareness and positive real-world practices.

4. Expected Challenges and Solutions

4.1. Challenges

- In order to complete this project, we have to manage time effectively during the internship period.
- None of our team members have prior experience on working with frontend and backend.

4.2. Solutions

Our project hinges on effective time management during the internship. We'll create a detailed schedule, prioritize tasks, and leverage each other's strengths through open communication and delegation.

While none of us have prior experience with frontend and backend development, we won't let that hinder our progress. We'll actively seek knowledge through online resources, mentorship, and collaboration within the team. By sharing our learnings and supporting each other, we'll bridge the skill gap and ensure project success.