BRAUDE
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PLANT GROWTH DYNAMICS: A LEARNING EXPERIENCE

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Introduction

- **Plant Growth Dynamics – A Learning Experience.**
- The project is about:
  - Learning about plants.
  - Growing plants virtually.
  - Challenges in growing plants.

The Current Situation and the Need for the Project

- Several tools already exist for plant care:
  - Identifying plants.
  - Assisting with real garden management.
  - Diagnosing plant diseases.
  - Virtual Gardening.

PlantSnap
Where Nature and Technology Live in Harmony

Plantix

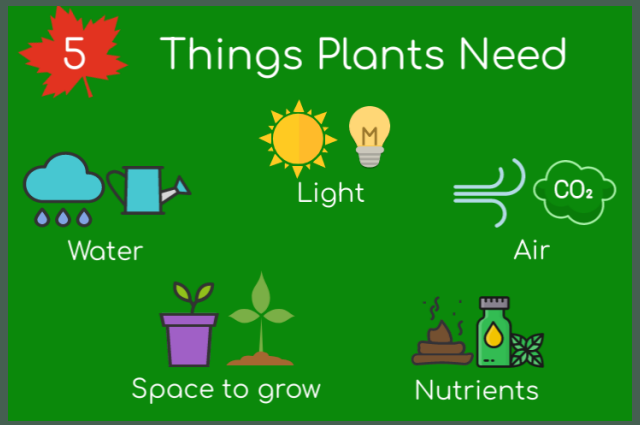
gardenía

The Current Situation and the Need for the Project

- Existing solutions lack interactivity.
- Applications do not offer useful insights for beginners.
- A system is required that incorporates:
  - Education
  - Engagement
  - Practical experience in a virtual environment.

The Problem and our Proposed Solution

- Encounter difficulties at home:
  - Requires an understanding of related factors.
  - Plants may fail to grow properly.
  - Applying knowledge can be challenging.
  - Information must be sourced online.

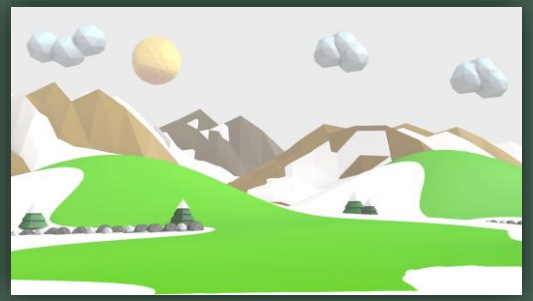


The Problem and our Proposed Solution

- A solution is proposed to these challenges:
  - A virtual plant-growing system.
  - Simulating real-world conditions.
  - Teaching growing and caring for plants.

Project Goals

- Develop a game that:
  - Is interactive and has a dynamic environment.
  - Uses real time weather data.
- The game will require:
  - Managing growth requirements of plants.
  - Maintaining the right balance of various factors.
  - Monitoring consequences of actions on plants.



Project Goals

- The game will enable users to:
  - Properly care for plants.
  - Take maintenance actions.
  - Upload images of real plants.

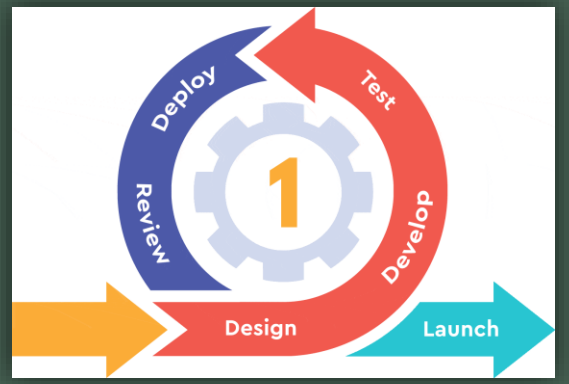
Technologies That will be Used

- Unity Engine
  - C# Programming Language
  - Game Objects

- Cloud Server (AWS)
- Machine Learning
- Weather API

The Development Process

- Agile methodology:
  - Iterative progress.
  - Continuous improvement.
- Design an intuitive and engaging user interface.
- Develop real-time plant growth simulation.



The Development Process

- Add features such as:
  - Points to motivate users.
  - Real-time feedback system.
- Unity as the main development tool.

The Development Process

- User testing to gather feedback and adjust.
- Release the system, ensuring it meets:
  - User expectations.
  - Project goals.

Challenges and Constraints

- Get acquainted with:
  - Unity's game-objects and components.
  - Other features of Unity.
- Implement many systems:
  - Growing plants.
  - Effects on plants.

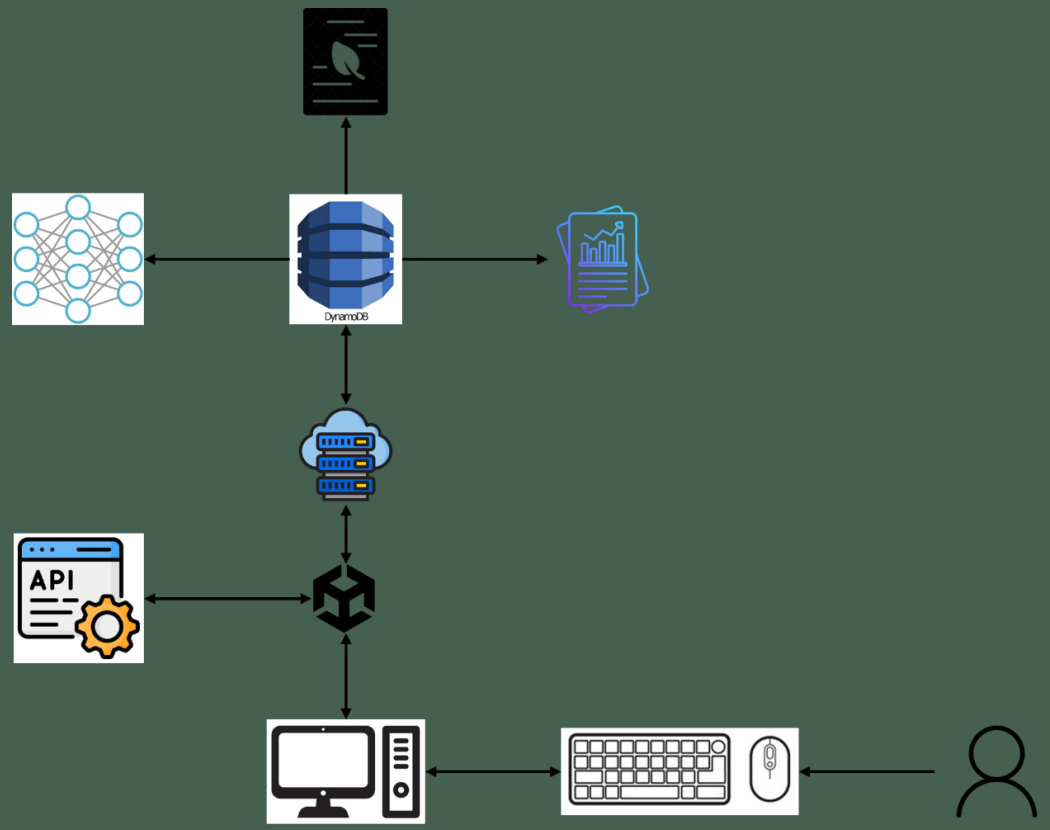
Challenges and Constraints

- The game should:
  - Be easy to use and interactive.
  - Include feedback and rewards.
  - Reflect realistic plant behavior.

Project Architecture

Client Layer:
Unity Engine and C#.

Simulates plant growth and integrates user inputs (keyboard, mouse).

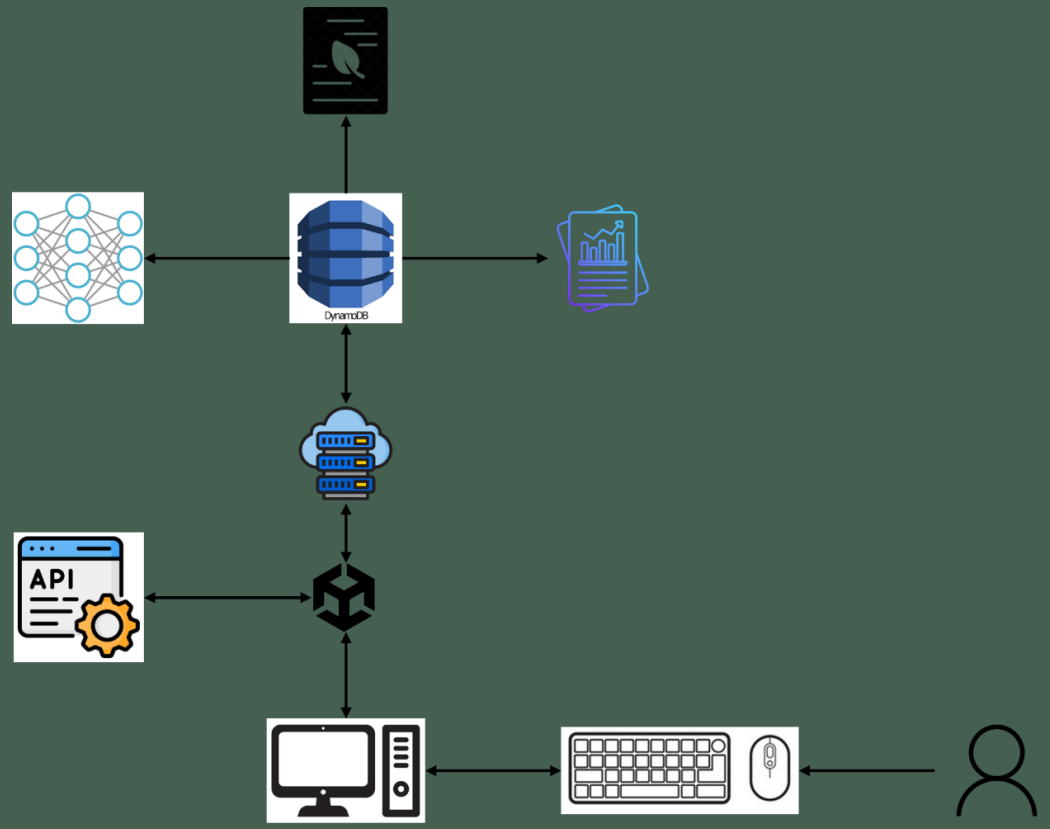


Project Architecture

Business Logic Layer:

Machine Learning: Identifies plant health and predicts outcomes.

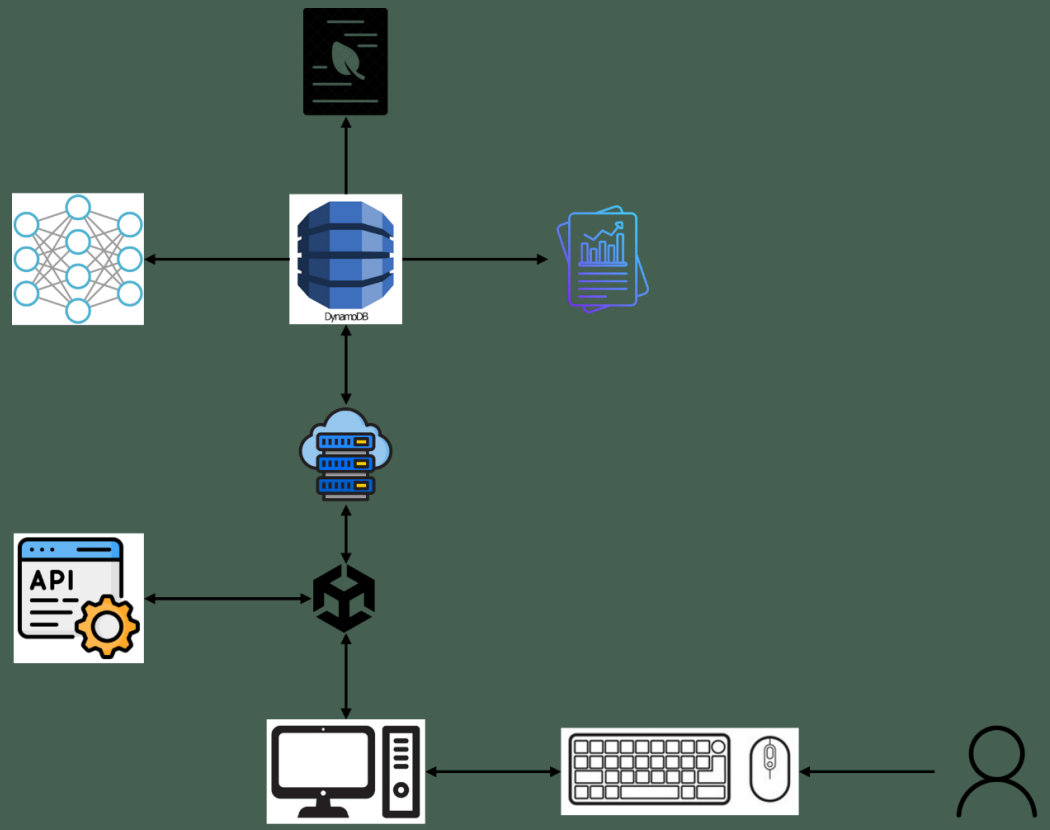
Weather API: Uses real-time weather data to simulate growth conditions.



Project Architecture

Data Management Layer:

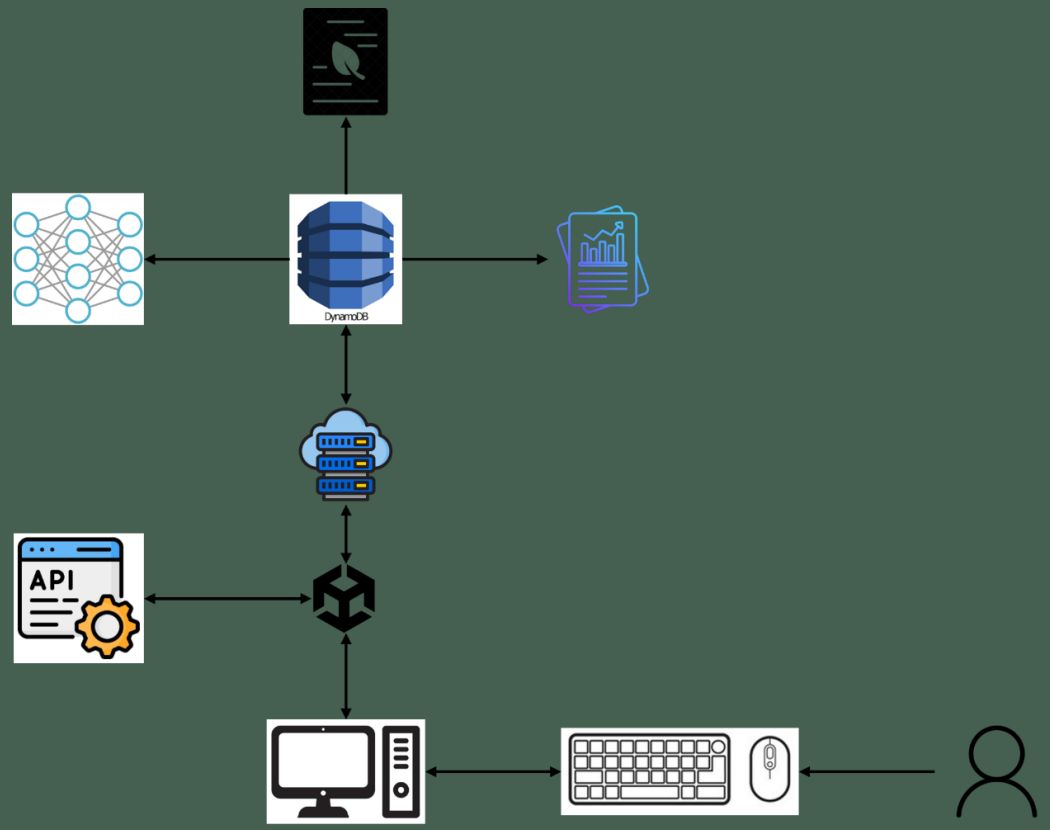
- **Cloud Server (AWS):** Stores user data, game statistics, and plant growth stages.
- **DynamoDB:** Manages system data and supports analytical processing.



Project Architecture

Key Integrations: Weather data in the game interface.

Objective: To create an interactive, educational system for plant care.

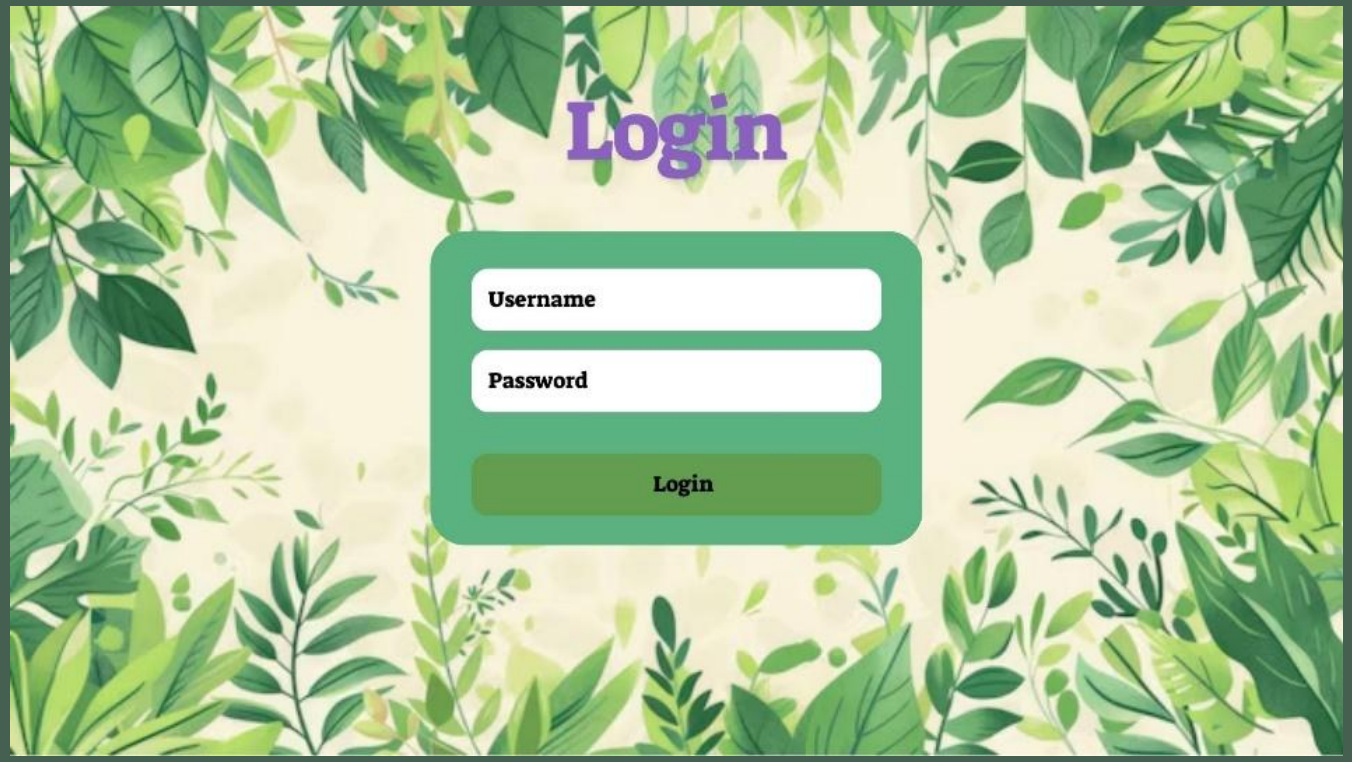


User Interface

- **Introduction Screen**:
  - log- in
  - register
  - information about the game's content and features.

User Interface

Login and Registration Screens:
- username
- password
- registration requires a username, password, and email



User Interface

- **Plants Menu Screen**:
  - Plant selection menu for growing.
- - Presentation of details (growing time, irrigation needs, etc.).
- - Upload a real plant image, which the game will match a virtual plant model.

User Interface

Statistics Screen:

- the plant's health
- soil humidity
- weather conditions.
- Players are guided on how their actions impact the plant’s growth.

User Interface

- 3D environments with dynamic weather based on location for planting and plant care.
- Instant feedback on plant status, weather, and growth stages.

User Interface

Test Plan

- The test plan includes various phases.
- We will need to test the different systems that will be implemented separately.
- Then, we will test the integration between them.
- In the end, we will test the whole game.

Test Plan

- Testing plant growth, interactions with plants and UI.
- Testing the machine learning model for plant classification and image uploads.
- Testing cloud servers for saving and retrieving game progress.