

**Final System Report**

By:

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# 

# Executive Summary

There is a growing concern for the future sustainability of the planet. As humans, we are responsible for ensuring that the earth is sustainable and liveable for many decades to come. As such, it is important for the current generation to instil beliefs and knowledge of sustainability and sustainable practices to future generations. Sustainability is a large field and there are a lot of problems that we can tackle as individuals to contribute to a more sustainable planet.

The problem that we want to address in particular here is the lack of awareness among young kids about being sustainable by encouraging them to plant their own plants to promote food sustainability and reduce CO2 emissions in the earth. Our team, Aztecs, aim to bring about sustainable thinking in children by building web game with a friendly user interface that introduces the process of gardening to children.

This report gives detailed information about our project, the functionalities that would be present in the iterations along with acceptance criteria and usability test of the project.

**Table of Contents**

[**Executive Summary**](#_heading=h.tl4navyjy0aa) **2**

[***Part A: Overview***](#_heading=h.2jxsxqh) ***4***

[**1. Introduction**](#_heading=h.17rm2ehct950) **4**

[***2. Project Overview***](#_heading=h.z337ya) ***4***

[**2.1 Problem statement**](#_heading=h.3j2qqm3) **4**

[**2.2 Project Description**](#_heading=h.1y810tw) **4**

[People](#_heading=h.lfna5xv11t7z) 5

[Activities](#_heading=h.d908wrw8roqh) 5

[Context](#_heading=h.iaw7ea1dkgl7) 5

[Technologies](#_heading=h.n9f6agl4iab) 5

[**2.3 Potential stakeholders**](#_heading=h.4i7ojhp) **5**

[**2.4 Potential sponsors**](#_heading=h.2xcytpi) **6**

[**Association for Childhood Education International (ACEI)**](#_heading=h.les3xaa9y0pk) **6**

[**United Nations Education, Scientific and Cultural Organization (UNESCO)**](#_heading=h.tn3kjesxhtjt) **6**

[**Kids for Saving Earth**](#_heading=h.k6lx7qx2ywj3) **6**

[***3. Data Source(s) Details***](#_heading=h.3o7alnk) ***6***

[***4. Security Aspects***](#_heading=h.1pxezwc) ***7***

[1. Secure Sockets Layer (SSL)](#_heading=h.ip5n0m9kqclu) 7

[2. Permissions Control](#_heading=h.rkploo5vxngf) 7

[3. Security Groups](#_heading=h.gawo1du4rhcm) 8

[4. Publish Key for SSH](#_heading=h.2m0sg1i7kccl) 8

[**Part B: The Final System**](#_heading=h.74u1ybvwmd55) **8**

[**System to be Integrity tested**](#_heading=h.b0p4pyoltufh) **8**

[**Maintenance Document**](#_heading=h.smt3swh982hs) **8**

[**Part C: Integrity/Acceptance Test Plan**](#_heading=h.ut562ikqpjk4) **8**

# Part A: Overview

# 1. Introduction

Attaining a sustainable future requires people to embrace distinct values, beliefs, methods, and procedures that are developed and reinforced at an early stage of life. Teaching kids to be sustainable at a young age helps them build an understanding about the place they have in the web of life. This means they have a better understanding of the existence of things that are required for living a decent life in terms of pure & clean water and air, the food we eat and the clothes we wear. Thus, through our project, we wish to educate young kids to be able to inculcate sustainable practises in their daily lives.

The children and the youth of today are the future and would grow up to be potential decision makers, consumers and influencers of the world over the next couple of decades. The education provided to them will then not only will impact their lives but also the future of the world. Encouraging children to explore the garden and getting their hands muddy in a playful manner contributes to a learning experience which they also love. Children enjoy the experience of the food growing outdoors, making them interested in the process and thus using it to be more connected to nature and its inhabitants.

Our main motivation for the project is to teach new generations how to be sustainable, it is mainly targeted at kids aged 5-9. Kids are usually energetic in accepting new knowledge and enthusiastic about participating in various activities. It inspired us in a way that this project can be made into a virtual activity that allows kids to participate in the process of planting trees. The activity flow will follow the pattern of an education simulation game, and it belongs to the category of frequent tasks, which can attract kids and is easy to follow. From this activity, kids will understand more about how to plant a tree in the real world according to the process of the game and they will be cultivated to be aware of the importance of being sustainable.

# 2. Project Overview

## 2.1 Problem statement

As a parent who feels frustrated about the lack of awareness their child has about sustainability and needs to teach their child about sustainable practices but does not have a media that is engaging to do so.

## 2.2 Project Description

Team Aztecs is keen on creating a web-based game which not only serves as an entertaining game for kids, but also educates them about the process of growing various plants and ways to be sustainable. Since many parents do not have big gardening spaces in their residences, it is difficult to teach kids about the process of planting a tree. This game ensures that the child learns about the process of how to grow a plant to negate CO2 emissions which ultimately contributes to the sustainability of the planet. The game will also show fun facts about the plant to help children gain more knowledge on the plants they are growing.

An important part of our approach to designing an interactive game website Bunny’s Garden is to make it as user centred as possible; in this case we want to make the game interface as friendly as possible, so it is easy for kids aged 5-9 years to use. The PACT Analysis consisting of the following factors: People, Activities, Contexts, Technologies help as a useful framework for thinking about a design situation in relation to an interactive system. From the analysis, we were able to sketch the target audiences and their interactions with our system. Following is the result of PACT analysis:

### People

The target audience for our project are basically children from the age of 5-9 years. We want to make sure that our website will be as kids friendly as possible, with many colourful pictures so that the children are attracted towards the website and encouraged to play the game regularly. We assume that the kids of the age range 5-9 years are not able to go through the usual process of register/login by themselves. Thus, we designed the game to store the progress users have made on their plant without any need to register or login. Since, most of the kids would be using our website, we tend to keep the interface very simple and easy to understand. Along with the above characteristics, we wish to make the website very responsive and interactive.

### Activities

The main activities that needs to be considered for this project is that we aim for the children to interact with the game on a regular basis. The interface of the website is as simple as possible. Since, it’s a website for the kids, we tend to use many colourful pictures and graphics. The main activity on the website would be the game that the child would play. Subsequently, we would be having an information/fun facts section where the child can read the fun facts about the plant, he/she would be planting. Besides, this game will represent the process of planting and taking care of a plant as done in reality which includes watering the plant at regular intervals, checking the health of the plant, and lastly gaining bonus rewards in the end.

### Context

The context for this project would be more of educating the kids about being sustainable in nature. Thus, the website could be accessed from various distinct places like home, educational institutions, child day cares, to name a few. As mentioned earlier, the website is targeted for kids, the support required for the website would be as simple and easy to understand with no complicated functionalities that the kid wouldn’t understand.

### Technologies

The technologies used for this website are to have a URL that can be accessed through web browsers like Google, Internet Explorer, Safari, Mozilla Firefox etc. The child can login via the login page where the child can then access the game and can come back to the game at any point by using the username given at the time of registration.

## 2.3 Potential stakeholders

As the project is focusing on the virtual experience of planting various trees and raising the awareness of sustainability in new generations, it is mainly targeting at the kids at age 5-9 years, as well as their parents and teachers who can assist them using this web application. Thus, the stakeholders, or target audience, are kids, parents, and teachers.

The final goal of this project is to teach kids to be more sustainable, which is definitely relating to the benefit of kids, hence, kids as main stakeholders are selected. Their parents, as their guardian and teacher at home, have strong relationships with the kids, are selected as stakeholders as well. The teachers that educate kids are also considered as stakeholders because they can provide knowledge by explaining the process but cannot really provide practical learning about it.

## 2.4 Potential sponsors

### Association for Childhood Education International (ACEI)

The mission of ACEI is to promote and support in the global community the optimal education, development and well-being of children. Optimal education and well-being development are all including sustainability education. Thus, ACEI is one of the potential sponsors.

### United Nations Education, Scientific and Cultural Organization (UNESCO)

The aim of UNESCO is committed to a holistic and humanistic vision of quality education worldwide, the realization of everyone’s right to education and the belief that education plays a fundamental role in human, social, and economic development. Additionally, UNESCO also helps solving the problem of poverty, which may possibly cause by running out of food or water in some areas. They may be one of the potential sponsors because what this project is going to build can help solve this problem in the earliest phase.

### Kids for Saving Earth

This organization provides parents and educators many documents and resources in saving earth. However, they do not have any game-style education material so far, hence, they may be a potential sponsor as well.

# 3. Data Source(s) Details

The datasets that we will utilise for this project are chosen to support the functions of our system. The aim of using these datasets are to create an immersive experience in the game, that mimics the real world, so that the intended target audience will be engaged in our web application and also be able to learn about the process of growing a plant in the real world. The data that is being used by the following dataset are the number of days required to grow the plants, the number of times the plant needs to be watered along with the number of times the plant needs to be fertilized.

The details of the open data sources are listed below:

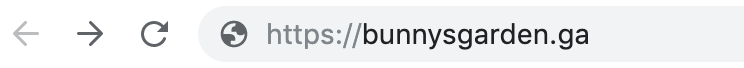
|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Names | Physical Access | Frequency of source updates | Frequency of iteration system updates | Granularity | Copyright/ Licensing details |
| Plants Nurturing Guidelines  <https://www.kaggle.com/rameshgupta74/plant-nurturing-guidelines> | CSV download | N/A | N/A | Nurturing guidelines for each type of plant |  |

# 4. Security Aspects

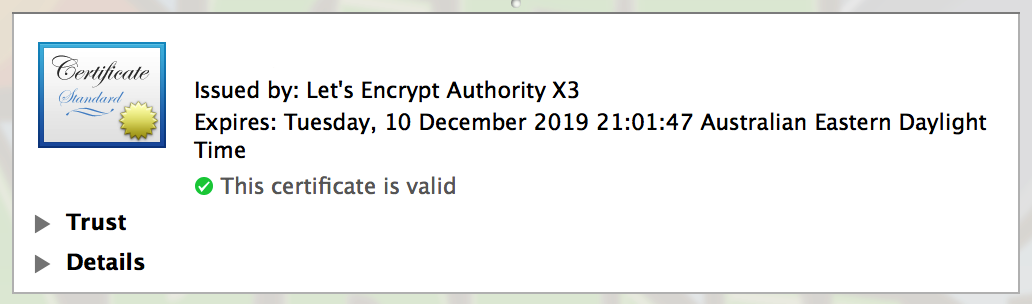
As it is a web-based project, to make sure the system can run properly and safely, Aztecs has done a lot of work as the system’s security components.

### 1. Secure Sockets Layer (SSL)

SSL (Secure Sockets Layer) is the standard security technology for establishing an encrypted link between a web server and a browser.



The SSL Certificates used by the system is provided by Let’s Encrypt. After installing certificates provided by Certbot, the http server has also been configured which forces every http request to the https (443) protocol to ensure the safe 443 port is the only available port to all users. Thus, all traffic between any possible visitor and the system are encrypted.



### 2. Permissions Control

Apache server uses /var/www/html as their default web folder. The default permission for that folder is 555 which allows visit only but write is not allowed. For uploading files, the permission must be changed to 777 at the time of uploading, but after finishing modifying, the permission has been changed back to 755 to ensure visitors have the permission to visit web pages (and their resources like js files, css files, pictures and videos).

### 3. Security Groups

AWS provides very handy security functions inside their EC2 dashboard. We’ve configured that according to our needs for security. We only allow necessary ports to be available to protect the system, like 443 for secure visiting, 22 for SSH remote login and 21 for FTP, all unnecessary ports are blocked like 80 and 8080 to ensure the security.

In Iteration 3, we changed our strategy since blocking port 80 may have some problems when user is using a browser that won’t automatically jump to https port if http port is unavailable. We opened both 80 and 443 port, and if a user tries to visit via http protocol, it will force jumping to https port to ensure the secure transport.

### 4. Publish Key for SSH

As the website is hosted on AWS server, it is necessary to visit it remotely to configure and manage it. AWS allows SSH for remote access. We generated private key using Putty with the certificate generated by AWS to ensure only team member with the key can access the host.

Also, we created passphrase with the public key file to ensure even if the key file is lost, no one would use the key without knowledge of the passphrase.

# Part B: The Final System

## System to be Integrity tested

The link to our web based simulator game is given as follows

Game URL: <https://bunnysgarden.ga/>

Application: <https://drive.google.com/drive/u/1/folders/15RyAtsppEHHsueD2eAkbRsOtTJnyWrCI>

## Maintenance Document

The maintenance document describes the technical aspects of our web application for Bunny’s Garden. The link to the maintenance document is given as follows:

[**https://docs.google.com/document/d/1xsBng60CBXg95AVqCZUKV2PQY0-tmNbE0FYjw\_ShoF8/edit**](https://docs.google.com/document/d/1xsBng60CBXg95AVqCZUKV2PQY0-tmNbE0FYjw_ShoF8/edit)

# Part C: Integrity/Acceptance Test Plan

Following is the acceptance form for all the functionalities, specifying the acceptance criteria and allowing for feedback after testing these functionalities.

|  |  |  |  |
| --- | --- | --- | --- |
| Date Tested: | |  | Date Retested: |
| Activity | Pass/Fail | Comments | Pass/Fail |
| On clicking the play button on the home page, the user will be logged in or registered automatically. |  |  |  |
| Upon entering the website and clicking on start game button, a bunny will appear and provide an introduction for the game. |  |  |  |
| The background music and audios for the instructions will also be played. |  |  |  |
| On clicking the blinking arrow, the next instruction page will be shown. |  |  |  |
| Upon entering the page that asks the user if the user needs help, two options will be provided (yes/no). |  |  |  |
| On clicking yes, the instruction will continue. |  |  |  |
| On clicking no, the instruction will be skipped and goes directly into the select plant page. |  |  |  |
| On entering the select plant page, an interface with three plants will be shown. |  |  |  |
| On clicking one specific plant, the user will enter the game page for that plant accordingly. |  |  |  |
| Upon entering the game page, the day / night background will be shown behind the plant. |  |  |  |
| The day and night changes twice a day, 6 am night to day and 6pm day to night. |  |  |  |
| Upon entering the game page, a progress bar will be shown at the bottom of the plant. |  |  |  |
| The progress bar shows the current phase of the plant. |  |  |  |
| Upon entering the game page, the level for water, fertilizer, pesticides, and scissors will be shown on the tool icons. |  |  |  |
| Once a plant has been planted by the user, it automatically grows over time visibly. |  |  |  |
| Upon entering the game page, the user can see the health value of the current plant. |  |  |  |
| The health will be deducted when the plant is not watered/ fertilized/ trimmed/ de-insected well. |  |  |  |
| The health will rise again when the plant is taken care of nicely for the next few days. |  |  |  |
| On clicking on the water pot, the plant will be watered. |  |  |  |
| The plant can be watered as per the required amount depends on the specific type of plant. |  |  |  |
| On clicking the fertilizer bag, the plant will be fertilized. |  |  |  |
| On clicking the scissors, the weeds around the plant will be cut. |  |  |  |
| On clicking any tool icon, the audio for that operation will be played automatically. |  |  |  |
| On clicking the pesticide, the injurious insects on the plant will be eliminated. |  |  |  |
| On clicking any tool, the level for that tool will rise if it hasn't reached the maximum. |  |  |  |
| After the required times of any tool is reached, that tool button is disabled. |  |  |  |
| On entering the tips page, an interface with dialogue bubbles with tip texts will be shown. |  |  |  |
| On clicking one specific dialogue bubble, the audio will be played automatically. |  |  |  |
| On clicking the back button on the bottom left of the page, user will be able to go back to the select plant page. |  |  |  |
| On clicking a new plant, a new plant will be selected, the user will enter the game page again, with the selected plant. |  |  |  |
| The growing time of the plant is rescaled to a shorter period in proportion. |  |  |  |
| On clicking on the plant, the plant will tell random tips about itself. |  |  |  |

# Part D: Sign Off facility

**Monash sign off Sheet**

We, ANKIT MEHTA and EVIAN ZHUANG acknowledge on behalf of The Monash IE Team, that we have received an external storage device containing:

**for Monash use only**

o Project Proposal Overview report

o Iteration 1 report

o Iteration 2 report

o Iteration 3 report

o Final System Report

- With final retrospective over whole unit

o Results of integrity testing

o Work hours / Timesheets

o Industry Mentor Folder (memos, minutes, emails, records of telephone conversations, everything to do with your mentor)

o Learning Journey Video: (Source video. E.g .AVI, .MP4 and online video file link)

**Handover information** (put in one super folder, so we can hand on to a future sponsor)

o Product Doc.

o Support Doc.

o Your contact details

o Maintenance Doc. (a document or could be a folder)

o A backup copy of the system to install if necessary, testing details (not test cases) and database (schema and data)

**and confirm that you have completed**

o Integrity Testing (and found issues fixed)

o Backup and recovery testing

o Uploading of EXPO and studio photos to a private google folder (do not put team members in there who say they do not want their photo uploaded)

o Final handover to Monash

Signed Monash \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_