



ECOTPIA

**A Parallax Enabled Website for
Climate Change Awareness with
Interactive Mini Arcade Game**

**Ecotopia: A Parallax Enabled Website for Climate Change Awareness with
Interactive Mini Arcade Game**

A Capstone Project

Submitted to the Faculty of

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In Partial Fulfillment of the Requirements for the Degree

Bachelor of Science in Information Technology

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DEDICATION

This study paper is dedicated to our dear family, who has been a constant source of support and inspiration for us during this academic journey. Our success is a result of their care, compassion, and sacrifices.

Also, to our esteemed professors and adviser, whose wisdom and expertise have impacted our intellectual development and kindled our love of learning.

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EXECUTIVE SUMMARY

The study presents a website focused on raising awareness about climate change. This website is designed to enlighten users about the causes, effects, and possible solutions to climate change. It is important to note that climate change is a long-term phenomenon caused by both human activities and natural factors, and it is different from rapid weather changes. The proposed study implements a parallax effect, creating an interactive and visually appealing browsing experience. Functioning as information hub, the website provides users with the opportunity to access current information and materials pertaining to climate change, effectively tackling one of the most pressing challenges of our era. The research targeted audience is on senior high school students, with the goal of enhancing consciousness and promoting proactive initiatives to confront the climate emergency. The objectives include developing a comprehensive web application with interactive elements and a retro mini arcade game focusing water pollution within the context of climate change to enhance engagement. However, the scope is limited to light transitions, and the admin module enables content editing without progress tracking. Despite these limitations, the study holds significant value in empowering individuals to take meaningful actions toward a sustainable future.

Keywords— Climate Change Education, Parallax Website, Parallax Effect, Mini Arcade Game, Information Awareness.

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CHAPTER 1

INTRODUCTION

This chapter discusses the purpose of creating a parallax effect on a website that provides information on how to respond to climate change. Climate change is a phenomenon where previously consistent weather patterns and temperatures start to change. The alterations can arise organically, such as due to volcanic eruptions, or through human activities, like releasing pollutants from industries and using coal, oil, and gas for energy generation [1]. Contrary to regular fluctuations in weather, climate transformations represent extended patterns that require hundreds or possibly millions of years to develop, in contrast to rapid shifts in temperature that can transpire swiftly within mere hours [2].

The study showcases a parallax effect on its landing page, a web design technique where the website's background scrolls slower than the foreground. This parallax creates a 2D or 3D effect as users scroll down the site, adding depth and enhancing the browsing experience [3]. The proposed study will be an e-learning website accessible through internet-connected devices, providing education and resources through digital means, commonly known as eLearning [4]. The assets featured on the project have been exclusively created and are the proprietary work of the talented artist. These assets showcase a distinct art style, harmoniously blending semi-realism and stylized art elements.

This study holds significant relevance as it addresses one of the most critical issues our nation is currently facing - climate change. This study allows users to access an educational environment with an interactive mini-arcade game. It is a small-scale, simplified version of a standard arcade game built for fast and fun gameplay. Moreover, its objective is to raise awareness of climate change and inspire people to explore solutions for this worldwide emergency.

The research project serves as an educational medium, with the researcher anticipating that individuals will value, utilize, and disseminate the insights acquired to promote awareness among others. After completing the research and development process, it will be easily accessible whenever there is an internet connection, offering convenience. The advantages for the intended users encompass the ability to access current information concerning the causes, effects, challenges, and solutions concerning climate change.

1.1 PROJECT CONTEXT

Climate change is one of the most pressing global issues of our time. It poses significant environmental and societal challenges, affecting communities and ecosystems worldwide. Recognizing the importance of climate change awareness and education, the Manila Disaster Risk Reduction Management Office (M.D.R.R.M.O.) seeks to address this issue by engaging senior high school students in the Manila area. The Manila Disaster Risk Reduction Management Office (M.D.R.R.M.O.) is the client of this project. The M.D.R.R.M.O. ensures the safety and resilience of the Manila community in the face of natural disasters and climate change impacts. By raising awareness and empowering senior high school students through this web application, the M.D.R.R.M.O. aims to:

- Strengthen community resilience and preparedness.
- Promote sustainable practices in the face of climate change.
- Encourage active participation in disaster risk reduction efforts.

The choice of senior high school students as the target users for this project considered several keys:

Youth as Change Agents: Senior high school students represent a demographic that is highly receptive to new ideas and can be effective change agents in their communities. Engaging them in climate change awareness and action can have a ripple effect, as they often influence their families and peers [5].

Formative Years for Lifelong Habits: Adolescence is critical for developing values, attitudes, and habits. Educating and inspiring high school students about climate change can instill lifelong, environmentally responsible behaviors.

Future Leaders: Today's high school students are the future leaders, policymakers, and influencers. Preparing them with a strong foundation in climate change awareness is essential for effective future decision-making [6].

1.2 PURPOSE AND DESCRIPTION

Primarily, Ecotopia aims to develop a website that inspires and provides resources for senior high school students to have an impact in the real world. This web application combines a parallax scrolling effect on the main landing page and an interactive mini arcade game to educate, raise

climate change awareness, inspire action, and gamify learning. It simplifies complex climate information, immerses students in a visually captivating experience, motivates them to take environmental movement, and makes learning about climate change engaging and interactive. Additionally, the website offers education through news, articles, and interactive content. A distinctive feature is the interactive mini arcade game, which addresses water pollution within the context of climate change challenges.

Senior High School Students. It enables them to gain the knowledge and skills needed to deal with an evolving world, make informed decisions, and contribute to creating a more sustainable future.

Climate Experts. It can contribute vital insights regarding the accuracy of the material presented on the website and the usefulness of the content in increasing awareness.

Educators and Teachers. It enables them to provide an exciting way of teaching complicated issues. It has the potential to have a long-term impact on students understanding and attitudes about climate change and environmental sustainability.

Researchers. It will help them become knowledgeable on the subject, further develop their skills as Information Technology students, and enable them to solve their clients' problems effectively.

Future Researchers. It will help them gather additional information about climate change and create a more enhanced system for study.

1.3 OBJECTIVES OF THE STUDY

The study's general objective is to develop a Parallax Enabled Website for Climate Change Awareness with an Interactive Mini Arcade Game that serves as a platform that imparts knowledge and empowers and mobilizes individuals to take meaningful actions toward combating climate change and creating a more sustainable future.

Specific Objectives

- To develop interactive and multimedia elements in a parallax effect.
- To create a website admin module to update necessary learning content and a web-based self-assessment module that measures visitors' understanding of learning content.

- To create a mini arcade game module related to the issue of water pollution within the context of climate change.
- To evaluate a system website that aligns with the evaluation principles outlined by the F.U.R.P.S. (*Functionality, Usability, Reliability, Performance, and Security*).

1.4 SCOPE AND DELIMITATION

SCOPE

This project includes several web modules. These modules include a *landing page* with a classic parallax scrolling effect, incorporating light, and professionally executed transitions and animations on a responsive webpage. The administrator cannot update the parallax effect pictures due to specific size constraints. It also consists of a *Materials* section with a dropdown menu containing information on *Current Issues* related to climate change challenges in the Philippines, *Climate Action S.D.G. 13* that provides details on the U.N. Sustainable Goal number 13 about taking urgent action to combat climate change and its impacts, a *Solutions* module containing data on potential solutions for addressing worldwide climate change issue, an *Overview of Climate Change*, and *Self-Assessment module* designed to evaluate users' knowledge gained from using the website. Additionally, there is a *News Module* that provides the latest news related to climate change. The study will integrate a five-level *Mini Arcade Game* for users to engage. The game will focus on water pollution in the context of climate change. The web application will also offer an *Admin* module to update the content. The system has CRUD operations to manage admin accounts, which include super admin and admin roles. Super admins have complete account management privileges, whereas admins can only edit content; super admins cannot delete default accounts. Furthermore, the admin is exclusive to updating the range of the News, Current Issues, Climate Action S.D.G. 13, Solutions, and Self-Assessment Module.

DELIMITATION

As per specifications, the game is a traditional mini arcade game without features for individual user account management or dashboards to monitor learning progress. No personalized game progress tracking, dashboard, or report summaries are available. Furthermore, the admin could modify the material except for government resources and the overview of climate change, and the news module is the only module that can add, edit, and delete content. The administrator cannot modify the admin-updatable structures. Users cannot undo changes once the page is published or saved, and there are no draft-saving options during

content updates. The admin function restricts access to desktop devices; no account creation or management module will be available. The project is not a learning management software nor a formal E-Learning tool.

CHAPTER 2

REVIEW OF RELATED LITERATURE AND SYSTEMS

This chapter presents an overview of the related literature, studies, and systems the researchers gathered. Furthermore, this chapter will present data and concepts to justify and critically analyze the study.

2.1 RELATED LITERATURES/STUDIES

Three Ways to Improve Net-Zero Emission Targets

About five years ago, the United Nations founded the Paris climate pact. Its main goal was to keep the rise in global temperatures to less than two °C, with an even more challenging target of 1.5°C. Countries, various institutions, and businesses worldwide agreed to achieve this aspiration. This consensus involved committing to stabilize the emissions of greenhouse gases as the latter part of the century unfolds. This commitment encompasses prominent entities such as the U.S., China, the E.U., Microsoft, and a consortium of European airports. While these commitments are encouraging, there are challenges and unclear definitions and details of net-zero targets, which can significantly affect their effectiveness in addressing climate change.

The critical aspect that needs clarification in the net-zero target is the scope. The Targets must clarify which emission sources and greenhouse gases are covered and whether the goal is to reduce, remove, or offset the emission. Different gases have different impacts on the climate, carbon dioxide or CO₂ being the leading cause of global warming because it lasts hundreds to thousands of years in the atmosphere. Countries and organizations take different approaches to the scope of their net-zero targets. For example, the E.U. aims to target all greenhouse gases by 2050, and China's net-zero plan focuses only on balancing CO₂ emissions by 2060. The United States did not specify which gases are covered in its net-zero target by 2050.

Countries, institutions, and companies increasingly adopt Net-zero targets to respond to the Paris Climate Agreement. The scope and emission sources and greenhouse gases covered, the timeline for achieving net zero, and the strategies for reducing and removing gases require careful attention and consistency.

Clarity, accuracy, and consistency in defining and implementing net-zero targets are essential to ensure that they contribute to the collective climate goal of the Paris Agreement and effectively address the urgent challenge of climate change.

Climate Education: Challenges of Climate Change and Energy Policies

Climate change presents intellectual and social challenges that require open research and dialogue; universities can facilitate it. Enhancing public understanding of climate change is the primary goal of the United Nations Framework Convention on Climate Change (U.N.F.C.C.C.). Throughout history, universities have consistently shouldered the responsibility of nurturing critical aptitudes among students and tackling matters connected to the environment and the interplay of societal and cultural elements. However, traditional university education often needs to include educating active citizens and informing them about relevant opportunities for action. Climate change is a relatively new phenomenon in scientific discourses, leading to inefficiencies in climate education [7].

The need to transform education related to climate change has arisen due to the constant paradigm shifts like the problem of human adaptation to climate change and its interaction with social systems. In 2020, most universities worldwide are transitioning to education for sustainable development to confront global threats and help students become conscious citizens, not just good professionals in their field [8]. As stated in [9], the educational component of corporate social responsibility or C.S.R. contains a comprehensive and transparent startling list of indicators for achieving basic knowledge and skills in climate education.

Methods for climate education should be flexible, universal, and applicable to local contexts. Hidden barriers exist, such as low student interest, lack of climate science communication, and insufficient interdisciplinary communication among universities [8].

How Can We Solve Our Air Quality Problem in the Face of Climate Change?

The trajectory of climate change is poised to interfere with almost every facet of our daily existence, as the Intergovernmental Panel on Climate Change underscored in its periodic assessments [10].

Substances that contribute to climate change, like CO₂, black carbon, and methane, can directly impact health or originate from origins that release harmful pollutants [11].

Over the past two decades, research has confirmed that climate change tends to worsen air pollution problems, a concept that Jacob and Winner [10] describe as the "climate penalty."

Holding air pollution emissions constant at 2011 levels, the authors [11] estimate that a rapid climate change scenario could lead to approximately 25,000 additional pollution-attributed deaths annually by 2095, compared with the 2005 baseline year.

The paper shows promising results in running air pollution simulation models. However, because of its computational expense, this analysis can be complicated when playing out a full range of scenarios. Suppose there is one answer that this paper can define. In that case, investing in air pollution emission reduction policies and simulation can help us solve or slow down our problem in Air Quality.

Financing the Climate Change through Green (Climate Sustainable) Bonds

Green bonds can be complex because of the need for a universal definition. Generally, green bonds are financial terms used to finance environment-friendly projects such as water and energy efficiency, renewables, low-carbon transports, and bioenergy [12].

Green bonds have many types: corporate, project, asset-based, financial sector, municipal, sovereign, and supranational.

Corporate bodies issue bonds and include "YieldCo" instruments to finance acquisitions. Project bonds are backed by one or multiple projects, exposing investors to project risk. Asset-backed securities or A.B.S. are the ones that are collateralized by one or more projects that usually provide to lean on assets. Financial institutions raise financial sector bonds to finance on-balance-sheet-lending municipal bonds issued by local governments, and supranational, sub-sovereign, and agency (S.S.A.) bonds are issued by international financial institutions such as the World Bank.

In the paper, there are challenges in developing the green bond market. These challenges include the lack of specialized skills for monitoring and assessing the use of proceeds, the lack of institutional arrangements in certain countries, high transaction costs for obtaining green certifications, currency risk for developing countries with unconvertible currencies, and the concentration of green bond issuance in a few countries.

Green bonds are a relatively new financial instrument used to finance environment-friendly projects. Despite lacking a universal definition, they have gained popularity recently as governments and investors recognize their potential for environmental sustainability and investment opportunities. However, challenges such as monitoring and assessment, institutional

arrangements, transaction costs, currency risk, and concentration of issuance in particular countries must be addressed to further develop the green bond market.

Denial- The Key Barrier to Solving Climate Change

Denial is a refusal to accept the reality of the problems we face. We often proceed in a cultural trance of denial, which [13] referred to as "psychic numbing," where people and societies block awareness of issues that are too painful to comprehend. So, what do we deny? Many things, the things that we don't want to exist. The authors focus on denying climate change, but many environmental scientists and scholars believe there are three other giant "elephants in the room" that society mostly does not want to see: overpopulation, overconsumption, and the endless growth economy [14]. As a society, we continue to act as if there is no climate or environmental crisis, no matter what the science shows. We call ourselves *Homo sapiens*, but many of us are seemingly actually "*Homo denialiensis*" [15].

Denial is the critical barrier to solving climate change because you don't solve a problem you deny exists. I see this as a college student that many people in the university still refuse or at least in their action that climate change and environment crisis is not happening; for example, some students throw their garbage anywhere, they take private service instead of using public transportation to lessen carbon footprint, smoking, etc. Also, I see the denials in our government, including our transportation system here in the Philippines, the recycling process, and taking responses to make cities "greener."

Water Pollution: Causes, Negative Effects, and Prevention Methods

Water pollution is a paramount concern, influencing and contributing to climate change. Its uniqueness lies in its irreplaceability, an indispensable necessity for sustaining all life forms on our planet. While it is a renewable asset, meeting demands is challenging since only 2.5% of our water reservoirs are suitable for consumption. Additionally, numerous water sources are marred, tarnished, and tainted by human activities, rendering the water unsafe due to hazardous chemicals and disease-carrying microorganisms.

Water holds the utmost value in the natural resources that grace our world. Indeed, it is a pivotal asset that is indispensable for the survival of every life form on Earth. The study listed the following contributors to water pollution: industrialization being the first, followed by plastics and polythene bags, pesticides and fertilizers, domestic sewage, population growth, urbanization, and

many more. Polluted bodies of water cannot be used for consumption because they are saturated with toxic substances. Moreover, they must undergo various treatment processes to be considered safe.

Without a proper standard for treating dirty water and nibbling the causes of pollution in the bud, an area's pollution problem can affect neighboring areas, thus becoming uncontrollable without thorough action to solve it. Polluted water can become a breeding ground for various diseases that a place may or may not be sufficiently ready to combat. In the case of a tropical country like the Philippines, floods can carry dangerous materials and cause untoward injury or death. It also allows organisms like mosquitoes that can take diseases to propagate.

According to Kılıç (2021), attempts to address water pollution must involve equipping learners with the skills, values, and learnings to make a valuable contribution towards alleviating pollution in local bodies of water. The problem itself can be approached in numerous ways since there is not one definite cause. Furthermore, given the inherent characteristic of water to move and flow, the issue of water pollution extends its impact across multiple regions rather than being confined to just one locale.

As a precious asset, water is indispensable in supporting all forms of life, and water contamination directly affects the natural thriving of various plant and animal species. If left unaddressed, water pollution diminishes the overall quality of life, considering its scarcity and limited renewability. Initiatives like Ecotopia promise to make these solutions accessible to a broader audience, particularly the younger generations. Such platforms equip them with the necessary resources to learn and contribute in their capacities toward resolving the challenges posed by water pollution.

Global Air Quality, Past, Present, and Future: An Introduction

The global air quality in 2019 has affected many countries, causing millions of premature deaths and health declines. Over time, air pollutants have consistently stood as one of the major culprits behind climate change, impacting lives significantly. A pivotal event in this context was the Air Quality Discussion Meeting organized by the Royal Society in November 2019. This assembly delved into the complexities surrounding the origins of air pollution, charted out potential remedies and strategies to address critical concerns, and evaluated the worldwide extent of air pollution distribution.

The meeting's subjects were divided into three sections, one examining the historical progression of air pollution issues and its effects on human health, ecosystems, and food security. The second was the 10-papers-long breakdown of the current global air quality issues. The third, comprising three papers, details the expected trends in international air quality and its effects over time. Two articles tackled the policies and the role of science in developing practical solutions for air pollution and the accompanying policies that should go with it.

The effects of pollutants on human health are the strongest drivers in policy development, but everything, such as food security, ecosystem, and biodiversity, must also be considered. China was cited as one of the notable hotspots for poor air quality from 2000 to 2010; however, policies implemented to reduce emissions in China have been effective over the past decade. Recent trends in air quality heavily rely on further policy interventions to control and reduce emissions and exposure to such emissions. With policies in place that are dutifully ensured to be exercised, global air pollution could be reduced by about 75%.

Climate change must be analyzed closely, especially now that there is an apparent lack of enforcing policies to reduce emissions and alleviate the effects of pollution on human health.

The Fundamental Links Between Climate Change and Marine Plastic Pollution

Plastic is often attributed to pollution in research discussions, especially as one of the main contributors to the climate crisis, not just from its production. Although there is much to be said about the policies in place to reduce the impact and scope of its use and production, it is an undeniable issue that must be assessed and taken care of globally.

Climate Change and marine pollution are linked because they have the exact root cause: overconsumption of resources and unchecked disposal after use. Studies focusing on the ocean and its ecosystems bring up plastics and marine pollution as one of its main problems; however, most of these studies do not also link this problem to that of climate change. Plastic requires the extraction of fossil fuels for production, thus consuming finite resources and contributing to climate change in this way. Moreover, not all plastics have the same E.O.L. (end-of-life) processes, contributing to the emission of GHG (Greenhouse Gases), and the bio-based plastic alternatives that we have currently are still questionable regarding sustainability and the contribution of its production to GHG.

There is also the problem that climate change influences how these disposed of plastics move around places, garbage moves along floods and currents during heavy typhoons, not to mention the trash floating freely in the ocean due to lack of garbage disposal action that also affects the ocean's ecosystems, microplastic being inadvertently consumed by marine life that end up on our plates. Plastics lie on the ocean floor and are more common than coral reefs due to the rise of coral bleaching events. The impacts of global warming and plastics can disrupt the reproductive cycles of marine organisms, especially species like turtles that rely on specific temperatures for successful incubation in tropical and temperate coastal regions.

In discussions concerning Climate Change and Global Warming, it's crucial to acknowledge how plastics exacerbate these challenges we confront. Over time, plastics' unregulated production, distribution, and disposal compound these issues. Additionally, plastics are non-biodegradable, rendering them unsuitable for regular disposal methods, and there exists no universally established approach mandated by world governments to effectively manage their presence in open waters, thereby perpetuating the pollution of our planet.

How Does Mindfulness Relate to Pro-Environmental Behavior? The Mediating Influence of Cognitive Reappraisal and Climate Change Awareness

In discussions of climate change awareness, there needs to be more research and understanding of the human psyche, specifically the influences of mindfulness on human behavior about consumption habits and the impacts of their actions. In addressing issues, there is always the question of how effective a message is in conveying and encouraging viewers to change their lives and involve their community. This study takes it a step further and delves into how reframing one's situations and actions contributing to climate change can make a person aware of their actions afterward.

The study found that encouraging its subjects to reflect on their actions and reframe them is effective at promoting pro-environmental behavior because they can reassess a situation and condition themselves to relate their previous harmful behavior as unfavorable and avoid repeating it in the future. According to Troy et al., mindfulness provides great cognitive flexibility and the ability to disengage from negative emotions, enhancing an individual's capacity to reinterpret the initial stimulus.

When considering cognitive reappraisal serves as a tool for managing the emotional responses that arise when an individual becomes conscious of climate change. This process, in

turn, acts as a driving force to steer clear of behaviors that might trigger the negative emotions linked to ecologically detrimental habits. Conversely, an inability to effectively handle these emotions could lead to a contrasting outcome. The study also noted that people less connected to nature may be more likely to have pro-environmental attitudes and be mindful of their actions in dealing with climate change.

There is a link between mindfulness and pro-environmental behavior. Concerning the study, there is also the variable of an individual's feelings of connectedness to nature and pro-environmental behavior. By making climate change awareness feel less of a burden or a significant task for our target audience (that evokes a negative emotion when not reframed), this study emphasizes the self-management capabilities of oneself in taking accountability and contributing to a better environment.

The Role of Lay Beliefs About Willpower and Daily Demands in Day-to-Day Pro-Environmental Behavior

As one of the significant threats to our existence, climate change has been part of a portion of our lifetime and has been worsening as time goes on. According to Bell, Poushter, Fagan, et al., people have positive attitudes towards nature and pro-environment ideals, having intentions to address climate change. However, standards and emotions sometimes translate to actions, the gap most people must address and manage. The study notes that it becomes a question of how people can self-regulate regarding pro-environmental behavior that aligns with their ideals to help alleviate climate change.

Within the research community, there have been debates about people's self-control and how it might be affected by individual differences in self-control ability and their previous experiences with exerting self-control. The study cited the "strength model of self-control" (Baumeister, Bratslavsky, Muraven, & Tice, 1998), which suggests that self-control is a limited resource that is depleted when used. When faced with tasks demanding heightened self-control, subsequent performance could suffer in a comparable situation or on future occasions. Yet, the impact of this phenomenon can differ among individuals, as what works well for one person might not produce equivalent outcomes for someone else. Consequently, this research lacks absolute certainty in its applicability to all individuals.

In lay, people's beliefs are assumed to be shaped or guided by their culture on top of their personal experiences. The authors Savani and Job (2017) found that when comparing U.S.

American respondents, they view their willpower as a limited resource, while Indian respondents view it as unlimited, and they connected this to the differences between cultural beliefs, especially religious beliefs and traditions. Aside from the cultural beliefs of an individual, the researchers also found that one's views of willpower and self-control may be tied to an individual's experience with striving towards a goal, as self-control is a vital part of it to reach a particular goal.

The study concluded that people who perceive their willpower as an unlimited resource are more likely to engage in pro-environmental behavior, as it is not a chore for them or does not deplete their willingness to change habits positively. Additionally, one's belief in one's willpower moderates how a person deals with the changes in demands once they engage in pro-environmental behavior and intend to continue it. The respondents who believe their willpower is a limited resource report a lesser likelihood of engaging in pro-environmental behavior, regardless of whether they feel that the task requires high or low willpower to perform.

Students' Knowledge of Climate Change, Mitigation, and Adaptation in the Context of Constructive Hope

Climatic change should be considerably minimized, and more efforts should be made to adapt, as humanity is experiencing a climatic emergency. Only a little study has been done on young people's abilities to mitigate and, specifically, adapt to the changes brought about by climate change. Children need help conceptualizing the complicated climate change challenges of reduction and adaptation since it only affects their everyday lives. In this study, children's perspectives on mitigation and adaptation are the main emphasis. Reserving realistic optimism regarding climate change is made possible through meaning-making coping techniques. According to this study, the pupils had a comparatively high degree of a strong correlation between students' constructive hope and their overall awareness of climate change.

Monroe et al. identified four components of effective climate change education in their review article:

- Involving students in deliberative discussions
- Involving them in scientific collaborations as part of their learning activities
- Addressing their misconceptions about climate change
- Incorporating school or community projects into the curriculum

This investigation directly and indirectly supports the findings of the earlier review research. In conclusion, this study highlights the students' need to understand climate change. Yet, deliberative dialogic debate and encounters with scientists drive students to learn more, and community initiatives involve students in climate change education. While knowledge is crucial in sustaining cheerful optimism, it may also catalyze real-world fear. But, regarding climate change education, this concern should be adequately considered, and this topic requires empirical research.

"Stickier" Learning Through Gameplay: An Effective Approach to Climate Change Education

An instructional game replicating climate change's impacts on Arctic ecosystems is known as an Arctic climate change game. These electronic games are created by imparting knowledge to players regarding the intricate connections between diverse species in the Arctic and the transformative effects climate change imposes on these relationships.

Games created with educational intentions, explicitly focusing on climate change, aim to offer players an absorbing and interactive method to grasp the evolving climate and its effects on the natural world. These video games can be structured to instruct players about the origins, repercussions, theories linked to climate change, and strategies for mitigating its repercussions. As players immerse themselves in these games, they can refine their critical thinking and problem-solving abilities, better comprehending the intricate interconnections between environmental factors and human behaviors. Furthermore, players can gather valuable perspectives on the extensive implications of climate change, encompassing aspects of society, economics, and ethics. This elevated consciousness emphasizes adopting proactive approaches to confront this intricate challenge. The accrual of understanding reinforces the importance of proactive measures in dealing with this concern.

Be the Change: Universities Shaping the Future of the World

Educational institutions worldwide increasingly recognize the imperative of resolving the challenge of climate change. In light of these circumstances, universities find themselves uniquely positioned to propel the efforts of climate change alleviation through research, educational endeavors, and advocacy, leveraging their role as hubs of advanced education. Universities are proactively involved in tackling the roots and repercussions of climate change, spanning from spearheading groundbreaking technologies to diminishing their carbon impact.

Universities lead in climate change exploration and ingenuity, offering a collaborative environment for scholars, scientists, and students to collaborate and devise innovative resolutions to the challenges posed by this phenomenon. The resources of advanced equipment, funding, and expertise make universities well-suited for climate change research. Additionally, their multidisciplinary character positions universities effectively to navigate the intricate and interconnected issues associated with climate change.

In universities, there are many ideas and research to solve climate change. We have advanced technologies nowadays to learn about climate change updates and get data. At Ecotopia, we can create and get solutions and an overview of climate change so that people are aware of climate change and what it is.

Climate Change: How Should Public Education Respond?

Public education is most likely to be used by people regarding climate change. Nowadays, many people are doing bad things, such as continuing with greenhouse gases that contain fossil fuels. Climate change is not a concern of the distant future but an immediate reality already exerting its influence on our planet and our daily existence across various fronts. Students must develop insights into strategies for mitigating and adapting to climate change, as this knowledge is crucial for their forthcoming journey, equipping them for what lies ahead. The query arises: how can they contribute, and what responsibilities do they bear toward their fellow individuals or the succeeding generations?

Alterations in rainfall trends, a gradual increase in worldwide temperatures, elevated sea levels, and a surge in the occurrence and intensity of intense weather incidents such as storms, deluges, arid spells, and forest fires offer compelling proof that shifts in the climate are transpiring. Our natural habitats, sustenance sources, water reserves, and the overall status of community health and welfare are presently encountering the repercussions of these outcomes. There is a requirement for widespread awareness to caution individuals about the necessity of assuming responsibility in all aspects related to climate change. Public education needs to make a warning to people to be responsible in everything when it comes to climate change. Not only students but also ordinary people.

The situation's urgency calls for immediate measures to curtail greenhouse gas emissions and transition to a low-carbon economic model. Ecotopia is poised to offer a forum for suggesting remedies to confront climate change. These proposals span approaches such as improving

energy efficiency, channeling investments into renewable energy alternatives, and curbing the generation of waste, among various other strategies.

Visualization of Climate Science Simulation Data

Scientists research the planet and forecast the future. They used enormous amounts of data to visualize the world. Visualizing the complex datasets produced by climate research simulations is crucial for understanding and evaluating these datasets. Researchers can spot patterns, trends, and links in the data using visualization to help make sense of the enormous amounts of information climate models provide.

Visualizing climate science is an effective way to know what is happening on Earth Day by day. A lot of data needs to be gathered, but with the help of the supercomputer and H.R.C. system, a large budget needs to be put together. They also used many software, such as ParaView, and hardware, such as scanning. At D.K.R.Z. (German Climate Computing Centre), visualizations are created for several reasons, i.e., exploration, verification, and communication of simulation results. The most crucial role in climate science is statistical data analysis. A greater understanding of the possible implications of climate change and the significance of taking action to mitigate its effects may be achieved by authorities using climate data visualization.

It is practical to create earth visualization through data. The data is most important if ample storage is needed for the retrieved data. Ecotopia can provide as much information as possible.

Introduction to Modern Climate Change

"Introduction to Modern Climate Change" represents a significant effort aimed at elucidating, elaborating upon, and engaging in discussions regarding the extensive array of information and competencies about climate change. Encompassing subjects like radiation and energy equilibrium, climate modeling, the reasons behind and mechanisms of climate shifts, and forthcoming adaptation and mitigation strategies, the book undertakes a commendable exploration. The book's fourteen individual chapters, each dedicated to specific facets of climate change-related issues or considerations, are distinctly organized into sections. The introductory segment encompasses the elucidation of weather and climate change, the planetary coordinate framework, and the book's importance in cultivating comprehension of the climate change predicament. This overview will help create a risk management tool for future climate scenarios.

A clear differentiation was established between weather and climate to assist individuals in formulating choices spanning immediate and prolonged durations.

Climate change denotes the fluctuations within the climate system, encompassing components like the atmosphere and biogeochemical cycles such as the Carbon, Nitrogen, and hydrological processes. This includes living (biotic) and non-living (abiotic) aspects, the terrestrial surface, and the Earth's icy realms. One of the most pronounced consequences of climate change is the escalation in temperature, recognized as global warming. Aspects ranging from social sciences to practical investigations exhibit a vested interest in climate change, encompassing its manifold dimensions. Due to recent climate extreme events, global food production systems and climate cycles are in danger. These occurrences include heat waves and modifications to the pattern of rainfall. To mitigate the consequences of climate change, it becomes imperative to implement strategies for risk reduction, namely adaptation and mitigation. Delving into the comprehension of the climate system's historical, contemporary, and impending components and their intricate interplay constitutes an integral facet of the mitigation approach—the model of global circulation (G.C.M.).

The assessment underscores the necessity for a united endeavor toward embracing a comprehensive mitigation initiative that targets emission reduction. However, it accentuates the importance of implementing such measures focusing on enduring goals. In the interim, a pivotal task is to gauge the balance between costs and benefits, a crucial step in devising a fitting strategy for effective mitigation. The author concluded by suggesting that each person plays a part in promoting the reductions in emissions required to stabilize the climate. This calls for group efforts and coordination.

Strategies for Mitigation of Climate Change: A Review

The definition of climate change is the alteration of weather patterns principally brought on by emissions of greenhouse gases. The emissions arise primarily from the interplay of natural phenomena and human actions. The influence of human activities on these emissions is significant. In fact, due to human-induced actions, the planet's temperature has surged by approximately 1.0 °C compared to the era before industrialization. If the ongoing pace of emissions persists, experts project that this increase could escalate to 1.5 °C within the period ranging from 2030 to 2052. The year 2018 observed a considerable number, specifically around 315, of natural disasters, a significant portion of which can be attributed to climate-related factors.

Around 68.5 million people were affected, and the cost of economic losses was \$131.7 billion, of which storms, floods, fires, and droughts were responsible for over 93%. The financial losses linked to wildfires in 2018 are nearly comparable to the total losses brought on by wildfires these past ten years, which is alarming.

The primary methods for reducing climate change are covered in this article, including traditional mitigation and harmful emissions and geoengineering using radiative forcing. Traditional mitigation techniques concentrate on lowering CO₂ emissions from fossil fuels. Negative emissions technologies seek to absorb and sequester atmospheric carbon to reduce carbon dioxide levels. To stabilize or mitigate global warming, geoengineering techniques of radiative forcing change the Earth's radiative energy budget temperatures.

According to the catastrophic nature of the climate, effective mitigation and adaptation strategies must be developed immediately. Mechanisms have a crucial role. A thorough examination of the literature identified three critical methods for addressing traditional methods for mitigating climate change: technology that reduces emissions and geoengineering techniques that use radiation. It is crucial to explain that combating climate change lacks a permanent solution. They also state that all methods and technology mentioned in this examine whether they are economically and technically practical.

Climate Change and Ecosystems: Threats, Opportunities and Solutions

Ecosystems are affected by climate change through changes in average conditions and climate variability, along with other related phenomena such as increased ocean acidification and rising atmospheric carbon dioxide levels. Additionally, it interacts with other tensions in ecosystems, such as fragmentation, deforestation, and degradation. The document engages in a discourse concerning a matter pertinent to the interplay between the biosphere and climate alterations. It delves into divergent standpoints about the consequences of climate shifts on ecosystems, the enhancement of ecosystem durability, and the potential of ecosystems to contribute to the resolution of the climate change difficulty.

The impact of climate change on society has been comparatively insignificant. They compare ecosystems and biodiversity to exploitation and other direct anthropogenic activities that cause habitat loss. On land, climate change increases precipitation uncertainty, the likelihood of extremely dry or wet weather, and ecosystem flammability. Long-term warming and rising atmospheric water deficits also increase physiological and hydrological stress. An increased

incidence of ocean heatwaves and long-term acidification trends are worsening, and numerous creatures and ecosystems are under physiological pressure. Considering the diverse array of ecosystems and their intricate dynamics, there exists a gap in our understanding of how certain species and interplays between them will react to the shifts in climate. To address this, embracing a flexible approach to researching ecosystems is imperative apart from the adaptive management of ecosystems.

In light of the persistent evolution of climate conditions, two potential scenarios emerge: societies and ecosystems will either acclimate to an environment notably warmer than the present, or substantial endeavors will have to be undertaken to curtail the extent of warming within the upcoming decades. Both scenarios heavily involve ecosystems. The effects of climate change can be mitigated by large, interconnected ecosystems, species variety, genetic diversity, trophic intactness, and habitat variation. To maximize the possibility of maintaining a diversified, robust, and well-functioning biosphere under the demanding circumstances of the twenty-first century, this concludes by outlining specific goals for academic study and practical implementation.

Cities: The Core of Climate Change Mitigation

Metropolitan regions are crucial in enacting measures designed to promote low-carbon advancement and mitigate the global repercussions of climate change. As more than half of the worldwide populace calls cities home, these urban hubs shoulder the responsibility for approximately three-fourths of the world's energy usage and the release of greenhouse gases. Being a source of wealth and having the resources and instruments needed for innovation, cities also have them. While this is happening, cities, typically located near water or on riverbanks, are highly exposed to and vulnerable to the effects of climate change, posing severe hazards to their infrastructure, citizens' lives, and the entire urban system.

This remarkable volume (S.V.) provides a platform that promotes multi- and interdisciplinary analyses and discussions on climate change mitigation for cities. Climate change and urban sectors, climate change and sustainable development, strategies and mitigation action plans, and GHG emission accounting and inventorying are the four main issues of this study. The first thing that this S.V. offers is a way to create an emission inventory that considers both production and consumption. With the aid of these techniques, carbon accounting for international cities can be made more thorough and precise. Secondly, there are many ways urban sectors are impacted by climate change, and the climate system is also affected by GHG emissions brought

on by activity in urban sectors. The assessment of the Energy, transportation, building, and service sectors, as well as mitigating policies, are the main topics of this S.V. Third, urban sustainable development is intimately related to mitigating climate change in cities. This S.V. investigates the connections between reducing climate change and urbanization, ecosystems, air pollution, and extreme weather. Fourth, in the context of climate change mitigation, there exist two central categories of strategies. The first is anchored in pricing mechanisms, exemplified by instruments like carbon taxes, while the second revolves around quantity mechanisms, illustrated by practices such as carbon emission trading. This section presents instances of regional climate change mitigation initiatives spanning the world, and it advocates collaboration between cities in this domain.

Cities emerge as pivotal players in facilitating the transition towards a low-carbon paradigm, and many urban centers are embarking on measures to curtail their ecological footprint. This S.V. examines methods and mitigation action plans at the level of cities, as well as emission accounting and sustainability. This S.V. offers techniques for creating emission inventories that consider production and consumption. These techniques help increase the thoroughness and precision of the carbon accounting for global cities. Mitigation of climate change cities and urban sustainable development are closely related. The relationship between reducing climate change and urbanization, ecosystems, air pollution, and extreme occurrences is covered in this S.V.

Nexus on Climate Change: Agriculture and Possible Solution to Cope Future Climate Change Stress

Global warming is causing the temperatures to rise, the average temperature of the international atmosphere. There is a very high risk of environmental change, increasing global mean temperature, and their effects on familiar structures and socioeconomic success. Every aspect of the natural world is impacted by climate change. Environment. The natural environment varies because of altering climatic factors excessively, effectively producing the Earth is changing. For instance, ecological change causes temperatures to rise in various parts of the planet.

Consequently, various areas experience a less harsh winter period. Changes in climatic factors, such as temperature, rainfall, and the frequency and strength of severe occurrences like droughts, floods, and storms, directly impact the productivity of plants and animals. The evolving climate scenarios introduce biotic stresses, manifesting as elevated insect and pest populations, escalated weed proliferation, decreased beneficial soil microorganisms, jeopardized pollinator

populations, and intensified abiotic stresses. These abiotic stresses encompass severe drought and waterlogging, extreme temperature fluctuations, shifts in salinity and alkalinity, and erratic rainfall patterns, each imposing a range of adverse impacts on plant life.

This comprehensive review paper delves into four principal themes: (1) the plausible repercussions of climate variations, which, in a period where food security is already a concern, will substantially affect all facets of food security, from production to consumption, thereby exacerbating malnutrition and inadequate nourishment, particularly among low-income communities; (2) the correlation between stressors and the decline of significant crops like wheat, cotton, rice, maize, and sugarcane. (3) How to create a strategic plan to reduce essential elements, such as their importance in breeding for a changing climate, building stress tolerance, and idiotic breeding. Moreover, it becomes imperative to heighten food security due to the substantial post-harvest losses endured by a significant portion of our food supply. For instance, there exists a need to address this aspect. (4) Furthermore, engagement with biotechnology and genetic engineering has emerged as a noteworthy factor in advancing transgenic plants and incorporating adaptive genes. Substantial financial investments are channeled into research and innovation to aid plants in coping with the challenges imposed by climate shifts. Consequently, community-based innovative adaptation is also recognized as a pivotal element contributing to progress in agriculture. We must take action to evolve crops because of such essential projections regarding the future effects of climate change on agriculture.

It has been shown that climate change and its adverse effects will endanger the viability of crops, insect pollinators, food security, and manufacturing. An insect epidemic brought on by sudden climate change is the most severe problem that will result in a significant loss of yield. Consequently, it is essential to establish a plan to adapt to the stresses that a changing climate will put on plants.

Climate Change and Water

Climate change has substantial implications for global water management and infrastructure. It affects crucial components of our water systems, including hydropower, flood protection measures, drainage systems, and irrigation networks. Additional elements like population expansion, economic changes, and urbanization amplify these consequences. The water demand is rising due to population expansion and increasing living standards, yet these changes are different everywhere. Addressing the effects of climate change might put

conventional water supply management methods under strain. These difficulties may appear as water supply disruptions, higher flood risks, and negative consequences on agriculture, energy production, and aquatic ecosystem health. Incorporating knowledge of current climate variability into our water management policies is a crucial first step in tackling these concerns.

Both supply-side and demand-side techniques should be included in effective adaptation measures. There are several things we can do to manage water better. For instance, we can make sure we use water more efficiently, encourage people to save water by offering financial rewards, create markets where water can be bought and sold, and use plans for managing water explicitly designed for specific regions. We can make practical efforts to reduce the effects of global warming on water. However, we must perform these things in a way that does not result in unexpected complications. Furthermore, the impact of water management strategies, such as those involving hydro dams, on greenhouse gas emissions might vary depending on the circumstances.

Regarding climate change and water, there are glaring knowledge and resource shortages. Some of these gaps are the development of comprehensive methods for evaluating adaptation and mitigation alternatives across many sectors and shortcomings in data collection and access. There is also a need for enhanced understanding of hydrological changes at decision-making scales. These knowledge gaps must be filled for efficient adaptive management in the face of climate change.

Water – at the Center of the Climate Crisis

The critical relationship between the climate problem and water-related concerns is an urgent worldwide challenge. Rising temperatures disturb the standard rainfall patterns and the water cycle, exacerbating water scarcity, floods, and droughts.

Water scarcity poses a grave concern, impacting almost two billion individuals across the globe. Over half of the world's population grapples with severe water shortages yearly. Climate change aggravates this issue by reducing terrestrial water storage, particularly affecting regions dependent on glaciers and snowmelt. Rising sea levels compound the crisis by increasing the salinity of coastal groundwater. Nevertheless, there is optimism that limiting global warming to 1.5°C can substantially alleviate water scarcity.

Additionally, climate change affects water quality, giving rise to higher temperatures and increased pollution from sources such as sediments, diseases, and pesticides. This endangers human health and food supplies because freshwater is essential for agriculture. Climate change contributes to water-related dangers, increasing the frequency of extreme occurrences such as floods and droughts. These natural calamities have already resulted in significant human and economic damage.

To address these issues, solutions such as maintaining aquatic habitats, creating early warning systems, and encouraging climate-resilient water supply and sanitation systems must be implemented. Climate-smart agriculture measures, such as drip irrigation, can also aid in water conservation and efficiency. A comprehensive approach that prioritizes water-related concerns is critical for effectively combating the climate crisis.

Water Pollution: A Critical Driver of Climate Change

In his exploration of the intricate relationship between water pollution and climate change, Dr. Thomas Shahady, a Professor of Environmental Science at the University of Lynchburg, sheds light on an emerging scientific connection that emphasizes how activities in inland waters and estuaries are closely intertwined with the emission of greenhouse gases (GHGs) and their impact on the Earth's climate. This novel perspective offers a more comprehensive understanding of the issue, highlighting the role of sediment, nutrients, and bacteria accumulation in water bodies as a source of GHGs.

The core of the problem lies in land use decisions, encompassing farming practices, urban expansion, and large-scale reservoir projects. As climate change alters temperature and precipitation patterns and places stress on our constructed environment, methane and CO₂ emissions from water resources are becoming increasingly significant contributors to heat-trapping gases in our atmosphere.

A crucial aspect of this water pollution challenge is the transformation of once-clear urban and suburban rivers into sediment-laden watercourses during floods. These floodwaters carry substantial water and pollutant loads into inland lakes and estuaries, with sediment, bacteria, and nutrients thriving in these conditions, facilitating gas accumulation.

The origins of these pollutants vary, with sediment being a mixture of sand, silt, and clay. Recent environmental changes introduce clay and organic matter into floodwaters, amplifying

bacterial and nutrient concentrations. Both overland flow and riverbank erosion reshape natural systems and even the atmosphere.

Addressing this complex challenge requires a multifaceted approach encompassing water pollution, methane release, regulation of ice cover, extension of ice-free periods, permafrost thaw, transitioning away from fossil fuels, and reconsidering large reservoirs associated with hydroelectric or nuclear power projects. Recognizing the interconnection of environmental elements and addressing water resource pollution is essential for effectively addressing climate-related issues.

Climate Change and Water: Impacts and Vulnerabilities in the Philippines

Even before climate change became a primary concern in the Philippines, the country faced challenges in maintaining a reliable and clean water supply. Access to clean water is declining despite the country's abundant freshwater resources, including rainfall, rivers, lakes, groundwater, and coastal areas. Population growth, urbanization, inadequate water infrastructure, ineffective waste management, and insufficient pollution control systems are complex problems that stem from a combination of factors. These have resulted in the overuse of groundwater, pollution of freshwater supplies, saltwater intrusion in regions such as Metro Manila and Cebu, and a general decline in the accessibility of fresh water.

Experts warn the country that it may confront a water shortage in the coming two decades if immediate action needs to be implemented to tackle pollution and the strain caused by population growth on freshwater resources. Forecasts depict a scenario with a potential 65% decrease in per capita freshwater availability by 2025, which could position the Philippines among Southeast Asian countries with the least water resources per individual. The effects of climate change are already noticeably affecting freshwater systems and resources. Instances of extreme weather events like droughts, floods, typhoons, and extended El Niño phases are leaving their mark. The rising sea levels and the growing occurrence of superstorms further highlights these issues.

This study emphasizes the urgent need to implement a comprehensive strategy to safeguard the enduring viability of freshwater resources, mitigate water scarcity, and confront the impending difficulties resulting from climate change and the imminent water crisis.

Study on Parallax Scrolling Web Page Conversion Module

In the initial stages of Web design, websites were basic, mostly made up of text and pictures that didn't move. As Web technology improved, things like animations, videos, and audio that you could interact with were added. They needed extra tools called plugins, like Flash, Shockwave, and QuickTime.

However, things have taken quite a turn in web design lately. The driving force behind this change is the increasing favor that HTML5, JavaScript, and CSS3 have found among many people. These new tools let designers make remarkable effects and multimedia on websites without needing those plugins. HTML5 offers diverse applications like banner animations, parallax scrolling, and seamless video integration, enhancing the overall user experience.

Parallax scrolling has become a widespread technique in contemporary web design. It involves layers and objects with varying movement rates, creating mesmerizing visual effects. For example, think about a website with something called parallax scrolling. Imagine this site where planets appear to move at different speeds, almost like they have depth and are in motion. We can expect fresh concepts and improved website creation methods with technology getting even more advanced. This is all set to make our online adventures much more captivating and fuller of interaction.

The Effects of Parallax Scrolling on User Experience and Preference in Web Design: A Case of Online Shopping Websites

The parallax scrolling technique has gained prominence in web design. Still, there needs to be more debate in the SEO community about its suitability for e-commerce platforms due to usability issues. Understanding users' emotional responses is crucial to gauging their online shopping preferences. However, more research is needed concerning parallax scrolling in e-commerce. That's why this study aimed to figure out how parallax scrolling truly impacts people's emotions and engagement as they navigate online shopping websites. The researchers also went the extra mile and checked participants' skin temperature while moving around on parallax and regular websites. The findings strongly support the promising potential of parallax scrolling in online shopping.

The good outcomes from this study are likely to boost web designers and e-commerce platforms. They might feel more inclined to use parallax scrolling, aiming to create a shopping

experience on the internet that's smooth and captivating. Ultimately, this move can bring more interaction, higher customer contentment, and outstanding achievements for online businesses.

The Effects of Parallax Scrolling on User Experience in Web Design

Parallax scrolling is a popular web design technique that enhances user engagement and satisfaction. A comprehensive study with 86 participants compared websites with and without parallax scrolling to assess its impact on various variables like usability, pleasure, enjoyment, fun, and visual appeal.

The study's statistical analysis revealed that parallax scrolling did not significantly improve the overall user experience as commonly believed. However, it positively affected specific aspects, remarkably increasing the "fun" factor and perception of a more professionally designed and visually appealing website.

While the study didn't offer unequivocal support for the widespread belief in parallax scrolling's profound impact, it highlighted its potential benefits in certain areas. Further exploration and refinement of parallax scrolling implementation are recommended to optimize user engagement and satisfaction. Web designers should approach its use with a nuanced understanding of its influence on the user experience.

How Does Parallax Scrolling Influence User Experience? A Test of TIME (Theory of Interactive Media Effects)

Parallax scrolling is a widely used web technique in product presentation websites, creating a captivating 3D effect by moving foreground objects faster than the background. Its popularity is attributed to its dimensionality and scrolling interactivity, appealing to web developers and users. A study with 295 participants investigated the impact of parallax scrolling on user engagement using a between-subjects design. It revealed two routes through which parallax scrolling influences user engagement: the cue route, involving perceived coolness and vividness, and the action route, including natural mapping and perceived ease of use.

Enhanced user engagement from parallax scrolling significantly affects website design and product perception. Positive attitudes and intentions towards websites and their offerings were observed, leading to increased overall website effectiveness. The study used the interactive media effects (TIME) theory as a framework, providing valuable insights into how parallax scrolling affects user perceptions and actions. The research recommends prioritizing affective factors such

as vividness and coolness over cognitive factors like natural mapping and perceived usefulness for optimizing the user experience of product presentation websites.

In conclusion, the study emphasizes the potential of parallax scrolling to captivate users through its visual cues and interactive nature, fostering positive attitudes and intentions towards websites and showcased products. Web developers can leverage these findings to create immersive and engaging online experiences that resonate with users on an emotional level.

Engaging Students with Experiential Website Design as Online Learning Media: Comparative Studies of Interactive Parallax Scrolling Technique on Commercial Website

This research aims to create a user experience framework for online education media experimentation driven by the Y generation's changing learning methods and behaviors (born in the early 1990s), who embrace heutagogy - taking ownership of their learning process. The rise of information technology has led to the adoption of new learning media like e-learning, MOOCs, and distant learning, all focused on creating immersive experiences (sensory, affective, intellectual, and behavioral) as a crucial strategy.

Considering the importance of catering to digitally native learners, especially during the pandemic, innovative learning media is vital. Websites, as online platforms, offer advantages like easy access without additional software and reducing hardware limitations for students. The investigation began with a preliminary study using qualitative descriptive analysis to identify design elements that promote immersive experiences. Commercial websites were studied as case studies to analyze their use of immersive experience elements.

The first experimental stage involved collaborating with website platforms to implement interactive parallax scrolling techniques. This process helped identify elements that enhance immersive experiences, leading to future research's next experimental stage focused on immersive technology. Consequently, a design framework model was developed by modifying the existing user experience elements framework to suit the unique needs of online education media.

Assessing The Usefulness of Mini-Games as Educational Resources

The paper discusses the growing interest in educational gaming, particularly in lightweight educational mini-games, and raises questions about their actual educational value and potential shallowness. It takes a comprehensive approach by examining existing researchers' proposed academic requirements to establish a solid foundation for analysis. The study investigates 30

educational mini-games and highlights their contrasting experiences; some are captivating and informative, while others are lackluster and formulaic.

The findings have broader implications for the future of educational gaming, suggesting the packaging of mini-games into compendia to enhance the overall experience and address shallowness concerns. Integrating mini-games into blended learning scenarios is also recommended to leverage traditional teaching methods alongside interactive gaming elements. Moreover, the paper explores innovative mechanisms to utilize player interactions within mini-games for learner assessment, providing valuable tools for educators to monitor progress.

Ultimately, the paper empowers educators to make informed decisions about incorporating educational mini-games into their teaching strategies. By understanding the strengths and weaknesses of these games, educators can tailor their approaches to better align with their educational objectives, ensuring maximum benefits for their learners.

Is Less More? The Usefulness of Educational Mini-Games

The recent resurgence of interest in educational gaming, particularly in lightweight educational mini-games, has prompted inquiries into their effectiveness and educational value. This paper addresses these questions by undertaking a thorough investigation. It begins by compiling a definitive list of academic requirements through a systematic review of proposals from other researchers. The study then examines 30 educational mini-games, spotlighting the three most engaging ones.

The analysis reveals that while certain mini-games provide immersive and thought-provoking experiences enriched with pertinent information, others must catch up due to shallow and formulaic designs with minimal informative content. Drawing insights from the examination, the paper proposes potential avenues for future research. One suggestion involves consolidating mini-games into collections to enhance their educational scope. Moreover, integrating mini-games into blended learning scenarios is a promising tactic to elevate the overall learning process.

The paper also advocates for mechanisms that utilize simple player interactions within mini-games to facilitate student assessment, offering educators valuable insights into their student's progress and comprehension. Ultimately, the paper aims to equip educators with informed decision-making tools for integrating educational mini-games into their teaching methodologies. In the face of growing interest in educational gaming, this research strives to

elucidate the possibilities and limitations of these games, enabling educators to align their choices with educational goals effectively.

An Online Game Approach for Improving Student's Learning Performance in Web-Based Problem-Solving Activities

The research paper introduces an innovative online game designed as a competitive board game for web-based problem-solving activities. Participants use dice rolls to make strategic moves, with each position on the game board representing a specific task - web-based information-searching questions or interactive mini-games. The former aids participants in finding relevant information for answering questions related to the learning topic, while the latter enhances the gaming experience.

The experiment conducted in an elementary school natural science course revealed positive outcomes. The game significantly improved the flow experience, indicating higher student immersion and engagement. It also positively influenced students' attitudes towards learning, fostering a more receptive mindset. Additionally, the game increased students' interest in education, making the educational process more engaging. Students also showed greater acceptance of technology as part of their learning experience.

Moreover, the game enhanced attitudes and engagement and led to tangible improvements in learning achievements related to web-based problem-solving activities. This highlights the effectiveness of incorporating gamification elements, such as the competitive board game format, in enriching the educational experience and achieving better learning outcomes.

In conclusion, developing this online game in a competitive board game format is a promising strategy for enhancing positive learning experiences and outcomes for elementary school students engaged in web-based problem-solving activities. Combining interactive gaming tasks, web-based information retrieval, and supplementary materials effectively fosters flow experiences, improves learning attitudes, stimulates interest in learning, and promotes technology acceptance. The findings hold significant implications for educational practices, suggesting the potential integration of this innovative approach across diverse educational settings to elevate students' learning experiences and achievements in web-based problem-solving activities.

Designing Mini-Games as Micro-Learning Resources for Professional Development in Multicultural Organizations

The growing demand for self-directed learning in professional development has led to the rise of easily accessible "just-in-time" resources that cater to the ever-changing workplace dynamics and cultural environment, which are critical in the era of globalization. As multinational companies expand internationally, working with diverse cultures, there's a need to educate employees continuously about cultural diversity for effective collaboration.

This study explores micro-learning, focusing on concise learning units for on-demand use, including text and interactive content. However, these resources may need more context. The research centers on a case study addressing cultural risk training in multicultural organizations. The study introduces interactive mini-games, with fifteen games complementing eight main topics like cultural awareness and communication. These games encourage reflection and practical application. Data from a survey among 154 employees in multicultural organizations across Cyprus, Italy, Latvia, Poland, and the U.K. inform the research.

The paper also dissects the pedagogical and gameful design using Arnab et al.'s (2015) Learning Mechanics-Game Mechanics Mapping (L.M.G.M.) model. Findings from testing the online platform involving 166 participants from these countries are discussed. This study's insights are valuable for researchers, practitioners, and developers focusing on micro-learning. Understanding the interplay between pedagogical and gameful design can enhance engaging learning experiences in cultural diversity training for multicultural organizations.

Ambient Educational Mini-Games

The research paper introduces two educational mini-games - a multiple-choice quiz and a geography-related game - that stand out due to their integration of learning content with ambient technology. These games utilize physical interaction through printed cards on a tabletop setup, monitored and identified by a basic webcam. The paper discusses the significance of ambient technology integration in education and how these mini-games enhance the learning experience.

The paper also explores possibilities for improving and expanding the educational mini-games to cater to various subjects and age groups. It emphasizes these games' interactive and engaging nature, highlighting their potential to transform the learning process and engage learners of all ages.

2.2 RELATED SYSTEMS

Table 1. Gap Analysis Table of Related System Applications

Websites	Sign Up	Causes	Overview	Effects	Solutions	Recent News & Features	Current Issues	Donations	Self-Assessment	Mini Arcade Game	Admin	SDG 13
Climate Science & Policy Watch		✓		✓		✓	✓	✓				
Science Tracer Bullets Online: Global Warming and Climate Change		✓		✓	✓							
Climate Change Laws of the World					✓	✓	✓					
The Daily Climate	✓	✓		✓	✓	✓	✓	✓				
Environmental and Energy Study Institute Climate Change News	✓	✓		✓	✓	✓	✓	✓				
Nature Climate Change	✓	✓		✓	✓	✓	✓	✓				
Climate Change US EPA		✓		✓	✓		✓					
Climate.gov		✓		✓	✓	✓	✓					
Ecotopia		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 1 displays a list of relevant web applications to this study. Various web apps have been evaluated and compared based on the following characteristics.

Climate Science & Policy Watch

It is a non-profit public interest education and advocacy project. This project is focused on policymaking and governance and the use and misuse of research and assessments on Climate Change [16].

The main page briefly introduces the project, its mission, and its background. Whistleblowers established this project during the founder's time to fight against chronic censorship and political interference in government climate science. They also have a "Seek Assistance" function where users can fill out a form to share their information and request assistance.

On the footer, the website displays current news related to climate change, environmental management, and policies. Aside from the news, they provided:

- There are a few links for their resources.
- A button for a mailing list subscription.
- Their contact information.

The system's "Blog" tab displays numerous blog posts and studies by experts. It allows users to explore these different topics by making it clickable via the paper's title or by the "Read More" option below each positioned below. The "Resources" tab provides written guides and books for more information, listed according to the websites' background.

It is a relatively simple website, keeping the contents and information compact and organized without many changes to the format of each tab. Since it is a non-profit project, they have a button that users can click if they want to donate to the project.

Science Tracer Bullets Online: Global Warming and Climate Change

An extensive guide to research, produced by the Library of Congress Science Reference Services in 2008 [16].

The homepage states that the website is an extensive resource on the Library of Congress Tracer Bullet series, listed according to their publication year and issue numbers. It is also clarified that some titles on this website may be accessible online, but some may only be available in

printed form. The homepage also gives background to the Science Tracer Bullet, its purpose, and its intended audience, primarily undergraduates, parents, and educators.

The Science Tracer Bullets provide a bibliographic guide to mimic the research process, with prescribed formats, review articles, and additional information on resources that students can search for themselves to further their understanding.

The website itself is simple and easy to navigate, and the topics available are about:

- Applied Science
- Engineering and Technology
- Biology
- Life Sciences and Genetics
- Chemistry
- Computer Science and Information Technologies
- Energy
- Environment and Natural Resources
- Physics and Astronomy

The tabs available on the site are as follows:

- Library of Congress
- Research Guides that provide an index of Congress Research Guides
- Science & Technology that displays a list of Science and Technical Reports
- Library of Congress Science Tracer Bullet Inventory (1972-2013)
- Introduction, the main page

In contrast to Climate Science & Policy Watch, this website focuses more on guiding science-related research and is not mainly focused on environmental science. Its intended audience is undergraduates, parents, and educators, so a layperson may only consider attending it if it is a niche outside academia. It also acts as an archive for guides, so it needs to be formatted to be attractive or cater to a broader audience.

Climate Change Laws of the World

It is an online database that allows users to search and browse for climate laws, policies, and litigation cases worldwide. Like the Climate Science & Policy Watch and Science Tracer Bullets Online, it does not require users to have an account to use the system. The homepage shows current news and updates related to climate laws and litigation cases alongside a map that presents their existing data in circles. Users can toggle the results on the map according to these categories:

- Number of climate laws and policies
- Number of litigation cases

And

- Country Greenhouse Gas Emissions Data (C.A.I.T. 2016) (MtCO₂e)
- Country Greenhouse Gas Emissions Data (C.A.I.T. 2016) (percent of global emissions)
- Global Climate Risk Index 1999-2018 (no units)

The website has different tabs, separate from the main page, as it is used for searching data and information. The tabs are as follows:

- About, which details the background of the database, as well as encourages users to use their website as a reference and for potential volunteers to fact-check their data.
- Methodology - Legislation provides a detailed account of how they collect, analyze, and organize their data for use in the database. This tab is for the policies and laws.
- Collaborations and Acknowledgements: this tab presents the foundations and organizations contributing to the system, especially in researching cases and policies.
- Climate Laws Publications, an archive that displays articles about climate laws, including news and commentary articles.

This system is functional and helpful for researchers and students but only caters to them specifically. It is easy to use, attractive visually, and visually manageable. Another thing it has in common with Climate Science & Policy Watch and Science Tracer Bullets Online is that it is not a parallax website and is not made for broad public use (they cater to specific demographics, even if all can access the website).

The Daily Climate

The Daily Climate provides news about climate change from international mass media sources daily and reports on overlooked and frequently missed aspects of climate research [16].

As you explore the homepage, you'll come across many different articles. Also, climate change is linked to the latest news, trending subjects, and ideas. If you look at the navigation bar, there's a "Newsletter" choice. Click on it, and a drop-down menu shows you a list of topics. If you click on these topics, you'll be taken to a fresh page. This page asks for your full name and email address. Why? So that they can send you emails about the newest stuff related to the specific topic you chose. Following the newsletters, a button for issues displays a menu with information on the solutions, impacts, causes, and more that you can read. The Partner Sites button lets you view other websites connected to the page. Then, the About Us button discusses the page, developer, and their privacy and terms. You were followed by a button on the upper proper navigation called a donation, where users can donate to support The Daily Climate, a project by Environmental Health Science. And lastly, their social media accounts can be found beside the donation button.

Environmental and Energy Study Institute Climate Change News

This source summarizes the most critical articles from the previous week and lists future activities. A bipartisan Congressional caucus formed the non-profit Environmental and Energy Study Institute (E.E.S.I.) in 1984 to identify innovative environmental and Energy solutions [16].

The most recent to oldest newsletter is displayed on the home page. The page features two navigation bars; the first is in the upper right corner and includes news, get involved, subscribe, contact, and links to their social network pages. The Topics, Initiatives, Briefings, Publications, and Resources menus are in the second nav bar, and it also has a button for donations and a search bar. To receive notifications for newsletters and publications, they also have a component where signing up is necessary.

Nature Climate Change

Nature Climate Change is a transformative journal where authors can publish via immediate gold Open Access OR the conventional publishing process. Funder and institutional criteria are met by our Open Access solution [17].

The page includes articles about climate change, including features and current issues. Users of the page may immediately comprehend how it works because of how simply it is created. The explore content, about the journal, and publish with us links are all found in the navigation bar. The page also has sign-up and login options to update users when new issues have been published. There is also a section called "nature careers" at the bottom of the page with event and job listings.

Climate Change | US EPA

The Environmental Protection Agency is an independent executive agency within the U.S. government. Its primary responsibility is to address issues connected to safeguarding the environment. The ultimate goal is to ensure the environment's and people's well-being.

As for the website's front page, it is crafted to strike a balance between simplicity and attractiveness, all while catering to users' preferences. The top navigation bar has a drop-down menu with options: About E.P.A., Laws and regulations, Report a violation, and Environmental topics. Following a quick introduction to the E.P.A. and a brief video in the right corner, then when you scroll down, you'll find a list of topics you can explore on this page.

Climate.gov

This section provides a deep dive into climate science and how climate change and variability affect what matters through blogs, F.A.Q.s, and long-read features. Americans' health, safety, and economic well-being directly correlate with the environment and weather. People seek knowledge to understand the climate better and make decisions about handling its hazards and possibilities [16].

The homepage has similarities to other websites, with drop-down menus in the navigation bar. A distinctive element of this page is the indicator at the bottom that tracks climate change and natural variability over time. The content also addresses recent news and topics about climate change.

2.3 SYNTHESIS

Ecotopia is a Parallax learning platform focused on addressing climate change. It offers a user-friendly experience, providing comprehensive information about the overview of climate change, such as evidence, causes, effects, solutions, and news and features related to climate change. Through engaging features like a self-assessment to assess their learning of the content and a mini arcade game, users can explore scenarios that highlight the factors contributing to climate change in the context of water pollution. The website aims to raise climate change awareness by enabling users to delve into various issues, causes, effects, and mitigation strategies. It offers reinforcing materials such as photos, lists of solutions, and interactive elements like the game. The creators believe that presenting this severe topic in an accessible manner is crucial for engaging and involving younger generations in environmental movements.

To enhance the platform's effectiveness, the researchers compare it to other initiatives by non-profit and government organizations that address climate change from different angles. This comparative analysis helps identify any missing aspects in existing systems, allowing them to improve the website's content and understanding of effective climate change solutions.

The platform strongly emphasizes the necessity of comprehending its worldwide repercussions. By nurturing a more profound awareness of the factors contributing to the increase in global temperatures and the resulting outcomes, students are motivated to undertake constructive measures and adjust to the demands presented by this urgent global concern.

CHAPTER 3

TECHNICAL BACKGROUND

This chapter discusses the proposed system's technology and technical specifications.

3.1 DETAILS OF THE TECHNOLOGY TO BE USED

SOFTWARE

Table 2. Software Requirements

Software	Specification
Windows Operating System	Windows 10 version 2004 or later is the minimum requirement for all the tools to be installed in the workstation.
Visual Studio Code	A 1.6GHZ or faster processor. At least 8GB RAM. At least 200MB of free disk space.
Browser	An updated version of Chrome, I.E. 11, Mozilla Firefox, and others running in Windows 10.
JavaScript	Angular CLI version 15 or later. Node: 16 or later and an updated version of browsers.
Angular	Angular CLI version 15 or later. Node: 16 or later
Heroku	A memory RAM of 512 MB, CPU share 1x, and compute 1x-4x.
MongoDB Compass	Windows 10 version for Windows. At least 1GHz processor. At least 4 GB RAM. At least 150MB of free disk space for installation and network connectivity.
Postman	Windows 7 and later are supported. Older operating systems are not supported (and do not work).
Git	At least Git version 2.41.0. windows. one and Windows Operating System.
GitHub	Internet connection, updated version of Browsers that are running in Windows 10.

Table 2 lists the software requirements in developing the Website Application used: VS Code for text/code editor, Angular for front-end framework, MongoDB Compass for managing the NoSQL Database, Heroku for deployment, Postman to build and test the API, Git to manage versions of the code that allows developers to track changes, GitHub is a web-based hosting service for Git repositories.

In developing the Parallax Website with a mini-arcade game, the languages used are as follows:

HTML (Hypertext Markup Language)

It is like the bone structure of the project. This will be the structure of the website.

TypeScript

It is a controller or manipulator of data and objects in HTML and others. This provides a heart or a brain to the parallax website.

Javascript

Researchers used J.S. for the backend server and API's. This serves as the backend logic and manipulator. Also, the website's security uses Javascript.

HARDWARE

Table 3. Hardware Specifications

Hardware	Specification
Personal Computer	Processor: most websites should perform perfectly on a recent dual-core or quad-core processor. An Intel Core i5 or higher processor is a good choice, as it can run smoothly and efficiently. Video Card: with an integrated graphics processor, which can support a resolution of 1440 x 900 or higher. RAM: a recommended amount would be 8 GB or more of RAM, which can handle multiple tabs. Storage: A solid-state drive (S.S.D.) is recommended for faster performance and

	<p>is quicker and more reliable than a traditional hard disk drive (HDD). A minimum size would be 240 GB or larger, which can hold a lot of files.</p>
Android Smartphone	<p>The screen size should be at least 4 inches diagonally, which is the minimum size for most modern websites to display correctly.</p> <p>The resolution should be at least 800 x 480 pixels, which is the standard for most Android devices.</p> <p>The network speed should be at least 3G or higher.</p> <p>The browser compatibility should be checked before accessing a responsive website.</p>
Pen Tablet	<p>Brand: HUION</p> <p>OS Support: Android/Windows/macOS</p> <p>Dimensions: 320.8x188.8x8mm</p> <p>Active area: 221x138mm</p> <p>Pressure sensitivity: 8192 levels.</p> <p>Interface type: Micro USB</p>

Table 3 indicates the hardware specifications for developing, implementing, and testing the proposed system.

Personal Computer

The Ecotopia parallax website system was created on a laptop with 8GB RAM and 500GB of accessible hard drive space. This specification is a perfect fit for the development of a responsive website.

Android Smartphones

Smartphones with Android O.S. versions 6.0 ("Marshmallow") up to 9.0 ("Pie") are the recommended system requirement to test the responsive parallax website mobile size smoothly. These requirements, however, are flexible and subject to change based on the website and user preferences. They are neither rigid nor absolute. To identify the best configuration for each website, trying several hardware and software options is a good idea.

Pen Tablet

The Pen Tab, which is a H.U.I.O.N. brand, to make drawing pictures for the website. All drawings on the parallax website are created using a pen tablet [18].

PEOPLEWARE

The prominent individuals involved in the development of the Ecotopia website systems are as follows:

Team Leader / Project Manager

This person guides the team, determines what tasks must be carried out, and inspires the team to meet its objectives. Developing and putting into action their mission to accomplish, assigning functions to its members, and most importantly, establishing communication to connect with the team to have a vision to achieve.

Front-End Developer

This individual is in charge of making sure that users may easily engage with the website. They are the ones who create the programming necessary to code a website's structure, design the webpage, and handle debugging.

Backend Developer

Backend developers create and maintain the systems that process data and conduct actions on websites. They are involved in data storage, security, and other non-visible server-side operations.

Graphic Artist

The person oversees the production of several layouts for the website, including web design, logos, and other illustrations. Create drafts and draw sketches for the website.

Technical Writer

The person oversees guaranteeing the accuracy and completeness of the paperwork. Creating, preserving, and filling the file's contents are also included. For the team to understand the information stated in the paper and determine whether it is accurate for the website being produced, the writer must share and discuss the contents with all its members.

Researcher

The responsibilities of a researcher include collecting, gathering, and comparing data to the team's proposed topic. To ensure the accuracy of the data acquired, facts must be verified, and findings must be shared with the entire team.

NETWORKS

The website is hosted publicly online and thus requires an internet connection by Wi-Fi or mobile data.

Wi-Fi (Wireless Fidelity) / Wired Connection

To access and explore the website fast and with ease, an internet speed of at least 5-40MBPS can help to play videos smoothly and allow users to play the arcade game without lag. 5MBPS is the minimum for general use of the website since it offers sources of information within the database.

Mobile Data

The website has similar speed requirements for mobile data, except for accessing the arcade game, since it is only optimized for a desktop interface. An internet speed of about 5-25 M.B.P.S. would allow users to browse the webpages and view videos easily.

3.2 PROJECT TECHNICAL DESCRIPTION

Project Technical Description

The following Project Technical Description will provide an overview of the web development project to create a parallax website with a mini-arcade game. Utilizing the MEAN stack to develop this project. The technical description outlines the essential technologies, features, and implementation strategies that will be used to execute to bring this project into reality.

MongoDB

MongoDB is a source-available cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with optional schemas [19].

Express.js

Express.js, or Express, is a backend web application framework for building RESTful APIs with Node.js, released as free and open-source software under the M.I.T. License. It is designed for building web applications and APIs [20].

Angular

Angular is a TypeScript-based, accessible, and open-source web application framework led by the Angular Team at Google and by a community of individuals and corporations. Angular is a complete rewrite from the same team that built AngularJS. Angular is a single-page application framework for fast web Applications [21].

Node.js

Node.js is a cross-platform, open-source server environment that can run on Windows, Linux, Unix, macOS, and more. Node.js is a backend JavaScript runtime environment that runs on the V8 JavaScript Engine and executes JavaScript code outside a web browser [22].

Heroku

Heroku is a platform as a service (PaaS) in the cloud that makes it easier and faster to launch and manage web applications. Developers can easily design, scale, and maintain applications in this austere environment without worrying about infrastructure administration [23].

RestAPI

An API, or *application programming interface*, rules define how applications or devices can connect to and communicate [24].

WEBSITE SYSTEM ARCHITECTURE AND MODULE

Ecotopia can only be accessed online. The features available in the application are discussed below. See Figure 1 to see more of the modules presented.

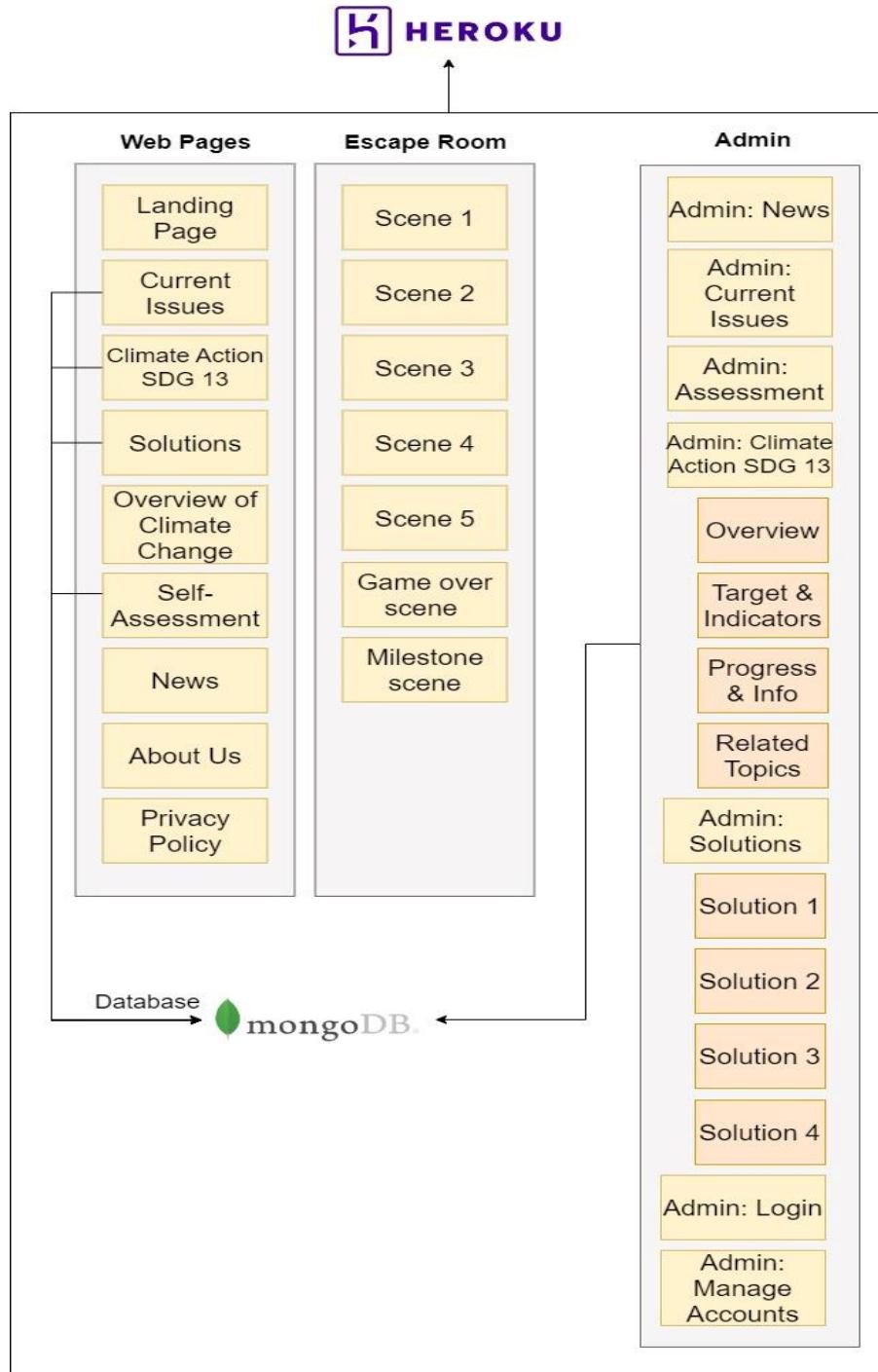


Figure 1. Ecotopia System Architecture

Landing Page Module

In this module, the users will experience parallax effect scrolling with some animation. They can also see the solutions towards a sustainable future here.

Current Issues Module

In this module, the users will read about the current issues of climate change in the Philippines, such as climate change scenarios and the impact of climate change.

Climate Action SDG13 Module

In this module, the users can view the details about the UN SDG no. 13.

Solutions Module

This module presents different solutions, like responding to climate change, other solutions to climate change, and sustainability and government resources.

Overview of Climate Change Module

This module presents an overview of climate change, indicating how much the sea level has risen since then, ocean warming, global temperature, etc., and an example of human-made infrastructure that causes global warming.

Self-Assessment Module

In this module, the users can take a quiz to measure their understanding of the learning materials presented.

News Module

In this module, different news & features about climate change that users can read and inform about the latest issue of the said event.

Escape Room (Game)

In this module, the user will be able to navigate and play the game titled "Escape Room" it consists of the five-level scenario of a water environment; the gameplay instructions and narration will be displayed upon navigation.

About Us Module

In this module, the users can view the team behind the project and the goals, partners, and contacts.

Admin Login Module

In this module, only the admin can log in, modify the learning material with an in-line text editor, and publish the contents.

Admin Accounts

In this module, the super admin can access and manage it exclusively. The super admin can create, read, update, and delete accounts. However, there is a default account that the super admin cannot be deleted.

Admin News

The admin can add, edit, and delete news content in this module. The structure is fixed and cannot be modified.

Admin Current Issues Module

In this module, the admin can edit the current issues' content materials with an in-line text editor and publish it. The structure is fixed and cannot be modified.

Admin Self-Assessment Module

In this module, the admin can edit the assessment content with an in-line text editor and publish it. The structure is fixed and cannot be modified.

Admin Climate Action S.D.G. 13 Module

In this module, the admin can edit the learning materials with an in-line text editor and publish them. The structure is fixed and cannot be modified.

Admin Solutions Module

In this module, the admin can edit the solutions learning materials with an in-line text editor and publish them. The structure is fixed and cannot be modified.

CHAPTER 4

METHODOLOGY, RESULTS AND DISCUSSION

In this chapter, the researcher explores the essential components of software development. The primary focus lies on the requirements analysis and documentation, the designing phase utilizing various models, the development process, and the testing procedures to ensure software quality and dependability.

4.1 REQUIREMENTS ANALYSIS AND DOCUMENTATION

Project Design Methodology

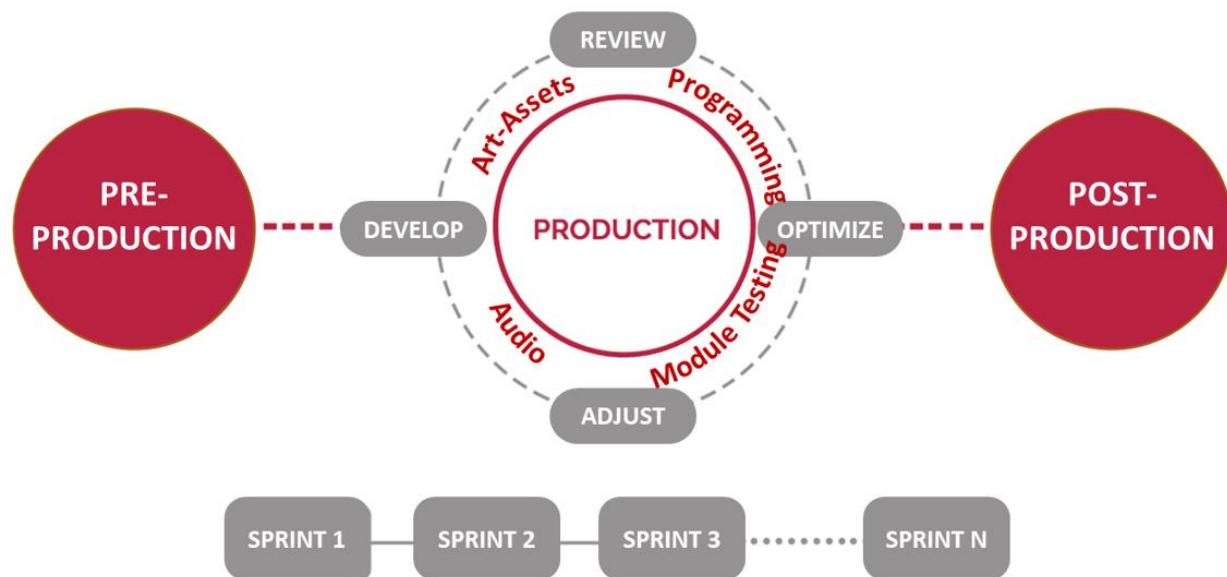


Figure 2. Web and Game Content Development

Figure Reference: Drafting a Comprehensive Schema for the Development of Gamified Learning Application for National University



Figure 3. Outlined Web and Game Phases

Figure Reference: *Drafting a Comprehensive Schema for the Development of Gamified Learning Application for National University*

Figures 2 and 3 highlight the production process model of parallax web development and the various phases involved in game development, including conceptualization, pre-production, and post-production phases. These processes are suitable for the production stage of a parallax website with a mini arcade game.

Conceptualization phases begin with establishing a clear vision or the direction of the implementation; ultimately, it is the setting stage for the successful execution of the project.

Pre-production started with drafting concepts, scenario writing, research, and content gathering since ideas needed to be finalized before production began. The drafts of the content and assets follow the finalization of the images.

Production phases are clearly defined tasks. These tasks include executing the scenarios that have been outlined, creating objects, images, backgrounds, and sounds to be used in the game, and filtering the gathered data in addressing the topic.

Sprint takes place for the development process, allowing for the project's breakdown into manageable components. It aims to deliver a functional website and game within a short, predefined timeframe.

Development is the first phase in the production phase, which includes creating, organizing, and integrating an output that was based on the planning process in the pre-

production stage. Web and game development includes creating assets such as images, objects, backgrounds, and thumbnails and researching and gathering information content and sound discovery for game production.

The review phase is wherein the developers carefully examine the web and game problems, like unnecessary data contents and assets, by closely monitoring the output. Identifying and addressing errors will be under the development modification.

Optimization occurs after thoroughly reviewing the output produced during the development phase. During this stage, enhancements and other considerations are implemented to enhance the website's overall Functionality and refine the game arrangements.

Adjustments take place before the system is deployed. To ensure the best state of the website, the developer takes the opportunity to identify and resolve any remaining issues and improvements needed to provide a quality user interface and experience.

Post-production is the last phase, considering revisions are also done during production. Thus, there aren't significant adjustments needed aside from resizing assets, adjusting formats, minor changes to the web content, or adjusting some web UI.

Table 4 shows the distinct stages of web and game development, comprising a range of activities and specific goals to accomplish.

Table 4. Web and Game Development Phases, Activities, and List of Deliverables

Web and Game Development Phases	ACTIVITIES	DELIVERABLES
Conceptualization	<ul style="list-style-type: none"> • Generating topic ideas. • Team formation • Outlining Milestones 	<ul style="list-style-type: none"> • Topic Proposal • Team roles • Gantt Chart
Pre-production	<ul style="list-style-type: none"> • Outline the scope and limitation of the proposed system. • Drafting web and game assets, and mechanics. • Design the overall UI and UX of the web pages. • Research and gather information related to the study. • Propose the system to client 	<ul style="list-style-type: none"> • Scope and limitations of the system • Game mechanics and assets. • UI/UI of webpages in Figma • Constructed information about climate change. • Client software agreement
Production (Develop, Review, Optimize, Adjust)	<ul style="list-style-type: none"> • Illustrate system architecture of the system. • Program the UI/UX of the system. • Implement good coding practices. • Security Checklist. • Develop the backend and game. • Draw the assets for web and game. • Align the website theme to Manila DRRM • Identify bugs, and errors 	<ul style="list-style-type: none"> • System architecture. • Web and Game UI/UX. • Backend functions. • Game functions. • Assets for the web and game. • Website theme. • Clean code • OWASP Web Security compliance • Testing result. • Update errors in result. • Fix bugs and errors
Post-production	<ul style="list-style-type: none"> • Compress assets to optimize performance efficiency. 	<ul style="list-style-type: none"> • Compressed assets

	<ul style="list-style-type: none"> • Deploy the website. • Assess Website after deployment. • Look for bugs. 	<ul style="list-style-type: none"> • Complete the proposed system.
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Ecotopia comprises several modules to showcase its functionalities. See Table 5 and Table 6 to explore more about the functional requirements of the Ecotopia web Application.

Table 5. Functional Requirements for Ecotopia Web Application

Functional Requirement ID	Function	Description	Access Type
FR ID #1	Landing Page	<p>This module allows users to experience the parallax-enabled website and gain insights about different climate change insights.</p> <p>Output:</p> <ul style="list-style-type: none"> • Parallax-enabled web page 	<p>This module can be viewed by:</p> <ul style="list-style-type: none"> • Users • Admin
FR ID #2	Materials	<p>This module enables user to easily browse and explore materials, offering a user-friendly interface to cater to all material-related requirements.</p> <p>Output:</p> <ul style="list-style-type: none"> • Materials Page 	<p>This module can be viewed by:</p> <ul style="list-style-type: none"> • Users • Admin
FR ID #3	Current Issues	<p>This module offers the user a seamless structure to stay informed and up to date.</p> <p>Output:</p> <ul style="list-style-type: none"> • Current Issues Page 	<p>This module can be viewed by:</p> <ul style="list-style-type: none"> • Users • Admin

FR ID #4	Climate Action SDG 13	<p>This module provides user with comprehensive information regarding climate change.</p> <p>Output:</p> <ul style="list-style-type: none"> • Climate Action SDG 13 Page 	<p>This module can be viewed by:</p> <ul style="list-style-type: none"> • Users • Admin
FR ID #5	Solutions	<p>This module provides users with effective tools and strategies to address climate change.</p> <p>Output:</p> <ul style="list-style-type: none"> • Solutions Page 	<p>This module can be viewed by:</p> <ul style="list-style-type: none"> • Users • Admin
FR ID #6	Overview of Climate Change	<p>This module provides users with comprehensive educational resources.</p> <p>Output:</p> <ul style="list-style-type: none"> • Overview of Climate Change Page 	<p>This module can be viewed by:</p> <ul style="list-style-type: none"> • Users • Admin
FR ID #7	Self-Assessment	<p>This module will allow user to conduct a short assessment to test their knowledge after reading the materials.</p> <p>Output:</p> <ul style="list-style-type: none"> • Self-Assessment Page 	<p>This module can be viewed by:</p> <ul style="list-style-type: none"> • Users • Admin
FR ID #8	News	<p>This module provides users with the latest and most recent data and reports to keep them informed.</p> <p>Output:</p> <ul style="list-style-type: none"> • Directed to News Page 	<p>This module can be viewed by:</p> <ul style="list-style-type: none"> • Users • Admin
FR ID #9	Game	<p>This module allows users to dive into a gaming experience.</p> <p>Output:</p> <ul style="list-style-type: none"> • Game Page 	<p>This module can be viewed by:</p> <ul style="list-style-type: none"> • Users • Admin

FR ID #10	About Us	<p>This module enables users to learn about our dedication to achievement and explore our background.</p> <p>Output:</p> <ul style="list-style-type: none"> • Directed to About Us Page 	<p>This module can be viewed by:</p> <ul style="list-style-type: none"> • Users
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**Table 6. Functional Requirements for Ecotopia Web Application
(Administrator)**

Functional Requirement ID	Function	Description
FR ID #1	Admin Log In	<p>This module will allow admin to access the application with the created administrator account.</p> <p>Input:</p> <ul style="list-style-type: none"> • Admin Account and Password. <p>Output:</p> <ul style="list-style-type: none"> • Different Admin Web pages.
FR ID #2	Admin News	<p>This module will allow admin to access the application with the created administrator account.</p> <p>Input:</p> <ul style="list-style-type: none"> • Modify the content according to specification. <p>Output:</p> <ul style="list-style-type: none"> • Add, edit, and delete content.
FR ID #3	Admin Current Issues	<p>This module allows the admin to update the content of current issues in PH.</p> <p>Input:</p> <ul style="list-style-type: none"> • Modify the content according to specification. <p>Output:</p>

		<ul style="list-style-type: none"> • Updated content.
FR ID #4	Admin Climate Action SDG 13	This is an admin navigation bar that enables admin to expand its drop-down menu.
FR ID #5	Admin SDG 13	<p>This module enables admin to update certain content about UN SDG 13.</p> <p>Input:</p> <ul style="list-style-type: none"> • Modify the content according to specification. <p>Output:</p> <ul style="list-style-type: none"> • Updated content.
FR ID #6	Admin Overview	<p>This module enables admin to update certain content about UN SDG 13.</p> <p>Input:</p> <ul style="list-style-type: none"> • Modify the content according to specification. <p>Output:</p> <ul style="list-style-type: none"> • Updated content
FR ID #7	Admin Target and Indicators	<p>This module enables admin to update certain content about UN SDG 13.</p> <p>Input:</p> <ul style="list-style-type: none"> • Modify the content according to specification. <p>Output:</p> <ul style="list-style-type: none"> • Updated data/content.
FR ID #8	Admin Progress and Info	<p>This module enables admin to update certain content about UN SDG 13.</p> <p>Input:</p> <ul style="list-style-type: none"> • Modify the content according to specification. <p>Output:</p> <ul style="list-style-type: none"> • Updated content.
FR ID #9	Admin Related Topics	This module enables admin to update certain content about UN SDG 13.

		<p>Input:</p> <ul style="list-style-type: none"> • Modify the content according to specification. <p>Output:</p> <ul style="list-style-type: none"> • Updated content.
FR ID #10	Admin Solutions	<p>This module allows admin to update effective solutions for addressing climate change.</p> <p>Input:</p> <ul style="list-style-type: none"> • Modify the content according to specification. <p>Output:</p> <ul style="list-style-type: none"> • Updated content.
FR ID #11	Admin Solution 1	<p>This module allows admin to update effective solutions for addressing climate change.</p> <p>Input:</p> <ul style="list-style-type: none"> • Modify the content according to specification. <p>Output:</p> <ul style="list-style-type: none"> • Updated content
FR ID #12	Admin Solution 2	<p>This module allows admin to update effective solutions for addressing climate change.</p> <p>Input:</p> <ul style="list-style-type: none"> • Modify the content according to specification. <p>Output:</p> <ul style="list-style-type: none"> • Updated content.
FR ID #13	Admin Solution 3	<p>This module allows admin to update effective solutions for addressing climate change.</p> <p>Input:</p> <ul style="list-style-type: none"> • Modify the content according to specification. <p>Output:</p> <ul style="list-style-type: none"> • Updated content.

FR ID #14	Admin Self-Assessment	<p>This module enables admin to update the questions and answers.</p> <p>Input:</p> <ul style="list-style-type: none"> • Modify the content and correct answer according to specification. <p>Output:</p> <ul style="list-style-type: none"> • Updated questions and answers.
FR ID # 15	Admin Accounts	<p>This module enables super admin to create, update, reset password and delete accounts.</p> <p>Input:</p> <ul style="list-style-type: none"> • Add new information for creation of new admin account. • Modify and update the selected account according to specification. • Reset password of the selected account. • Delete selected account. <p>Output:</p> <ul style="list-style-type: none"> • New account created. • Updated account information. • Modified reset account password. • Deleted selected account.

Table 7. Non-Functional Requirements

Criteria	Requirement Description
Functionality	<p>The system should</p> <ul style="list-style-type: none"> • Provide Climate action SDG about climate change. • Show available and timely Solutions. • Provide timely information for Current issues. • Provide important and relevant information regarding Climate Change in the Philippines. • Give edit access for admin accounts upon login. • Include lists of reputable sources used. • Run the mini-arcade game.
Usability	<p>The system should</p> <ul style="list-style-type: none"> • Effectively read the texts on the screen. • Icons are understandable and simple. • Webpage layout should be responsive according to specification.
Reliability	<p>The system should</p> <ul style="list-style-type: none"> • Function appropriately with good network connectivity when the webpages are in use.
Performance Efficiency	<p>The system should</p> <ul style="list-style-type: none"> • Provide an easy and convenient way to view and explore information about Climate Change. • Function properly with the network connection to satisfy the need of the users.
Security	<p>The system should</p> <ul style="list-style-type: none"> • Accessed by the authorized user only. • Reject failures in input validation. • Have data privacy statement.

Table 7 is a complete list of the detailed non-functional requirements the system must fulfill. The table serves as a repository for these specifications and an overview of the system's capabilities, providing clients with valid information.

4.2 DESIGN OF SOFTWARE, SYSTEMS, PRODUCT, AND/OR PROCESSES

USE CASE DIAGRAM

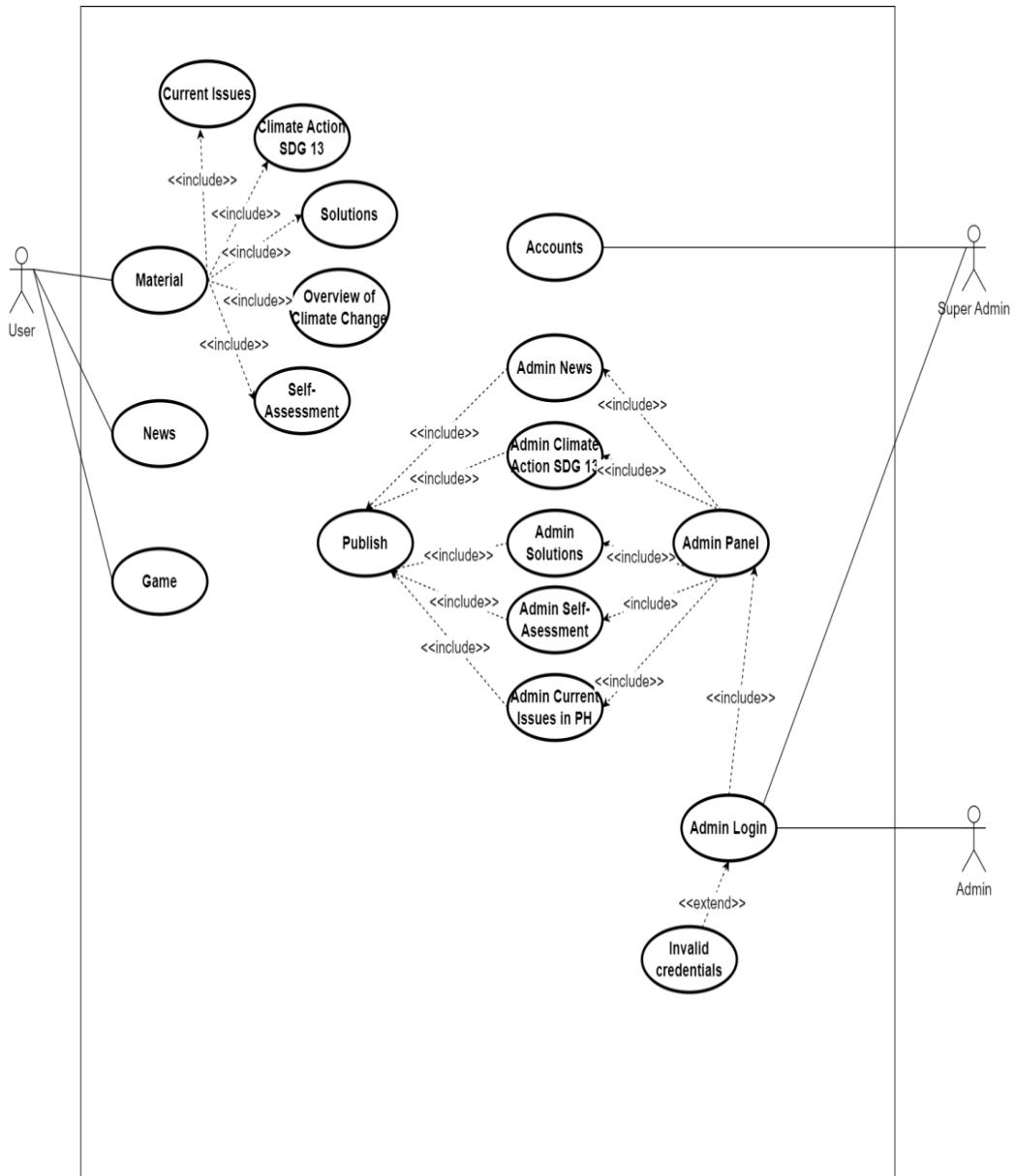


Figure 4. Ecotopia Use Case Diagram

Figure 4 illustrates the system's use case diagram. It enables the analysts to recognize the system requirements and demonstrates the procedures that should be possible inside the system's limit. It additionally includes the two actors in the system. The system actors are the user and administrator. The user can directly access the Material, and there are items that the user can choose from in the Material. There are current issues, climate action S.D.G. 13, solutions, an

overview of climate change, and self-assessment. Moreover, users can access news, and lastly, they can play the game. A user can only directly access the admin panel if logging in first.

The administrator can log in with an admin login. It will redirect to the admin panel, which contains links for different admin pages like admin accounts that have two user roles, which are super admin and admin role, admin current issue, admin climate action S.D.G. 13, admin S.D.G. 13 admin overview, admin target and indicators, admin progress, and info, admin related topics, admin solutions, admin solution 1, admin solution 2, admin solution 3, admin self-assessment, admin news, and admin current issues. Once editing is done, the admin can click publish to publish the modified content. If the credentials are invalid, the admin cannot log in.

Table 8. Use Case Narrative for Material

Use Case Name		Material – Web Application
Actor	User	
Objectives	To provide website users access to a vast number of resources about climate change.	
Entry Conditions	<ul style="list-style-type: none"> The User should select the Material tab. The user is on the climate change website's material. 	
Success End Condition	The user successfully accesses and navigates the “Material” tab.	
Fail End Condition	<ul style="list-style-type: none"> Without internet, it is unable to view the Material. The user is unable to access the Material tab due to technical issues 	
Alternative	<ul style="list-style-type: none"> The user did not click the “Materials” Tab. 	
Main Scenario	<ol style="list-style-type: none"> The user clicks the Material tab. The user will see the material lists. 	

Table 9. Use Case Narrative for Current Issues

Use Case Name		Current Issue – Web Application
Actor	User	
Objectives	To provide users the most recent information possible on the most important climate change issues affecting the Philippines.	
Entry Conditions	<ul style="list-style-type: none"> The user should select the Current Issues section. 	

	<ul style="list-style-type: none"> The user is on the climate change website's current issues section.
Success End Condition	<ul style="list-style-type: none"> The user successfully accesses and navigates the "Current Issues." The user obtains a deeper understanding of the global impacts of climate change as well as its local impacts.
Fail End Condition	<ul style="list-style-type: none"> Without internet, it is unable to view the Current Issues The user is unable to access the Current Issues due to technical issues.
Alternative	<ul style="list-style-type: none"> The user did not click the "Materials" tab to see the sub module for Current Issues. The user did not click "Current Issues" tab.
Main Scenario	<ol style="list-style-type: none"> 1. The user clicks the Material tab. 2. The user selects the Current Issues. 3. The user will see the content and read.

Table 10. Use Case Narrative for Climate Action SDG13

Use Case Name		Climate Action SDG 13 – Web Application
Actor	User	
Objectives	To educate users on the many aspects of climate change through concrete instances.	
Entry Conditions	<ul style="list-style-type: none"> The user should select the Climate Action SDG 13 section. The user is on the climate change website's climate action SDG 13 section. 	
Success End Condition	<ul style="list-style-type: none"> The user successfully accesses and navigates the "Climate Action SDG 13." The user is interested in finding out more about specific instances of climate change. 	
Fail End Condition	<ul style="list-style-type: none"> Without internet, it is unable to view the Climate Action SDG 13. The user is unable to access the Climate Action SDG 13 due to technical issues. 	

Alternative	<ul style="list-style-type: none"> The user did not click the “Materials” tab to see the sub module for Climate Action SDG 13. The user did not click “Climate Action SDG 13” tab.
Main Scenario	<ol style="list-style-type: none"> 1. The user clicks the Material Tab. 2. The user selects the Climate Action SDG 13. 3. The user has an option of four climate action SDG 13 to read. 4. The user will see the content and read.

Table 11. Use Case Narrative for Solutions

Use Case Name	Solutions – Web Application
Actor	User
Objectives	To provide for users a complete set of useful methods to mitigate and protect for climate change.
Entry Conditions	<ul style="list-style-type: none"> The user should select the Solutions section. The user is on the climate change website's Solutions section
Success End Condition	<ul style="list-style-type: none"> The user successfully accesses and navigates the "Solutions." The user has a deeper understanding of the many strategies and initiatives used to mitigate climate change.
Fail End Condition	<ul style="list-style-type: none"> Without internet, it is unable to view the Solutions. The user is unable to access the Solutions due to technical issues.
Alternative	<ul style="list-style-type: none"> The user did not click the “Materials” tab to see the sub module for Solutions. The user did not click “Solutions” tab.
Main Scenario	<ol style="list-style-type: none"> 1. The user clicks the Material Tab. 2. The user selects the Solutions. 3. The user has an option of Three Solutions and Government Resources to read. 4. The user will see the content and read.

Table 12. Use Case Narrative for Overview of Climate Change

Use Case Name		Overview of Climate Change – Web Application
Actor	User	
Objectives	To educate users of the urgent nature and importance of mitigating global climate change.	
Entry Conditions	<ul style="list-style-type: none"> The user should select the Overview of Climate Change section. The user is on the climate change website's Overview of Climate Change section. 	
Success End Condition	<ul style="list-style-type: none"> The user successfully accesses and navigates the "Overview of Climate Change." The user receives an in-depth understanding of the climate change science, including its causes and effects, evidence, and solutions. 	
Fail End Condition	<ul style="list-style-type: none"> Without internet, it is unable to view the Overview of Climate Change. The user is unable to access the Overview of Climate Change due to technical issues. 	
Alternative	<ul style="list-style-type: none"> The user did not click the "Materials" tab to see the sub module for Overview of Climate Change. The user did not click "Overview of Climate Change" tab. 	
Main Scenario	<ol style="list-style-type: none"> 1. The user clicks the Overview of Climate Change. 2. The user will see the content and read. 	

Table 13. Use Case Narrative for Self-Assessment

Use Case Name		Self-Assessment – Web Application
Actor	User	
Objectives	To evaluate users' understanding and knowledge of climate change	
Entry Conditions	<ul style="list-style-type: none"> The user should select the Self-Assessment section. The user is on the climate change website's Self-Assessment section. 	
Success End Condition	<ul style="list-style-type: none"> The user successfully accesses and completes the "Self-Assessment." The user receives scores that show how much they have learned. 	
Fail End Condition	<ul style="list-style-type: none"> The user is unable to access or finish the Self-Assessment due to technical issues. When the questions are not answered or something is forgotten, a prompt message will appear "Please answer all questions before submitting." 	
Alternative	<ul style="list-style-type: none"> The user did not click the "Materials" tab to see the sub module for Self-Assessment. The user did not click "Self-Assessment" tab. 	
Main Scenario	<ol style="list-style-type: none"> 1. The user clicks the Self-Assessment 2. The user will answer the Self-Assessment. 3. When 10 questions in the self-assessment are answered, it can be submitted. 4. Self-assessment have a submit button. 5. The user can see the score of the self-assessment. 	

Table 14. Use Case Narrative for News

Use Case Name		News – Web Application
Actor	User	
Objectives	To provide users with the latest and most recent news and updates related to climate change	
Entry Conditions	<ul style="list-style-type: none"> The user should select the News tab. The user is on the climate change website's News. 	
Success End Condition	<ul style="list-style-type: none"> The user successfully accesses and navigates the "News" tab. The user understands more about current climate-related occurrences. 	
Fail End Condition	<ul style="list-style-type: none"> Without internet, it is unable to view the News. The user is unable to access the News tab due to technical issues. 	
Alternative	<ul style="list-style-type: none"> The user did not click the "News" tab. 	
Main Scenario	<ol style="list-style-type: none"> The user clicks the News tab. The user will see the content and read. 	

Table 15. Use Case Narrative for Game

Use Case Name		Game – Web Application
Actor	User	
Objectives	To provide games with a climate change theme to interact with user in a fun and useful way.	
Entry Conditions	<ul style="list-style-type: none"> The user should select the Games tab. The user is on the climate change website's Games. 	
Success End Condition	<ul style="list-style-type: none"> The user successfully accesses and navigates the "Games" tab. After playing the games, the user gets inspired to learn more about climate change and its impacts. 	
Fail End Condition	<ul style="list-style-type: none"> Without internet, it is unable to play the games. The user is unable to access the Games tab or playing the games due to technical issues. 	

Alternative	<ul style="list-style-type: none"> The user did not click the “Game” tab.
Main Scenario	<ol style="list-style-type: none"> The user clicks the Games Tab. The user will play five-level games.

Table 16. Use Case Narrative for Admin Login

Use Case Name		Login – Web Application
Actor	Admin & Super Admin	
Objectives	<ul style="list-style-type: none"> The admin must log in to the application using admin account. To ensure the privacy and accuracy of website data and preferences 	
Entry Conditions	<ul style="list-style-type: none"> The admins should be able to access the web application. The admin has the valid login credentials. The admin has permission to manage the Ecotopia website. 	
Success End Condition	<ul style="list-style-type: none"> The admin successfully accesses the admin login page and enters valid credentials. The admin can perform to update content of the Ecotopia website's content. 	
Fail End Condition	<ul style="list-style-type: none"> A toaster message will appear with the phrase “User is not authenticated. Please try again.” The admin is unable to access the Admin Login page due to technical issues 	
Alternative	<ul style="list-style-type: none"> The admin did not access the login page successfully. The admin input invalid credentials. The admin input credentials are empty. The admin is not connected to internet connection. 	
Main Scenario	<ol style="list-style-type: none"> The admin enters email address credentials. The admin enters password credentials. The admin clicks the Login button. 	

Table 17. Use Case Narrative for Admin Invalid Credentials

Use Case Name		Admin Invalid Credentials – Web Application
Actor	Admin & Super Admin	
Objectives	To provide admin feedback on whether their login credentials are valid.	
Entry Conditions	<ul style="list-style-type: none"> The admin has opened the application or website. The admin is not currently logged in. 	
Success End Condition	<ul style="list-style-type: none"> The admin successfully logs in with valid credentials. The admin chooses to try logging in again with valid credentials. 	
Fail End Condition	<ul style="list-style-type: none"> The user closes the application or website without successfully logging in. 	
Alternative	<ul style="list-style-type: none"> The admin did not access the login page. The admin did not input valid credentials to access the admin page. The admin is not connected to internet connection. 	
Main Scenario	<ol style="list-style-type: none"> The admin opens the application or website. The admin is prompted to log in with their username and password. The admin enters their credentials (username and password). The system validates the credentials. If the credentials are valid, the user is successfully logged in. If the credentials are invalid, an error message is displayed, informing the admin user that the credentials are incorrect. If the admin tries 5 attempts to log in, the user will wait 20 minutes before trying to log in with credentials. The procedure keeps on until the user signs in successfully or decide to take another action. 	

Table 18. Use Case Narrative for Admin Panel

Use Case Name		Admin Panel – Web Application
Actor	Admin & Super Admin	
Objectives	<ul style="list-style-type: none"> The admin must log in to the application using admin account. To efficiently manage web contents within the application, ensuring the security and integrity of the website. 	
Entry Conditions	<ul style="list-style-type: none"> The admin must have successfully logged into the admin panel. The admin panel must be available and accessible. 	
Success End Condition	<ul style="list-style-type: none"> The admin successfully completes the selected system content management action. 	
Fail End Condition	<ul style="list-style-type: none"> The admin is unable to access the Admin Login page due to technical issues 	
Alternative	<ul style="list-style-type: none"> The admin did not access the login page. The admin did not successfully access and navigate admin panel. The admin is not connected to internet connection. 	
Main Scenario	<ol style="list-style-type: none"> 1. The admin successfully logs in. 2. The logs into the admin panel. 3. Admin selects one of the following tabs: News, Current Issues, Assessment, Climate action SDG 13, SDG 13, Overview, Target and Indicators, Progress and Info, Related Topics, Solutions, Solution 1, Solution 2, Solution 3, Log Out. 4. Admin can perform actions (edit and update) if necessary and only “News” can add and delete contents. 	

Table 19. Use Case Narrative for Admin Accounts

Use Case Name		Admin Accounts – Web Application
Actor	Super Admin	
Objectives	<ul style="list-style-type: none"> The admin must log in to the application using admin account. To efficiently manage web contents within the application, ensuring the security and integrity of the website. 	
Entry Conditions	<ul style="list-style-type: none"> The admin must have successfully logged into the admin panel. The admin panel must be available and accessible. 	
Success End Condition	<ul style="list-style-type: none"> The admin successfully completes the selected system admin management action. 	
Fail End Condition	<ul style="list-style-type: none"> The admin is unable to access the Admin Login page due to technical issues. 	
Alternative	<ul style="list-style-type: none"> The admin did not access the login page. The admin did not successfully access and navigate admin panel. The admin is not connected to internet connection. 	
Main Scenario	<ol style="list-style-type: none"> 1. The admin successfully logs in 2. The admin logs into the admin accounts 3. Admin selects one of the following buttons: new admin, update info, reset password, delete, close, create account, and logout. 4. Admin can perform actions: create new admin, update info, and delete account. 	

Table 20. Use Case Narrative for Admin News

Use Case Name		Admin News – Web Application
Actor	Admin & Super Admin	
Objectives	To manage and update current climate change news that are relevant to the Philippines.	
Entry Conditions	<ul style="list-style-type: none"> The admin should be able to access the web application. The admin has permission to manage the News. 	
Success End Condition	<ul style="list-style-type: none"> The admin successfully logs in to the admin panel and navigates the “admin News” tab 	
Fail End Condition	<ul style="list-style-type: none"> The admin is unable to access the Admin News page due to technical issues 	
Alternative	<ul style="list-style-type: none"> The admin did not access and navigate the admin page. The admin did not click the “Admin News” tab. The admin is not connected to internet connection. 	
Main Scenario	<ol style="list-style-type: none"> 1. The admin successfully logs in. 2. The admin clicks the admin news. 3. The admin will just click the modified text box and add, edit, and delete the content. 4. The admin clicks the publish button. 	

Table 21. Use Case Narrative for Admin Current Issues

Use Case Name		Admin Current Issues – Web Application
Actor	Admin & Super Admin	
Objectives	To manage and update current climate change news and topics that are relevant to the Philippines.	
Entry Conditions	<ul style="list-style-type: none"> The admin should be able to access the web application. The admin has permission to manage the Current Issues. 	
Success End Condition	<ul style="list-style-type: none"> The admin successfully logs in to the admin panel and navigates the “admin Current Issues” tab. 	
Fail End Condition	<ul style="list-style-type: none"> The admin is unable to access the Admin Current Issues page due to technical issues. 	
Alternative	<ul style="list-style-type: none"> The admin did not access and navigate the admin page. 	

	<ul style="list-style-type: none"> The admin did not click the “Admin Current Issues” tab. The admin is not connected to internet connection.
Main Scenario	<ol style="list-style-type: none"> 1. The admin successfully logs in. 2. The admin clicks the admin current issues. 3. The admin will just click the modified text box and update the content. 4. The admin clicks the publish button.

Table 22. Use Case Narrative for Admin Self-Assessment

Use Case Name	Admin Self-Assessment – Web Application
Actor	Admin & Super Admin
Objectives	To manage and update self-assessment quizzes
Entry Conditions	<ul style="list-style-type: none"> The admin should be able to access the web application. The admin has permission to manage the Admin Self-Assessment.
Success End Condition	<ul style="list-style-type: none"> The admin successfully logs in to the admin panel and navigates the “Admin Self-Assessment” tab.
Fail End Condition	<ul style="list-style-type: none"> The admin is unable to access the Admin Self-Assessment page due to technical issues.
Alternative	<ul style="list-style-type: none"> The admin did not access and navigate the admin page. The admin did not click the “Admin Self-Assessment” tab. The admin is not connected to internet connection.
Main Scenario	<ol style="list-style-type: none"> 1. The admin successfully logs in. 2. The admin clicks the admin self-assessment. 3. The admin will just click the modified text box and update the content. 4. The admin clicks the publish button.

Table 23. Use Case Narrative for Admin Climate Action SDG 13

Use Case Name		Admin Climate Action SDG 13 – Web Application
Actor	Admin & Super Admin	
Objectives	To manage and update climate action SDG 13 of climate change.	
Entry Conditions	<ul style="list-style-type: none"> The admin should be able to access the web application. The admin has permission to manage the Admin Climate Action SDG 13. 	
Success End Condition	<ul style="list-style-type: none"> The admin successfully logs in to the admin panel and navigates the “Admin Climate Action SDG 13” tab. 	
Fail End Condition	<ul style="list-style-type: none"> The admin is unable to access the Admin Climate Action SDG 13 page due to technical issues. 	
Alternative	<ul style="list-style-type: none"> The admin did not access and navigate the admin page. The admin did not click the “Admin Climate Action SDG 13” tab. The admin is not connected to internet connection. 	
Main Scenario	<ol style="list-style-type: none"> 1. The admin successfully logs in. 2. The admin clicks the admin Climate Action SDG 13. 3. The admin will just click the modified text box and update the content. 4. The admin clicks the publish button. 	

Table 24. Use Case Narrative for Admin Solutions

Use Case Name		Admin Solutions – Web Application
Actor	Admin & Super Admin	
Objectives	To manage and update solutions of climate change	
Entry Conditions	<ul style="list-style-type: none"> The admin should be able to access the web application. The admin has permission to manage the Admin Solutions. 	
Success End Condition	<ul style="list-style-type: none"> The admin successfully logs in to the admin panel and navigates the “Solutions” tab. 	
Fail End Condition	<ul style="list-style-type: none"> The admin is unable to access the Solutions page due to technical issues. 	

Alternative	<ul style="list-style-type: none"> • The admin did not access and navigate the admin page. • The admin did not click the “Solutions” tab. • The admin is not connected to internet connection.
Main Scenario	<ol style="list-style-type: none"> 1. The admin successfully logs in. 2. The admin clicks the admin solutions. 3. The admin will just click the modified text box and update the content. 4. The admin clicks the publish button.

Table 25. Use Case Narrative for Admin Publish Button

Use Case Name		Admin Publish Button – Web Application
Actor	Admin & Super Admin	
Objectives	To ensure that users have access to correct and current information by giving administrators the tools they need to manage and publish material inside the content management system effectively.	
Entry Conditions	<ul style="list-style-type: none"> • The web application with the content management system must be running and accessible. • The admin must have a valid and active user account within the admin panel. 	
Success End Condition	<ul style="list-style-type: none"> • The published material is available to users on the website or application, and the admin is notified that it has been successfully published. 	
Fail End Condition	<ul style="list-style-type: none"> • The admin is unable to access the Admin Current Issues page due to technical issues 	
Alternative	<ul style="list-style-type: none"> • The admin did not access and navigate the admin page. • The admin did not click the “Publish” button. • The admin is not connected to internet connection. 	
Main Scenario	<ol style="list-style-type: none"> 1. The admin successfully logs in. 2. The logs into the admin panel. 3. The Admin selects the content item they wish to publish. 4. The Admin reviews and edits the content item as needed. 5. The admin clicks the publish button. 	

6. The system publishes the content item to the website or application.
7. The system notifies the administrator that the content has been published successfully.

FUNCTIONAL DECOMPOSITION DIAGRAM

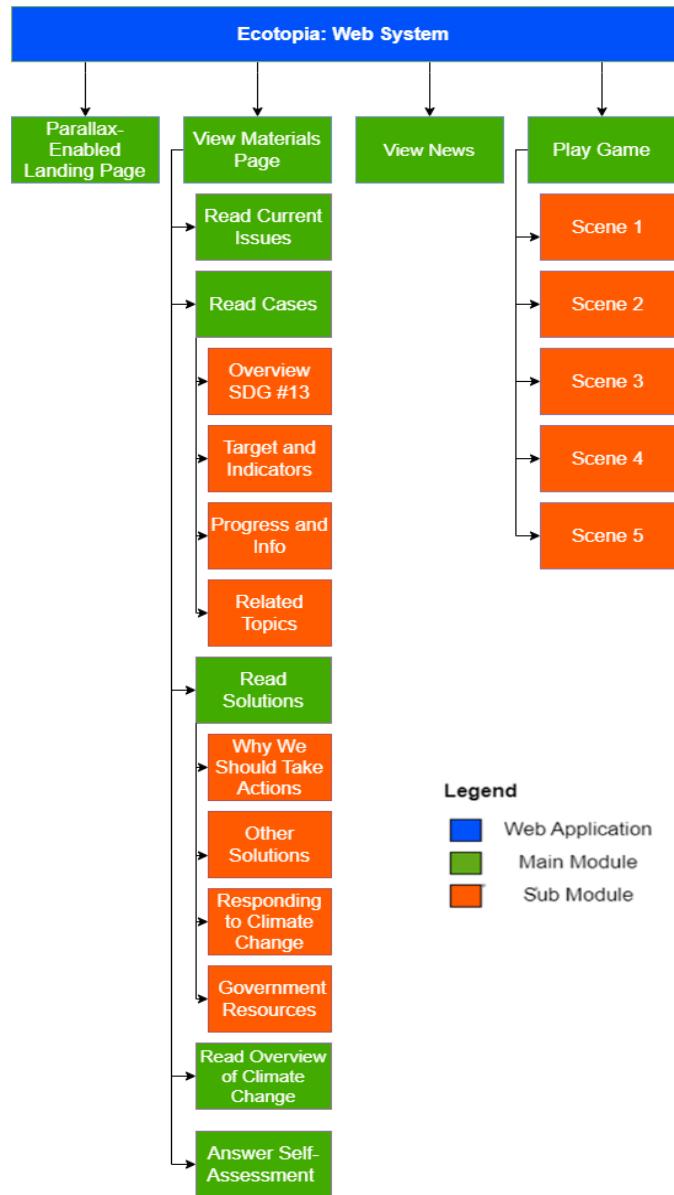


Figure 5. Functional Decomposition (Web System)

Figure 5 shows the Functional Decomposition Diagram of the Ecotopia Web system. Users interact with the parallax-enabled landing page. On the Materials page, users can gain

knowledge by exploring various topics, such as current issues in the Philippines, climate action S.D.G. 13, solutions, and an overview of climate change. After reviewing the materials, users can assess their knowledge by taking a self-assessment. The self-assessment consists of a quiz. Users can read articles and features related to climate change or related topics in the News section. Lastly, users can enjoy the escape room game, which includes five levels. Each scene corresponds to questions and heart points. Failing to complete a task will result in a deduction of heart points.

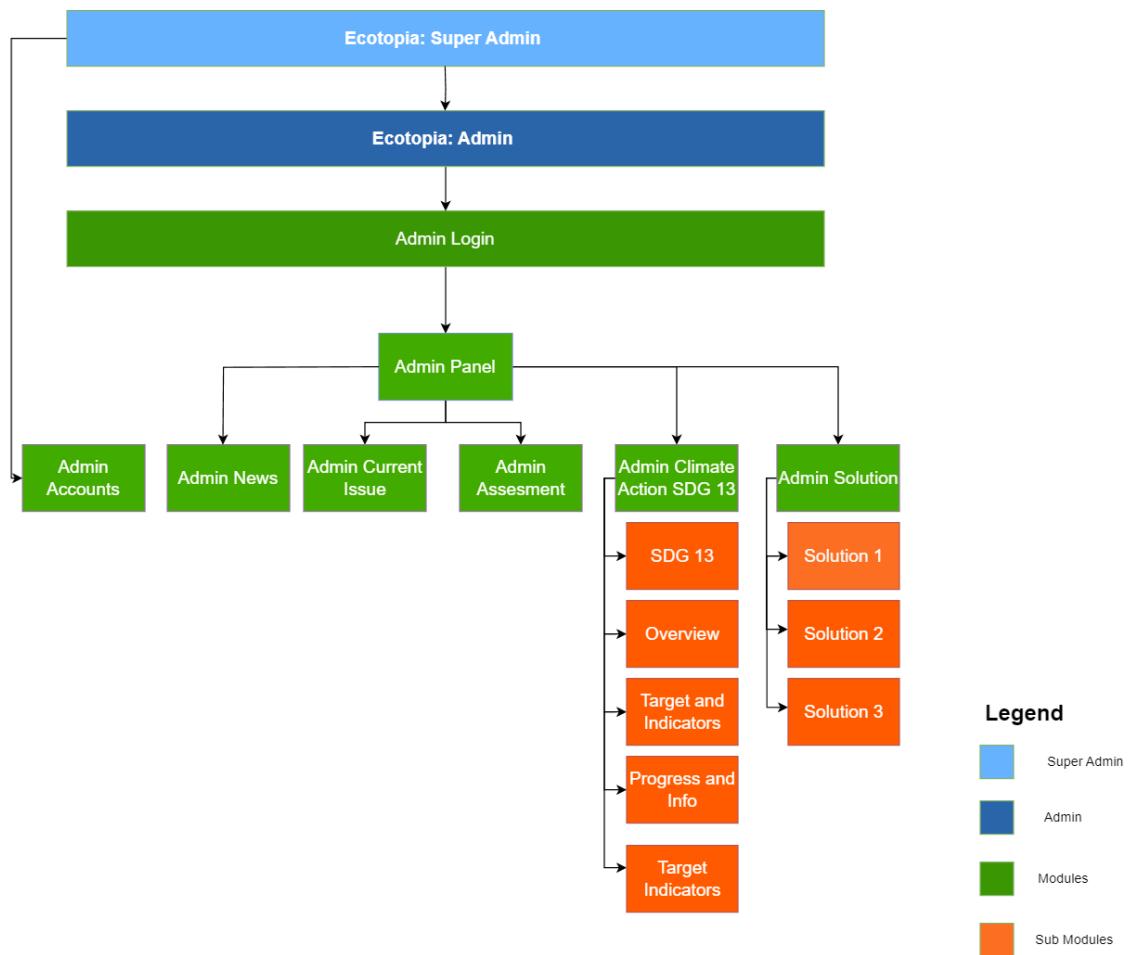


Figure 6. Functional Decomposition (Administrator)

Figure 6 shows the Functional Decomposition Diagram of Ecotopia Admin. This system contains two roles: super admin and admin; super admin is the only one who can access the managing of accounts, and admins can only edit the content. Furthermore, administrators will need to log in to add and delete the news, while the other component will only allow the revision or updating of the content of admin components. They can do so by simply clicking on the text.

This is an inline text editor. After administrators finish their work, they can click the publish button to save the edited content.

SYSTEM FRAMEWORK

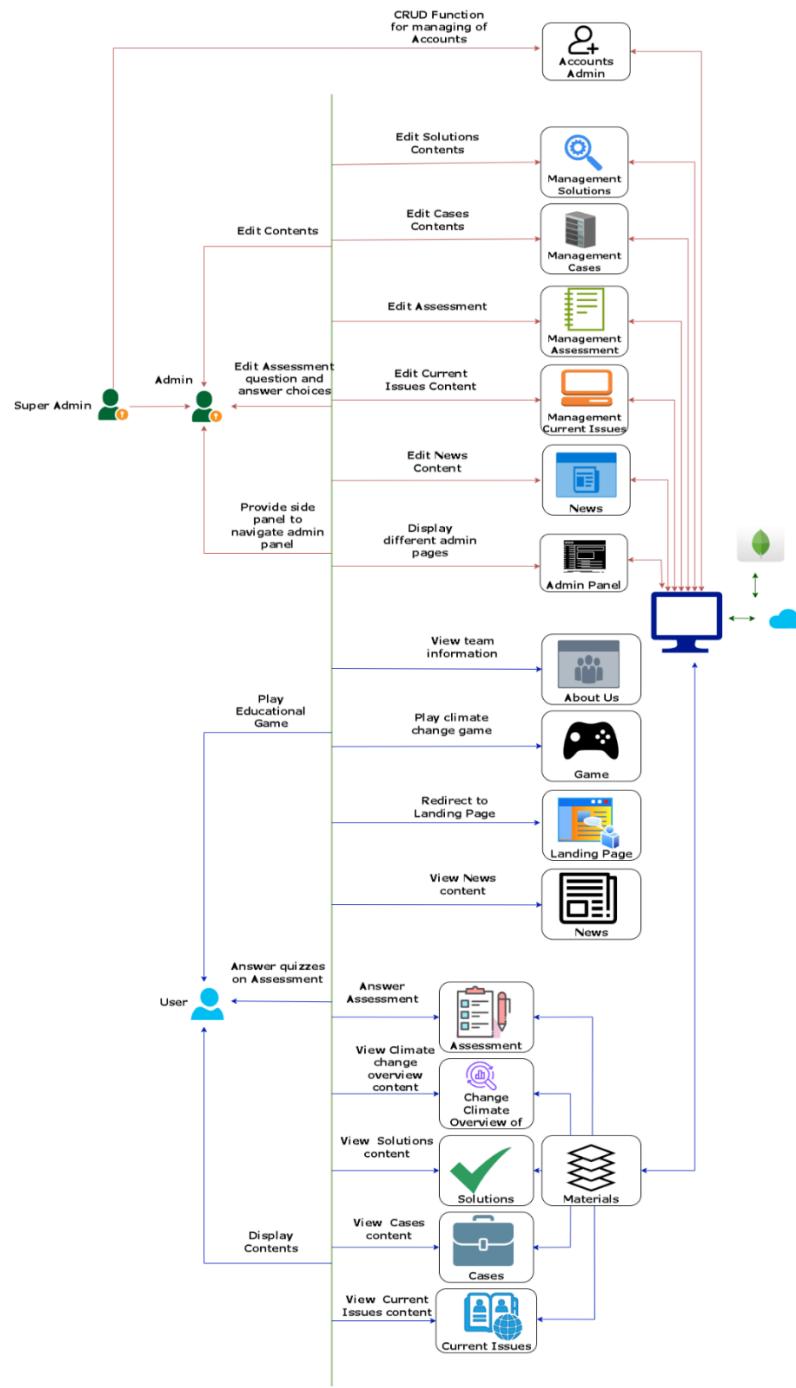


Figure 7. Ecotopia System Framework

Figure 7 shows the System Framework for the Ecotopia Web application. MongoDB's database caters to three key user roles: "User," "Admin," and the "Super Admin." Regular users can explore and navigate the primary modules of "Landing page," "News," "Game," and "About Us." Within the "Materials" module, the user has the benefit of navigating five submodules containing "Current Issues," "Climate Action S.D.G. 13", "Solutions," "Overview of Climate Change," and "Self-Assessment." On the other hand, the Admin Page is exclusive for Admin users to efficiently maintain, modify, and update the contents of "News, Current Issues," Self-Assessment," "Climate Action S.D.G. 13," and "Solutions." Furthermore, Super Admins are the only ones who can manage the CRUD functionality of managing accounts. Admins enhance the overall website functionality and relevance.

SYSTEM FLOWCHART

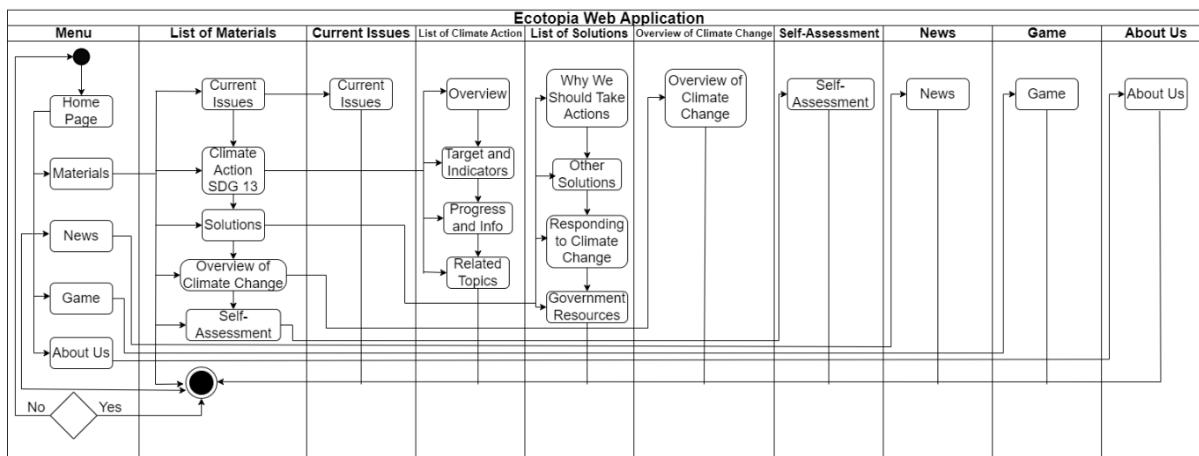


Figure 8. System Flowchart (Website)

The Activity Diagram of the Ecotopia website application is shown in the figure 8 above. The user can navigate the system without requiring a user account or log in. The user can freely engage in the modules without performing actions like providing personal information. They will be directed to the landing page, where the summary of the web application is outlined. Users can navigate the materials section, which consists of climate change data and an assessment page where they can participate to determine if they have learned from the given content. After hovering over the materials, they can engage in a game called Escape Room, which outlines a retro mini arcade game about water pollution in the context of climate change.

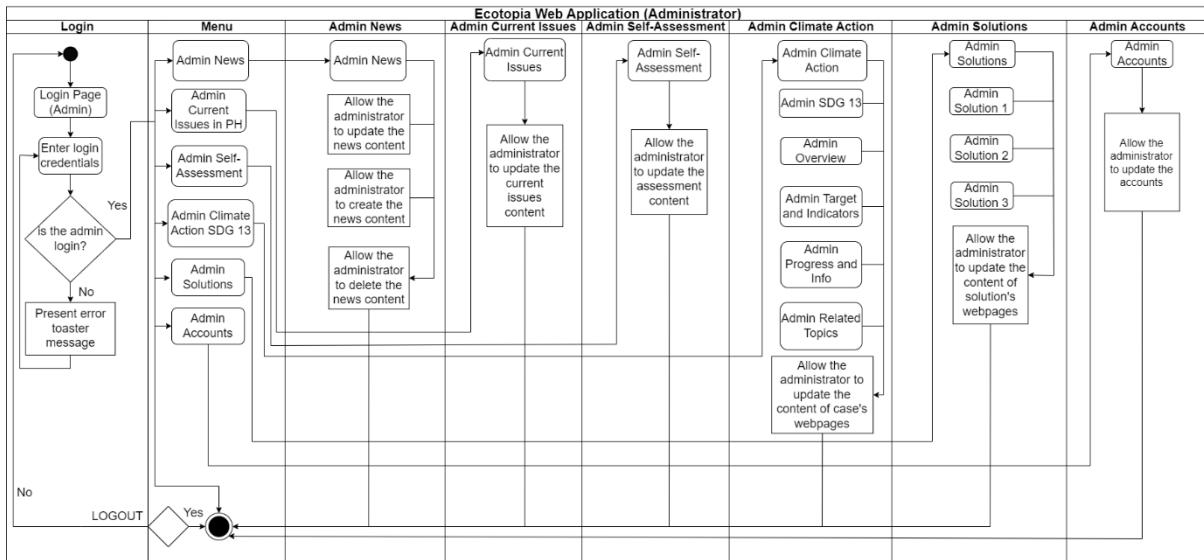


Figure 9. System Flowchart (Super Admin)

The Activity Diagram of the Ecotopia Administrator Web Application is shown in the figure 9 above. To access the admin webpage, the admin must first log in with the credentials given. The admin has access to modify and publish the specific contents on the web modules such as modules, news, current issues, assessments, climate action S.D.G. 13, S.D.G. 13, overview, target and indicators, progress and info, related topics, solutions, solution 1, solution 2, and solution 3. On the other hand, the super admin can access the management of accounts (Admin Accounts), which enables the use of the CRUD functionality.

ABOUT GAME

Title: Climate Escape

Description:

Dive into the World of Climate Escape is a mini arcade game designed to raise awareness about water pollution in the context of climate change. The game encourages players to protect water bodies through its gameplay.

Embark on a journey through various water environments. The game consists of five scenarios related to the water environment. The player must press the arrow keys to move the player to gather litter in the environment. The player has 30 seconds to collect the trash; failure to do so will decrease their heart life. If the player runs out of life, the game is over.

Game Mechanics:

To progress to the game and ultimately "escape," the player must complete each challenge successfully by picking the trash using "space bar" and "arrow keys/WASD key." These challenges are essentially "rooms" within the larger game environment that the player needs to navigate and solve.

Educational Component:

The game can also serve as an educational experience, highlighting the real-world issue of water pollution and the importance of taking action to address it. By connecting the challenges to the title "Escape," you can emphasize that the player's actions are about personal escape and positively impacting the environment.

GAME ASSETS



Figure 10. Scene Background Assets

Figure 10 shows the final 2D scene background used for every scene of the game. This offers a different water environment in an arcade game style. This image was made on Paint Tool Sai v2 and Adobe Photoshop.

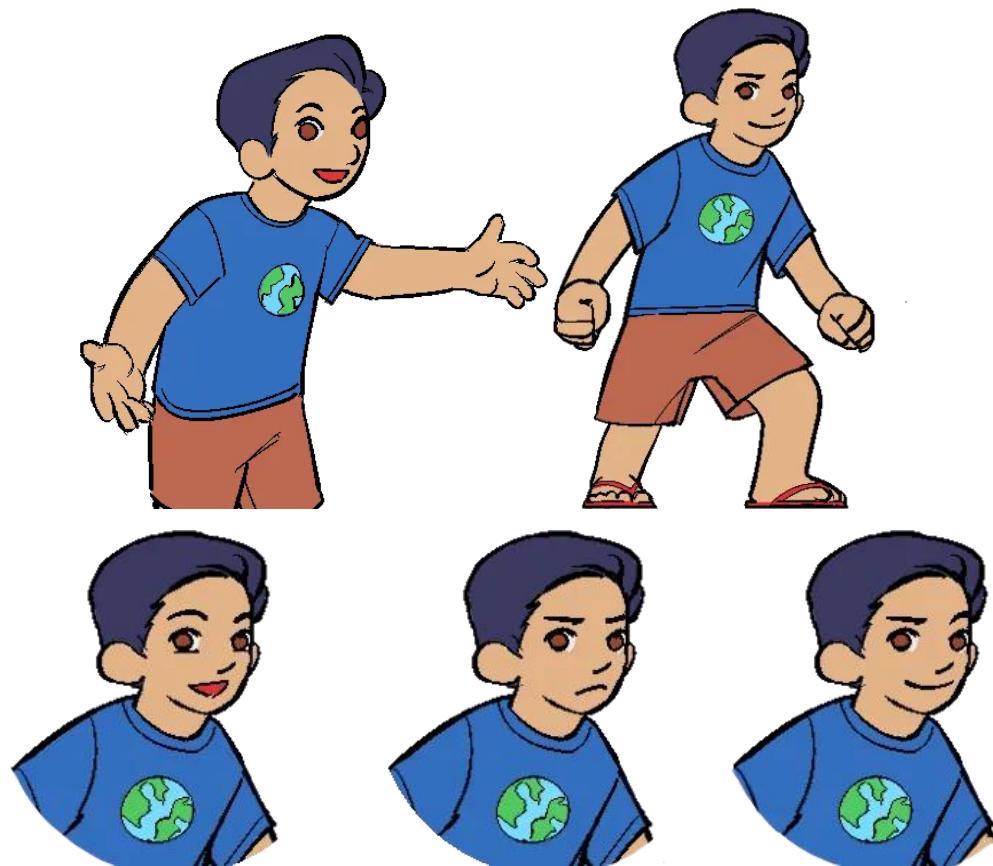


Figure 11. Game Narrator Character Sprites

Figure 11 shows the sprite sheet for Marco, the game narrator, the guide character in the "Climate Escape" arcade game. The sprites were made using the Paint Tool Sai v2 and Adobe Photoshop.



Figure 12. Player Sprite

Figure 12 above shows the sprite for the game player. The sprites were made using the Paint Tool Sai v2 and Adobe Photoshop.

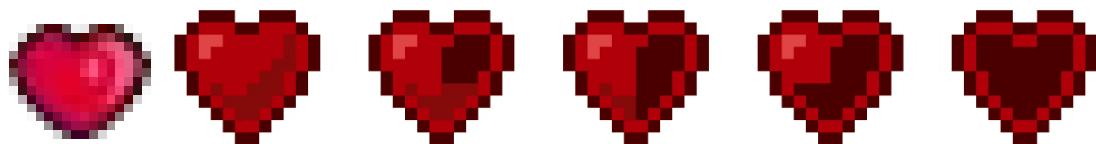


Figure 13. Heart Life Sprite

Figure 13 shows the sprite for the heart life used for the Escape room game. The sprite was made using the Paint Tool Sai v2 and Adobe Photoshop.

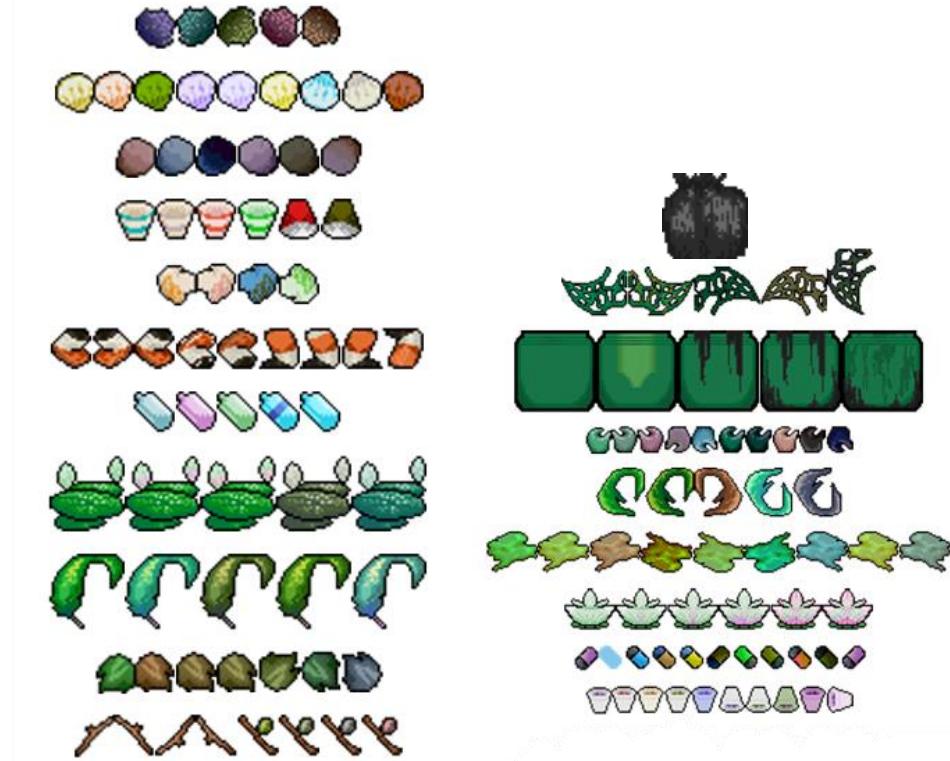


Figure 14. Trash/Garbage Sprites

Figure 14 shows the different sprites of the trash/garbage used for every scene of the Escape Room Game. The sprites were made using the Paint Tool Sai v2 and Adobe Photoshop.

4.3 DEVELOPMENT AND TESTING

Unit Testing

The team performed unit testing to ensure the web application's entries, results, and workflows were accurate. The development team offered feedback on each module during this testing phase to address any problems. Furthermore, the developers were notified of any difficulties by the Quality Assurance tester, and after these issues were resolved, the developers reviewed and made subtle changes. Web application unit testing gave successful and positive outcomes. (Appendix E.)

Table 26. Unit Testing Report Summary for Ecotopia Web Application

TEST CASE		MODULE NAME	REMARKS
SPECIFICATION	ID		
	1.1	Admin Login (Username & Password Invalid)	Passed
	1.2	Admin Login (Username Invalid & Password Valid)	Passed
	1.3	Admin Login (Username Valid & Password Invalid)	Passed
	1.4	Admin Login (Username & Password Valid)	Passed
	2.1	Admin Current Issue (Without Changes)	Passed
	2.2	Admin Current Issue (With Changes)	Passed
	2.3	Admin Current Issue (Empty Fields)	Passed
	2.4	Admin Current Issue (With Harmful Char)	Passed
	3.1	Admin Self-Assessment (Without Changes)	Passed
	3.2	Admin Self-Assessment (With Changes)	Passed
	3.3	Admin Self-Assessment (Empty Fields)	Passed
	3.4	Admin Self-Assessment (With Harmful)	Passed
	4.1	Admin Climate Action SDG 13 (Without Changes)	Passed
	4.2	Admin Climate Action SDG 13 (With Changes)	Passed
	4.3	Admin Climate Action SDG 13 (Empty Fields)	Passed
	4.4	Admin Climate Action SDG 13 (With Harmful Char)	Passed
	5.1	Admin Overview (Without Changes)	Passed
	5.2	Admin Overview (With Changes)	Passed
	5.3	Admin Overview (Empty Fields)	Passed
	5.4	Admin Overview (With Harmful Char)	Passed

6.1	Admin Target and Indicators (Without Changes)	Passed
6.2	Admin Target and Indicators (With Changes)	Passed
6.3	Admin Target and Indicators (Empty Fields)	Passed
6.4	Admin Target and Indicators (With harmful Char)	Passed
7.1	Admin Progress and Info (Without Changes)	Passed
7.2	Admin Progress and Info (With Changes)	Passed
7.3	Admin Progress and Info (Empty Fields)	Passed
7.4	Admin Progress and Info (With Harmful Char)	Passed
8.1	Admin Related Topics (Without Changes)	Passed
8.2	Admin Related Topics (With Changes)	Passed
8.3	Admin Related Topics (Empty Fields)	Passed
8.4	Admin Related Topics (With Harmful Char)	Passed
9.1	Admin Solutions (Without Changes)	Passed
9.2	Admin Solutions (With Changes)	Passed
9.3	Admin Solutions (Empty Fields)	Passed
9.4	Admin Solutions (With harmful Char)	Passed
10.1	Admin Solution 1 (Without Changes)	Passed
10.2	Admin Solution 1 (With Changes)	Passed
10.3	Admin Solution 1 (Empty Fields)	Passed
10.4	Admin Solution 1 (With harmful Char)	Passed
11.1	Admin Solution 2 (Without Changes)	Passed
11.2	Admin Solution 2 (With Changes)	Passed
11.3	Admin Solution 2 (Empty Fields)	Passed
11.4	Admin Solution 2 (With Harmful Char)	Passed
12.1	Admin Solution 3 (Without Changes)	Passed
12.2	Admin Solutions 3 (With Changes)	Passed
12.3	Admin Solution 3 (Empty Fields)	Passed
12.4	Admin Solution 3 (With Harmful Char)	Passed
13.1	Admin Logout	Passed
14.1	Game (User Press Any Key to Start) Default Scene	Passed
14.2	Game (Press the arrow keys/WASD keys) Pre-play	Passed
14.3	Game (Click continue button)	Passed
14.4	Game (Click the continue button)	Passed

14.5	Game (Scene 1 press the arrow keys/WASD)	Passed
14.6	Game (Scene 1 Space bar) Failed.	Passed
14.7	Game (Click “continue” button) Wrong.	Passed
14.8	Game (Click “continue” button)	Passed
14.9	Game (Scene 1 Space bar) Success.	Passed
14.0.1	Game (Scene 1 Continue button) Correct.	Passed
14.0.2	Game (Scene 1 Continue button)	Passed
14.0.3	Game (Scene 2 press the arrow keys/WASD)	Passed
14.0.4	Game (Scene 2 Space bar) Failed.	Passed
14.0.5	Game (Click “continue” button) Wrong.	Passed
14.0.6	Game (Click “continue” button)	Passed
14.0.7	Game (Scene 2 Space bar) Success.	Passed
14.0.8	Game (Scene 2 Continue button) Correct.	Passed
14.0.9	Game (Scene 2 Continue button)	Passed
14.1.0	Game (Scene 3 press the arrow keys/WASD)	Passed
14.1.1	Game (Scene 3 Space bar) Failed.	Passed
14.1.2	Game (Click “continue” button) Wrong.	Passed
14.1.3	Game (Click “continue” button)	Passed
14.1.4	Game (Scene 3 Space bar) Success.	Passed
14.1.5	Game (Scene 3 Continue button) Correct.	Passed
14.1.6	Game (Scene 3 Continue button)	Passed
14.1.7	Game (Scene 4 press the arrow keys/WASD)	Passed
14.1.8	Game (Scene 4 Space bar) Failed.	Passed
14.1.9	Game (Click “continue” button) Wrong.	Passed
14.2.0	Game (Click “continue” button)	Passed
14.2.1	Game (Scene 4 Space bar) Success.	Passed
14.2.2	Game (Scene 4 Continue button) Correct.	Passed
14.2.3	Game (Scene 4 Continue button)	Passed
14.2.4	Game (Scene 5 press the arrow keys/WASD)	Passed
14.2.5	Game (Scene 5 Space bar) Failed.	Passed
14.2.6	Game (Click “continue” button) Wrong.	Passed
14.2.7	Game (Click “continue” button) Game Over.	Passed
14.2.8	Game (Scene 5 Space bar) Success.	Passed

14.2.9	Game (Scene 5 Continue button) Correct.	Passed
14.3.0	Game (Scene 5 Continue button) Restart.	Passed
15.1	User Self-Assessment (No Option Selected)	Passed
15.2	User Self-Assessment (Incomplete Answer)	Passed
15.3	User Self-Assessment (Wrong Answer)	Passed
15.4	User Self-Assessment (Correct Answer)	Passed
15.5	User Self-Assessment (Review Form)	Passed
15.6	User Self-Assessment (Play Again)	Passed
15.7	User Self-Assessment (Reset Trivia Game)	Passed
16.1	Admin News (Add with Empty Fields)	Passed
16.2	Admin News (Add with Harmful Char)	Passed
16.3	Admin News (Edit Without Changes)	Passed
16.4	Admin News (Edit with Harmful Char)	Passed
16.5	Admin News (Edit with Changes)	Passed
16.6	Admin News (Delete)	Passed
17.1	Admin Accounts (Click “New Admin” button) Close form.	Passed
17.2	Admin Accounts (Click “New Admin” button) Incomplete.	Passed
17.3	Admin Accounts (Click “New Admin” button) Invalid.	Passed
17.4	Admin Accounts (Click “New Admin” button) Valid.	Passed
17.5	Admin Accounts (Click “Update Info” button) Close form.	Passed
17.6	Admin Accounts (Click “Update Info” button) No Changes.	Passed
17.7	Admin Accounts (Click “Update Info” button) With Changes.	Passed
17.8	Admin Accounts (Click “Reset Password” button) Invalid.	Passed
17.9	Admin Accounts (Click “Reset Password” button) Valid.	Passed
17.0.1	Admin Accounts (Click “Delete” button) Close dialog.	Passed
17.0.2	Admin Accounts (Click “Delete” button) Delete.	Passed

Functional testing

The team collaborated on a functional test with the other teams to ensure the web application worked as expected. The module was tested by members of the Bonafide group, who then evaluated its Functionality using quality control procedures based on the test results. This process served as a process to enhance the proposed system before the actual deployment. (Appendix F.)

Table 27. Functional Testing Report Summary for Ecotopia Web Application

TEST CASE		MODULE NAME	REMARKS
SPECIFICATION	ID		
1.1	Admin Login (Username & Password Invalid)	Passed	
1.2	Admin Login (Username Invalid & Password Valid)	Passed	
1.3	Admin Login (Username Valid & Password Invalid)	Passed	
1.4	Admin Login (Username & Password Valid)	Passed	
2.1	Admin Current Issue (Without Changes)	Passed	
2.2	Admin Current Issue (With Changes)	Passed	
2.3	Admin Current Issue (Empty Fields)	Passed	
2.4	Admin Current Issue (With Harmful Char)	Passed	
3.1	Admin Self-Assessment (Without Changes)	Passed	
3.2	Admin Self-Assessment (With Changes)	Passed	
3.3	Admin Self-Assessment (Empty Fields)	Passed	
3.4	Admin Self-Assessment (With Harmful)	Passed	
4.1	Admin Climate Action SDG 13 (Without Changes)	Passed	
4.2	Admin Climate Action SDG 13 (With Changes)	Passed	
4.3	Admin Climate Action SDG 13 (Empty Fields)	Passed	
4.4	Admin Climate Action SDG 13 (With Harmful Char)	Passed	
5.1	Admin Overview (Without Changes)	Passed	
5.2	Admin Overview (With Changes)	Passed	
5.3	Admin Overview (Empty Fields)	Passed	
5.4	Admin Overview (With Harmful Char)	Passed	
6.1	Admin Target and Indicators (Without Changes)	Passed	
6.2	Admin Target and Indicators (With Changes)	Passed	

6.3	Admin Target and Indicators (Empty Fields)	Passed
6.4	Admin Target and Indicators (With harmful Char)	Passed
7.1	Admin Progress and Info (Without Changes)	Passed
7.2	Admin Progress and Info (With Changes)	Passed
7.3	Admin Progress and Info (Empty Fields)	Passed
7.4	Admin Progress and Info (With Harmful Char)	Passed
8.1	Admin Related Topics (Without Changes)	Passed
8.2	Admin Related Topics (With Changes)	Passed
8.3	Admin Related Topics (Empty Fields)	Passed
8.4	Admin Related Topics (With Harmful Char)	Passed
9.1	Admin Solutions (Without Changes)	Passed
9.2	Admin Solutions (With Changes)	Passed
9.3	Admin Solutions (Empty Fields)	Passed
9.4	Admin Solutions (With harmful Char)	Passed
10.1	Admin Solution 1 (Without Changes)	Passed
10.2	Admin Solution 1 (With Changes)	Passed
10.3	Admin Solution 1 (Empty Fields)	Passed
10.4	Admin Solution 1 (With harmful Char)	Passed
11.1	Admin Solution 2 (Without Changes)	Passed
11.2	Admin Solution 2 (With Changes)	Passed
11.3	Admin Solution 2 (Empty Fields)	Passed
11.4	Admin Solution 2 (With Harmful Char)	Passed
12.1	Admin Solution 3 (Without Changes)	Passed
12.2	Admin Solutions 3 (With Changes)	Passed
12.3	Admin Solution 3 (Empty Fields)	Passed
12.4	Admin Solution 3 (With Harmful Char)	Passed
13.1	Admin Logout	Passed
14.1	Game (User Press Any Key to Start) Default Scene	Passed
14.2	Game (Press the arrow keys/WASD keys) Pre-play	Passed
14.3	Game (Click continue button)	Passed
14.4	Game (Click the continue button)	Passed
14.5	Game (Scene 1 press the arrow keys/WASD)	Passed
14.6	Game (Scene 1 Space bar) Failed.	Passed

14.7	Game (Click “continue” button) Wrong.	Passed
14.8	Game (Click “continue” button)	Passed
14.9	Game (Scene 1 Space bar) Success.	Passed
14.0.1	Game (Scene 1 Continue button) Correct.	Passed
14.0.2	Game (Scene 1 Continue button)	Passed
14.0.3	Game (Scene 2 press the arrow keys/WASD)	Passed
14.0.4	Game (Scene 2 Space bar) Failed.	Passed
14.0.5	Game (Click “continue” button) Wrong.	Passed
14.0.6	Game (Click “continue” button)	Passed
14.0.7	Game (Scene 2 Space bar) Success.	Passed
14.0.8	Game (Scene 2 Continue button) Correct.	Passed
14.0.9	Game (Scene 2 Continue button)	Passed
14.1.0	Game (Scene 3 press the arrow keys/WASD)	Passed
14.1.1	Game (Scene 3 Space bar) Failed.	Passed
14.1.2	Game (Click “continue” button) Wrong.	Passed
14.1.3	Game (Click “continue” button)	Passed
14.1.4	Game (Scene 3 Space bar) Success.	Passed
14.1.5	Game (Scene 3 Continue button) Correct.	Passed
14.1.6	Game (Scene 3 Continue button)	Passed
14.1.7	Game (Scene 4 press the arrow keys/WASD)	Passed
14.1.8	Game (Scene 4 Space bar) Failed.	Passed
14.1.9	Game (Click “continue” button) Wrong.	Passed
14.2.0	Game (Click “continue” button)	Passed
14.2.1	Game (Scene 4 Space bar) Success.	Passed
14.2.2	Game (Scene 4 Continue button) Correct.	Passed
14.2.3	Game (Scene 4 Continue button)	Passed
14.2.4	Game (Scene 5 press the arrow keys/WASD)	Passed
14.2.5	Game (Scene 5 Space bar) Failed.	Passed
14.2.6	Game (Click “continue” button) Wrong.	Passed
14.2.7	Game (Click “continue” button) Game Over.	Passed
14.2.8	Game (Scene 5 Space bar) Success.	Passed
14.2.9	Game (Scene 5 Continue button) Correct.	Passed
14.3.0	Game (Scene 5 Continue button) Restart.	Passed

15.1	User Self-Assessment (No Option Selected)	Passed
15.2	User Self-Assessment (Incomplete Answer)	Passed
15.3	User Self-Assessment (Wrong Answer)	Passed
15.4	User Self-Assessment (Correct Answer)	Passed
15.5	User Self-Assessment (Review Form)	Passed
15.6	User Self-Assessment (Play Again)	Passed
15.7	User Self-Assessment (Reset Trivia Game)	Passed
16.1	Admin News (Add with Empty Fields)	Passed
16.2	Admin News (Add with Harmful Char)	Passed
16.3	Admin News (Edit Without Changes)	Passed
16.4	Admin News (Edit with Harmful Char)	Passed
16.5	Admin News (Edit with Changes)	Passed
16.6	Admin News (Delete)	Passed
17.1	Admin Accounts (Click “New Admin” button) Close form.	Passed
17.2	Admin Accounts (Click “New Admin” button) Incomplete.	Passed
17.3	Admin Accounts (Click “New Admin” button) Invalid.	Passed
17.4	Admin Accounts (Click “New Admin” button) Valid.	Passed
17.5	Admin Accounts (Click “Update Info” button) Close form.	Passed
17.6	Admin Accounts (Click “Update Info” button) No Changes.	Passed
17.7	Admin Accounts (Click “Update Info” button) With Changes.	Passed
17.8	Admin Accounts (Click “Reset Password” button) Invalid.	Passed
17.9	Admin Accounts (Click “Reset Password” button) Valid.	Passed
17.0.1	Admin Accounts (Click “Delete” button) Close dialog.	Passed
17.0.2	Admin Accounts (Click “Delete” button) Delete.	Passed

Integration Testing

Integration testing is a method in software testing that concentrates on validating how different components or modules within a software system interact. Its main aim is to confirm that when these individual parts are combined, they function as designed and that the data and control flow between them is accurate. (**Appendix G.**)

Table 28. Integration Testing Report Summary for Ecotopia Web Application as App User

MODULE	MODULE NAME	REMARKS
1	Access the URL	Passed
2	Landing Page Parallax Effect	Passed
3	MDDRMO Thumbnail	Passed
4	Climate Escape Thumbnail	Passed
5	Materials	Passed
6	Current Issues	Passed
7	Climate Action SDG 13	Passed
8	Overview	Passed
9	Target and Indicators	Passed
10	Progress and Info	Passed
11	Related Topics	Passed
12	Solutions	Passed
13	Why We Should Take Actions	Passed
14	What are the Other Solutions to Climate Change	Passed
15	Responding to Climate Change	Passed
16	Sustainability and Government Resources	Passed
17	Overview of Climate Change	Passed
18	Evidence	Passed
19	Causes	Passed
20	Effects	Passed
21	Solutions	Passed
22	Related News and Features	Passed
23	Self-Assessment	Passed
24	Submit and Reset Button in Self-Assessment Page	Passed
25	News	Passed

26	Game	Passed
27	About Us	Passed
28	Footer Navigation	Passed
29	Social Media Icons	Passed

Table 29. Integration Testing Report Summary for Ecotopia Web Application as Administrator

MODULE	MODULE NAME	REMARKS
1	Access URL	Passed
2	Login Button	Passed
3	News	Passed
4	Current Issues	Passed
5	Self-Assessment	Passed
6	Climate Action SDG 13	Passed
7	Overview	Passed
8	Target and Indicators	Passed
9	Progress and Info	Passed
10	Related Topics	Passed
11	Solutions	Passed
12	Solution 1	Passed
13	Solution 2	Passed
14	Solution 3	Passed
15	Publish Buttons	Passed
16	Logout Button	Passed
Super Admin		
1	New Admin Button	Passed
2	Create Account Button	Passed
3	Close Button	Passed
4	Update Info Button	Passed
5	Update Button	Passed
6	Close Button	Passed
7	Reset Password Button	Passed
8	Reset Button	Passed

9	Close Button	Passed
10	Delete Button	Passed
11	Delete Button	Passed
12	Close Button	Passed

System Testing

The researchers used a testing tool called GTmetrix to test the system's Functionality, Usability, Reliability, Performance, and Security.

The developers utilized GTmetrix. It is an online tool used for website performance testing and optimization. It provides a set of tools and metrics to evaluate the speed and performance of a website. Website owners and developers use GTmetrix to assess how well their websites perform and identify areas for improvement. (**Appendix H.**)

Table 30. GTmetrix Test Report Summary

Run(s)	Grade	Performance	Structure	LCP	TBT	CLS
		Percentage	Percentage	(seconds)	(milliseconds)	Score
		Score	Score			
1	E	46%	58%	5.7s	0ms	0.22
2	E	52%	47%	9.5s	143ms	0
3	E	55%	50%	10.2s	47ms	0
4	E	54%	59%	6.0s	137ms	0
5	E	53%	67%	6.8s	129ms	0
6	E	52%	65%	9.3s	143ms	0
7	E	53%	57%	8.5s	131ms	0
8	E	53%	66%	8.5s	131ms	0
9	E	53%	66%	8.3s	122ms	0
10	E	52%	63%	9.8s	158ms	0
Overall Mean	E	52.3%	59.8%	8.26s	108.1ms	0.022

OWASP ZAP Vulnerability Assessment

The OWASP Zed Attack Proxy (ZAP) is a popular open-source security testing tool developers use to find and fix security vulnerabilities in web applications. It was developed and maintained by the Open Web Application Security Project (OWASP); a well-known organization focused on improving software security. Once the system website undergoes testing under OWASP ZAP, it gives flags for levels such as informational, low, medium, and high vulnerabilities. The testing for the Ecotopia web application received zero (0) high vulnerability alerts, five (5) medium vulnerability alerts, two (2) low vulnerability alerts, and three (3) informational vulnerability alerts. (**Appendix I.**)

Security Headers

The developers used an online assessment tool to scan the report summary for a concise overview of the security headers on the Ecotopia web application. Security headers typically provide a quick assessment of the HTTP security headers included in the server's responses and their effectiveness in enhancing the site's security. The researchers have Referrer-Policy, Content-Security-Policy, Strict-Transport-Security, X-Content-Type-Options, and X-Frame-Options. (**Appendix J.**)

Supportability Test

Table 31. Web Application Browser Compatibility

Ecotopia (Web Application)		
Browsers	Compatible	Version
Google Chrome	✓	Chrome 50 up to latest version 120
Mozilla Firefox	✓	Mozilla Firefox 80 up to latest version 119
Opera	✓	Opera 69 up to latest version 105
Microsoft Edge	✓	Microsoft Edge 75 upto latest version
Brave	✓	Brave 1.15.75 up to latest version 1.60.110

The Ecotopia web application was developed to offer users a simple and secure means of accessing its features and content. Ensuring compatibility with various web browsers is crucial for achieving optimal Functionality. The recommended web browsers for using the Ecotopia online

application are detailed in Table. These browsers have been tested for compatibility to ensure the best user experience and performance. ([Appendix K.](#))

OWASP Web Application Secure Coding Practices Checklist

For the secure coding practices checklist, the developers include the following: Input validation, Authentication and Password Management, Session Management, Access Control, Cryptographic Practices, Error Handling and Logging, and System Configuration. For a detailed secure coding practices checklist, see the ([Appendix L.](#)).

Table 32. OWASP Web Application Secure Coding Practices Checklist Summary

Secure Coding Practices	Compliance Status
Input Validation	Compliant
Authentication and Password Management	Compliant
Session Management	Compliant
Access Control	Compliant
Cryptographic Practices	Compliant
Error Handling and Logging	Compliant
System Configuration	Compliant

Data Privacy

Data privacy is essential for developers, as they are dedicated to fostering the free exchange of knowledge and information while respecting your privacy and personal information. Ecotopia includes data privacy descriptions for the following sections: Information We Collect, How We Use Your Information, Sharing Your Information, Data Security, Changes to this Policy, and Contact Us. For a more comprehensive understanding of data privacy, please refer to ([Appendix M.](#)) for a detailed description.

Web Application Accessibility Compliance

Achecker web accessibility checker is a tool created to assist website developers in making sure their websites and web applications are accessible to people with disabilities. They are making web content and apps valuable and understandable for users.

The researchers utilized an online tool to check the Compliance of web application accessibility. Developers used the WCAG 2.0 Guidelines Level AA and Level AAA for Compliance. ([Appendix N.](#))

Table 33. Web Accessibility Compliance

User Interface(s)	WCAG 2.0 Guidelines	Level AA	Level AAA
Landing Page/Home Page	Compliant	Compliant	Compliant
Materials	Compliant	Compliant	Compliant
Current Issues	Compliant	Compliant	Compliant
Climate Action SDG 13	Compliant	Compliant	Compliant
Solutions	Compliant	Compliant	Compliant
Overview of Climate Change	Compliant	Compliant	Compliant
Self-Assessment	Compliant	Compliant	Compliant
News	Compliant	Compliant	Compliant
Games	Compliant	Compliant	Compliant
About Us	Compliant	Compliant	Compliant
Admin Login	Compliant	Compliant	Compliant
Admin Accounts	Compliant	Compliant	Compliant
Admin News	Compliant	Compliant	Compliant
Admin Current Issues	Compliant	Compliant	Compliant
Admin Self-Assessment	Compliant	Compliant	Compliant
Admin Climate Action SDG 13	Compliant	Compliant	Compliant
Admin Overview	Compliant	Compliant	Compliant
Admin Target and Indicators	Compliant	Compliant	Compliant
Admin Progress and Info	Compliant	Compliant	Compliant
Admin Related Topics	Compliant	Compliant	Compliant
Solutions	Compliant	Compliant	Compliant
Solution 1	Compliant	Compliant	Compliant
Solution 2	Compliant	Compliant	Compliant
Solution 3	Compliant	Compliant	Compliant

User Acceptance Test

The developers have requested an onsite User Acceptance Test on October 18, 2023, using specifications that align with the client's requirements. These specifications cover the following categories: Functionality, Reliability, Usability, Efficiency, Portability, Supportability, Time, and Security Compliance. The client has approved all the requirements and provided comments for each category. For detailed information, please refer to the (**Appendix O**).

Software Quality Evaluation

The researchers adapted the ISO 9126 Software Quality Standard and Jacob Nielsen's Usability to assess the system's multimedia aspect. The criteria are Functionality, Reliability, performance efficiency, Compliance, and usability.

The researchers conducted several user evaluations among senior high school students of NU Nazareth. The developers requested an online evaluation survey by having permission to complete a survey on their principal, and with the help of the cluster heads, it was distributed to both grade 11 and grade 12 students. (**Appendix P**.)

Likert Scale

Table 34. Likert Scale

Number Scale	Rating	Verbal Interpretation
6	5.51 – 6.00	Strongly Agree
5	5.01 – 5.50	Agree
4	4.01 – 5.00	Partially Agree
3	3.01 – 4.00	Partially Disagree
2	2.01 – 3.00	Disagree
1	1.00 – 2.00	Strongly Disagree

Table 34 displays the Likert scale, a six-point rating system that is neatly organized. The respondents are asked to rate how much they agree and disagree with each question using a Likert scale.

Percentage Distribution

The researchers provided a formula to get the percentage of the grade level of the senior high school student and the years of experience of I.T. Professionals in user evaluation surveys.

The part of the total number of respondents is divided by the total number of respondents and multiplied by 100. Below is the formula.

$$\frac{\text{PART}}{\text{WHOLE}} \times 100 = \%$$

Sample Size and Technique

The researchers used Slovin's Formula to get the sample size of the senior high school students of NU Nazareth, with a population of four hundred (400) senior high school students. This formula requires determining the error of tolerance to get the sample size. In this case, the researchers use 0.05 error tolerance. Below is the procedure to compute the sample size.

$$n = N / (1 + Ne^2)$$

Where n – Sample size

N – Population

e – Error of Tolerance

This part corresponds to the correct values of the formula to get the actual sample size of senior high school students of NU Nazareth.

$$N = 400$$

$$e = 0.05$$

$$n = \frac{400}{1 + 400(0.05)^2}$$

$$n = \frac{400}{1 + 400(0.0025)}$$

$$n = \frac{400}{2}$$

$$\mathbf{n = 200}$$

Weighted Mean and Standard Deviation

The weighted mean considers the value or weight of each data point, a measure of central tendency. Each data point is multiplied by its corresponding weight, these products are added, and the result is divided by the total importance. The standard deviation, however, shows how much the data values differ from the group's average. Most data points are close to the average if the standard deviation is slight. If it's large, it means the data points are all over the place, far from the average.

$$\mu = \frac{\sum x}{n}$$

where μ – population

n – number of sources

x – number of occurrences

Table 35. Number of Respondents for Senior High School Students based on their Grade

Level		
Criteria	Frequency	Percentage
Grade 11	89	44.5%
Grade 12	111	55.5%
Total	200	100%

Table 35 shows the frequency or number of respondents and their percentage count according to their grade level. The evaluation test gathered two hundred respondents from senior high school students. As shown in Table, eighty-nine (89) respondents are grade 11, and one hundred one (111) are grade 12 students.

Table 36. Number of Respondents for IT Professionals based on their Years of Experience

Criteria	Frequency	Percentage
2 years	5	50%
3 years and above	5	50%
Total	10	100%

Table 36 shows the frequency or number of respondents and their percentage count according to their years of experience. The evaluation test gathered 10 I.T. Professionals to test

the system. As shown in Table, five (5) respondents have two years' experience as an I.T. Professional, and 5 have 2 to 3 years of experience in the profession.

Table 37. Result Summary of Ecotopia Web Application Evaluated by SHS Students for Functionality

Functionality	Mean	Standard Deviation	Interpretation
System has adequate set of functions for specified tasks and user objectives.	4.73	1.33	Partially Agree
System performs the task or functions as required.	4.75	1.30	Partially Agree
System interacts seamlessly from one another.	4.75	1.33	Partially Agree
System accurately provides the right or agreed output results or effects	4.83	1.31	Partially Agree
System prevents unintended access and resist deliberate attacks intended to gain unauthorized access to confidential information.	4.79	1.35	Partially Agree
GRAND MEAN	4.77	1.32	Partially Agree

Table 37 summarizes the Ecotopia Web Application that Senior High School students evaluated about the *Functionality* criteria. As assessed by 200 students of NU Nazareth, it is

evident that the functionalities are working as it totals to the grand mean of 4.77, equivalent to the interpretation of "Partially Agree."

Table 38. Result Summary of Ecotopia Web Application Evaluated by SHS Students for Reliability

Reliability	Mean	Standard Deviation	Interpretation
System provides the available information as requested.	4.78	1.33	Partially Agree
System is capable of handling errors.	4.71	1.27	Partially Agree
System is robust such that it still can continue working after an error or failure happens.	4.69	1.37	Partially Agree
GRAND MEAN	4.73	1.32	Partially Agree

Table 38 summarizes the Ecotopia Web Application, which was evaluated by senior high school students based on the *Reliability* criteria. As assessed by 200 students of NU Nazareth, it is evident that the system's *Reliability* meets its standard as it totals the grand mean of 4.73, equivalent to the interpretation of "Partially Agree."

Table 39. Result Summary of Ecotopia Web Application Evaluated by SHS Students for Performance Efficiency

Performance Efficiency	Mean	Standard Deviation	Interpretation
System quickly responds to users' intended transactions or tasks.	4.68	1.36	Partially Agree
System and other components load in reasonable time.	4.74	1.35	Partially Agree
System operates smoothly even with large number of user access at the same time.	4.69	1.40	Partially Agree
GRAND MEAN	4.70	1.37	Partially Agree

Table 39 summarizes the Ecotopia Web Application that Senior High School students evaluated about the *Performance and Efficiency* criteria. As assessed by 200 students of NU Nazareth, it is evident that the *Performance and Efficiency* of the system meet its standard as it totals to the grand mean of 4.70, equivalent to the interpretation of "Partially Agree."

Table 40. Result Summary of Ecotopia Web Application Evaluated by SHS Students for Security/Compliance

Compliance	Mean	Standard Deviation	Interpretation
System has data privacy statement for compliance to existing laws or regulations.	4.78	1.44	Partially Agree
System have provided a safe and trusted user's experience.	4.82	1.38	Partially Agree
GRAND MEAN	4.80	1.41	Partially Agree

Table 40 summarizes the Ecotopia Web Application, which was evaluated by senior high school students, *regarding the security* criteria. As assessed by 200 students of NU Nazareth, it is evident that the system's *Security* meets its standard as it totals 4.80, equivalent to the interpretation of "Partially Agree."

Table 41. Result Summary of Ecotopia Web Application Evaluated by SHS Students for Usability Learnability

Usability Learnability	Mean	Standard Deviation	Interpretation
I found the system simple to use and information provided within the system is easy to understand.	4.40	1.41	Partially Agree
I think that I would not need to learn a lot of things before I could get going with the system.	4.17	1.45	Partially Agree
GRAND MEAN	4.29	1.43	Partially Agree

Table 41 summarizes the Ecotopia Web Application that Senior High School students evaluated about the *Usability Learnability* criteria. As assessed by 200 students of NU Nazareth, it is evident that the *Usability Learnability* of the system meets its standard as it totals to the grand mean of 4.29, equivalent to the interpretation of "Partially Agree."

Table 42. Result Summary of Ecotopia Web Application Evaluated by SHS Students for Usability Efficiency

Usability Efficiency	Mean	Standard Deviation	Interpretation
I easily found the information I am looking for.	4.70	1.41	Partially Agree
I was able to quickly complete my task with this system.	4.66	1.38	Partially Agree
GRAND MEAN	4.68	1.40	Partially Agree

Table 42 summarizes the Ecotopia Web Application that Senior High School students evaluated about the *Usability Efficiency* criteria. As assessed by 200 students of NU Nazareth, it is evident that the *Usability Efficiency* of the system meets its standard as it totals to the grand mean of 4.68, equivalent to the interpretation of "Partially Agree."

Table 43. Result Summary of Ecotopia Web Application Evaluated by SHS Students for Usability Memorability

Usability Memorability	Mean	Standard Deviation	Interpretation
The organization of information in the system screens is clear.	4.76	1.38	Partially Agree
I think that I would not need assistance to be able to use the system.	4.63	1.47	Partially Agree
GRAND MEAN	4.70	1.43	Partially Agree

Table 43 summarizes the Ecotopia Web Application that Senior High School students evaluated about the *Usability Memorability*. As assessed by 200 students of NU Nazareth, it is evident that the *Usability Memorability* of the system meets its standard as it totals to the grand mean of 4.70, equivalent to the interpretation of "Partially Agree."

Table 44. Result Summary of Ecotopia Web Application Evaluated by SHS Students for Usability Error Protection

Usability Error Protection	Mean	Standard Deviation	Interpretation
The interface is designed such that I know what to do to avoid mistakes.	4.66	1.32	Partially Agree
The system gives error messages that clearly tell me the problem when interacting with the interface.	4.68	1.35	Partially Agree
GRAND MEAN	4.67	1.34	Partially Agree

Table 44 summarizes the Ecotopia Web Application Senior High School students evaluated about the *Usability Error Protection*. As assessed by 200 students of NU Nazareth, it is evident that the *Usability Error Protection* of the system meets its standard as it totals to the grand mean of 4.67, equivalent to the interpretation of "Partially Agree."

Table 45. Result Summary of Ecotopia Web Application Evaluated by SHS Students for Usability Satisfaction

Usability Satisfaction	Mean	Standard Deviation	Interpretation
I found the system's interface design is pleasant.	4.76	1.32	Partially Agree
I found the system has the functions and performs tasks as what I expected.	4.79	1.34	Partially Agree
GRAND MEAN	4.78	1.33	Partially Agree

Table 45 summarizes the Ecotopia Web Application that Senior High School students evaluated about *Usability Satisfaction*. As assessed by 200 students of NU Nazareth, it is evident that the *Usability Satisfaction* of the system meets its standard as it totals to the grand mean of 4.78, equivalent to the interpretation of "Partially Agree."

Table 46. Result Summary of Ecotopia Web App Evaluated by SHS Students

Criteria	Mean	SD	Interpretation
Functionality	4.77	1.32	Partially Agree
Reliability	4.73	1.32	Partially Agree
Performance Efficiency	4.70	1.37	Partially Agree
Security	4.80	1.41	Partially Agree
Usability	4.62	1.39	Partially Agree
GRAND MEAN	4.60	1.36	Partially Agree

Table 46 summarizes the Ecotopia Web Application evaluated by senior high school students at NU Nazareth. As assessed by SHS students, it is evident that all the criteria meet the level of agreement of "Partially Agree."

Table 47. Result Summary of Ecotopia Web Application Evaluated by IT Professionals for Functionality

Functionality	Mean	Standard Deviation	Interpretation
System has adequate set of functions for specified tasks and user objectives.	5.08	0.76	Agree
System performs the task or functions as required.	5.15	0.69	Agree
System interacts seamlessly from one another.	5.85	0.99	Strongly Agree
System accurately provides the right or agreed output results or effects	5.08	0.76	Agree
System prevents unintended access and resist deliberate attacks intended to gain unauthorized access to confidential information.	4.77	1.17	Partially Agree
GRAND MEAN	5.18	0.87	Agree

Table 47 summarizes the Ecotopia Web Application that Senior High School students evaluated about the *Functionality*. As assessed by 10 I.T. Professionals, it is evident that the Functionality of the system meets its standard as it totals to the grand mean of 5.18, equivalent to the interpretation of "Agree."

Table 48. Result Summary of Ecotopia Web Application Evaluated by IT Professionals for Reliability

Reliability	Mean	Standard Deviation	Interpretation
System provides the available information as requested.	5.38	0.65	Agree
System is capable of handling errors.	4.54	1.45	Partially Agree
System is robust such that it still can continue working after an error or failure happens.	4.54	1.27	Partially Agree
GRAND MEAN	4.82	1.12	Partially Agree

Table 48 summarizes the Ecotopia Web Application that Senior High School students evaluated about *Reliability*. As assessed by 10 I.T. Professionals, it is evident that the system's Reliability meets its standard as it totals to the grand mean of 4.82, equivalent to the interpretation of "Partially Agree."

Table 49. Result Summary of Ecotopia Web Application Evaluated by IT Professionals for Performance Efficiency

Performance Efficiency	Mean	Standard Deviation	Interpretation
System quickly responds to users' intended transactions or tasks.	5.08	0.95	Agree
System and other components load in reasonable time.	4.92	0.86	Partially Agree
System operates smoothly even with large number of user access at the same time.	4.77	0.83	Partially Agree
GRAND MEAN	4.92	0.88	Partially Agree

Table 49 summarizes the Ecotopia Web Application, which senior high school students evaluated in terms of performance and efficiency. As assessed by 10 I.T. Professionals, it is evident that the performance and efficiency of the system meet its standard as it totals to the grand mean of 4.92, equivalent to the interpretation of "Partially Agree."

Table 50. Result Summary of Ecotopia Web Application Evaluated by IT Professionals for Security/Compliance

Compliance	Mean	Standard Deviation	Interpretation
System has data privacy statement for compliance to existing laws or regulations.	5.23	0.73	Agree
System have provided a safe and trusted user's experience.	5.30	0.75	Agree
GRAND MEAN	5.27	1.48	Agree

Table 50 summarizes the Ecotopia Web Application, which senior high school students evaluated in terms of Security. As assessed by 10 I.T. Professionals, it is evident that the system's Security meets its standard as it totals a grand mean of 5.27, equivalent to the interpretation of "Agree."

Table 51. Result Summary of Ecotopia Web Application Evaluated by IT Professionals for Usability Learnability

Usability Learnability	Mean	Standard Deviation	Interpretation
I found the system simple to use and information provided within the system is easy to understand.	5.31	0.95	Agree
I think that I would not need to learn a lot of things before I could get going with the system.	5.00	0.82	Agree
GRAND MEAN	5.15	1.77	Agree

Table 51 summarizes the Ecotopia Web Application that senior high school students evaluated regarding usability and learnability. As assessed by 10 I.T. Professionals, it is evident

that the usability learnability of the system meets its standard as it totals to the grand mean of 5.15, equivalent to the interpretation of “Agree.”

Table 52. Result Summary of Ecotopia Web Application Evaluated by IT Professionals for Usability Efficiency

Usability Efficiency	Mean	Standard Deviation	Interpretation
I easily found the information I am looking for.	4.92	1.04	Partially Agree
I was able to quickly complete my task with this system.	5.08	0.86	Agree
GRAND MEAN	5.00	0.93	Partially Agree

Table 52 summarizes the Ecotopia Web Application that Senior High School students evaluated about *Usability Efficiency*. As assessed by 10 I.T. Professionals, it is evident that the usability efficiency of the system meets its standard as it totals to the grand mean of 5.00, equivalent to the interpretation of “Partially Agree.”

Table 53. Result Summary of Ecotopia Web Application Evaluated by IT Professionals for Usability Memorability

Usability Memorability	Mean	Standard Deviation	Interpretation
The organization of information in the system screens is clear.	5.00	1.08	Partially Agree
I think that I would not need assistance to be able to use the system.	5.15	0.80	Agree
GRAND MEAN	5.07	1.88	Agree

Table 53 summarizes the Ecotopia Web Application that Senior High School students evaluated about the *Usability Memorability*. As assessed by 10 I.T. Professionals, it is evident that the usability memorability of the system meets its standard as it totals the grand mean of 5.07, equivalent to the interpretation of “Agree.”

Table 54. Result Summary of Ecotopia Web Application Evaluated by IT Professionals for Usability Error Protection

Usability Error Protection	Mean	Standard Deviation	Interpretation
The interface is designed such that I know what to do to avoid mistakes.	4.92	0.95	Partially Agree
The system gives error messages that clearly tell me the problem when interacting with the interface.	4.69	1.11	Partially Agree
GRAND MEAN	4.81	1.03	Partially Agree

Table 54 summarizes the Ecotopia Web Application Senior High School students evaluated about the *Usability Error Protection*. As assessed by 10 I.T. Professionals, it is evident that the usability error protection of the system meets its standard as it totals to the grand mean of 4.81, equivalent to the interpretation of “Partially Agree.”

Table 55. Result Summary of Ecotopia Web Application Evaluated by IT Professionals for Usability Satisfaction

Usability Satisfaction	Mean	Standard Deviation	Interpretation
I found the system's interface design is pleasant.	4.84	0.80	Partially Agree
I found the system has the functions and performs tasks as what I expected.	5.08	0.76	Agree
GRAND MEAN	4.96	0.78	Partially Agree

Table 55 summarizes the Ecotopia Web Application that Senior High School students evaluated about *Usability Satisfaction*. As assessed by 10 I.T. Professionals, it is evident that the usability satisfaction of the system meets its standard as it totals to the grand mean of 4.96, equivalent to the interpretation of “Partially Agree.”

Table 56. Result Summary of Ecotopia Web App Evaluated by IT Professionals

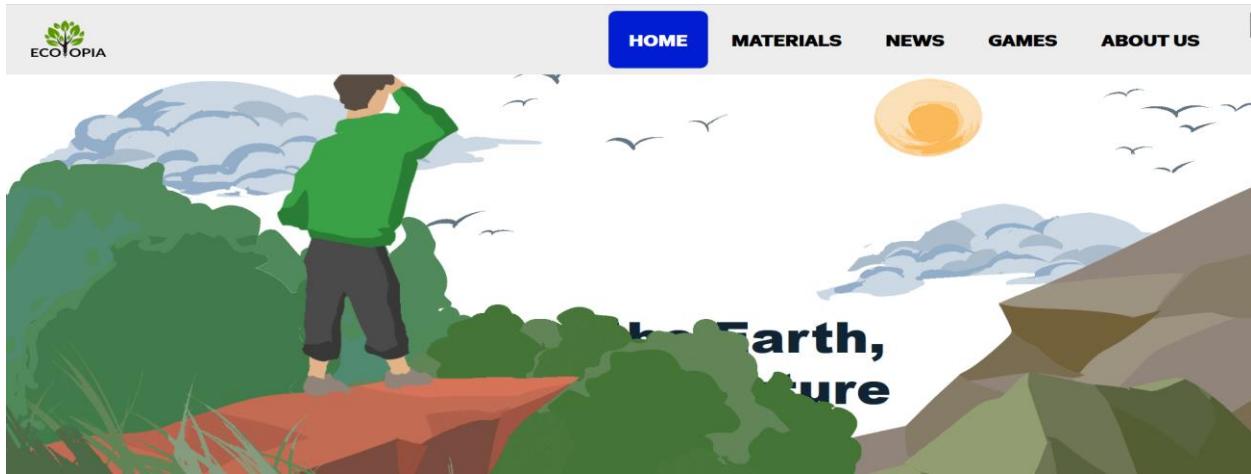
Criteria	Mean	SD	Interpretation
Functionality	5.18	0.87	Agree
Reliability	4.82	1.12	Partially Agree
Performance Efficiency	4.92	0.88	Partially Agree
Security	5.27	1.48	Agree
Usability	5.00	1.29	Partially Agree
GRAND MEAN	5.04	1.13	Agree

Table 56 summarizes the Ecotopia Web Application evaluated by I.T. Professionals. As assessed by I.T. Professionals, it is evident that the grand mean of the criteria meets the level of agreement of "Agree."

4.4 DESCRIPTION OF THE SYSTEM

Ecotopia aims to be a viable hub of information about climate change and to act as a platform for disseminating correct and timely information for users. It also encourages users to use the information they've learned and can access through the websites to make a change by engaging in their communities.

**Figure 15. Ecotopia Web Application Logo**



Climate Change

A website regarding climate change should enlighten visitors, educate them, and increase awareness of the problem's causes, effects, and possible solutions. It acts as a platform for disseminating accurate, current information, encouraging environmental stewardship, and engaging the general public, individuals and industry in solving the issues of climate change and reducing its consequences.



Figure 16. Homepage

Figure 16 displays the landing page. It is the first page users can access and explore and a directory of the available modules to navigate. In this module, the developers incorporate the parallax scrolling effect.



Figure 17. Thumbnails on Homepage

Figure 17 shows thumbnails for the Manila Disaster Risk Reduction & Management Office Facebook account and Climate Escape, the arcade game on the website. Clicking on these thumbnails will redirect the users to their corresponding pages.

Figure 18. Materials Page

Figure 18 shows the materials page of the Ecotopia web application, where users can see the following thumbnails available for materials content: current issues, climate action S.D.G. 13, solutions, overview of climate change, and the self-assessment page.

Current Issues on Climate Change in the Philippines



Due to its geographical positioning, the Philippines is exceptionally susceptible to typhoons and other extreme weather phenomena. The impact of climate change has the potential to magnify the intensity of these occurrences, culminating in heightened frequencies of more severe typhoons, along with increased incidents of flooding and landslides.

The 7,100 islands that make up the Philippine Archipelago make it more vulnerable to typhoons and storm surges, which are abrupt elevations in water that affect nearby places during storms and typhoons.

The Asian Disaster Reduction Center (ADRC) estimates that the Philippines experiences 20 typhoons year, of which five cause significant damage.

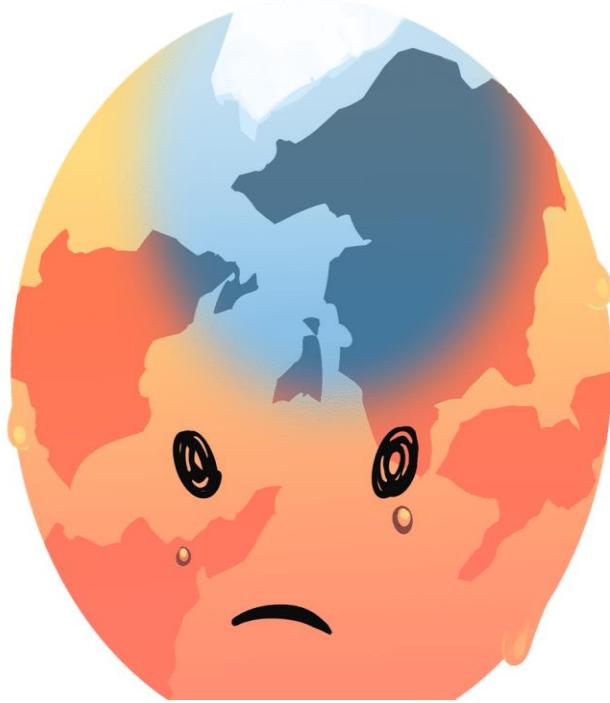
FOLLOW US

Figure 19. Current Issues Page

Figure 19 shows the Current Issues page, which contains the current state of events regarding the climate and environment in the Philippines, namely typhoons, ocean acidification, sea level rise, and more.

Everything is Changing

Climate change is happening now: understand the problem and take action.



Goal 13: Climate Action

Overview

Sustainable Development Goal 13, one of the 17 established by the United Nations General Assembly in 2015, aims to address climate change by both reducing its impact and adapting to it. The primary objective of this goal is officially stated as the need for immediate action to combat climate change and its consequences.

[KNOW MORE ▶](#)

Target and Indicators

Sustainable Development Goal (SDG) 13 focuses on climate action. Its target is to "Take urgent action to combat climate change and its impacts." To monitor progress toward this goal, several key indicators are used to help governments and organizations gauge their progress in addressing climate change and its effects, as outlined in SDG 13.

[KNOW MORE ▶](#)

Progress and Info

Sustainable Development Goal (SDG) 13, which focuses on climate action, has seen significant global progress in recent years. Efforts have been made to strengthen resilience to climate-related hazards, integrate climate measures into national policies, and enhance education and awareness about climate change mitigation and adaptation.

[KNOW MORE ▶](#)

Related Topics

Sustainable Development Goal 13 (SDG 13), known as "Climate Action," is intrinsically linked to several critical and interrelated topics: Atmosphere, Climate Action and Synergies, Small Island Developing State, and National Strategies and SDG Integration.

[KNOW MORE ▶](#)

Figure 20. Climate Action SDG 13 Page

Figure 20 displays the contents of Climate Action S.D.G. 13 page, discussing the United Nations' Sustainable Development Goal 13, which emphasizes limiting and adapting to climate change.

Take Urgent Action to Combat Climate Change and its Impacts

 Overview

 Target and Indicators

 Progress and Info

 Related Topics

Overview

SDG 13 aims to combat climate change and its impacts by taking urgent action. Climate change and environmental degradation are equity issues that undermine the rights of every child, especially the most disadvantaged. The realization of children's rights, as embedded throughout the SDGs, are contingent on taking action to address and adapt to climate change.

Climate change is a direct threat to a child's ability to survive, grow and thrive. While children are the least responsible for the changing environment, close to 90 per cent of the burden of disease attributable to climate change is borne by children under the age of 5. Every year, over half a million children under the age of 5 die from causes related to air pollution. Even more will suffer lasting damage to their developing brains and lungs. Today, for the first time, a global generation of children will grow up in a world made far more dangerous and uncertain by changing climate and a degraded environment.

Figure 21. Overview Page

Figure 21 visually represents the Overview for Sustainable Development Goal 13 information. This figure is a snapshot of the critical details and data related to S.D.G. 13, offering a concise overview of its content.

 Overview

 Target and Indicators

 Progress and Info

 Related Research

Target and Indicators

SDG Goal 13

Target 13.1

Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.

Indicators

- 13.1.1 - Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population
- 13.1.2 - Number of countries that adopt and implement national disaster risk reduction strategies in line with the

Figure 22. Target and Indicators

Figure 22 shows the specific targets outlined for the United Nations' Sustainable Development Goal 13 and the measurable indicators that serve as evidence of achieving these targets. This figure visually encapsulates the core elements of S.D.G. 13, showcasing the goals and their associated tracking measures.

Progress and Info

2023

The world is on the brink of a climate catastrophe and current actions and plans to address the crisis are insufficient. Without transformative action starting now and within this decade to reduce greenhouse gas emissions deeply and rapidly in all sectors, the 1.5°C target will be at risk and with it the lives of more than 3 billion people. Failure to act leads to intensifying heatwaves, droughts, flooding, wildfires, sea-level rise, and famines. Emissions should already be decreasing now and will need to be cut almost by half by 2030 - a mere seven years from now. To combat climate change and its impacts by 2030, urgent and transformative action is needed to meet the commitments under the Paris Agreement across mitigation and adaptation efforts.

- Target 13.1
 - The number of deaths and missing persons due to disasters per 100,000 population has steadily decreased from 1.64 during 2005–2015 to 0.86 during 2012–2021. The average disaster mortality stood at 47,337 in absolute terms in 2015–2021. However, the number of persons affected by disasters per 100,000 people rose from 1,198 during 2005–2015 to 2,113 during 2012–2021. The number of countries with national strategies for disaster risk reduction has increased from 55 in 2015 to 126 by the end of 2021. Based on this, a total of 118 countries have reported having some level of policy coherence with other global frameworks, such as the 2030 Agenda and the Paris Agreement.

Figure 23. Progress and Info Page

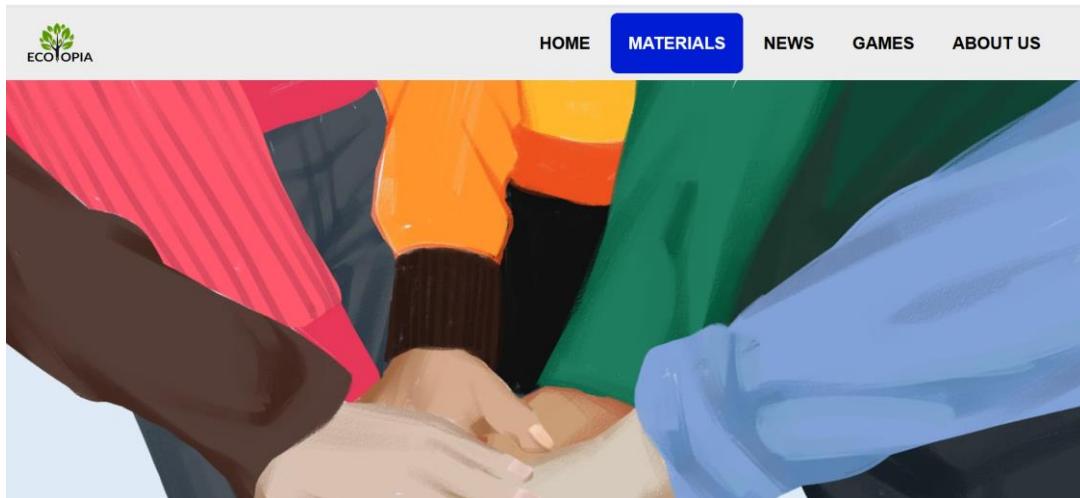
Figure 23 shows the extent of progress realized in working towards the objectives of Sustainable Development Goal 13. It offers the advancements made in achieving the targets of this sustainability goal, making it easy to assess how far we've come in addressing the related environmental challenges.

Related Topics

1. **Atmosphere**
Related Goal: SDG 13
[Learn more](#)
2. **Climate Action and Synergies**
Related Goal: SDG 3
[Learn more](#)
3. **Small Island and Developing State**
Related Goal: SDG 2, 5, 6, 7, 12, 13, 14, 15, 17
[Learn more](#)
4. **National Strategies and SDG Integration**
Related Goal: SDG 3, 11, 13, 15, 16, 17EQWEQW
[Learn more](#)

Figure 24. Related Topics Page

Figure 24 shows the related topics to Sustainable Development Goal 13, including other related Sustainable Development Goals, information on the current state of our atmosphere, the actions taken to mitigate climate change, and more.



Solutions of Climate Change



WHY SHOULD WE TAKE ACTIONS

Climate change is one of the most challenging problems that humanity has ever faced. At stake are hundreds of millions of lives, innumerable species and ecosystems, the health and viability of the economy, and the future habitability of this planet.



WHAT ARE THE OTHER SOLUTIONS TO CLIMATE CHANGE

Climate change is a serious problem that affects millions of lives, but there are solutions. The solutions can help us stop global warming and create a better future for everyone.

Figure 25. Solutions Page

Figure 25 shows the Solutions page, which prominently features thumbnails and corresponding links to the submodules. These submodules provide comprehensive details on actionable measures and strategies to mitigate climate change, offering a valuable resource for those seeking practical steps to address environmental challenges.



Why should we take action

Climate change is one of the most challenging problems that humanity has ever faced. At stake are hundreds of millions of lives, innumerable species and ecosystems, the health and viability of the economy, and the future habitability of this planet.

Cut emissions

Carbon dioxide and other heat-trapping gases are the main drivers of global warming. While climate change cannot be stopped, it can be slowed. To avoid the worst consequences of climate change, we'll need to reach "net zero" carbon emissions by 2050 or sooner. Net zero means that, on balance, no more carbon is dumped into the atmosphere than is taken out. To achieve net zero emissions, we need a massive transformation in how we produce and consume electricity. We need a newer, better transportation system. We need to stop deforestation. We need a climate-friendly agricultural system.

Remove carbon dioxide

To reach net zero emissions, we need to do more than just reduce our emissions: we need to actively remove carbon dioxide from the atmosphere or offset its effects. The easiest way to do this is by planting new forests (afforestation) or restoring old ones (reforestation). Other enhanced land management practices can help, as can new technologies that suck CO₂ out of the air ("direct air capture"), or prevent it from leaving smokestacks ("carbon capture and storage").

Act now!

No matter how quickly we reduce emissions, the reality is that certain climate impacts are inevitable. The seas are rising. Temperatures break records every year. Droughts, floods, and extreme weather are damaging communities today. Cutting carbon is the only long-term solution for avoiding climate impacts. In the short-term, we need to adapt. The best policy ideas in the world aren't worth much if we don't have activists, experts, and everyday people fighting for change. From school groups to churches; from corporate boardrooms to mayors and local leaders: we need action.

Climate change is already an urgent threat to millions of lives – but there are solutions. From changing how we get our energy to limiting deforestation, here are some of the key solutions to climate change.

The main ways to stop climate change are to pressure government and business to:

- **Keep fossil fuels in the ground**

Fossil fuels include coal, oil and gas – and the more that are extracted and burned, the worse climate change will get. All countries need to move their economies away from fossil fuels as soon as possible.

- **Protect forests like the Amazon**

Forests are crucial in the fight against climate change, and protecting them is an important climate solution. Cutting down forests on an industrial scale destroys giant trees which could be sucking up huge amounts of carbon. Yet companies destroy forests to make way for animal farming, soya or palm oil plantations. Governments can stop them by making better laws.

Figure 26. Why We Should Take Actions Page

Figure 26 displays the contents of the Why Should We Take Actions page, detailing what can be done to help mitigate climate change and why it must be done.

What are the other solutions to Climate Change

Climate change is a serious problem that affects millions of lives but there are solutions. The solutions can help us stop global warming and create a better future for everyone.

Below, we outline 8 effective solutions for addressing climate change and explain how you can contribute to their implementation.

- **Recycle plastic bags separately**

You might think plastic bags are convenient for gathering all your recyclable material together. However, plastic bags can be an unpredictable and time-consuming nightmare for those sorting at the recycling plant.

- **Try not to shred paper**

Shredded paper was difficult to recycle and often ended up in landfill. Since then, recycling plants have improved and now shredded paper is usually properly recycled. However this doesn't mean you should shred your sheets at every opportunity.

- **Compress bottles and put the lid back on**

Since then, recycling has advanced, making it acceptable to leave caps on bottles. In fact, it is now advised to leave them on since bottle caps that are given in separately and not detected during screening might end up in general rubbish.

[Continue Reading >](#)

Figure 27. What Are the Other Solutions Page

Figure 27 displays the contents outlining the other solutions for climate change. Users can quickly do the solutions given on this page, take actions that do not have high stakes, and forge better habits for taking care of the environment.

Climate change is a complex global problem with scientific, economic, societal, political, and moral dimensions, and it will persist for thousands of years. Despite halting greenhouse gas emissions, the long-lasting presence of carbon dioxide and the delayed response of the planet mean that future generations will still experience the effects of global warming and climate change. Humanity is therefore bound to a certain level of climate change.

Mitigation and adaptation are crucial elements in addressing climate change. Mitigation focuses on reducing the causes of climate change, while adaptation aims to manage its impacts. A comprehensive approach that integrates both strategies is vital for establishing a sustainable and resilient future in the context of climate change.

There are two approaches to address climate change: mitigation and adaptation.

1. Mitigation

Involves reducing and stabilizing the presence of greenhouse gases in the atmosphere to limit further warming.

2. Adaptation

Focuses on adjusting to the changes that are already occurring due to climate change.

Mitigation refers to the actions taken to reduce climate change by decreasing the release of heat-trapping greenhouse gases into the atmosphere. This can be achieved by limiting the sources of these gases, such as the combustion of fossil fuels for energy and transportation, or by enhancing natural sinks like forests, oceans, and soil that absorb and store these gases. The objective of mitigation is to prevent significant human interference with the Earth's climate, stabilize greenhouse gas levels within a timeframe that allows ecosystems to naturally adapt to climate change, safeguard food production, and support sustainable economic development (as outlined in the 2014 report on Mitigation of

Figure 28. Responding to Climate Change

Figure 28 shows the contents of the Responding to Climate Change page, which has information on ways to respond to Climate Change as users.

Data and Information

The following resources from government organizations in the United States offer information on potential approaches for addressing climate change.



Climate Change Commission (CCC)

CCC is the sole policy-making body of the government tasked to coordinate, monitor and evaluate the programs and action plans of the government relating to climate change pursuant to the provisions of the Philippine Climate Change Act (RA 9729).



Department of Environmental and Natural Resources (DENR)

The Department of Environment and Natural Resources (DENR) is responsible for the conservation, management, and development of the country's environment and natural resources. It shall ensure the proper use of these resources and the protection of the environment within the framework of sustainable development.



National Integrated Climate Change Database Information and Exchange System (NICCDIES)

To track the actions necessary to address these climate change issues, the National Integrated Climate Change Database Information and Exchange System (NICCDIES) serves as the integrated climate information portal of the Climate Change Commission. NICCDIES serves as the primary enabling platform of the CCC in consolidating and monitoring, among other things, data and information on climate change and climate action from sources and actors coming from both public and private sector and other stakeholders, allowing for decision-makers to access, distribute and exchange these data for use in policymaking, development planning, investment decision making.

Figure 29. Sustainability and Government Resources

Figure 29 shows the government agencies and resources that may aid users in looking into more information and solutions, as well as credible resources for updates on climate change.

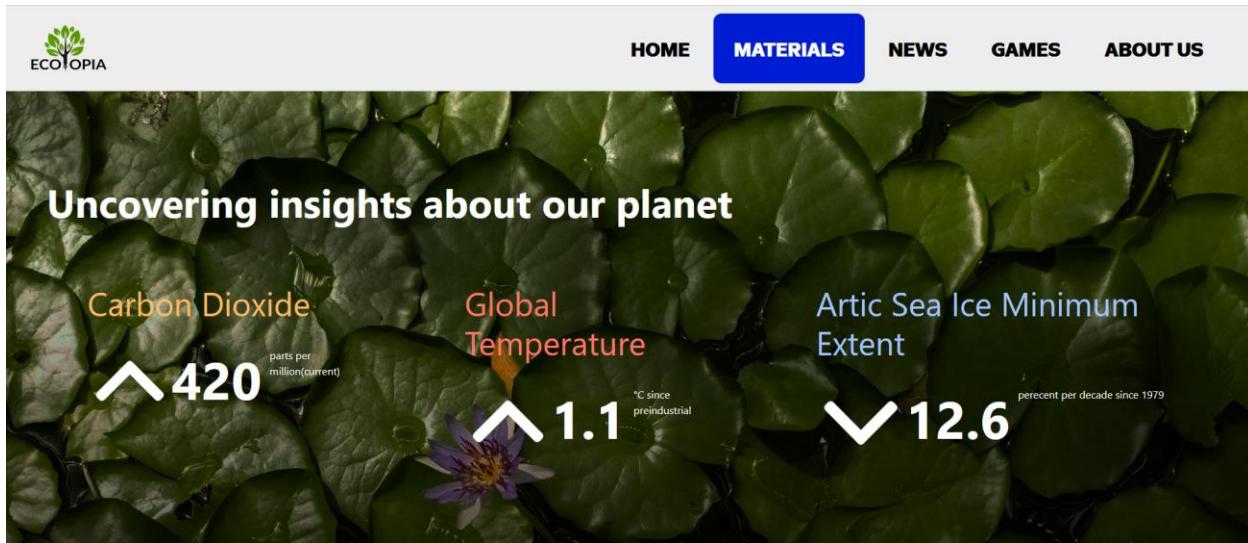


Figure 30. Overview of Climate Change Page

Figure 30 displays a brief overview of climate change, including a definition of climate change, its causes, effects, solutions, and evidence of its existence.

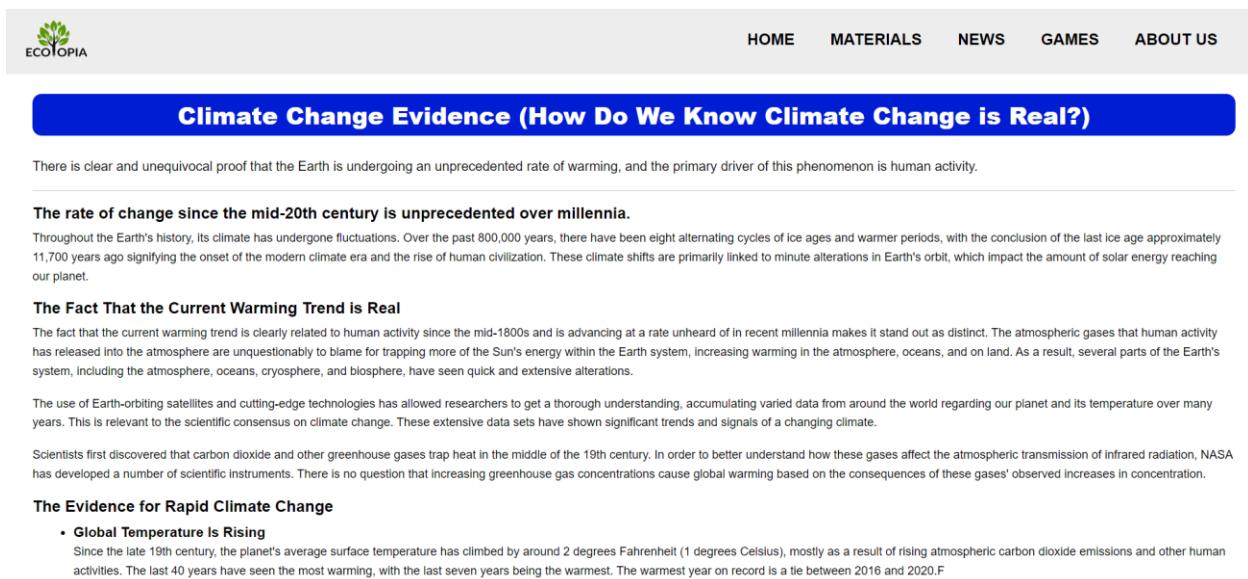


Figure 31. Evidence Page

Figure 31 shows the evidence for the existence and the progression of Climate change.

Causes of Climate Change

Human activities are driving the global warming trend observed since the mid-20th century.

Increasing Greenhouse Gases Are Warming the Planet

The human expansion of the "greenhouse effect"—warming that occurs when the atmosphere traps heat radiating from Earth toward space—is what scientists believe is responsible for the trend in global warming that has been seen since the middle of the 20th century.

Energy from the Sun is essential to life on Earth. Nearly half of the light energy that reaches the Earth's atmosphere is reflected and emitted as infrared heat as it travels through the atmosphere and clouds to the surface. A greenhouse gas absorbs around 90% of this heat, which is then reflected out into space at a slower rate.

Four Major Gases That Contribute to the Greenhouse Effect:

- **Carbon Dioxide**

A vital component of the atmosphere, carbon dioxide (CO₂) is released through natural processes (like volcanic eruptions) and through human activities, such as burning fossil fuels and deforestation.

- **Methane**

Methane is a common atmospheric gas that has both natural and man-made sources. Methane is released through landfills and rice fields in addition to being produced when plant matter breaks down in wetlands. Methane is produced by the digestion and feces of livestock animals. Another significant source of methane emissions is from the production and transportation of fossil fuels, as natural gas contains between 70% and 90% methane.

Figure 32. Causes Page

Figure 32 shows the Causes of Climate Change page, detailing the activities, gases, and other substances contributing to climate change.

The screenshot shows the header with the ECO TOPIA logo and navigation links for HOME, MATERIALS, NEWS, GAMES, and ABOUT US. Below the header is a blue banner with the title 'Effects of Climate Change'. The main content area discusses the effects of human-caused global warming, mentioning irreversible changes like melting ice sheets and shifting plant ranges. It also highlights the work of the Intergovernmental Panel on Climate Change (IPCC) and the long-term impacts of greenhouse gas emissions. A 'Takeaways' section lists the consequences of continued warming.

Effects of Climate Change

The effects of human-caused global warming are happening now, are irreversible for people alive today, and will worsen as long as humans add greenhouse gases to the atmosphere.

Earth Will Continue to Warm and the Effects Will be Profound

Global warming is not a future issue. Increased human emissions of heat-trapping greenhouse gases are altering the Earth's climate, which is already having a significant impact on the environment. Glaciers and ice sheets are melting, lake and river ice is breaking up earlier, plant and animal ranges are shifting, and plants and trees are blooming earlier.

Sea ice loss, rapid sea level rise, and longer, more intense heat waves are just a few of the effects of global climate change that scientists have long anticipated will happen.

Droughts, wildfires, and excessive rainfall are a few examples of changes that are occurring more quickly than previously thought by scientists. In fact, the Intergovernmental Panel on Climate Change (IPCC), a body of the UN tasked with evaluating the science surrounding climate change, asserts that the observed changes in our planet's climate are unprecedented in human history and that some of these changes will be irreversible over the course of the next hundreds to thousands of years.

Scientists are very confident that the rise in global temperatures, which is mostly caused by greenhouse gases produced by human activity, will last for many decades.

According to the IPCC's Sixth Assessment report, which was released in 2021, human emissions of gases that trap heat had already caused the climate to warm by almost 2 degrees Fahrenheit (1.1 degrees Celsius) between 1850 and 1900. Within the next few decades, the average global temperature is predicted to approach or surpass 1.5 degrees C (about 3 degrees F). All areas of the planet will be impacted by these developments.

The direction that future human activities take will determine how severe the effects of climate change are. More climatic extremes and extensive negative repercussions on our planet will result from increased greenhouse gas emissions. However, the extent to which we emit carbon dioxide will determine these long-term repercussions. Therefore, some of the worst effects might be avoided if we can lower emissions.

Takeaways

- The sea ice loss, glacier and ice sheet melting, sea level rise, and more violent heat waves are already occurring, as predicted by scientists.
- Scientists anticipate that greenhouse gases produced by humans will continue to cause global temperature increases. The effects of the severe weather will also worsen and increase.

Figure 33. Effects Page

Figure 33 shows the effects of climate change on the environment and humans.



Climate change is a complex global problem with scientific, economic, societal, political, and moral dimensions, and it will persist for thousands of years. Despite halting greenhouse gas emissions, the long-lasting presence of carbon dioxide and the delayed response of the planet mean that future generations will still experience the effects of global warming and climate change. Humanity is therefore bound to a certain level of climate change.

Mitigation and adaptation are crucial elements in addressing climate change. Mitigation focuses on reducing the causes of climate change, while adaptation aims to manage its impacts. A comprehensive approach that integrates both strategies is vital for establishing a sustainable and resilient future in the context of climate change.

There are two approaches to address climate change: mitigation and adaptation.

1. Mitigation

Involves reducing and stabilizing the presence of greenhouse gases in the atmosphere to limit further warming.

Figure 34. Solutions Page

Figure 34 shows the possible solutions for climate change, including climate mitigation and adaptation details.

Self-Assessment

1. It is a long-term shift of temperature and typical weather pattern in a place.
 Climate Change
 Weather
 Temperature
 Biodiversity

2. Which of the following is not considered as significant issue on climate change in the Philippines?
 Sea level rise
 Coastal Erosion
 Ecosystem Loss
 Urban Smog

3. Which of the following is not considered as significant issue on climate change in the Philippines?
 Agriculture
 Food Security
 Climate Change

Figure 35. Self-Assessment Page

Figure 35 shows the contents of the Self-Assessment page that users can use to test their understanding of the materials.

News & Features

2023-10-17

Extraordinary September heat means 2023 is now on track to be the warmest year on record

2023 is on course to be the hottest year on record, scientists warned on Thursday

[Read more](#)

Sept. 7, 2023

Climate change worsening heat waves, air quality

Climate change is driving more intense and more frequent heat waves, which in turn generate a 'witch's brew' of pollutants, threatening the health of humans and other living things, the UN warned Wednesday.

[Read more](#)

Sept. 19, 2023

'No nonsense' Climate Ambition Summit: What you need to know

The race to protect the planet is about to accelerate, as world leaders, business giants, and experts gather to attend the Climate Ambition Summit on Wednesday

[Read more](#)

Oct. 12, 2023

October 2023 El Niño update: big cats

El Niño is currently purring along in the tropical Pacific

[Read more](#)

Figure 36. News Page

Figure 36 shows the News page, which displays current climate change and global warming news. Each thumbnail redirects users to the news articles for further reading.

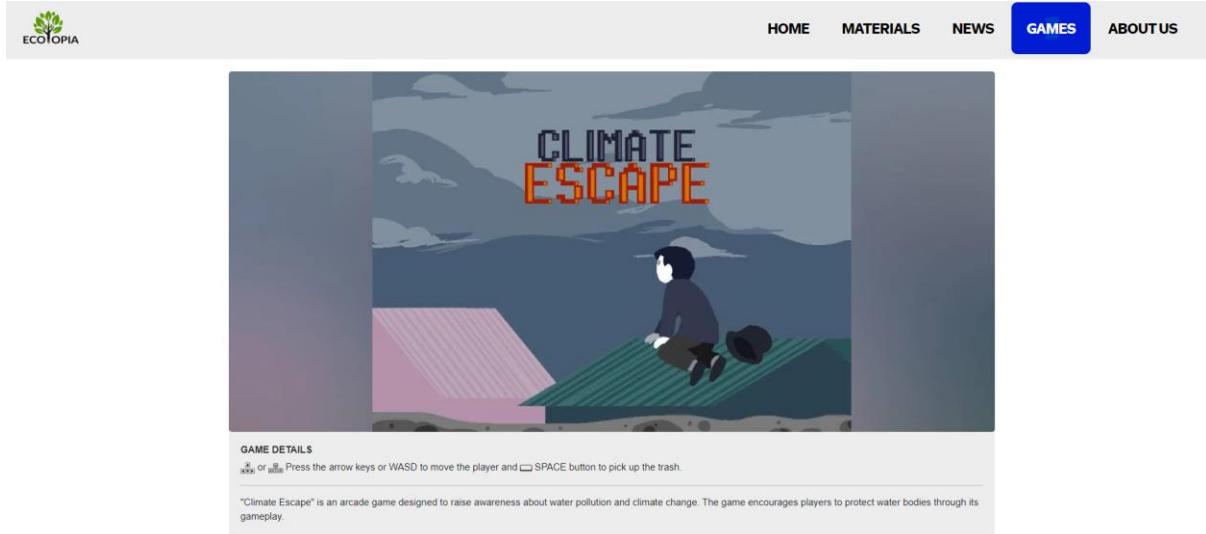


Figure 37. Game Page

Figure 37 shows the arcade game developed called “Climate Escape” that users can play to test their understanding in a gamified format.

The screenshot shows the 'About Us' page. At the top, there's a navigation bar with links for HOME, MATERIALS, NEWS, GAMES (highlighted in blue), and ABOUT US. Below the navigation is a large blue header box containing the text 'About Maafia'. To the left of this box is the Ecotopia logo. To the right is a section titled 'MAAFIA' with a detailed paragraph about the team's mission and goals. Further down, there's another section titled 'OBJECTIVES' with a brief statement about their mission.

Figure 38. About Us Page

Figure 38 shows the About Us page, detailing the information about the developer team, their objectives, and partner organization.

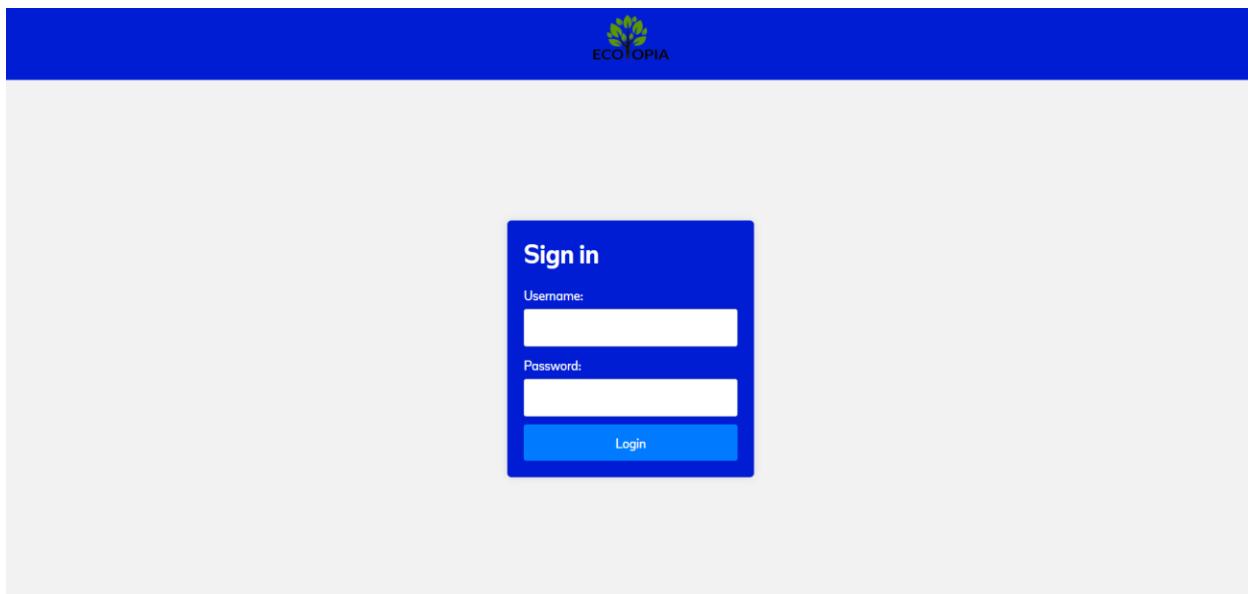


Figure 39. Admin Login Page

Figure 39 is the Ecotopia web application login page for administrators. Only authorized admins can navigate this page; invalid credentials will lead to error validation.

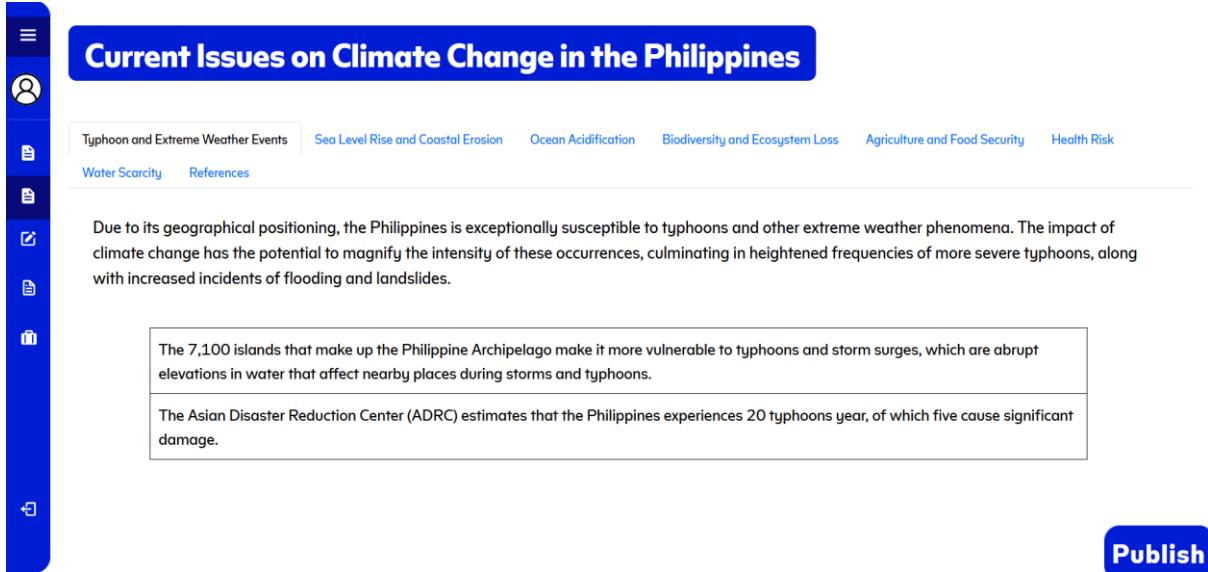
The image shows the "Manage Admin Account" page from the Ecotopia web application. On the left is a vertical blue sidebar with icons for navigation. The main content area has a white background and displays a table titled "Manage Admin Account".

#	Status	Username	Email	Full Name	Phone Number	Role	Actions		
1	Verified	karlmarx	roxaskv@students.national-u.edu.ph	Karl Marx Roxas	09239703709	superadmin	<button>Update Info</button>	<button>Reset Password</button>	<button>Delete</button>
2	Verified	marxk	marxcrane21@gmail.com	Karl Marx	09232323232	superadmin	<button>Update Info</button>	<button>Reset Password</button>	<button>Delete</button>
3	Verified	vincent	regalavb@students.national-u.edu.ph	Vincent	09232323232	superadmin	<button>Update Info</button>	<button>Reset Password</button>	<button>Delete</button>
4	Verified	rogel	karlmarrroxas1@gmail.com	Rogel	09232323233	admin	<button>Update Info</button>	<button>Reset Password</button>	<button>Delete</button>
5	Not Verified	administrator	karlmarrroxas1@gmail.com	Karl	09239703709	admin	<button>Update Info</button>	<button>Reset Password</button>	<button>Delete</button>
6	Verified	karina	delacruzkb@students.national-u.edu.ph	Karina	09232323232	admin	<button>Update Info</button>	<button>Reset Password</button>	<button>Delete</button>
7	Verified	karina2	karlmarrroxas1@gmail.com	Karina	09232323232	superadmin	<button>Update Info</button>	<button>Reset Password</button>	<button>Delete</button>

[New admin](#)

Figure 40. Admin Accounts

Figure 40 is the admin accounts of the Ecotopia web application, where only the super admin can access this web page. The super admin can manage the system's CRUD functionality in this part.



The screenshot shows the 'Current Issues on Climate Change in the Philippines' page. On the left is a vertical sidebar with icons for navigation. The main content area has a blue header bar with the title. Below the header is a navigation bar with links: Typhoon and Extreme Weather Events, Sea Level Rise and Coastal Erosion, Ocean Acidification, Biodiversity and Ecosystem Loss, Agriculture and Food Security, and Health Risk. Underneath the navigation bar are two buttons: 'Water Scarcity' and 'References'. The main content area contains text about the Philippines' geographical positioning and its susceptibility to typhoons. It also includes two boxed sections with additional information: one about the 7,100 islands and another from the Asian Disaster Reduction Center (ADRC) regarding typhoon frequency and damage.

Figure 41. Admin Current Issues Page

Figure 41 shows the current issues page where the admin will be directed to this page upon logging in. This page enables administrators to edit inline text and publish the content.



The screenshot shows the 'Current Issues on Climate Change in the Philippines' page with a navigation panel on the left. The navigation panel has a dark blue background and lists several items: 'Administrator' (selected), 'News', 'Current Issues' (selected), 'Assessment', 'Climate Action SDG 13', and 'Solutions'. At the bottom of the panel are 'Logout' and a 'Publish' button. The main content area is identical to Figure 41, showing the same text and boxed information sections.

Figure 42. Admin Navigation Panel

Figure 42 displays the side panel designed for administrators to navigate through. Within this panel, they can access various sections, including News, Current Issues, Assessment, Climate Action S.D.G. 13, and Solutions. The Climate Action SD 13 and Solutions section also features a dropdown menu for expanded options.

The screenshot shows the 'Admin News & Features' page. On the left is a vertical blue sidebar with icons for navigation. The main area has a header 'Admin News & Features' with a 'Add News' button. Below are two news cards:

- News Card 1:** Date: 2023-10-17. Title: Extraordinary September heat means 2023 is now on track to be the warmest year on record. Subtext: 2023 is on course to be the hottest year on record, scientists warned on Thursday. Actions: 'Edit' (blue) and 'Delete' (red).
- News Card 2:** Date: Sept. 7, 2023. Title: Climate change worsening heat waves, air quality. Subtext: Climate change is driving more intense and more frequent heat waves, which in turn generate a 'witch's brew' of pollutants, threatening the health of humans and other living things, the UN warned Wednesday. Actions: 'Edit' (blue) and 'Delete' (red).

Figure 43. Admin News and Features Page

Figure 43 shows the Ecotopia web application's Admin News and Features page. It is only the page where the administrators add, edit, delete, and update its contents.

The screenshot shows the 'Goal 13: Climate Action' page. The left sidebar includes icons for navigation. The main content area is titled 'Goal 13: Climate Action' and contains four sections:

- Overview:** Sustainable Development Goal 13, one of the 17 established by the United Nations General Assembly in 2015, aims to address climate change by both reducing its impact and adapting to it. The primary objective of this goal is officially stated as the need for immediate action to combat climate change and its consequences.
- Target and Indicators:** Sustainable Development Goal (SDG) 13 focuses on climate action. Its target is to "Take urgent action to combat climate change and its impacts." To monitor progress toward this goal, several key indicators are used to help governments and organizations gauge their progress in addressing climate change and its effects, as outlined in SDG 13.
- Progress and Info:** Sustainable Development Goal (SDG) 13, which focuses on climate action, has seen significant global progress in recent years. Efforts have been made to strengthen resilience to climate-related hazards, integrate climate measures into national policies, and enhance education and awareness about climate change mitigation and adaptation.
- Related Topics:** Sustainable Development Goal 13 (SDG 13), known as "Climate Action," is intrinsically linked to several critical and interrelated topics: Atmosphere, Climate Action and Synergies, Small Island Developing State, and National Strategies and SDG Integration.

Figure 44. Admin Climate Action SDG 13 Page

Figure 44 shows the Ecotopia web application's admin Climate Action S.D.G. 13 page, where the administrators can only edit inline text and update its contents.

The screenshot shows the 'Overview' section of the admin interface. On the left is a vertical sidebar with icons for navigation. The main content area has a blue header 'Overview'. Below it is a text block about SDG 13 aims to combat climate change and its impacts by taking urgent action. It discusses children's rights and the burden of disease attributable to climate change. Another text block from UNICEF highlights their work with partners at global and local levels to ensure children live in safe and clean environments. A 'References' link is visible at the bottom of the content area.

Figure 45. Admin Overview Page

Figure 45 shows the Ecotopia web application's admin Overview page for Climate Action S.D.G. 13. The administrators can only edit inline text and update its contents.

The screenshot shows the 'Target and Indicators' section of the admin interface. The sidebar on the left includes an icon for this section. The main content area features a large title 'Target 13.1' in bold. To its right is a 'SDG Goal 13' section with the goal's name and a brief description: 'Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.' Below this is an 'Indicators' section with a bulleted list of three items: 13.1.1 - Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population; 13.1.2 - Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030; and 13.1.3 - Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies.

Figure 46. Admin Target and Indicators Page

Figure 46 shows the admin Target and Indicators page for Climate Action S.D.G. 13 of the Ecotopia web application, where the administrators can only edit inline text and update its contents.

The screenshot shows a blue sidebar menu on the left with icons for navigation, user profile, file management, and other system functions. The main content area has a blue header bar with the title "Progress and Info". Below the header, the year "2023" is displayed in large blue text. A detailed paragraph discusses the global climate crisis, mentioning the Paris Agreement and the need for urgent action. Below the paragraph, there are two bullet points under the heading "Target 13.1":

- Target 13.1
 - The number of deaths and missing persons due to disasters per 100,000 population has steadily decreased from 1.64 during 2005-2015 to 0.86 during 2012-2021. The average disaster mortality stood at 47,337 in absolute terms in 2015-2021. However, the number of persons affected by disasters per 100,000 people rose from 1,198 during 2005-2015 to 2,113 during 2012-2021. The number of countries with national strategies for disaster risk reduction has increased from 55 in 2015 to 126 by the end of 2021. Based on this, a total of 118 countries have reported having some level of policy coherence with other global frameworks, such as the 2030 Agenda and the Paris Agreement.

Below the first bullet point, there is another bullet point under "Target 13.2":

- Target 13.2
 - Global temperatures have already hit 1.1°C, rising due to increasing global greenhouse gas emissions, which reached record highs in 2021. Real-time data from 2022

Figure 47. Admin Progress and Info Page

Figure 47 shows the Ecotopia web application's admin Progress and Info page for Climate Action S.D.G. 13. The administrators can only edit inline text and update its contents.

The screenshot shows a blue sidebar menu on the left with icons for navigation, user profile, file management, and other system functions. The main content area has a dark red header bar with the title "Related Topics". Below the header, there is a numbered list of related topics:

1. **Atmosphere**
Related Goal: SDG 13
<https://sdgs.un.org/topics/atmosphere> (Link)
2. **Climate Action and Synergies**
Related Goal: SDG 3
<https://sdgs.un.org/topics/climate-action-synergies> (Link)
3. **Small Island and Developing State**
Related Goal: SDG 2, 5, 6, 7, 12, 13, 14, 15, 17
<https://sdgs.un.org/topics/small-island-developing-states> (Link)
4. **National Strategies and SDG Integration**
Related Goal: SDG 3, 11, 13, 15, 16, 17EQWEQW
<https://sdgs.un.org/topics/national-sustainable-development-strategies> (Link)

At the bottom of the page, there is a small "References" link.

Figure 48. Admin Related Topics Page

Figure 48 shows the admin Related Topics page for Climate Action S.D.G. 13 of the Ecotopia web application, where the administrators can only edit inline text and update its contents.

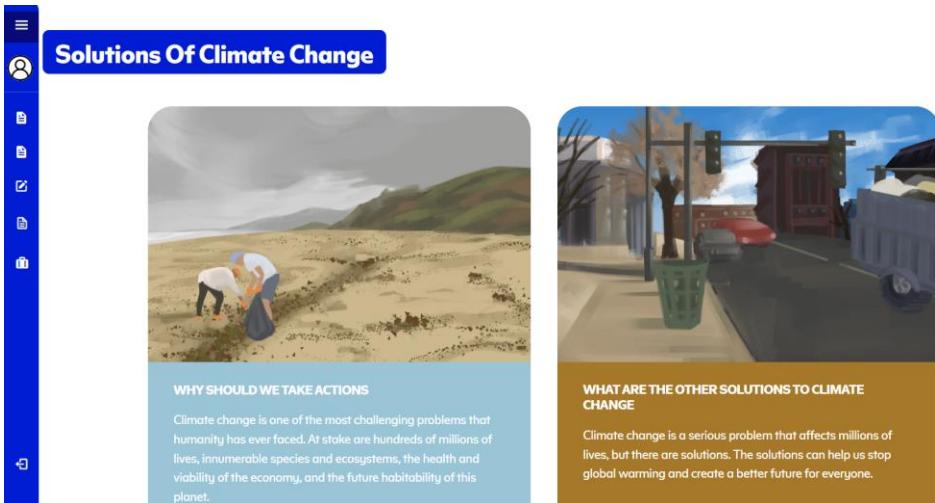


Figure 49. Admin Solutions Page

Figure 49 shows the admin Solutions page for the Ecotopia web application, where the administrators can only edit inline text and update its contents.

Why should we take action

Climate change is one of the most challenging problems that humanity has ever faced. At stake are hundreds of millions of lives, innumerable species and ecosystems, the health and viability of the economy, and the future habitability of this planet.

Cut emissions

Carbon dioxide and other heat-trapping gases are the main drivers of global warming. While climate change cannot be stopped, it can be slowed. To avoid the worst consequences of climate change, we'll need to reach "net zero" carbon emissions by 2050 or sooner. Net zero means that, on balance, no more carbon is dumped into the atmosphere than is taken out. To achieve net zero emissions, we need a massive transformation in how we produce and consume electricity. We need a newer, better transportation system. We need to stop deforestation. We need a climate-friendly agricultural system.

Remove carbon dioxide

To reach net zero emissions, we need to do more than just reduce our emissions: we need to actively remove carbon dioxide from the atmosphere or offset its effects. The easiest way to do this is by planting new forests (afforestation) or restoring old ones (reforestation). Other enhanced land management practices can help, as can new technologies that suck CO₂ out of the air ("direct air capture"), or prevent it from leaving smokestacks ("carbon capture and storage").

Act now!

No matter how quickly we reduce emissions, the reality is that certain climate impacts are inevitable. The seas are rising. Temperatures break records every year. Droughts, floods, and extreme weather are damaging communities today. Cutting carbon is the only long-term solution for avoiding climate impacts. In the short-term, we need to adapt. The best policy ideas in the world aren't worth much if we don't have activists, experts, and everyday people fighting for change. From school groups to churches; from corporate boardrooms to mayors and local leaders: we need action.

Figure 50. Admin Solution 1 Page

Figure 50 shows the admin Solution 1 page, explaining why we should act on the Ecotopia web application, where the administrators can only edit inline text and update its contents.

The screenshot shows a web application interface for managing content. On the left is a vertical sidebar with icons for user management, file storage, and other system functions. The main content area has a blue header bar with the text 'MANAGE THE OTHER SOLUTIONS TO CLIMATE CHANGE'. Below this, there is a section titled 'Climate change is a serious problem that affects millions of lives but there are solutions. The solutions can help us stop global warming and create a better future for everyone.' followed by a note about outlining 8 effective solutions. Three bullet points are listed: 'Recycle plastic bags separately' (with a note about their convenience and potential issues), 'Try not to shred paper' (with a note about recycling improvements), and 'Compress bottles and put the lid back on' (with a note about recycling advancements). At the bottom of this section is a link to a website: <https://www.clearancesolutionsltd.co.uk/reuse-and-recycling/how-to-recycle-more-effectively/>. A small note '(Continue Reading)' is visible at the bottom.

Figure 51. Admin Solution 2

Figure 51 shows the admin Solution 2 page of the other solutions for climate change of the Ecotopia web application, where the administrators can only edit inline text and update its contents.

The screenshot shows a web application interface for managing content. On the left is a vertical sidebar with icons for user management, file storage, and other system functions. The main content area contains several paragraphs of text. The first paragraph discusses climate change as a complex global problem with various dimensions. The second paragraph explains the difference between mitigation and adaptation. The third paragraph defines mitigation as reducing greenhouse gases. The fourth paragraph defines adaptation as adjusting to changes already occurring. The fifth paragraph provides a detailed explanation of mitigation, mentioning actions like reducing greenhouse gas emissions through energy efficiency and reforestation, and its goal of stabilizing greenhouse gas levels to prevent further warming.

Figure 52. Admin Solutions 3

Figure 52 shows the admin Solution3 page for responding to climate change of the Ecotopia web application, where the administrators can only edit inline text and update its contents.

4.5 IMPLEMENTATION PLAN

Deployment Plan

The researchers discuss putting the web system into action and getting it up and running.



Figure 53. Diagram for Deployment of the Web System

As part of the deployment plan, we will use Heroku as the hosting platform, name.com for our DNS management, and GitHub as our remote repository. There will be two repositories: one for the codebase and one for the backend. Once the build process is completed in the codebase repository, the 'dist' folder will automatically output into the backend repository. The backend repository is connected to Heroku, where every push or update to the backend repository will be automatically detected and deployed in Heroku. Environment variables are secured by using Env and angular built-in environments component.

Implementation Plan



Figure 54. Ecotopia Gantt Chart for Implementation Plan

An implementation plan outlines the steps and activities required to achieve a specific goal or project. It provides a roadmap for the execution of a project, highlighting key milestones, timelines, and responsibilities.

The developers use a Gantt chart in the figure 54, a visual representation of the implementation plan that displays project tasks and their durations over time.

CHAPTER 5

SUMMARY, CONCLUSION, AND RECOMMENDATION

This chapter summarizes the capstone project's key findings, conclusions drawn from the research, and recommendations for future actions or considerations.

5.1 SUMMARY

Climate change results from shifts in weather patterns and temperatures, which can occur naturally, such as from volcanic activity, or due to human actions, like the release of pollutants and the use of fossil fuels for energy. Unlike short-term weather fluctuations, climate changes unfold over long periods, taking hundreds or even millions of years to manifest, as opposed to sudden temperature shifts that can happen rapidly within hours. The study acknowledges the urgency of addressing the climate emergency and recognizes the importance of empowering young individuals to engage with its complexities. To encourage meaningful discussions, scientific collaboration, and address misconceptions to enhance students' awareness and instill constructive hope. The researchers developed a parallax website to highlight the importance of climate change awareness, employing proper management and web development methodologies including conceptualization, pre-production, production, and post-production.

Based on the testing conducted on the Ecotopia web application: During Unit Testing, all system modules were found to be functioning properly, with no bugs discovered, resulting in overall passing marks. In Integration Testing, all functionalities performed as expected, resulting in overall passing marks. Similarly, during functional testing, all properties were found to be functional and matched their expected results. Unit testing and integration testing were reviewed by group member Vincent Regala, while the functional testing was reviewed by the other group named Bonafied, consisting of the group members Veronica Silva, Rei Vergara, and Klarenz De Vera. In system testing, the application was run and tested ten times in GT Metrix to evaluate its performance. The overall performance received a grade of "E," with the highest performance score being 51%. Other metrics include a structure score of 63%, an LCP of 9.8s, a TBT of 158ms, and a CLS of 0. These results suggest that the website has room for improvement, particularly in reducing loading times (LCP) and optimizing interactivity (TBT). While the structure of the website appears relatively well-organized, there may still be opportunities for further optimization. In the OWASP ZAP, ten vulnerabilities were identified, including CSP: Wildcard Directive, CSP: script-src unsafe-eval, CSP: script-src unsafe-inline, CSP: style-src unsafe-inline, Cross-Domain Misconfiguration, Server Leaks Information via "X-Powered-By HTTP Response Header Fields,"

Timestamp Disclosure -Unix, Information Disclosure – Suspicious Comments, Modern Web Application, and Re-examine Cache-control Directives. Regarding usability testing, ten IT professionals tested the system, resulting in an overall mean score of 5.00, interpreted as "Partially Agree," indicating that there is room for improvement for the developed web application.

Below are the following specific objectives set by the researchers that have been accomplished:

- The researchers developed an interactive and multimedia element in a parallax effect.
- The researchers developed a web-based self-assessment module that measures the user's understanding of learning content.
- The researchers developed a website with an admin module to update necessary content.
- The researchers developed a mini arcade game module related to the issue of water pollution within the context of climate change.
- The researchers developed a system website that aligns with the evaluation principles outlined by the following criteria:

- *Functionality* is evaluated by how the system will function as required by the set objectives of the developers. It weighted the Grand Mean of 4.77 and Standard Deviation of 1.32, which shows that the system's functionality meets the level of agreement of the user of "Partially Agree."

- *Reliability* is evaluated by how the system can provide information and how capable the system can handle errors and failures. It weighted the Grand Mean of 4.73 and Standard Deviation of 1.32, which shows that the system's functionality meets the level of agreement of the user of "Partially Agree."

- *Performance* is evaluated by how quickly the system can respond and operate in a reasonable time. It weighted the Grand Mean of 4.70 and Standard Deviation of 1.37, which shows that the system's functionality meets the level of agreement of the user of "Partially Agree."

- *Security/Compliance* is evaluated by how trusted the system can be. It weighted the Grand Mean of 4.80 and Standard Deviation of 1.41, which shows that the system's functionality meets the level of agreement of the user of "Partially Agree."

- *Usability* is evaluated by five criteria: Learnability, Efficiency, Memorability, Error Protection, and Satisfaction. Each criterion results from the level of agreement of "Partially Agree," which has a Grand Mean total of 4.62 and a Standard Deviation of 1.39.

5.2 CONCLUSION

With thorough investigation and testing, the researchers conclude the following:

- The researcher developed a web application that aligns with the objective established in the study.
- The researcher provides information about climate change to mobilize individuals to take meaningful actions toward combating climate change and creating a more sustainable future.
- Ecotopia provides a parallax effect for the users to have a captivating experience while using the web application.
- Ecotopia provides a mini arcade game that imparts knowledge, empowers, and mobilizes individuals to take meaningful actions towards water pollution in the context of climate change.

Moreover, we conclude that to implement a Parallax website with mini-arcade game, it is very helpful to use MEAN stack in developing the web application. By using the MEAN stack, we have created an informative web application. MongoDB's flexible document-based data model allows for efficient storage. Express.js provides a streamlined framework for building the backend server, handling HTTP requests, and routing. Angular enables the creation of a responsive and interactive user interface, facilitating seamless navigation and gameplay experiences. Lastly, Node.js powers the backend server, allowing for real-time communication and efficient handling of game logic.

5.3 RECOMMENDATION

The following are the list of recommendations the developers would like to improve in the future:

1. The developers would like to develop this application for the Android-based mobile and IOS platforms to cater to more users.
2. The web application addresses climate change issues in both the Philippines and globally. The developers would like to consider creating a consistent range of topics or expanding the application's scope to encompass a more comprehensive array of environmental challenges and regions, thus enhancing its global impact approach.

3. The developers would like to incorporate more interactive games and have more challenging levels to make the platform more engaging and effective for the users.
4. We recommend enriching the content by integrating images and including videos to enhance the learning experience and have a more comprehensive and engaging understanding of the subject matter.
5. Finally, the developers would like to improve the web application's user interface by implementing a uniform design and theme, creating a more visually appealing user experience.

REFERENCES

- [1] "United Nations," *Climate Action*.
- [2] "NASA," May 2014. [Online]. Available: <https://www.nasa.gov/learning-resources/for-kids-and-students/what-is-climate-change-grades-k-4/>. [Accessed 9 May 2023].
- [3] "WIX," 4 June 202. [Online]. Available: <https://www.wix.com/blog/what-is-parallax-scrolling-explained-with-examples>. [Accessed 9 May 2023].
- [4] C. Lawless, "LearnUponBlog," [Online]. Available: <https://www.learnupon.com/blog/what-is-elearning/>. [Accessed 5 May 2023].
- [5] S. W. A. Heejin Han, "Youth Mobilization to Stop Global Climate Change: Narratives and Impact," *Sustainability*, vol. 12, no. 10, 2020.
- [6] M. C. K. P. Anna Pettee, November 2021. [Online]. Available: https://plan-international.org/uploads/2022/01/plan_international_workbook_overview.pdf. [Accessed 24 October 2023].
- [7] UNESCO, UNESCO science report: towards 2030, Paris, France: IEEE, 2015.
- [8] A. Patlins, J. Caiko, N. Kunicina, A. Zhiravetska and V. Riashchenko, "IEEE Explore," 2020. [Online]. Available: <https://ieeexplore.ieee.org/document/9316561>. [Accessed April 2023].
- [9] M. Fontaine, "Semantic Scholar," 2013. [Online]. Available: <https://www.semanticscholar.org/paper/Corporate-Social-Responsibility-and-Sustainability%3A-Fontaine/e2200942c5bdca45307850865d07d514b12dd194>. [Accessed 14 April 2023].
- [10] "IPCC," [Online]. Available: <https://www.ipcc.ch/report/ar5/wg2/>. [Accessed 16 April 2023].
- [11] P. L. Kinney, "JAMA Network Open," 4 January 2021.
- [12] N. L. Fann, C. G. Nolte and M. C. Sarofim, "JAMA Network Open," 4 January 2021. [Online]. Available: <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2774529>. [Accessed April 2023].

- [13] R. J. Lifton and R. Falk, *Indefensible weapons: the political and psychological case against nuclearism*, US, 1982.
- [14] H. Washington, Taylor and Francis Group, London, 2015.
- H. Washington, "Denial as a key obstacle to solving the environmental crisis," in *Denial as a key obstacle to solving the environmental crisis By Dr Haydn Washington, Visiting Fellow, The Institute of Environmental Studies, UNSW Fenner*, 2013.
- [16] "Climate Laws," [Online]. Available: <https://climate-laws.org/>. [Accessed April 2023].
- [17] "Nature," [Online]. Available: <https://www.nature.com/nclimate/>. [Accessed April 2023].
- [18] "HUION," [Online]. Available: <https://store.huion.com/>. [Accessed August 2023].
- [19] Wikipedia. [Online]. Available: <https://en.wikipedia.org/wiki/MongoDB>. [Accessed August 2023].
- [20] "Wikipedia," [Online]. Available: <https://en.wikipedia.org/wiki/Express.js>. [Accessed August 2023].
- [21] "Wikipedia," [Online]. Available: <https://en.wikipedia.org/wiki/Express.js>. [Accessed August 2023].
- [22] "Wikipedia," [Online]. Available: <https://en.wikipedia.org/wiki/Node.js>. [Accessed September 2023].
- [23] "Heroku," [Online]. Available: <https://www.heroku.com/>. [Accessed October 2023].
- [24] "IBM," [Online]. Available: <https://www.ibm.com/topics/rest-apis>. [Accessed September 2023].
- "The Nature Conservancy," 9 December 2018. [Online]. Available: https://www.nature.org/en-us/what-we-do/our-priorities/tackle-climate-change/climate-change-stories/climate-change-frequently-asked-questions/?fbclid=IwAR0idbNBpvw3RnrbcfR1WmKZwYnGhwCOINUGIfH9IOcKV_VmS52vCDN7KMM#humans. [Accessed 13 March 2023].
- [26] J. Rogelj, O. Geden, A. Cowie and A. Reisinger, "Three ways to improve," *Nature*, vol. 591, 2021.

- Z. KILIÇ, "Water Pollution: Causes, Negative Effects and Prevention Methods," *Istanbul Sabahattin Zaim Üniversitesi Fen Bilimleri Enstitüsü Dergisi*, vol. 3, no. 2, pp. 129 - 132, 2021.
- D. Fowler, J. A. Pyle, M. A. Sutton and M. L. Williams , "National Library of Medicine," October 2020. [Online]. Available: <https://pubmed.ncbi.nlm.nih.gov/32981444/>. [Accessed April 2023].
- H. V. Ford, . N. H. Jones, . A. . J. Davies, . B. J. Godley, . J. R. Jambeck, I. E. Napper, C. . C. Suckling, . G. J. Williams , . L. C. Woodall and H. J. Koldewey, "The fundamental links between climate change and marine plastic pollution," *Science of The Total Environment*, vol. 806, 2022.
- V. Apaolaza, M. R. Paredes, P. Hartmann, J. M. Barrutia and C. Echebarria, "How does mindfulness relate to proenvironmental behavior? The mediating," *Journal of Cleaner Production*, 2022.
- J. M. Jankowski and V. Jon, "The role of lay beliefs about willpower and daily demands in day-to-day," *Journal of Environmental Psychology*, 2023.
- I. Ratinen, "Students' Knowledge of Climate Change, Mitigation and," *Education Sciences*, vol. 11, p. 14, 2021.
- S. Pfirman, T. O'Garra, B. S. E, B. J, J. J. Lee and E. Lukasiewics, "Stickier" learning through gameplay: An effective approach to climate change education," *Journal of Geoscience Education*, pp. 192-206, 2020.
- M. Kayyali, "Be the change: Universities Shaping the Future of the World," *International Journal of Management, Sciences, Innovation, and Technology IJMSIT*, vol. 3, no. 4, pp. 1-2, 2022.
- [35] K. FACER, "Climate Change: how should," vol. 61, 2019.
- N. Röber, M. Böttiger and B. Stevens, *Computer Graphics and Application*, vol. 41, no. 1, pp. 42-48, 2021.
- A. E. Dessler, Introduction to Modern Climate Change, Texas: Cambridge University Press, 2021.
- [38] S. Fawzy, A. . I. Osman, J. Doran and D. W. Rooney, "Strategies for mitigation of climate change: a review," *Environmental Chemistry Letters*, 2020.

- Y. Malhi, . J. Franklin, N. Seddon, M. Solan, M. G. Turner, C. . B. Field and N. Knowlton, [39] "Climate change and ecosystems: threats, opportunities and solutions," *Biological Science*, 2020.
- Z. Mi, Dabo Guan, Zhu Liu, Jingru Liu, Vincent Viguié, Neil Fromer and Yutao Wang, [40] "Cities: the core of climate change mitigation," *Journal of Cleaner Production*, 2018.
- A. U. S. D. A. e. a. Shahzad, "Nexus on climate change: agriculture and possible solution [41] to cope future climate change stresses," *Environmental Science and Pollution Research*, vol. 28, p. 14211–14232 , 2021.
- "United Nations," [Online]. Available: <https://www.unwater.org/water-facts/water-and-climate-change>. [Accessed October 2023].
- [42] "United Nations," [Online]. Available: [https://www.un.org/en/climatechange/science/climate-issues/water#:~:text=Water%20and%20climate%20change%20are,water%20water%20\(UN%20Water\)..](https://www.un.org/en/climatechange/science/climate-issues/water#:~:text=Water%20and%20climate%20change%20are,water%20water%20(UN%20Water)..) [Accessed October 2023].
- [43] "INNOVATION," [Online]. Available: <https://www.innovationnewsnetwork.com/water-pollution-and-climate-change/22928/>. [Accessed October 2023].
- [44] "NICCDIES," [Online]. [Accessed October 2023].
- S.-N. W. & F.-M. Shyu, "Study on Parallax Scrolling Web Page Conversion Module," in [46] *Springer, Cham*.
- D. Frederick, "ResearchGate," February 2015. [Online]. Available: https://www.researchgate.net/publication/273440419_The_Effects_of_Parallax_Scrolling_on_User_Experience_in_Web_Design#:~:text=This%20scrolling%20technique%20creates%20the,that%20it%20improves%20user%20experience.. [Accessed 2023].
- D. Frederick, "researchgate," February 2015. [Online]. Available: https://www.researchgate.net/publication/273440419_The_Effects_of_Parallax_Scrolling_on_User_Experience_in_Web_Design#:~:text=This%20scrolling%20technique%20creates%20the,that%20it%20improves%20user%20experience.. [Accessed 4 August 2023].
- S. S. S. Ruoxu Wang, "How does Parallax Scrolling Influence User Experience? A Test of [49] TIME (Theory of Interactive Media Effects)," *International Journal of Human–Computer Interaction* , vol. 34, no. 6, pp. 533-543, 2017.

- [50] R. A. Susanto, "researchgate," January 2020. [Online]. Available: https://www.researchgate.net/publication/347481180_Engaging_Students_With_Experiential_Website_Design_As_Online_Learning_Media_Comparative_Studies_of_Interactive_Parallax_Scrolling_Technique_on_Commercial_Website. [Accessed 4 August 2023].
- [51] A. A. D. a. W. G. Frazer, "eprints," 5 September 2007. [Online]. Available: <https://eprints.soton.ac.uk/264174/>. [Accessed 4 August 2023].
- [52] A. A. D. a. W. G. Frazer, "University of Southampton Institutional Repository," 2007. [Online]. Available: <https://eprints.soton.ac.uk/264174/>. [Accessed 2023].
- [53] P.-H. W. C.-C. C. Gwo-Jen Hwang, "An online game approach for improving students' learning performance in web-based problem-solving activities," *Computers & Education*, vol. 59, no. 4, pp. 1246-1256, 2012.
- [54] L. W. M. L. S. K.-A. M. L. A. M. J. C. S. C. Sylvester Arnab, "Designing Mini-Games as Micro-Learning Resources for Professional Development in Multi-Cultural Organisations," vol. 19, no. 2, pp. 44-58, 2021.
- [55] A. L. G. M. P. K. X. Z. M. A. C. S. Maria Korozi, "Ambient educational mini-games," *Proceedings of the International Working Conference on Advanced Visual Interfaces*, p. 802–803, 2012.
- [56] "US Department of Interior," [Online]. Available: https://www.doi.gov/library/internet/climate?fbclid=IwAR1xpL2oJ0_f3zmOMCOjrrDZ81JzpBJqTknwt1ucY7dPvX5wzGxwUHXEaSI. [Accessed April 2023].
- [57] "Heroku," [Online]. Available: <https://www.heroku.com/what>. [Accessed 14 October 2023].

APPENDICES

APPENDIX A.

SIMILARITY INDEX

REPORT

PAPER NAME

MAAFIA CHAPTER 1-5.docx

WORD COUNT

28632 Words

CHARACTER COUNT

162706 Characters

PAGE COUNT

162 Pages

FILE SIZE

18.6MB

SUBMISSION DATE

Mar 11, 2024 1:26 PM GMT+8

REPORT DATE

Mar 11, 2024 1:27 PM GMT+8**● 7% Overall Similarity**

The combined total of all matches, including overlapping sources, for each database.

- 5% Internet database
- Crossref database
- 5% Publications database
- Crossref Posted Content database

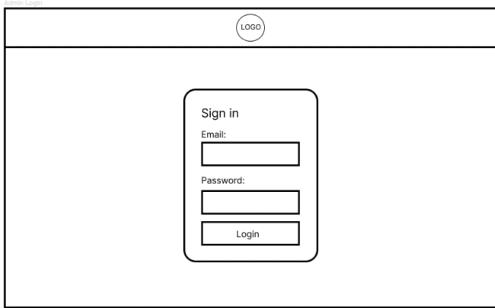
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- Submitted Works database
- Cited material
- Bibliographic material

APPENDIX B. WIREFRAME

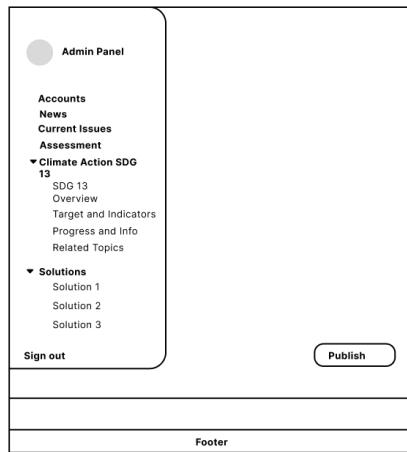
WIREFRAME

The storyboard of Ecotopia web application provides a representation of the system, module by module. Its creation was guided by its focus on prioritizing user-friendliness and integrating the clients' preferences, such as the aspects of color selection, website structure, and content selection.



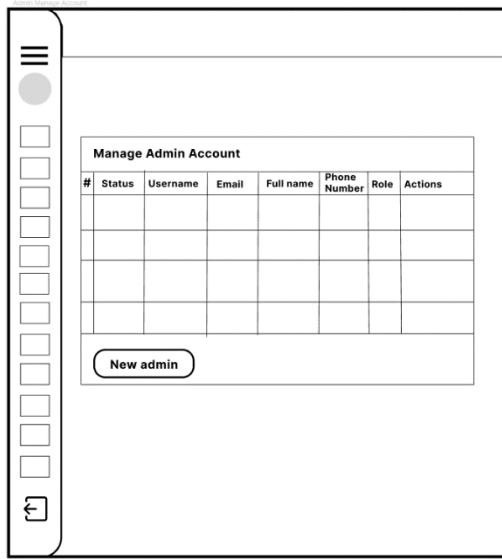
Admin Login

Figure shows the Admin Login storyboard for the Ecotopia web application.



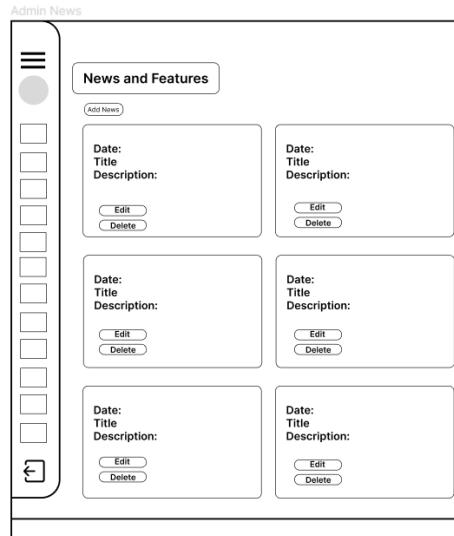
Admin Panel

Figure shows the Admin Panel storyboard for the Ecotopia web application.



Admin Accounts

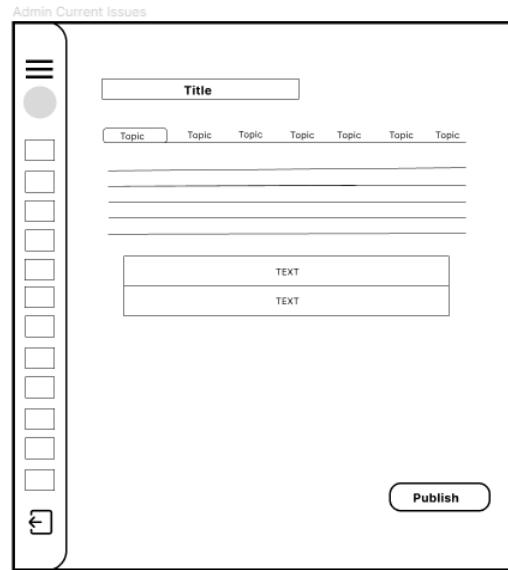
Figure shows the Admin Manage account storyboard for the Ecotopia web application.



Admin News

Figure shows the Admin News storyboard for the Ecotopia web application.

Admin Current Issues



This wireframe shows the Admin Current Issues interface. On the left is a vertical sidebar with a menu icon (three horizontal lines) and a circular profile picture. Below the sidebar is a 'Publish' button. The main area contains a 'Title' input field, a row of seven 'Topic' input fields, and two large text input fields labeled 'TEXT'. There are also several small, empty square input fields.

Admin Current Issues

Figure shows the Admin Current Issues storyboard for the Ecotopia web application.

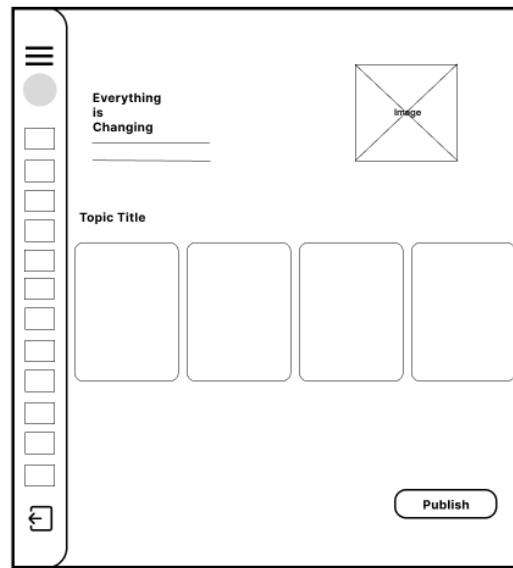
Admin Self-Assessment



This wireframe shows the Admin Self-Assessment interface. It has a similar layout to the Admin Current Issues page, featuring a sidebar with a menu icon and a circular profile picture, and a 'Publish' button at the bottom. The main content area is titled 'SELF-ASSESSMENT' and contains a large, empty rectangular input field.

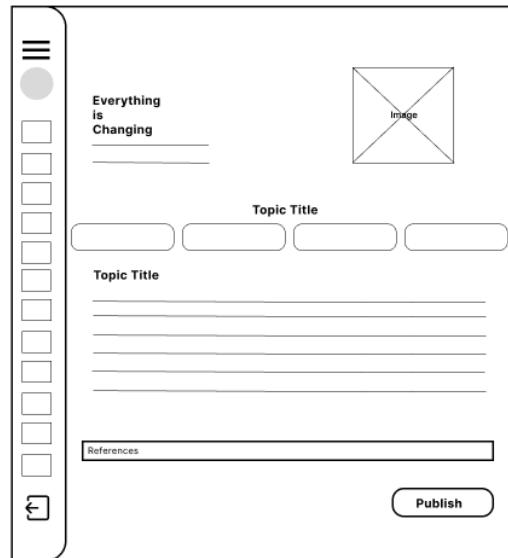
Admin Self-Assessment

Figure shows the Admin Assessment storyboard for the Ecotopia web application.



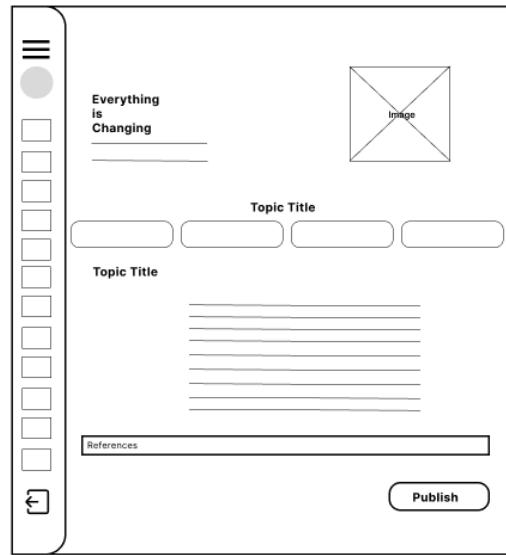
Admin SDG 13

Figure shows the Admin SDG 13 storyboard for the Ecotopia web application.



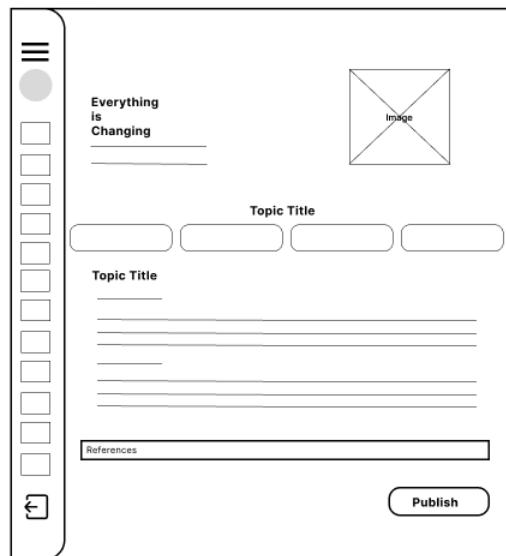
Admin Overview

Figure shows the Admin Overview storyboard for the Ecotopia web application.



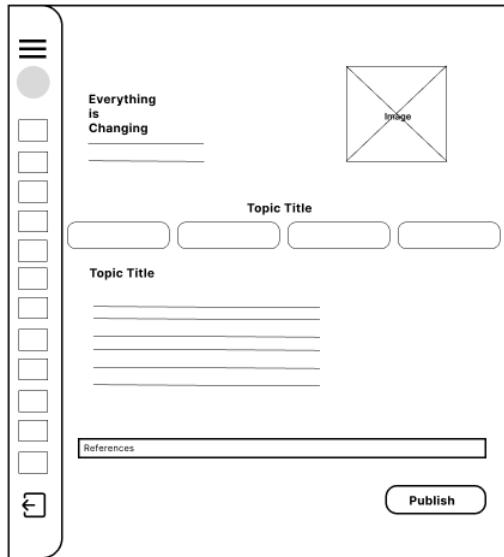
Admin Target and Indicators

Figure shows the Admin Target and Indicators storyboard for the Ecotopia web application.



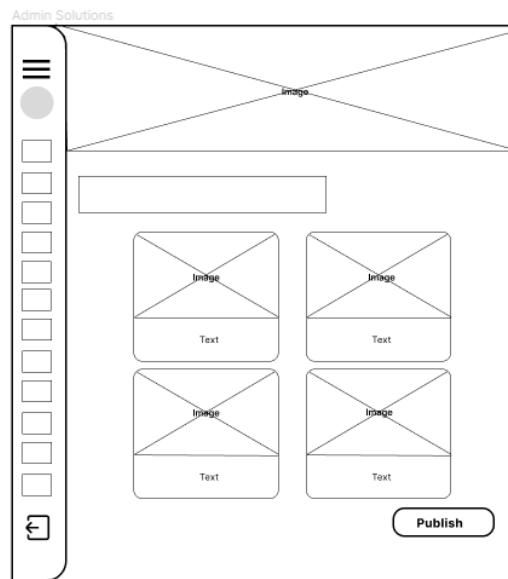
Admin Progress and Info

Figure shows the Admin Progress and Info storyboard for the Ecotopia web application.



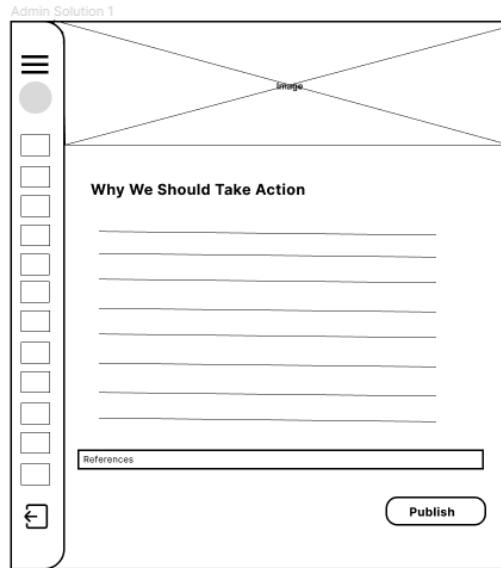
Admin Related Topics

Figure shows the Admin Related Topics storyboard for the Ecotopia web application.



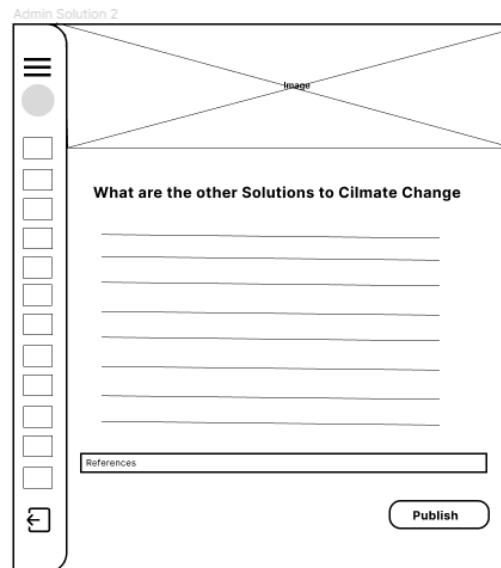
Admin Solutions

Figure shows the Admin Solutions storyboard for the Ecotopia web application.



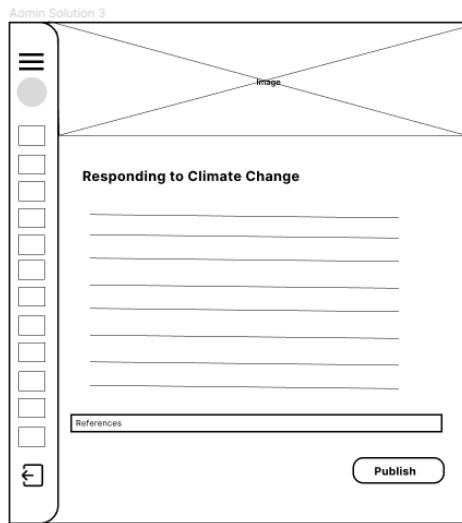
Admin Solution 1

Figure shows the Admin Solution 1 storyboard for the Ecotopia web application.



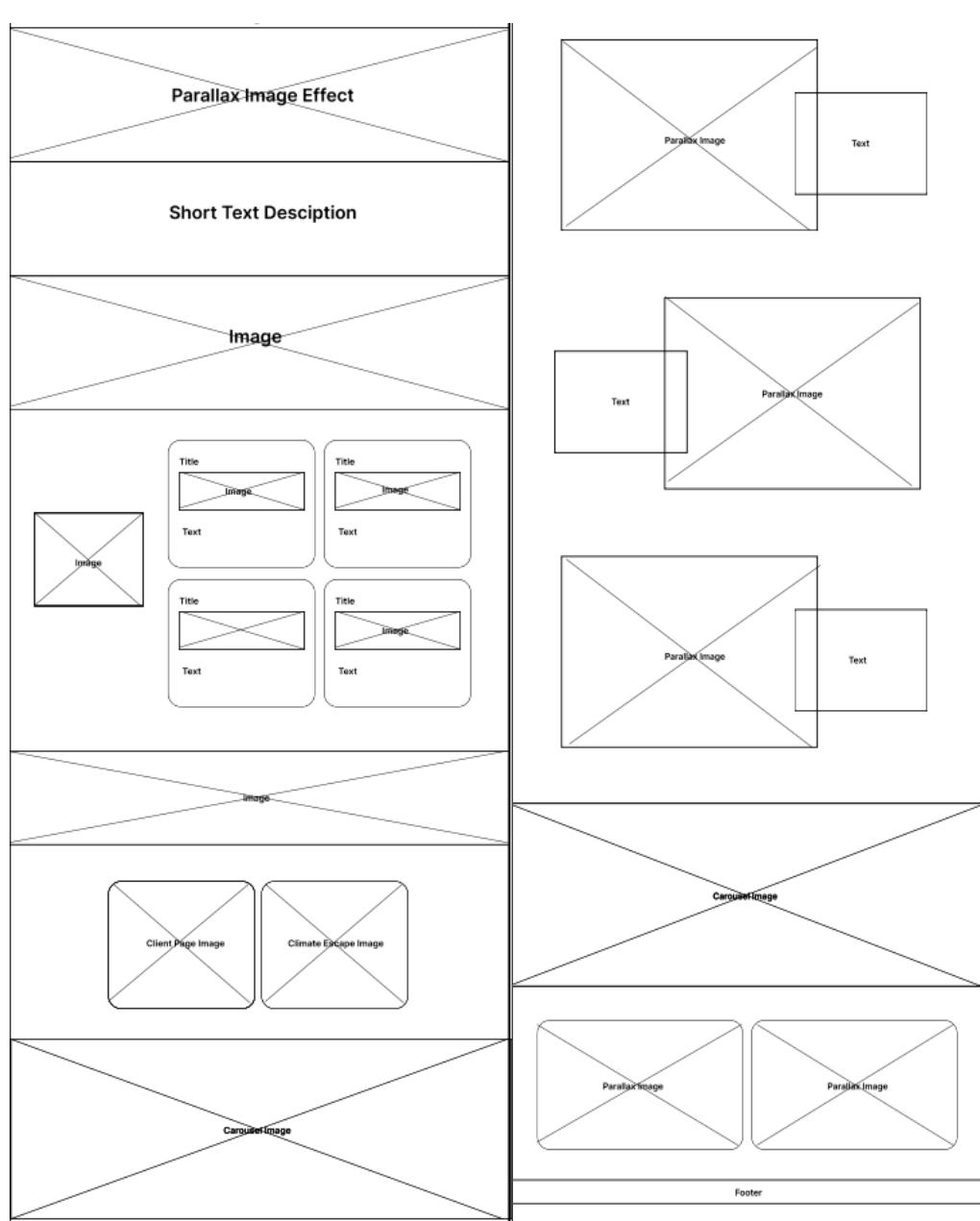
Admin Solution 2

Figure shows the Admin Solution 2 storyboard for the Ecotopia web application.



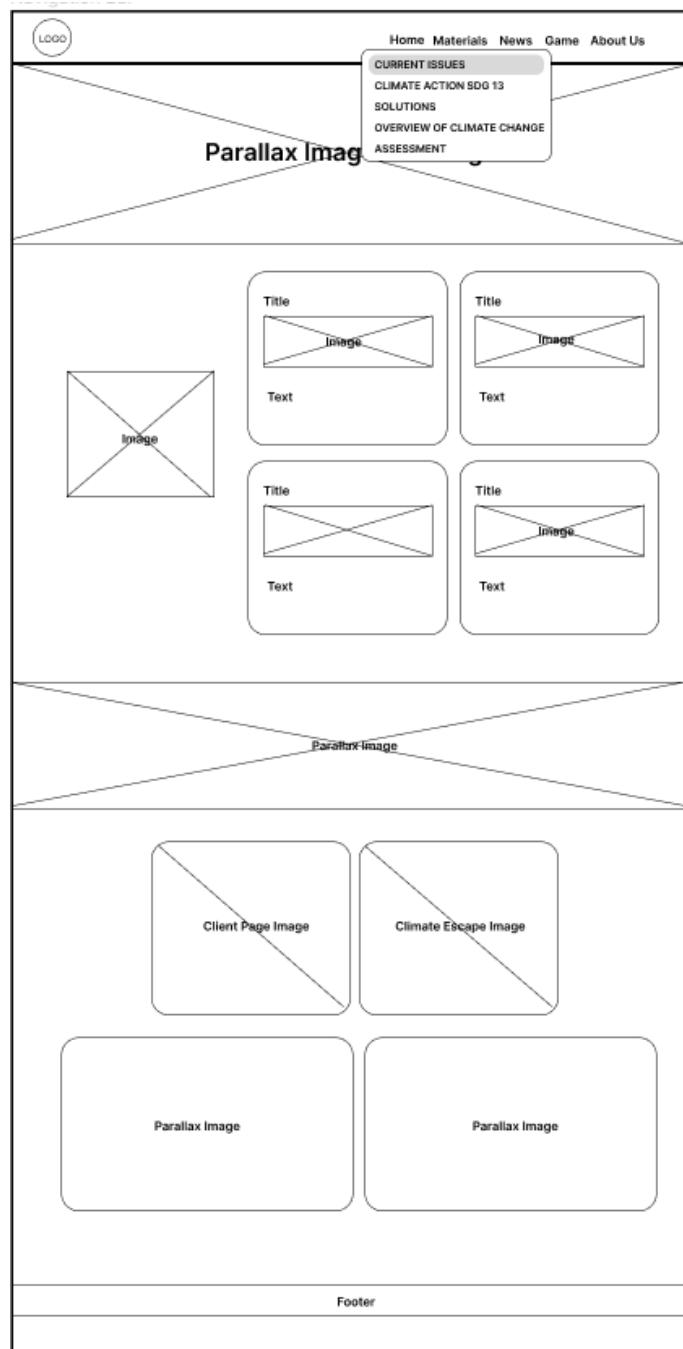
Admin Solution 3

Figure shows the Admin Solution 2 storyboard for the Ecotopia web application.



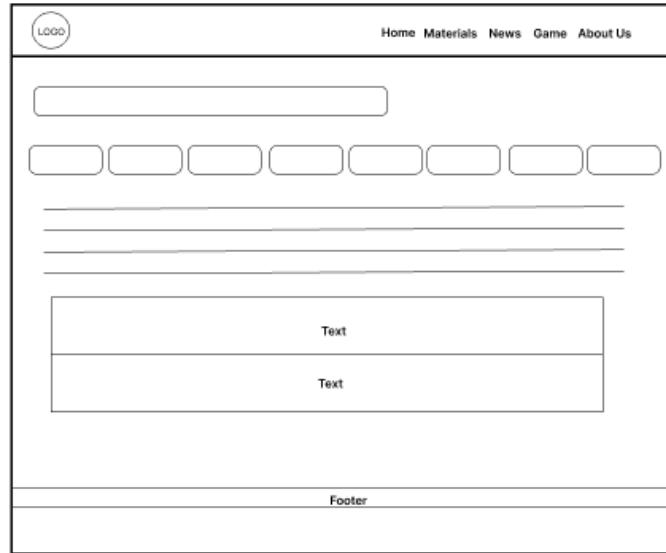
Landing Page

Figure shows the user Landing Page storyboard for the Ecotopia web application.



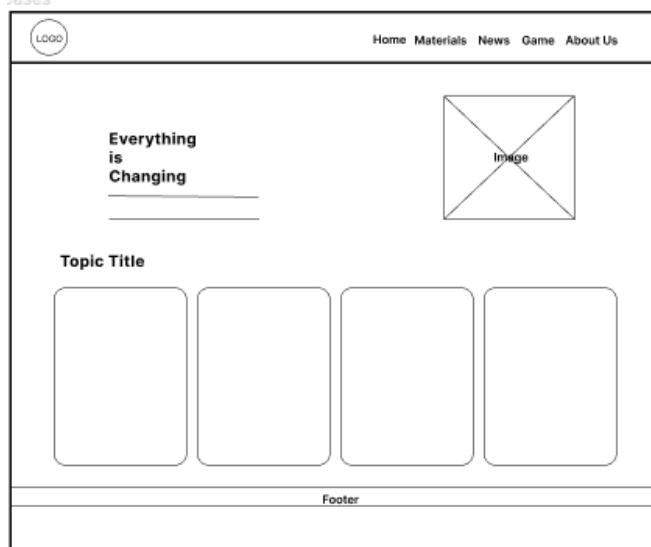
Navigation Bar

Figure shows the user Navigation Bar storyboard for the Ecotopia web application.



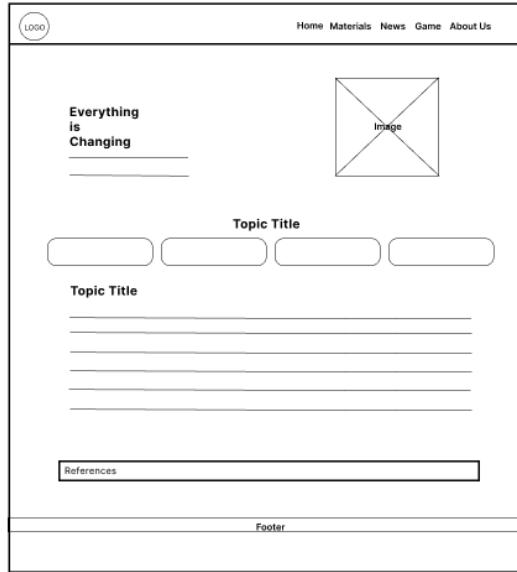
Current Issues

Figure shows the user Current Issues storyboard for the Ecotopia web application.



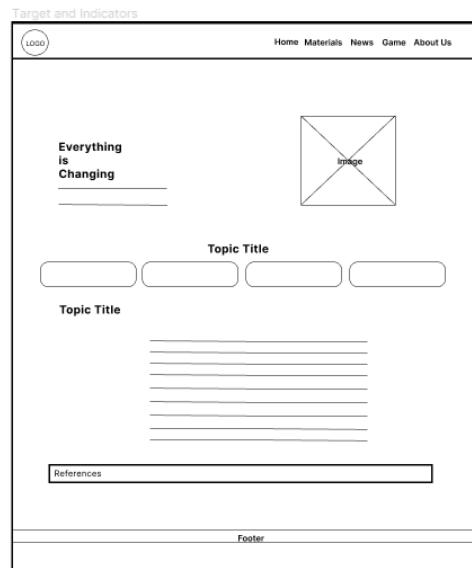
Climate Action SDG 13

Figure shows the user Current Issues storyboard for the Ecotopia web application.



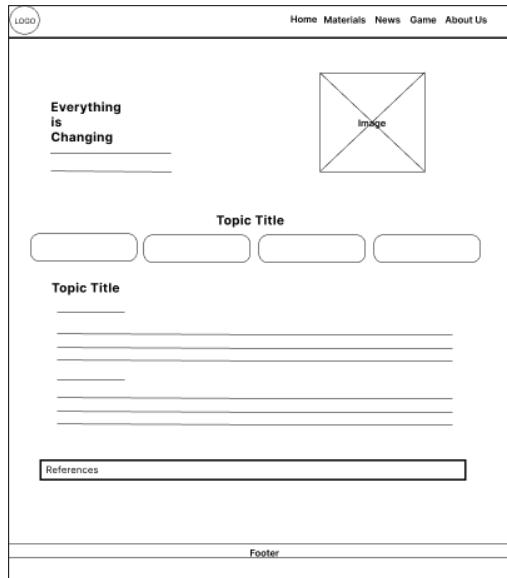
Overview

Figure shows the user Overview storyboard for the Ecotopia web application.



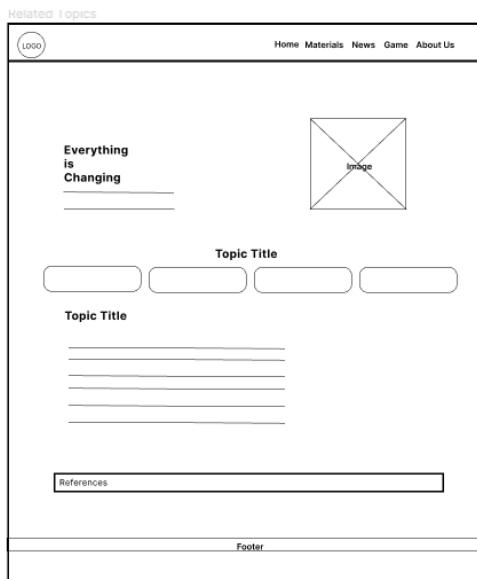
Target and Indicators

Figure shows the user Target and Indicators storyboard for the Ecotopia web application.



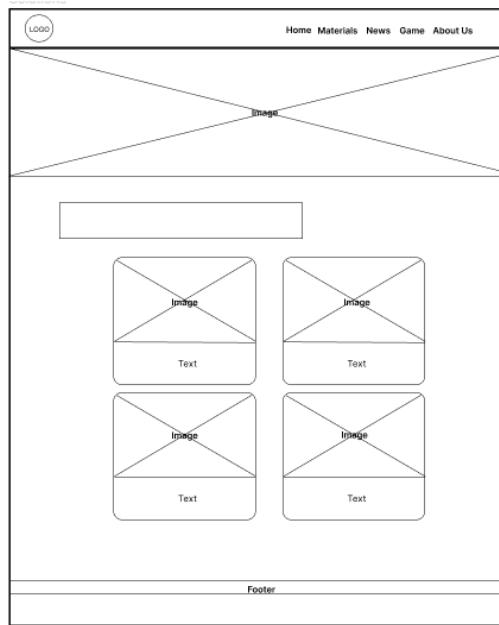
Progress and Info

Figure shows the user Progress and Info storyboard for the Ecotopia web application.



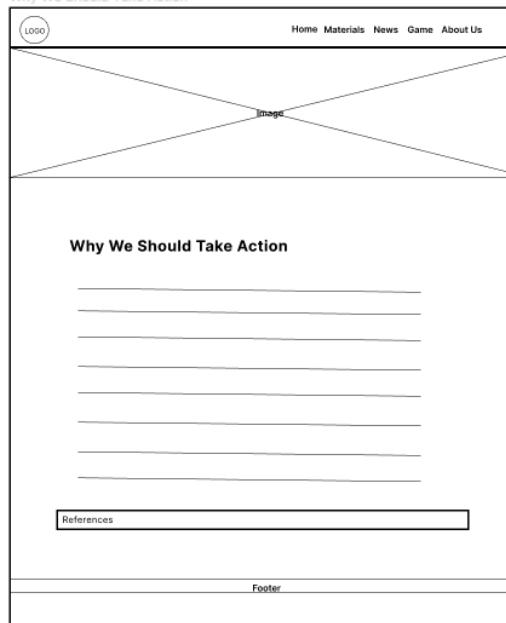
Related Topics

Figure shows the user Progress and Info storyboard for the Ecotopia web application.



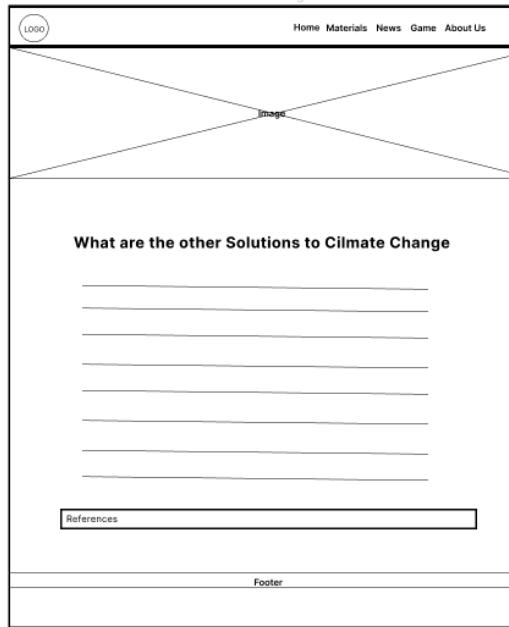
Solutions

Figure shows the user Solutions storyboard for the Ecotopia web application.



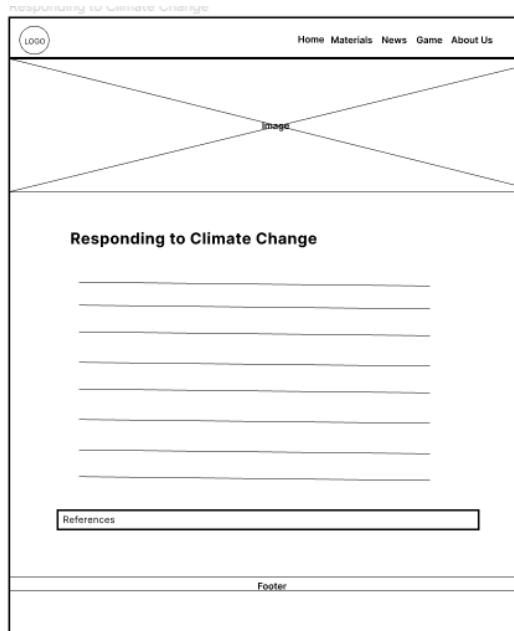
Why We Should Take Actions

Figure shows the user Why We Should Take Actions storyboard for the Ecotopia web application.



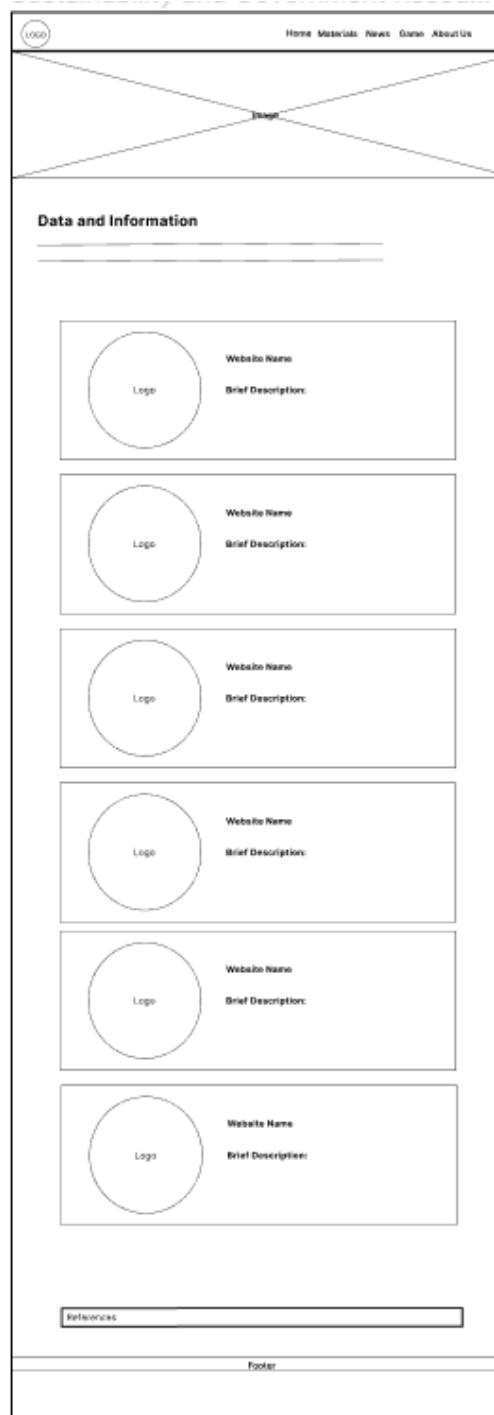
What are the Other Solution to Climate Change

Figure shows the user What are the other Solutions to Climate Change storyboard for the Ecotopia web application.



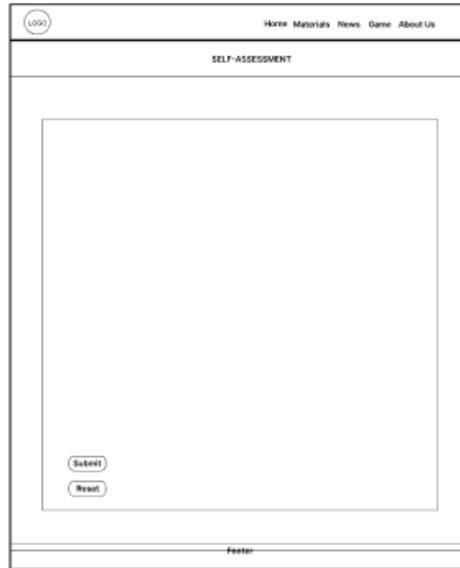
Responding to Climate Change

Figure shows the user Responding to Climate Change storyboard for the Ecotopia web application.



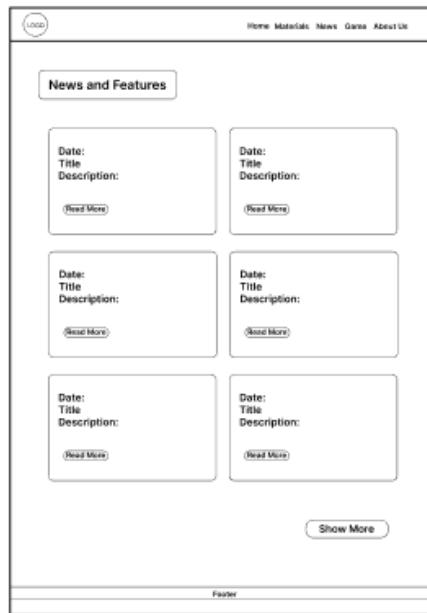
Sustainability and Government Resources

Figure shows the user Sustainability and Government Resources storyboard for the Ecotopia web application.



Self-Assessment

Figure shows the user Self-Assessment storyboard for the Ecotopia web application.



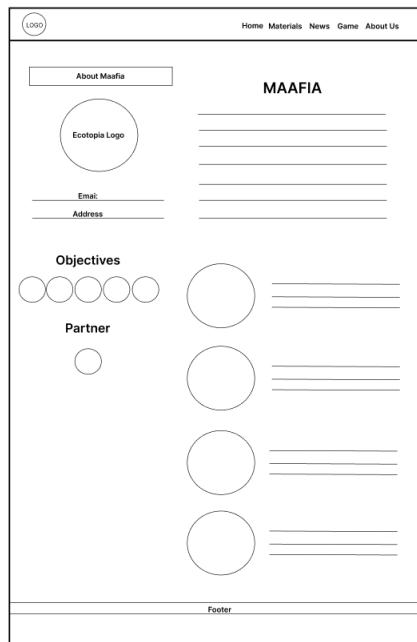
News

Figure shows the user News storyboard for the Ecotopia web application.



Game

Figure shows the user Game storyboard for the Ecotopia web application.



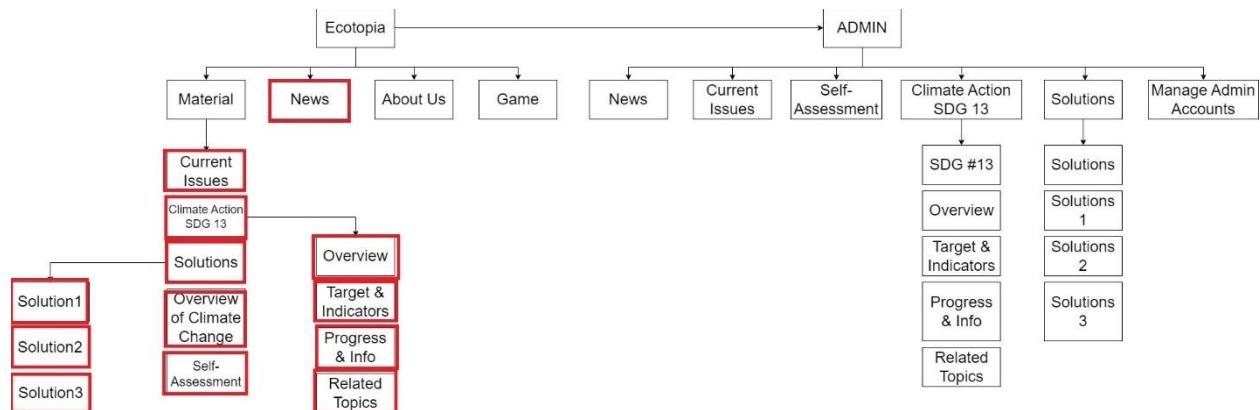
About Us

Figure shows the user About Us storyboard for the Ecotopia web application.

APPENDIX C. USER MANUAL

USER MANUAL

Here is the Sitemap of the website. A box with red indicates that you can modify its content including pictures and text but not structure.



Sitemap of Ecotopia To access admin you need to go to ecotopia.systems/login

Manage Admin Accounts

You can only Manage Admin Accounts with Super Admin Account logged in.

Create Admin Account Note: *You can only create admin accounts if you are logged in as super admin.*

There are two types of admin:

- Super admin: Can manage accounts and modify text and pictures
- Admin: Can only modify text and pictures

To create new account, you must have a super admin access, or you can contact us at [karlm.roxas@gmail.com](mailto:karlrm.roxas@gmail.com)

Manage Admin Account									
#	Status	Username	Email	Full Name	Phone Number	Role	Actions		
1	Verified	karlmarx	roxaskv@students.national-u.edu.ph	Karl Marx Roxas	09239703709	superadmin	<button>Update Info</button>	<button>Reset Password</button>	<button>Delete</button>
2	Verified	marxk	marxcrane21@gmail.com	Karl Marx	09232323232	superadmin	<button>Update Info</button>	<button>Reset Password</button>	<button>Delete</button>
3	Verified	vincent	regalavb@students.national-u.edu.ph	Vincent	09232323232	superadmin	<button>Update Info</button>	<button>Reset Password</button>	<button>Delete</button>
4	Verified	rogel	karlmarroxas1@gmail.com	Rogel	09232323233	admin	<button>Update Info</button>	<button>Reset Password</button>	<button>Delete</button>
5	Not Verified	administrator	karlmarroxas1@gmail.com	Karl	09239703709	superadmin	<button>Update Info</button>	<button>Reset Password</button>	<button>Delete</button>
6	Verified	testkarl	karlmarroxas1@gmail.com	Karl	09232323232	admin	<button>Update Info</button>	<button>Reset Password</button>	<button>Delete</button>
7	Verified	testecotopiasystems	karlmarroxas1@gmail.com	Karl	09123123123	admin	<button>Update Info</button>	<button>Reset Password</button>	<button>Delete</button>
8	Verified	testsuperadmin	karlmarroxas1@gmail.com	Karl	09212312312	superadmin	<button>Update Info</button>	<button>Reset Password</button>	<button>Delete</button>
9	Verified	testagain	karlmarroxas1@gmail.com	Karl	09231231231	superadmin	<button>Update Info</button>	<button>Reset Password</button>	<button>Delete</button>
10	Verified	karltestagain	karlmarroxas1@gmail.com	Karl	09232323332	superadmin	<button>Update Info</button>	<button>Reset Password</button>	<button>Delete</button>

[New admin](#)

Click Blue New Admin Button at lower left side and fill the required fields. After that, check your email to verify your account. If the account is not verified, you cannot login.

Update Admin Account

Note: You can only update info of admin accounts if you are logged in as super admin.

You can update the following:

- Username
- Email
- Full name
- Phone Number
- Role:
- Super Admin
- Admin

Status:

- Not Verified: User cannot log in with this status
- Verified: User can login in with this status
- Disabled: User cannot log in with this status

To reset password, click the Reset Password button and enter new password.

Delete Admin Account

Note: You can only delete admin accounts if you are logged in as super admin.

To delete an account, just simply click the Red Delete Button on the same row of account you want to delete.

Manage News

You can manage news with both super admin and admin accounts.

Add News

Admin News & Features

Add News

2023-11-13

Ammonia fuel offers great benefits but demands careful action

Researchers have identified the potential environmental risks of using ammonia as a zero-carbon fuel in order to develop an engineering roadmap to a sustainable ammonia economy.

Edit

Delete

2023-11-13

Cooling glass' blasts building heat into space

Researchers aiming to combat rising global temperatures have developed a new 'cooling glass' that can turn down the heat indoors without electricity by drawing on the cold depths of space. The new technology, a microporous glass coating, can lower the temperature of the material beneath it by 3.5 degrees Celsius at noon, and has the potential to reduce a mid-rise apartment building's yearly carbon emissions by 10 percent.

Edit

Delete

To add news, simply click the Add News button and fill the required fields.

Edit News

2023-11-13

Ammonia fuel offers great benefits but demands careful action

Researchers have identified the potential environmental risks of using ammonia as a zero-carbon fuel in order to develop an engineering roadmap to a sustainable ammonia economy.

Edit

Delete

To edit the news, simply click the Edit button and modify the field you want to edit. In website, you will see a quote block of source. What you put in link will show in quote block.

Delete News

To delete news, simply click the delete button and confirm its deletion.

Manage Current Issues

In current issues, you cannot edit the link and name of the tabs. You can only edit the area within the red box.

Current Issues on Climate Change in the Philippines

Typhoon and Extreme Weather Events Sea Level Rise and Coastal Erosion Ocean Acidification Biodiversity and Ecosystem Loss Agriculture and Food Security Health Risk Water Scarcity References

Due to its geographical positioning, the Philippines is exceptionally susceptible to typhoons and other extreme weather phenomena. The impact of climate change has the potential to magnify the intensity of these occurrences, culminating in heightened frequencies of more severe typhoons, along with increased incidents of flooding and landslides. This is the issue that we are facing

The 7,100 islands that make up the Philippine Archipelago make it more vulnerable to typhoons and storm surges, which are abrupt elevations in water that affect nearby places during storms and typhoons.

The Asian Disaster Reduction Center (ADRC) estimates that the Philippines experiences 20 typhoons year, of which five cause significant damage.

Publish

To edit the text, simply click it. It is a inline-text. If you want to remove the text-area just click on the random blank space.

Current Issues on Climate Change in the Philippines

Typhoon and Extreme Weather Events Sea Level Rise and Coastal Erosion Ocean Acidification Biodiversity and Ecosystem Loss Agriculture and Food Security Health Risk Water Scarcity References

Due to its geographical positioning, the Philippines is exceptionally susceptible to typhoons and other extreme weather phenomena. The impact of climate change has the potential to magnify the intensity of these occurrences, culminating in heightened frequencies of more severe typhoons, along with increased incidents of flooding and landslides. This is the issue that we are facing

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The Asian Disaster Reduction Center (ADRC) estimates that the Philippines experiences 20 typhoons year, of which five cause significant damage.

Publish

To ensure to save the changes, click the Publish button. If you do not Publish it, the changes will not save.

Manage Assessment

In self-assessment, it has the same idea. You click the text you want to edit, click on the random blank space to remove the text area.

To edit the correct answer, click the correct answer field and enter the correct answer. Correct answer must be the same in the selection.

Admin Self-Assessment

1. If the cloud is black, it is raining or not?
Maybe
Raining
No
Sunrise
Correct Answer: Rainings
2. Which of the following is not considered as significant issue on climate change in the Philippines?
Sea level rise
Coastal Erosion
Ecosystem Loss
Urban Smog
Correct Answer: Urban Smog

The Blue box area is the question, red box area is the options or selection of answer, violet box area is the answer. To edit it, simply click it and click the Publish button to save.

Note: *Make sure that correct answer field has the same character including capitalization and spelling of the correct answer in selection or option.*

Manage SDG #13

Note: In website, it represents the /problems

Format should be .webp
Max image size is 100kb
Resolution should be exact 1200px*1200px

Browse... No file selected. Upload

Goal 13: Climate Action

Overview

Sustainable Development Goal 13, one of the 17 established by the United Nations General Assembly in 2015, aims to address climate change by both reducing its impact and adapting to it. The primary objective of this goal is officially stated as the need for immediate action to combat climate change and its consequences.

Target and Indicators

Sustainable Development Goal (SDG) 13 focuses on climate action. Its target is to "Take urgent action to combat climate change and its impacts." To monitor progress toward this goal, several key indicators are used to help governments and organizations gauge their progress in addressing climate change and its effects, as outlined in SDG 13.

Progress and Info

Sustainable Development Goal (SDG) 13, which focuses on climate action, has seen significant global progress in recent years. Efforts have been made to strengthen resilience to climate-related hazards, integrate climate measures into national policies, and enhance education and awareness about climate change mitigation and adaptation.

Related Topics

Sustainable Development Goal 13 (SDG 13), known as "Climate Action," is intrinsically linked to several critical and interrelated topics: Atmosphere, Climate Action and Synergies, Small Island Developing State, and National Strategies and SDG Integration.

Publish

The red box is the only area you can modify. You can modify the picture by browsing the picture but be mindful with the constraint indicated.

Manage Overview

Note: In website, it represents the /case1

The screenshot shows a user interface for managing a website case study. On the left is a vertical sidebar with icons for navigation. The main area features a title card with a red border containing the text "Everything is Changing" in large blue letters. Below the title is a subtitle: "Climate change is happening now: understand the problem and take action." To the right of the title card is a large, stylized illustration of Earth with a sad face, colored in shades of orange, yellow, and blue. Below the illustration is a file upload section with instructions: "Format should be .webp", "Max image size is 100kb", and "Resolution should be exact 1200px*1200px". It includes a "Browse..." button, a "No file selected." message, and an "Upload" button.

Overview

The screenshot shows the "Overview" section of the case study. It contains three main paragraphs. The first paragraph discusses SDG 13 aims to combat climate change and its impacts by taking urgent action. The second paragraph highlights that climate change is a direct threat to children's survival and well-being. The third paragraph describes UNICEF's role in working with partners at global and local levels to ensure children live in safe and clean environments.

References

<https://sdgs.un.org/goals/goal13>

Publish

The red box is the only area you can modify.

Manage Target and Indicators

Note: In website, it represents the /case2

Everything is
Changing

Climate change is happening now: understand the problem and take action.

SDG Goal 13

Target 13.1

Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries

Indicators

- 13.1.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population
- 13.1.2 Number of countries that have and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030
- 13.1.3 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies

Target 13.2

Integrate climate change measures into national policies, strategies and planning

Indicators

- 13.2.1 Number of countries which nationally determine climate-change related targets and indicators, communicated to relevant stakeholders, as reported to the secretariat of the United Nations Framework Convention on Climate Change
- 13.2.2 Total greenhouse gas emissions per year

Target 13.3

Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning

Indicators

- 13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) teacher assessment

Target 13.a

Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly \$100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and sustainable development, in particular through fully operationalizing the Green Climate Fund through its capitalization as soon as possible

Indicators

- 13.a.1 Amounts pledged and mobilized in United States dollars per year in relation to the continued scaling-up of the mobilization goal of the \$100 billion commitment through to 2025

Target 13.b

Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing states, including building on women, youth and local and indigenous communities

Indicators

- 13.b.1 Number of least developed countries and small island developing states with nationally determined contributions, long-term strategies, national adaptation plans and associated information systems as reported to the secretariat of the United Nations Framework Convention on Climate Change

<https://udgteam.org/goals/goal13>

Publish

The red box is the only area you can modify.

Manage Progress and Info

Note: In website, it represents the /case3



Progress and Info

2023

The world is on the brink of a climate catastrophe and current actions and plans to address the crisis are insufficient. Without transformative action starting now and within this decade to reduce greenhouse gas emissions deeply and rapidly in all sectors, the 1.5°C target will be at risk and with it the lives of more than 3 billion people. Failure to act leads to intensifying heatwaves, droughts, flooding, wildfires, sea-level rise, and famines. Emissions should already be decreasing now and will need to be cut almost by half by 2030 – a mere seven years from now. To combat climate change and its impacts by 2030, urgent and transformative action is needed to meet the commitments under the Paris Agreement across mitigation and adaptation efforts.

• Target 13.1

- The number of deaths and missing persons due to disasters per 100,000 population has steadily decreased from 1.64 during 2005–2015 to 0.86 during 2012–2021. The average disaster mortality stood at 47,337 in absolute terms in 2015–2021. However, the number of persons affected by disasters per 100,000 people rose from 1,198 during 2005–2015 to 2,113 during 2012–2021. The number of countries with national strategies for disaster risk reduction has increased from 55 in 2015 to 126 by the end of 2021. Based on this, a total of 118 countries have reported having some level of policy coherence with other global frameworks, such as the 2030 Agenda and the Paris Agreement.

• Target 13.2

- Global temperatures have already hit 1.1°C, rising due to increasing global greenhouse gas emissions, which reached record highs in 2021. Real-time data from 2022 show emissions continuing on upward trajectory. Instead of decreasing emissions as required by the target to limit warming, carbon dioxide levels increased from 2020 to 2021 at a rate higher than the average annual growth rate of the last decade and is already 149% higher than pre-industrial levels. Projected cumulative future CO2 emissions over the lifetime of existing and currently planned fossil fuel infrastructure exceed the total cumulative net CO2 emissions in pathways that limit warming to 1.5°C (>50%) with no or limited overshoot.

• Target 13.3

- An analysis of 100 national curriculum frameworks reveals that nearly half (47%) do not mention climate change. In 2021, despite 95% of teachers recognizing the importance of teaching about climate change severity, only one-third are capable of effectively explaining its effects in their region. Additionally, 70% of young people can only describe the broad principles of climate change in 2022.

• Target 13.a

- According to the OECD, total climate finance provided and mobilized by developed countries for developing countries amounted to \$83.3 billion in 2020, a 4% increase from 2019, but still short of the \$100 billion target. Climate finance remains primarily targeted to mitigation; however, and adaptation finance continues to lag, with international finance flows to developing countries 5–10 times below estimated needs.

2022

The increases in heatwaves, droughts and floods caused by climate change are destroying the planet and affecting billions of lives worldwide. Despite the temporary reduction of CO2 emissions in 2020, global energy-related CO2 emissions rose by 6.0 per cent as demand for coal, oil and gas rebounded with the economy in 2021. Based on current national commitments, global emissions are set to increase by almost 14 per cent over the current decade, which could lead to a climate catastrophe unless Governments, the private sector and civil society work together to take immediate action. However, the war in Ukraine threatens to become the cause of a huge setback for concerted efforts to speed up climate action.

As at 31 December 2021, a total of 123 countries had reported the adoption of national disaster risk reduction strategies, an increase from 55 countries in 2015. The number of countries with disaster risk reduction strategies that promote policy coherence with the Sustainable Development Goals and the Paris Agreement has reached 118, compared with only 44 in 2015. The COVID-19 crisis highlighted a further accelerated global effort and an approach to disaster risk reduction strategies that is more systemic and more multi-hazard in nature.

By April 2022, 193 parties (192 countries plus the European Union) had communicated their first nationally determined contribution under the United Nations Framework Convention on Climate Change and 13 parties had submitted their second nationally determined contribution. The nationally determined contributions attest that countries are articulating more quantified targets and indicators for adaptation and identifying links between adaptation and the Sustainable Development Goals and other frameworks.

As of 31 March 2021, 125 of 154 developing countries were taking measures related to national adaptation plans and prioritizing formulation and implementation of national adaptation plans in their adaptation efforts. Six of the least developed countries (including three small island developing States) and an additional four small island developing States had completed a national adaptation plan. More of the least developed countries had prepared a draft national adaptation plan and were on track to complete and submit it in line with the vision of all least developed countries having their national adaptation plan by 2021.

In order to limit global warming to 1.5 degrees Celsius above pre-industrial levels, scientists recommend that by 2030 global emissions should be cut by 4 per cent compared with 2010 levels. According to current national commitments, however, global emissions are set to increase by almost 14 per cent during the rest of the decade.

[References](#)

<https://wds.un.org/green/pdf13.pdf>

Publish

The red box is the only area you can modify.

Manage Related Topics

Note: In website, it represents the /case4

The screenshot shows a user interface for managing related topics. On the left is a vertical sidebar with icons for navigation. The main area has a red border around its top half. Inside this border, the title "Everything is Changing" is displayed in large blue text. Below the title is a subtitle: "Climate change is happening now: understand the problem and take action." To the right of this title area is a large red-bordered box containing a sad Earth emoji with a face. Below the Earth emoji is a file upload section with instructions: "Format should be .webp", "Max image size is 100kb", and "Resolution should be exact 1200px*1200px". It includes a "Browse..." button, a "No file selected." message, and an "Upload" button.

Related Topics

- 1. Atmosphere**
Related Goal: SDG 13
<https://sdgs.un.org/topics/atmosphere> (Link)
- 2. Climate Action and Synergies**
Related Goal: SDG 3
<https://sdgs.un.org/topics/climate-action-synergies> (Link)
- 3. Small Island and Developing State**
Related Goal: SDG 2, 5, 6, 7, 12, 13, 14, 15, 17
<https://sdgs.un.org/topics/small-island-developing-states> (Link)
- 4. National Strategies and SDG Integration**
Related Goal: SDG 3, 11, 13, 15, 16, 17
<https://sdgs.un.org/topics/national-sustainable-development-strategies> (Link)

References

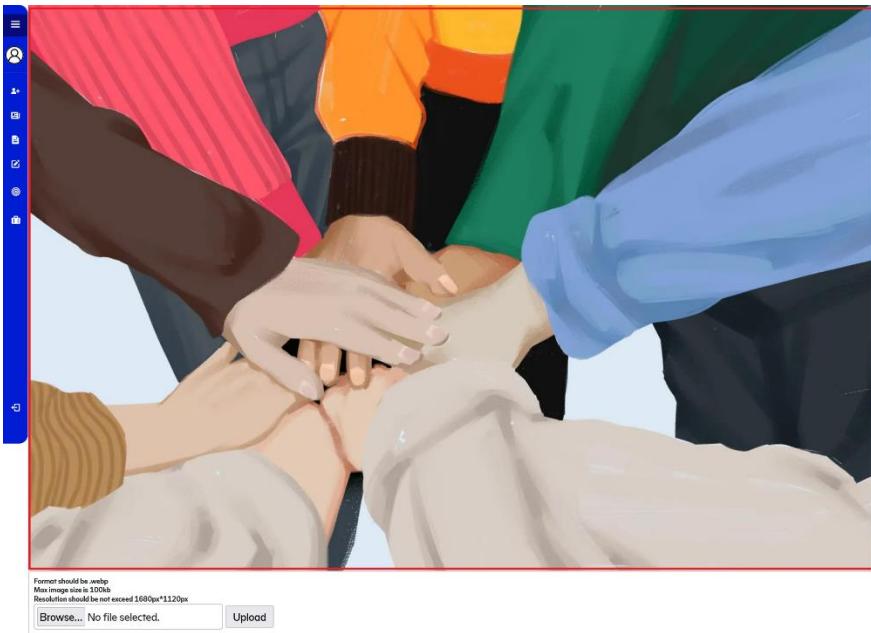
https://sdgs.un.org/topics/climate-action-synergies?fbclid=IwAR3xy-85JC3EC_kPtw2Fuz53ubdhrYx2gP6rP-Gl8kjG9NWKFdqJQ74

Publish

The red box is the only area you can modify.

Manage Solutions

Note: In website, it represents the /solutions



Solutions Of Climate Change

WHY SHOULD WE TAKE ACTIONS
Climate change is one of the most challenging problems that humanity has ever faced. At stake are hundreds of millions of lives, innumerable species and ecosystems, the health and viability of the economy, and the future habitability of this planet.

WHAT ARE THE OTHER SOLUTIONS TO CLIMATE CHANGE
Climate change is a serious problem that affects millions of lives, but there are solutions. The solutions can help us stop global warming and create a better future for everyone.



Publish

The red box is the only area you can modify. The image of each solution can be changed in their respective web page. For example, if you want to change the image display in “Why we should take action” you should go to /admin-solution-1 and change the picture. Same rules apply to all solutions.

Note: In website, it represents the /why should we take actions



Why should we take action

Climate change is one of the most challenging problems that humanity has ever faced. At stake are hundreds of millions of lives, innumerable species and ecosystems, the health and viability of the economy, and the future habitability of this planet.

Cut emissions

carbon emissions from fossil fuels in the United States or around the world. To achieve net zero carbon emissions by 2050, we will need to end "last gas" carbon emissions by 2050 at the latest. Net zero means that, on balance, no more carbon is dumped into the atmosphere than is taken out. To achieve net zero emissions, we need a massive transformation in how we produce and consume electricity. We need a newer, better transportation system. We need to stop deforestation. We need a climate-friendly agricultural system.

To reach net zero emissions, we need to do more than just reduce our emissions: we need to actively remove carbon dioxide from the atmosphere or offset its effects. The easiest way to do this is by planting new forests (afforestation) or restoring old ones (reforestation). Other enhanced land management practices can help, as can new technologies that suck CO₂ out of the air ("bioactive capture"), or prevent it from leaking (so-called "carbon capture and storage").

No other issue risks us reducing emissions. The reality is that certain climate impacts are inevitable. The task is to limit, mitigate, and track records over time. Through its, hard, and as these weather are damaging communities today. Cutting carbon is the only long-term strategy for avoiding climate impacts. In the short-term, we need to adapt. The best policy ideas in the world are worth much if we don't have activists, experts, and everyday people fighting for change. From school groups, from corporate boardrooms to major and local leaders; we need to

Climate change is already an urgent threat to millions of lives – but there are solutions. From changing how we get our energy to limiting deforestation, here are some of the key solutions to climate change.

- Keep fossil fuels in the ground

[Protect forests like the Amazon](#)

such as sucking up huge amounts of carbon. Yet companies destroy forests to make way for animal farming, soya or palm oil plantations. Governments can stop them by making better laws.
Using renewable energy
Changing our main energy sources to clean and renewable energy is the best way to stop using fossil fuels. These include technologies like solar, wind, wave, tidal and geothermal power.

Petrol and diesel vehicles, planes and ships use fossil fuels. Reducing car use, switching to electric vehicles and minimising plane travel will not only help stop climate change, it will

Help us keep our homes cosy
Homes should be draft-free and cold - it's a waste of energy and expensive in the winter. The government can help households heat our homes in a more sustainable way by introducing

- Improve farming and encourage vegan diets

forming practices and provide more plant-based products to help people make the shift.

- Protect the oceans

- Reduces how much greenhouse gas we emit

Our transport, nutrition, food and other lifestyle choices all have different impacts on the climate. This is where big design – innovation and technology – comes in. But, as ever, we will need to produce more products than are realistically needed. But while reducing consumption of these products might be hard, it's most certainly worth it. Reducing overall consumption in more wealthy countries could help cut greenhouse gas emissions.

• Redecoo plastic
Dilute is made from all and the excess of acetone, ethanol and toluene oil into plastic for some adhesives for electronic's electrical conductive interface. It doesn't have strong adhesive.

carbon budget by 2030 (this is the emissions count we need to stay within according to the Paris agreement).

Refinement

<http://www.issuu.com/andreaalvarez>

PUB

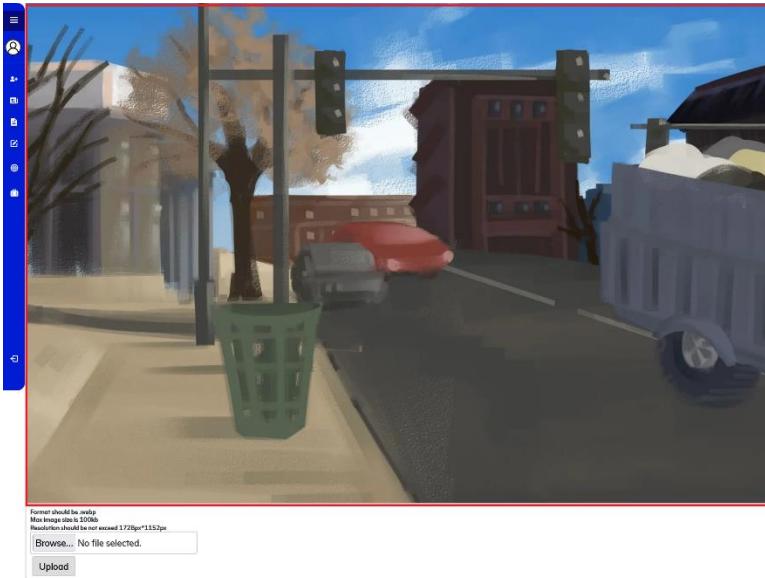
The red box is the only area you can modify.

The red box is the only area you can modify.



Manage Solution 2

Note: In website, it represents the /othersolutions



What are the other solutions to Climate Change

Climate change is a serious problem that affects millions of lives but there are solutions. The solutions can help us stop global warming and create a better future for everyone.

Below, we outline 8 effective solutions for addressing climate change and explain how you can contribute to their implementation.

• Recycle plastic bags separately

You might think plastic bags are convenient for gathering all your recyclable material together. However, plastic bags can be an unpredictable and time-consuming nightmare for those sorting at the recycling plant.

• Try not to shred paper

Shredded paper was difficult to recycle and often ended up in landfill. Since then, recycling plants have improved and now shredded paper is usually properly recycled. However this doesn't mean you should shred over sheets of every opportunity.

• Compress bottles and put the lid back on

Since then, recycling has advanced, making it acceptable to leave caps on bottles. In fact, it is now advised to leave them on since bottle caps that are given in separately and not detected during screening might end up in general rubbish.

<https://www.climatesolutionsuk.co.uk/reuse-and-recycling/how-to-recycle-more-effectively/>

(Continue Reading)

• Shift to renewable energy sources in all key sectors

The United Nations identified a six-sector solution to climate change, focusing on actions that can be taken by the energy, industry, agriculture, transportation, nature-based solutions, and urban planning. If all of these actions are completed, the UN Environment Programme estimates we could reduce global carbon emissions by 29 to 32 gigatonnes, thereby limiting the global temperature rise to 1.5°C.

• Reduce Food loss and waste and shift to more sustainable diets

There are a few different ways people can reduce food waste and go hand-in-hand. Whether it's tofu or Kobe beef, producing food accounts for some measure of greenhouse gasses. In 2012, the Food and Agriculture Organization estimated we consumed more meat than ever before. By 2050 this will, by some estimates, increase greenhouse gas emissions from food production by 60%. Likewise, many farmers use nitrogen-based fertilizers to grow more crops; more quickly to meet demand.

• Halt deforestation and commit to rebuilding damaged ecosystems

The rapid deforestation of the Earth, especially over the last 60 years, has contributed to climate change, creating "heat islands" out of land that would normally be protected by trees and other flora from overheating. Simply put, this has to stop. These actions each of us can take as individuals to help halt this—going paperless and buying recycled paper products, planting trees or supporting organizations that do this (like Concern), and recycling.

• Embrace electric vehicles, public transport, and other non-motorized options for getting around

The carbon savings on jettisoning your current car in favor of an electric model are basically nullified if you aren't seriously in the market for a new vehicle. However, mass adoption of electric vehicles and public transport — along with walking, biking, skating, and scooting — is key to cutting the greenhouse gas emissions from fuel-based motor vehicles.

• Subsidize low-carbon alternatives for urban planning

In tandem with low-carbon alternatives for public transportation, governments need to commit to similar measures with our growing cities. New buildings mean a new opportunity to reward green design methods that help to decrease the strain on urban resources, whether they're apartments or entertainment venues.

<https://www.climateconnections.org/library/solutions-to-climate-change/>

(Continue Reading)

References

<https://www.climatesolutionsuk.co.uk/reuse-and-recycling/how-to-recycle-more-effectively/>
<https://www.climateconnections.org/library/solutions-to-climate-change/>

Publish

Manage Solution 3

Note: In website, it represents the /responding to climate change

Format should be .webp
Max image size is 100kb
Resolution should not exceed 1623px*1080px

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Upload

Climate change is a complex global problem with scientific, economic, societal, political, and moral dimensions, and it will persist for thousands of years. Despite halting greenhouse gas emissions, the long-lasting presence of carbon dioxide and the delayed response of the planet mean that future generations will still experience the effects of global warming and climate change. Humanity is therefore bound to a certain level of climate change.

Mitigation and adaptation are crucial elements in addressing climate change. Mitigation focuses on reducing the causes of climate change, while adaptation aims to manage its impacts. A comprehensive approach that integrates both strategies is vital for establishing a sustainable and resilient future in the context of climate change.

There are two approaches to address climate change: mitigation and adaptation.

1. Mitigation
involves reducing and stabilizing the presence of greenhouse gases in the atmosphere to limit further warming.

2. Adaptation
focuses on adjusting to the changes that are already occurring due to climate change.

Mitigation refers to the actions taken to reduce climate change by decreasing the release of heat-trapping greenhouse gases into the atmosphere. This can be achieved by limiting the sources of these gases, such as the combustion of fossil fuels for energy and transportation, or by enhancing natural sinks like forests, oceans, and soil that absorb and store these gases. The objective of mitigation is to prevent significant human interference with the Earth's climate, stabilize greenhouse gas levels within a timeframe that allows ecosystems to naturally adapt to climate change, safeguard food production, and support sustainable economic development (as outlined in the 2014 report on Mitigation of Climate Change by the United Nations Intergovernmental Panel on Climate Change, page 4).

Adaptation refers to the process of adapting to the challenges posed by a changing climate, both present and anticipated. The objective is to minimize the risks associated with the adverse impacts of climate change, such as rising sea levels, intensified extreme weather events, and food scarcity. Additionally, adaptation involves harnessing any potential advantages that may arise from climate change, such as longer growing seasons or improved agricultural yields in certain regions.

Throughout history, societies have dealt with climate changes and extremes to varying degrees of success, with climate-related factors contributing to the rise and fall of civilizations, particularly through droughts. The stability of Earth's climate over the past 10,000 years has allowed for the development of modern civilization and agriculture, which are adapted to this stable climate rather than the warmer conditions anticipated in the future. As our climate continues to change, adaptation becomes crucial, and the speed at which it changes affects the level of difficulty.

Although climate change is a global challenge, its impacts are experienced at the local level, making local governments the forefront of adaptation efforts. Cities and communities worldwide have been addressing their specific climate issues by constructing flood defenses, preparing for heatwaves and higher temperatures, implementing improved drainage systems to handle floods and stormwater, and enhancing water storage and management.

Governments at various levels are increasingly integrating adaptation measures into their development plans, as highlighted in the 2014 report on Climate Change Impacts, Adaptation, and Vulnerability by the United Nations Intergovernmental Panel on Climate Change (page 8). These efforts involve managing extreme disasters, protecting coastlines from sea-level rise, implementing sustainable land and forest management practices, preparing for and mitigating droughts, developing resilient crop varieties, and safeguarding energy and public infrastructure.

References
<https://climate.nasa.gov/solutions/responding-mitigation/>

Publish

The red box is the only area you can modify.

APPENDIX D.

RELEVANT

SOURCE CODE

server.js:

```
require('dotenv').config();

const express = require('express');
const cors = require('cors');
const path = require('path');
const bodyParser = require('body-parser');
const mongoose = require('mongoose');

const history = require('connect-history-api-fallback');

const app = express();

const helmet = require('helmet');
app.disable('x-powered-by');

app.use((req, res, next) => {
  res.setHeader('Referrer-Policy', 'same-origin');
  next();
});

app.use(helmet.contentSecurityPolicy({
  directives: {

```

```

    defaultSrc: ["self", "http://localhost", "https://ecotopiabeta.live", "https://ecotopia.live"],

    scriptSrc: ["self", "unsafe-eval",
    "https://cdn.jsdelivr.net/npm/bootstrap@5.3.2/dist/js/bootstrap.bundle.min.js", "unsafe-inline"],

    styleSrc: ["self", "https://ecotopia.live", "localhost:4200", "https://fonts.googleapis.com",
    "https://unpkg.com/aos@2.3.1/dist/aos.css",
    "https://pro.fontawesome.com/releases/v5.10.0/css/all.css",
    "https://fonts.cdnfonts.com/css/henry-sans",
    "https://cdn.jsdelivr.net/npm/bootstrap@5.3.2/dist/css/bootstrap.min.css", "unsafe-inline"],

    imgSrc: ["self", "data:", "blob:", "unsafe-inline"],

    scriptSrcAttr: ["unsafe-inline"],

    reportTo: ["csp-endpoint"]

}

}));



```

```

app.use(helmet.hsts({


maxAge: 15552000, // 180 days in secs

includeSubDomains: true,


}))
```

```

app.use((req, res, next) =>{


res.setHeader('X-Content-Type-Options', 'nosniff');

next();


})

const admin_case_routes = require('./routes/admin/cases/cases-routes');

const admin_causes_climate_change_routes = require('./routes/admin/cases/causes-climate-
change-routes');
```

```
const admin_effects_climate_change_routes = require('./routes/admin/cases/effects-climate-change-routes');

const admin_outdated_engine_routes = require('./routes/admin/cases/outdated-engine-routes');

const admin_problem_trash_routes = require('./routes/admin/cases/problem-trash-routes');

const admin_other_solutions_routes = require('./routes/admin/solutions/other-solutions-routes');

const admin_responding_climate_change_routes =
require('./routes/admin/solutions/responding-climate-change-routes');

const admin_solutions_routes = require('./routes/admin/solutions/solutions-routes');

const admin_y_take_actions_routes = require('./routes/admin/solutions/y-take-actions-routes');

const admin_current_issues_ph_routes = require('./routes/admin/current-issues-ph-routes');

const admin_assessment_routes = require('./routes/admin/assessment-routes');

const cases_routes = require('./routes/cases/cases-routes');

const causes_climate_change_routes = require('./routes/cases/causes-climate-change-routes');

const effects_climate_change_routes = require('./routes/cases/effects-climate-change-routes');

const jeep_outdated_engine_routes = require('./routes/cases/jeep-outdated-engine-routes');

const problem_trash_routes = require('./routes/cases/problem-trash-routes');

const other_solutions_routes = require('./routes/solutions/other-solutions-routes');

const responding_climate_change_routes = require('./routes/solutions/responding-climate-change');

const solutions_routes = require('./routes/solutions/solutions-routes');

const y_take_action_routes = require('./routes/solutions/y_take_action-routes');

const current_issues_ph_routes = require('./routes/current-issues-ph-routes');

const news_features_routes = require('./routes/news-features-routes');

const overview_climate_change_routes = require('./routes/overview-climate-change-routes');

const assessment_trivia = require('./routes/assessment-routes');
```

```
const login_routes = require('./routes/login-routes');

const game_routes = require('./routes/game-routes');

const port = process.env.PORT || 80;

const URI=process.env.DB_CONNECTION;

mongoose.connect(URI)

const allowedOrigin = ['vast-chipmunk-pmtbqfn8dn3rzmindozaebrn.herokuapp.com', 'ecotopia-kwattro-1d9051e0c450.herokuapp.com', 'ecotopia.live'];

const corsOptions = {

  origin: allowedOrigin,

  origin: 'localhost',

  methods: 'GET,POST,PUT',

  allowedHeaders: 'Content-Type',

};

app.use(cors());

app.use(bodyParser.json());

app.use(history());
```

```
app.use(express.static(path.join(__dirname, 'dist/ecotopia-capstone')));

app.get('/', (req, res) => {
  res.
    sendFile(path.join(__dirname, 'dist/ecotopia-capstone/index.html'));
});

app.use('/', admin_case_routes );
app.use('/', admin_causes_climate_change_routes );
app.use('/', admin_effects_climate_change_routes );
app.use('/', admin_outdated_engine_routes );
app.use('/', admin_problem_trash_routes );
app.use('/', admin_other_solutions_routes );
app.use('/', admin_responding_climate_change_routes );
app.use('/', admin_solutions_routes );
app.use('/', admin_y_take_actions_routes );
app.use('/', admin_current_issues_ph_routes );
app.use('/', admin_assessment_routes);
app.use('/', cases_routes );
app.use('/', causes_climate_change_routes );
app.use('/', effects_climate_change_routes );
app.use('/', jeep_outdated_engine_routes );
app.use('/', problem_trash_routes );
app.use('/', other_solutions_routes );
```

```
app.use('/', responding_climate_change_routes );

app.use('/', solutions_routes );

app.use('/', y_take_action_routes );

app.use('/', current_issues_ph_routes );

app.use('/', news_features_routes );

app.use('/', overview_climate_change_routes );

app.use('/', assessment_trivia);

app.use('/', login_routes);

app.use('/', game_routes);

app.listen(port);
```

landing-page.css

```
* {

margin: 0;

padding: 0;

box-sizing: border-box;

font-family: 'Henry Sans', sans-serif;

font-display: swap;

}
```

```
body {

background: #112434;

}

section {
```

```
position: relative;  
display: flex;  
justify-content: center;  
align-items: center;  
min-height: 70vh;  
padding-top: 50px;  
}
```

```
section h2 {  
font-size: 4em;  
color: #fff;  
margin-bottom: 50px;  
text-align: center;  
}
```

```
section .container {  
position: relative;  
width: 1420px;  
display: flex;  
justify-content: space-between;  
align-items: center;  
margin-bottom: 50px;  
}
```

```
section:nth-child(even) .container {
```

```
flex-direction: row-reverse;  
}  
  
}
```

```
section .container .imgBx {  
position: relative;  
width: 1000px;  
height: 600px;  
overflow: hidden;  
background-size: 70% auto;  
background-repeat: no-repeat;  
background-attachment: fixed;  
background-position: center;  
}
```

```
section .container .content {  
position: absolute;  
right: 0;  
margin-top: 200px;  
margin-bottom: 40px;  
padding: 20px;  
background: #333;  
z-index: 1;  
max-width: 400px;  
color: #fff;
```

```
    box-shadow: 0 25px 35px rgba(0, 0, 0, 0.8);  
    border-bottom: 6px solid #5A9700;  
}  
  
section .container .content p{  
    font-size: 20px;  
}  
  
section:nth-child(even) .container .content{  
    left: 0;  
}  
  
@media only screen and (max-width: 1407px) {  
    section {  
        min-height: 40vh;  
    }  
  
    section .container {  
        width: 100%;  
        flex-direction: column;  
        align-items: center;  
    }  
  
    section .container .imgBx {  
        height: 400px;  
        width: 85%;  
    }  
  
    section .container .content {  
        position: relative;  
    }
```

```
margin: 20px 0;  
max-width: 100%;  
font-size: 20px;  
}  
  
section .container .content p{  
font-size: 20px;  
}  
  
section:nth-child(even) .container {  
flex-direction: column;  
}  
  
section:nth-child(3) .container {  
justify-content: center;  
margin: 0 auto;  
}  
  
section:nth-child(4) .container {  
justify-content: center;  
margin: 0 auto;  
}  
  
section:nth-child(1) .container {  
justify-content: center;  
margin: 0 auto;  
}
```

```
section:nth-child(2) .container {  
    justify-content: center;  
    margin: 0 auto;  
}  
  
section:nth-child(5) .container {  
    justify-content: center;  
    margin: 0 auto;  
}  
  
section:nth-child(6) .container {  
    justify-content: center;  
    margin: 0 auto;  
}  
  
section:nth-child(7) .container {  
    justify-content: center;  
    margin: 0 auto;  
}  
  
}  
  
@media only screen and (max-width: 735px) {  
    section {  
        min-height: 40vh;  
    }  
  
    section .container {  
        width: 100%;
```

```
flex-direction: column;  
align-items: center;  
}  
  
section .container .imgBx {  
height: 400px;  
width: 100%;  
}  
  
section .container .content {  
position: relative;  
margin: 20px 0;  
max-width: 100%;  
}  
  
section .container .imgBx {  
background-size: 100% auto;  
}  
}  
  
@media only screen and (max-width: 612px) {  
section .container .imgBx {  
background-size: 100% auto;  
}  
}  
  
@media only screen and (max-width: 346px) {  
section {  
min-height: 5vh;
```

```
padding-top: 40px;  
}  
  
section .container .imgBx {  
height: 200px;  
}  
  
section .container .imgBx {  
background-size: 100% auto;  
}  
  
}  
  
.parallax-container {  
height: 115vh;  
display: flex;  
justify-content: center;  
align-items: center;  
overflow: hidden;  
position: relative;  
}  
  
  
.parallax-description {  
position: absolute;  
top: 50%;  
left: 50%;  
transform: translate(-50%, -50%);  
text-align: center;
```

```
z-index: 2;  
color: #fff;  
}  
  
.parallax-description h1 {  
font-size: 32px;  
}  
  
.parallax-description p {  
font-size: 24px;  
}  
  
.parallax-image {  
width: 100px;  
height: 50px;  
background-size: cover;  
background-position: center;  
transition: transform 0.3s;  
background-repeat: no-repeat;  
opacity: 0.7;  
}  
  
@media only screen and (max-width: 1053px) {  
.parallax-container{  
height: 80vh;
```

```
}

.parallax-image{
    width: 5%;

    height: 5%;

}

}

@media only screen and (max-width: 673px) {

    .parallax-container{
        height: 40vh;

    }

    .parallax-image{
        width: 5%;

        height: 5%;

    }

    .parallax-description h1 {
        font-size: 18px;

    }

}

.parallax-description p {
    font-size: 14px;

}

}

@media only screen and (max-width: 438px) {

    .parallax-description h1 {
```

```
    font-size: 14px;  
}  
  
.parallax-description p {  
    font-size: 10px;  
}  
}  
  
/*slider parallax*/  
  
.parallax-slider {  
    position: relative;  
    overflow: hidden;  
    height: 800px;  
    width: 75%;  
    display: flex;  
    justify-content: center;  
    align-items: center;  
    margin: 0 auto;  
    margin-bottom: 20px;  
    box-shadow: 5px 5px 10px rgba(0, 0, 0, 0.5);  
}
```

```
.slide-container {  
    height: 100%;  
    width: 100%;  
    position: relative;  
    transition: transform 0.5s ease-in-out;  
}  
  
/* .slide {
```

```
    height: 100%;  
    width: 100%;  
    background-size: cover;  
    background-position: center;  
}
```

```
/* .description-overlay {  
    position: absolute;  
    top: 0;  
    left: 0;  
    width: 100%;  
    height: 100%;  
    display: flex;  
    align-items: center;  
    justify-content: center;
```

```
background: rgba(0, 0, 0, 0.5);

color: white;

opacity: 0;

transition: opacity 0.5s ease-in-out;

}

.parallax-slider:hover .description-overlay {

    opacity: 1;

}

.description {

    font-size: 20px;

    text-align: center;

} */


```

```
.arrow {

    position: absolute;

    top: 50%;

    transform: translateY(-50%);

    font-size: 30px;

    background: rgba(0, 0, 0, 0.5);

    color: white;

    border-radius: 50%;

    cursor: pointer;

}
```

```
padding: 10px 20px;  
}  
  
.left {  
left: 0;  
}  
  
.right {  
right: 0;  
}  
  
@media only screen and (max-width: 1164px) {  
.parallax-slider{  
width: 90%;  
}  
}  
  
@media only screen and (max-width: 673px) {  
.parallax-slider{  
width: 100%;  
}  
}  
  
@media only screen and (max-width: 549px) {  
.parallax-slider{  
height: 400px;
```

```

        }
    }

    @media only screen and (max-width: 378px) {

        .slide {
            height: 200px
        }

        .arrow {
            top: 50%;
            font-size: 10px;
        }

    }

    .parallax-slider {
        height: 200px;
        width: 90%;
    }

}

}

```

Landing-page.ts

```

import { Component, HostListener, OnInit } from '@angular/core';
import { trigger, style, animate, transition } from '@angular/animations';
import { Title } from '@angular/platform-browser';

```

```
@Component({
```

```

selector: 'app-landing-page-new',
templateUrl: './landing-page-new.component.html',
styleUrls: ['./landing-page-new.component.css'],
animations: [
  trigger('slideIn', [
    transition(':enter', [
      style({ transform: 'translateX(-100%)' }),
      animate('500ms', style({ transform: 'translateX(0)' })),
    ]),
  ]),
],
}),
}

export class LandingPageNewComponent implements OnInit{
  scale: number = 1;
  imageUrl: string = 'assets/landingpagenew/parallaxtop/ext.jpg';
  scrollY = 0;

  @HostListener('window:scroll', ['$event'])
  onScroll(event: Event): void {
    this.scrollY = window.scrollY;
    this.scale = 1 + (window.scrollY / 500);
    if (this.scale < 1) this.scale = 1;
  }
}

```

```
currentIndex: number = 0;

isSmaller: boolean = false;

images: string[] = [
  'assets/landingpagenew/climateaction.jpg',
  'assets/landingpagenew/takeurgentaction.jpg',
  // 'assets/landingpagenew/targetgoals.png'

];

// descriptions: string[] = [
  // 'Description for Image 1',
  // 'Description for Image 2',
  // 'Description for Image 3'

//];
```

```
constructor(private titleService: Title) { }
```

```
ngOnInit(): void {
  this.startSlider();
}
```

```
startSlider() {
  setInterval(() => {
```

```

        this.nextSlide();

    }, 9000);

}

nextSlide() {
    this.isSmaller = true;

    setTimeout(() => {
        this.currentIndex = (this.currentIndex + 1) % this.images.length;
        this.isSmaller = false;
    }, 500);
}

prevSlide() {
    this.isSmaller = true;

    setTimeout(() => {
        this.currentIndex = (this.currentIndex - 1 + this.images.length) % this.images.length;
        this.isSmaller = false;
    }, 500);
}

getSlideStyle() {
    return {
        transform: this.isSmaller ? 'scale(0.8)' : 'scale(1)'
    };
}

```

```
 }  
 }
```

login.component.ts:

```
import { Component } from '@angular/core';  
  
import { HttpClient } from '@angular/common/http';  
  
import { Router } from '@angular/router';  
  
import { ToastrService } from 'ngx-toastr';  
  
import { environment } from '../environments/environment'  
  
import { Title } from '@angular/platform-browser';  
  
  
@Component({  
  selector: 'app-login',  
  templateUrl: './login.component.html',  
  styleUrls: ['./login.component.css']  
})  
  
export class LoginComponent {  
  
  username: string = "";  
  password: string = "";  
  loginAttempts: number = 0;  
  
  
  constructor(private http: HttpClient,  
    private router: Router,  
    private toastr: ToastrService,  
    private titleService: Title) { }
```

```

ngOnInit(){
  this.titleService.setTitle("Admin Login");
}

sessionCheck(): boolean{
  if(!localStorage.getItem('token')){
    return true;
  }

  return false;
}

redirectAdmin(){
  this.router.navigate(['/admin-current-issues-ph'])
}

login() {
  if (!this.username || !this.password) {
    this.toastr.error('Username and password are required.', 'Login Failed');
    return;
}

```

```
}
```

```
// to check for harmful characters
```

```
const harmfulCharsRegex = /[<>&""';@^$#%()!*!]/;
```

```
if (harmfulCharsRegex.test(this.username) || harmfulCharsRegex.test(this.password)) {
```

```
    this.toastr.error('Username or password must not include any malicious or unsafe  
characters.', 'Login Failed');
```

```
    return;
```

```
}
```

```
const lastFailedLoginTime = localStorage.getItem('lastFailedLoginTime');
```

```
if (lastFailedLoginTime) {
```

```
    const currentTime = new Date().getTime();
```

```
    const timeDifference = currentTime - parseInt(lastFailedLoginTime, 10);
```

```
// If less than 20 minutes (20 * 60 * 1000 milliseconds), show error and return
```

```
if (timeDifference < 20 * 60 * 1000) {
```

```
    const remainingTime = Math.ceil((20 * 60 * 1000 - timeDifference) / 1000);
```

```
    this.toastr.error(
```

```
        `Too many login attempts. Please try again in ${remainingTime} seconds.`,
    
```

```
    'Login Failed'
);
```

```
return;
```

```

        }

    }

const formData = {

    username: this.username,
    password: this.password,
};

this.http.post(`/${environment.apiUrl}/login`, formData).subscribe(
    (response: any) => {
        localStorage.setItem('token', response.token);

        // Reset login attempts and lastFailedLoginTime upon successful login
        this.loginAttempts = 0;
        localStorage.removeItem('lastFailedLoginTime');

        this.toastr.success('You have successfully logged in', 'Login Success!');
        this.router.navigate(['/admin-current-issues-ph']);
    },
    (error) => {
        this.loginAttempts++; // Increment login attempts

        if (this.loginAttempts === 5) {
            // Store the timestamp of the last failed login attempt

```

```

localStorage.setItem('lastFailedLoginTime', new Date().getTime().toString());

this.toastr.error(
  'Too many login attempts. Please try again in 20 minutes.',
  'Login Failed'
);

} else {
  this.toastr.error(
    'User is not authenticated. Please try again.',
    'Login Failed',
    error
  );
}

}
);
}

}

```

auth-guard.ts:

```

import { Injectable } from '@angular/core';

import { ActivatedRouteSnapshot, CanActivate, RouterStateSnapshot, UrlTree, Router } from
  '@angular/router';

import { Observable } from 'rxjs';

@Injectable({

```

```

providedIn: 'root'

})

export class AuthGuard implements CanActivate {

  canActivate(
    route: ActivatedRouteSnapshot,
    state: RouterStateSnapshot): Observable<boolean | UrlTree> | Promise<boolean | UrlTree> | boolean | UrlTree {

    if(localStorage.getItem('token')){
      return true;
    }else{
      this.router.navigate(['/login']);
      return false;
    }
  }

  constructor(private router: Router){}
}

```

main-scene.ts:

```

import Phaser from 'phaser';

export class MainScene extends Phaser.Scene {

  constructor() {

```

```

super({ key: 'main' });

}

background: any;

preload() {

    // Background in default scene

    this.load.image(
        'default-scene-bg',
        '..../..../assets/background/climate-escape-background.jpg'
    );
}

// SFX

this.load.audio('x-button', '..../..../assets/game/x-button.mp3');

this.load.audio('level-passed', '..../..../assets/game/level-passed.mp3');

this.load.audio('game-over', '..../..../assets/game/game-over.mp3');

this.load.audio('failed', '..../..../assets/game/failed.mp3');

this.load.audio('choice', '..../..../assets/game/choice-button.mp3');

this.load.audio('bg-music', '..../..../assets/game/bg-music.mp3');

this.load.audio('game-over', '..../..../assets/game/game-over.mp3');

this.load.audio('milestone', '..../..../assets/game/milestone-scene.mp3');

// Level 1 Assets

// BG

```

```
this.load.image('level-1-bg', '../../..../assets/game/scene1/beach.png');

// Shark

this.load.image('shark', '../../..../assets/lvl1/shark_spritesheet.png');

// Cloud

this.load.image('cloud-1', '../../..../assets/game/scene1/cloud1.png');

this.load.image('cloud-2', '../../..../assets/game/scene1/cloud2.png');

this.load.image('cloud-3', '../../..../assets/game/scene1/cloud3.png');

this.load.image('cloud-4', '../../..../assets/game/scene1/cloud4.png');

this.load.image('cloud-5', '../../..../assets/game/scene1/cloud5.png');

this.load.image('cloud-6', '../../..../assets/game/scene1/cloud6.png');

this.load.image('cloud-7', '../../..../assets/game/scene1/cloud7.png');

this.load.image('cloud-8', '../../..../assets/game/scene1/cloud8.png');

this.load.image('cloud-9', '../../..../assets/game/scene1/cloud9.png');

this.load.image('cloud-0', '../../..../assets/game/scene1/cloud0.png');
```

```
// Sea shells and pebbles

this.load.image('clutter1', '../../..../assets/game/scene1/clutter1.png');

this.load.image('clutter2', '../../..../assets/game/scene1/clutter2.png');

this.load.image('clutter3', '../../..../assets/game/scene1/clutter3.png');

this.load.image('clutter4', '../../..../assets/game/scene1/clutter4.png');

this.load.image('clutter5', '../../..../assets/game/scene1/clutter5.png');

this.load.image('clutter6', '../../..../assets/game/scene1/clutter6.png');

this.load.image('clutter7', '../../..../assets/game/scene1/clutter7.png');

this.load.image('clutter8', '../../..../assets/game/scene1/clutter8.png');
```

```
this.load.image('clutter9', '../../..../assets/game/scene1/clutter9.png');

this.load.image('clutter10', '../../..../assets/game/scene1/clutter10.png');

this.load.image('clutter11', '../../..../assets/game/scene1/clutter11.png');

this.load.image('clutter12', '../../..../assets/game/scene1/clutter12.png');

this.load.image('clutter13', '../../..../assets/game/scene1/clutter13.png');

this.load.image('clutter14', '../../..../assets/game/scene1/clutter14.png');

this.load.image('clutter15', '../../..../assets/game/scene1/clutter15.png');
```

// Garbages

```
this.load.image('garbage1', '../../..../assets/game/scene1/garbage1.png');

this.load.image('garbage2', '../../..../assets/game/scene1/garbage2.png');

this.load.image('garbage3', '../../..../assets/game/scene1/garbage3.png');

this.load.image('garbage4', '../../..../assets/game/scene1/garbage4.png');

this.load.image('garbage5', '../../..../assets/game/scene1/garbage5.png');

this.load.image('garbage6', '../../..../assets/game/scene1/garbage6.png');

this.load.image('garbage7', '../../..../assets/game/scene1/garbage7.png');

this.load.image('garbage8', '../../..../assets/game/scene1/garbage8.png');

this.load.image('garbage9', '../../..../assets/game/scene1/garbage9.png');

this.load.image('garbage10', '../../..../assets/game/scene1/garbage10.png');

this.load.image('garbage11', '../../..../assets/game/scene1/garbage11.png');

this.load.image('garbage12', '../../..../assets/game/scene1/garbage12.png');

this.load.image('garbage13', '../../..../assets/game/scene1/garbage13.png');

this.load.image('garbage14', '../../..../assets/game/scene1/garbage14.png');
```

```

// Scene 2

this.load.image('scene2-bg', '../..../..../assets/game/scene2/riverbank_mess.png');

this.load.image('scene2-bg-correct', '../..../..../assets/game/scene2/riverbank.png');

this.load.image('scene2-bg-wrong', '../..../..../assets/game/scene2/riverbank_mess.png');


// Scene 3

this.load.image('scene3-bg', '../..../..../assets/game/scene3/park_mess.png');

this.load.image('scene3-bg-correct', '../..../..../assets/game/scene3/park(lpd).png');

this.load.image('scene3-bg-wrong', '../..../..../assets/game/scene3/park_mess.png');


// Scene 4

this.load.image('scene4-bg', '../..../..../assets/game/scene4/harbor_mess.png');

this.load.image('scene4-bg-wrong', '../..../..../assets/game/scene4/harbor_mess.png');

this.load.image('scene4-bg-correct', '../..../..../assets/game/scene4/harbor(swd).png');


// Scene 5

this.load.image('scene5-bg', '../..../..../assets/game/scene5/lake_mess.png');

this.load.image('scene5-bg-wrong', '../..../..../assets/game/scene5/lake_mess.png');

this.load.image('scene5-bg-correct', '../..../..../assets/game/scene5/lake(wli).png');


// Game Over Scene

this.load.image('game-over', '../..../..../assets/game/game_over.png');


// Milestone scene

```

```

// Game Over Scene

this.load.image('character-win', '../../..../assets/game/char_cngrts.png');

this.load.image('congrats-bg', '../../..../assets/game/cngts_bg.png');


// Example sprite character

this.load.spritesheet('character', '../../..../assets/game/chara.png',{
    frameWidth: 408,
    frameHeight: 460
});

// Heart sprite

this.load.spritesheet('heart-icon', '../../..../assets/game/heart_sprite.png', {
    frameWidth: 510,
    frameHeight: 510
});

// Loading bar

let loadingBar = this.add.graphics({
    fillStyle: { color: 0xffffffff },
});

// Height and Width of game screen

const screenHeight = this.game.renderer.height;

const screenWidth = this.game.renderer.width;

```

```

// Loading bar size and position

const loadingBarWidth = screenWidth * 0.5;

const loadingBarHeight = 50;

const loadingBarX = (screenWidth - loadingBarWidth) / 2; // X Coords

const loadingBarY = (screenHeight - loadingBarHeight) / 2; // Y Coords


loadingBar.fillRect(
    loadingBarX,
    loadingBarY,
    loadingBarWidth,
    loadingBarHeight
);

// Text below loading bar and load arcade custom font

const loadingText = this.add.text(
    screenWidth / 2,
    loadingBarY + loadingBarHeight + 20, // Below loading bar
    'Loading game...',
    {
        font: '18px monospace',
        color: '#ffffff'
    }
);

// Origin of the text to center

loadingText.setOrigin(0.5);

```

```

this.load.on('progress', (percent: number) => {
    // Update loading bar based on the progress
    loadingBar.clear();
    loadingBar.fillStyle(0xffffffff, 1);
    loadingBar.fillRect(
        loadingBarX,
        loadingBarY,
        loadingBarWidth * percent, // Update width based on the progress of loading bar
        loadingBarHeight
    );
});

```

```

// Uncomment this when done in level 1!
this.load.on('complete', () => {
    // default-scene is the original value
    this.scene.start('default-scene', { config: this.game.config });
});

```

```

// Temporary to see Level 2 Scene Fast.
// this.load.on('complete', () => {
//     this.scene.start('pre-play-level2-scene', { config: this.game.config });
// });
}

}

```

```
create() {  
  
}  
  
}  
  
default-scene.ts:  
  
import Phaser from 'phaser';  
  
  
export class DefaultScene extends Phaser.Scene{  
  
    constructor(){  
  
        super({key: 'default-scene'});  
  
    }  
  
  
    config: Phaser.Types.Core.GameConfig | any;  
  
    init(data: {config: Phaser.Types.Core.GameConfig} ){  
  
        this.config = data.config;  
  
    }  
  
  
    // Put here the declaration of variables  
  
    background: any;  
  
  
    gameStarted: boolean = false;  
  
    bgMusic: any;
```

```

create(){

    const width = this.config.width;

    const height = this.config.height;

    this.background = this.add.image(0, 0, 'default-scene-bg');

    this.background.setOrigin(0, 0);

    const startText = this.add.text(
        width / 2,
        height - 70,
        'Press any key to start',
        {
            font: '18px monospace',
            color: '#ffffff'
        }
    );

    startText.setOrigin(0.5);

    // Keyboard listener if any key is clicked to start the game

    this.input.keyboard.on('keydown', () => {

        if(!this.gameStarted){

            this.gameStarted = true;

            startText.destroy();

        }

    });

}

```

```

// Text blinking

this.time.addEvent({
    delay: 400,
    callback: () => {
        startText.visible = !startText.visible;
    },
    loop: true
});

// BG Music

this.bgMusic = this.sound.add('bg-music', {loop: true, volume: 0.3});
this.bgMusic.play();

}

override update(){
if(this.gameStarted){
    this.bgMusic.destroy();
    this.scene.start('pre-play-scene', { config: this.game.config });
}
}

```

APPENDIX E. UNIT TEST REPORT



UNIT TEST

Test Case ID	001	Test Item Module	Buttons and Elements Admin Login					
Pre-conditions	Navigate to the Login page using login URL							
Verification Steps	Admin has been successfully navigating admin login page.							
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023			
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)			
1.1	Submit Login Request	Username = invalid Password = invalid	Login Failed notification should be shown.	Success	Pass			
1.2	Submit Login Request	Username = invalid Password = valid	Login Failed notification should be shown.	Success	Pass			
1.3	Submit Login Request	Username = valid Password = invalid	Login Failed notification should be shown.	Success	Pass			
1.4	Submit Login Request	Username = valid Password = valid	Successful notification should be shown	Success	Pass			

Test Case ID	002	Test Item Module	Buttons and Elements Admin Current Issue					
Pre-conditions	Must have login success.							
Verification Steps	Admin must successfully have login to navigate Admin Current Issues page.							
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023			
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)			
2.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass			
2.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass			
2.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Succes	Pass			

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2.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Succes	Pass
-----	--	-----------------------------	---	--------	------

Test Case ID	003	Test Item Module	Buttons and Elements Admin Assessment					
Pre-conditions	Must have login success.							
Verification Steps	Admin must successfully have login to navigate Admin Assessment page.							
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023			
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)			
3.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass			
3.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass			
3.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Succes	Pass			
3.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Succes	Pass			

Test Case ID	004	Test Item Module	Buttons and Elements Admin Cases					
Pre-conditions	Must have login success.							
Verification Steps	Admin must successfully have login to navigate Admin Cases page.							
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023			
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)			
4.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass			
4.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass			

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4.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Succes	Pass
4.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Succes	Pass

Test Case ID	005	Test Item	Buttons and Elements					
Module	Admin Case 1							
Pre-conditions	Must have login success.							
Verification Steps	Admin must successfully have login to navigate Admin Case 1 page.							
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023			
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)			
5.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass			
5.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass			
5.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Succes	Pass			
5.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Succes	Pass			

Test Case ID	006	Test Item	Buttons and Elements					
Module	Admin Case 2							
Pre-conditions	Must have login success.							
Verification Steps	Admin must successfully have login to navigate Admin Case 2 page.							
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023			
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)			
6.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass			

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6.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass
6.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Succes	Pass
6.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Succes	Pass

Test Case ID	007	Test Item	Buttons and Elements					
Module	Admin Case 3							
Pre-conditions	Must have login success.							
Verification Steps	Admin must successfully have login to navigate Admin Case 3 page.							
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023			
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)			
7.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass			
7.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass			
7.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Succes	Pass			
7.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Succes	Pass			

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Test Case ID	008	Test Item	Buttons and Elements					
Module	Admin Case 4							
Pre-conditions	Must have login success.							
Verification Steps	Admin must successfully have login to navigate Admin Case 4 page.							
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023			
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)			
8.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass			
8.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass			
8.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Succes	Pass			
8.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Succes	Pass			

Test Case ID	009	Test Item	Buttons and Elements					
Module	Admin Solutions							
Pre-conditions	Must have login success.							
Verification Steps	Admin must successfully have login to navigate Admin Solutions page.							
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023			
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)			
9.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass			
9.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass			
9.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Succes	Pass			

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9.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Succes	Pass
-----	--	-----------------------------	---	--------	------

Test Case ID	010	Test Item	Buttons and Elements					
Module	Admin Solution 1							
Pre-conditions	Must have login success.							
Verification Steps	Admin must successfully have login to navigate Admin Solution 1 page.							
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023			
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)			
10.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass			
10.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass			
10.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Succes	Pass			
10.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Succes	Pass			

Test Case ID	011	Test Item	Buttons and Elements					
Module	Admin Solution 2							
Pre-conditions	Must have login success.							
Verification Steps	Admin must successfully have login to navigate Admin Solution 2 page.							
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023			
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)			
11.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass			
11.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass			

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11.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Succes	Pass
11.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Succes	Pass

Test Case ID	012	Test Item	Buttons and Elements					
Module		Reviewed By	Admin Solution 3					
Pre-conditions Must have login success.								
Verification Steps Admin must successfully have login to navigate Admin Solution 3 page.								
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023			
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)			
12.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass			
12.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass			
12.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Succes	Pass			
12.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Succes	Pass			

Test Case ID	013	Test Item	Button					
Module		Reviewed By	Logout					
Pre-conditions Must have login success.								
Verification Steps Admin must successfully have login to navigate logout.								
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023			
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)			
13.1	Click logout button	Admin attempts to click logout button	Administrator will redirect to login page.	Success	Pass			

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Test Case ID	014	Test Item	Buttons and Key					
Module		Reviewed By	Game (Escape Room)					
Pre-conditions Click games in navigation bar								
Verification Steps User Click the game in navigation bar.								
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023			
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)			
14.1	Press any key to start	User Press any key	Scene will change to pre-play	Success	Pass			
14.2	Click the 'X' or close button	User Click 'X' or close button	Scene will change to scene 1 or level 1	Success	Pass			
14.3	Click the wrong answer	User Click Scene 1 Wrong Choice	Scene will change to wrong answer scene 1 and heart point will decrease	Success	Pass			
14.4	Click the correct answer	User Click Scene 1 Correct Choice	Scene will change to correct answer 1	Success	Pass			
14.5	Click the 'X' or close button	User Click Wrong answer scene 1	Proceed to scene 2	Success	Pass			
14.6	Click the 'X' or close button	User Click Correct answer scene 1	Proceed to scene 2	Success	Pass			
14.7	Click the wrong answer	User Click Scene 2 Wrong Choice	Scene will change to wrong answer scene 2 and heart point will decrease	Success	Pass			
14.8	Click the correct answer	User Click Scene 2 Correct Choice	Scene will change to correct answer 2	Success	Pass			
14.9	Click the 'X' or close button	User Click Wrong answer scene 2	Proceed to scene 3	Success	Pass			
14.0.1	Click the 'X' or close button	User Click Correct answer scene 2	Proceed to scene 3	Success	Pass			
14.0.2	Click the wrong answer	User Click Scene 3 Wrong Choice	Scene will change to wrong answer scene 3 and heart point will decrease. If the heart points are all consumed, scene will change to game over scene	Success	Pass			
14.0.3	Click the correct answer	User Click Scene 3 Correct Choice	Scene will change to correct answer 3	Success	Pass			
14.0.4	Click the 'X' or close button	User Click Wrong answer scene 3	Proceed to scene 4	Success	Pass			

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14.0.5	Click the 'X' or close button	User Click Correct answer scene 3	Proceed to scene 4	Success	Pass
14.0.6	Click the wrong answer	User Click Scene 4 Wrong Choice	Scene will change to Wrong answer scene 4 and heart point will decrease. If the heart points are all consumed, scene will change to game over scene	Success	Pass
14.0.7	Click the correct answer	User Click Scene 4 Correct Choice	Scene will change to correct answer 4	Success	Pass
14.0.8	Click the 'X' or close button	User Click Wrong answer scene 4	Proceed to scene 5	Success	Pass
14.0.9	Click the 'X' or close button	User Click Correct answer scene 4	Proceed to scene 5	Success	Pass
14.1.0	Click the wrong answer	User Click Scene 5 Wrong Choice	Scene will change to Wrong answer scene 5 and heart point will decrease. If the heart points are all consumed, scene will change to game over scene	Success	Pass
14.1.1	Click the correct answer	User Click Scene 5 Correct Choice	Scene will change to correct answer 5	Success	Pass
14.1.2	Click the 'X' or close button	User Click Wrong answer scene 5	Proceed to congratulation scene	Success	Pass
14.1.3	Click the 'X' or close button	User Click Correct answer scene 5	Proceed to congratulation scene	Success	Pass
14.1.4	Click the 'X' or close button	User Click Game over scene	Proceed to pre-play scene	Success	Pass
14.1.5	Click the 'X' or close button	User Click Congratulation scene	Proceed to pre-play scene	Success	Pass

Test Case ID		015	Test Item Module	Buttons					
Pre-conditions		Navigate to the Assessment page Trivia Game.							
Verification Steps		User navigates the Assessment page.							
Created By		Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023			
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)				
15.1	No options are selected to all questions.	User Submit Trivia Game without answering all questions	Error notification will be shown, requiring all questions to be answered before submitting.	Success	Pass				

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15.2	Incomplete answer selected.	User Submit Trivia Game Question with Incomplete Answer	Error notification will be shown, requiring the field to be answered	Success	Pass
15.3	Selected the wrong answer.	User Submit Trivia Game Question with Wrong Answer	Shows successfully submitted notification with Trivia Game Score and Review form button.	Success	Pass
15.4	Selected the correct answer.	User Submit Trivia Game Question with Correct Answer	Shows successfully submitted notification with Trivia Game Score and Review form button.	Success	Pass
15.5	Click the review form button	User clicked Review Trivia Game form	It displays the trivia game form answered by the user, providing a preview of the details of their answers, and a play again button will be shown below.	Success	Pass
15.6	Click the play again button	User clicked Play again Trivia Game	The Trivia Game will be reset, and the user can answer Trivia Game again.	Success	Pass
15.7	Click the reset button.	User click Reset Trivia Game	A notification will be shown that the response has been reset.	Success	Pass

Test Case ID		016	Test Item Module	Buttons					
Pre-conditions		Navigate to the Assessment page Pop Quiz.							
Verification Steps		User navigates the Assessment page.							
Created By		Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023			
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)				
16.1	No options are selected to all questions.	User Submit Pop Quiz without answering all questions	Error notification will be shown, requiring all questions to be answered before submitting.	Success	Pass				
16.2	Incomplete answer selected.	User Submit Pop Quiz Question with Incomplete Answer	Error notification will be shown, requiring the field to be answered	Success	Pass				
16.3	Selected the wrong answer.	User Submit Pop Quiz Question with Wrong Answer	Shows successfully submitted notification with Pop Quiz Score and Review form button.	Success	Pass				

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I6.4	Selected the correct answer.	User Submit Pop Quiz Question with Correct Answer	Shows successfully submitted notification with Pop Quiz Score and Review form button.	Success	Pass
I6.5	Click the review form button	User clicked Review Pop Quiz form	It displays the Pop Quiz form answered by the user, providing a preview of the details of their answers, and a play again button will be shown below.	Success	Pass
I6.6	Click the play again button	User clicked Play again Pop Quiz	The Pop Quiz will be reset, and the user can answer Pop Quiz again.	Success	Pass
I6.7	Click the reset button.	User clicked Reset Pop Quiz	A notification will be shown that the response has been reset.	Success	Pass



UNIT TEST

Test Case ID		001	Test Item Module	Buttons and Elements		
Pre-conditions		Navigate to the Login page using login URL.				
Verification Steps		Admin has been successfully navigating admin login page.				
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023	
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)	
1.1	Submit Login Request	Username = invalid Password = valid	Login Failed notification should be shown.	Success	Pass	
1.2	Submit Login Request	Username = invalid Password = valid	Login Failed notification should be shown.	Success	Pass	
1.3	Submit Login Request	Username = valid Password = invalid	Login Failed notification should be shown.	Success	Pass	
1.4	Submit Login Request	Username = valid Password = valid	Successful notification should be shown	Success	Pass	

Test Case ID		002	Test Item Module	Buttons and Elements		
Pre-conditions		Must have login success.				
Verification Steps		Admin must successfully have login to navigate Admin Current Issues page.				
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023	
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)	
2.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass	
2.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass	
2.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Success	Pass	
2.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Success	Pass	

Test Case ID		003	Test Item Module	Buttons and Elements		
Pre-conditions		Must have login success.				
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)	

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Verification Steps		Admin must successfully have login to navigate Admin Assessment page.				
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023	
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)	
3.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass	
3.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass	
3.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Success	Pass	
3.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Success	Pass	

Test Case ID		004	Test Item Module	Buttons and Elements		
Pre-conditions		Must have login success.				
Verification Steps		Admin must successfully have login to navigate Admin Climate Action SDG 13 page.				
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023	
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)	
4.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass	
4.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass	
4.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Success	Pass	
4.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Success	Pass	

Test Case ID		005	Test Item Module	Buttons and Elements		
Pre-conditions		Must have login success.				
Verification Steps		Admin must successfully have login to navigate Admin Overview page.				
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023	
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)	
5.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass	

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5.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass
5.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Succes	Pass
5.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Succes	Pass

Test Case ID	006	Test Item	Buttons and Elements					
Module	Admin Target and Indicators							
Pre-conditions	Must have login success.							
Verification Steps	Admin must successfully have login to navigate Admin Target and Indicators page.							
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023			
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)			
6.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass			
6.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass			
6.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Succes	Pass			
6.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Succes	Pass			

Test Case ID	007	Test Item	Buttons and Elements					
Module	Admin Progress and Info							
Pre-conditions	Must have login success.							
Verification Steps	Admin must successfully have login to navigate Admin Progress and Info page.							
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023			
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)			
7.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass			
7.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass			
7.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Succes	Pass			
7.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Succes	Pass			

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Test Case ID	008	Test Item	Buttons and Elements					
Module	Admin Related Topics							
Pre-conditions	Must have login success.							
Verification Steps	Admin must successfully have login to navigate Admin Related Topics page.							
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023			
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)			
8.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass			
8.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass			
8.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Succes	Pass			
8.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Succes	Pass			

Test Case ID	009	Test Item	Buttons and Elements					
Module	Admin Solutions							
Pre-conditions	Must have login success.							
Verification Steps	Admin must successfully have login to navigate Admin Solutions page.							
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala	Date Tested	26-Sept-2023			
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)			
9.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass			
9.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass			
9.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Succes	Pass			
9.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Succes	Pass			

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Test Case ID	010	Test Item	Buttons and Elements
		Module	Admin Solution 1

Pre-conditions Must have login success.

Verification Steps Admin must successfully have login to navigate Admin Solution 1 page.

Created By Karina Dela Cruz **Reviewed By** Vincent Regala **Date Tested** 26-Sept-2023

ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)
10.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass
10.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass
10.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Succes	Pass
10.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Succes	Pass

Test Case ID	011	Test Item	Buttons and Elements
		Module	Admin Solution 2

Pre-conditions Must have login success.

Verification Steps Admin must successfully have login to navigate Admin Solution 2 page.

Created By Karina Dela Cruz **Reviewed By** Vincent Regala **Date Tested** 26-Sept-2023

ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)
11.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass
11.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass
11.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Succes	Pass
11.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Succes	Pass

Test Case ID	012	Test Item	Buttons and Elements
		Module	Admin Solution 3

Pre-conditions Must have login success.

Verification Steps Admin must successfully have login to navigate Admin Solution 3 page.

Created By Karina Dela Cruz **Reviewed By** Vincent Regala **Date Tested** 26-Sept-2023

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ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)
12.1	Click publish button without changing anything	"All Fields" = no changes made	No changes were made notification	Success	Pass
12.2	Click publish button with changes	"Other fields" = made changes	Data Successfully updated notification	Success	Pass
12.3	Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	Succes	Pass
12.4	Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	Succes	Pass

Test Case ID	013	Test Item	Button
		Module	Logout

Pre-conditions Must have login success.

Verification Steps Admin must successfully have login to navigate logout.

Created By Karina Dela Cruz **Reviewed By** Vincent Regala **Date Tested** 26-Sept-2023

ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)
13.1	Click logout button	Admin attempts to click logout button	Administrator will redirect to login page.	Success	Pass

Test Case ID	014	Test Item	Buttons and Key
		Module	Game (Escape Room)

Pre-conditions Click games in navigation bar

Verification Steps User Click the game in navigation bar.

Created By Karina Dela Cruz **Reviewed By** Vincent Regala **Date Tested** 03-06-2023

ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)
14.1	Press any key to start	User Press any key	Scene will change to pre-play scene	Success	Pass
14.2	Press the arrow keys/WASD keys (Pre-play)	User press arrow keys/WASD keys towards the character narrators	Scene will display the Game instructions.	Success	Pass
14.3	Click continue button	User Click continue button	Scene will change the background and display the narration of the game scene 1.	Success	Pass
14.4	Click the continue button	User Click continue button	Scene will be directed to scene 1 game.	Success	Pass
14.5	Scene 1 press the arrow keys/WASD	User press arrow keys/WASD keys to move the character.	The game character will move accordingly.	Success	Pass
14.6	Scene 1 presses the space bar	User failed to pick up the garbage.	Scene will change to a scene containing failed/wrong message and information background and heart point will decrease.	Success	Pass

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14.7	Click "continue" button	User click the continue button on wrong scene.	Proceed to next scene narration.	Success	Pass 
14.8	Click "continue" button	User click the continue button for next scene narration.	Proceed to next game scene 2.	Success	Pass 
14.9	Scene 1 presses the space bar	User successfully pick up the garbage.	Scene will change to a scene containing success/correct message and information background.	Success	Pass 
14.0.1	Click "continue" button	User click the continue button on correct scene.	Proceed to next scene narration.	Success	Pass 
14.0.2	Click "continue" button	User click the continue button for next scene narration.	Proceed to next game scene 2.	Success	Pass 
14.0.3	Scene 2 press the arrow keys/WASD	User press arrow keys/WASD keys to move the character.	The game character will move accordingly.	Success	Pass 
14.0.4	Scene 2 presses the space bar	User failed to pick up the garbage.	Scene will change to a scene containing failed/wrong message and information background and heart point will decrease.	Success	Pass 
14.0.5	Click "continue" button	User click the continue button on wrong scene.	Proceed to next scene narration.	Success	Pass 
14.0.6	Click "continue" button	User click the continue button for next scene narration.	Proceed to next game scene 3.	Success	Pass 
14.0.7	Scene 2 presses the space bar	User successfully pick up the garbage.	Scene will change to a scene containing success/correct message and information background.	Success	Pass 
14.0.8	Click "continue" button	User click the continue button on correct scene.	Proceed to next scene narration.	Success	Pass 
14.0.9	Click "continue" button	User click the continue button for next scene narration.	Proceed to next game scene 3.	Success	Pass 
14.1.0	Scene 3 press the arrow keys/WASD	User press arrow keys/WASD keys to move the character.	The game character will move accordingly.	Success	Pass 
14.1.1	Scene 3 presses the space bar	User failed to pick up the garbage.	Scene will change to a scene containing failed/wrong message and information background and heart point will decrease.	Success	Pass 
14.1.2	Click "continue" button	User click the continue button on wrong scene.	Proceed to next scene narration.	Success	Pass 
14.1.3	Click "continue" button	User click the continue button for next scene narration.	Proceed to next game scene 4.	Success	Pass 
14.1.4	Scene 3 presses the space bar	User successfully pick up the garbage.	Scene will change to a scene containing success/correct message and information background.	Success	Pass 
14.1.5	Click "continue" button	User click the continue button on correct scene.	Proceed to next scene narration.	Success	Pass 
14.1.6	Click "continue" button	User click the continue button for next scene narration.	Proceed to next game scene 4.	Success	Pass 
14.1.7	Scene 4 press the arrow keys/WASD	User press arrow keys/WASD keys to move the character.	The game character will move accordingly.	Success	Pass 
14.1.8	Scene 4 presses the space bar	User failed to pick up the garbage.	Scene will change to a scene containing failed/wrong message and information background and heart point will decrease.	Success	Pass 
14.1.9	Click "continue" button	User click the continue button on wrong scene.	Proceed to next scene narration.	Success	Pass 
14.2.0	Click "continue" button	User click the continue button for next scene narration.	Proceed to next game scene 5.	Success	Pass 

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14.2.1	Scene 4 presses the space bar	User successfully pick up the garbage.	Scene will change to a scene containing success/correct message and information background.	Success	Pass 		
14.2.2	Click "continue" button	User click the continue button on correct scene.	Proceed to next scene narration.	Success	Pass 		
14.2.3	Click "continue" button	User click the continue button for next scene narration.	Proceed to next game scene 5.	Success	Pass 		
14.2.4	Scene 5 press the arrow keys/WASD	User successfully pick up the garbage.	The game character will move accordingly.	Success	Pass 		
14.2.5	Scene 5 presses the space bar	User failed to pick up the garbage.	Scene will change to a scene containing failed/wrong message and information background and heart point will decrease.	Success	Pass 		
14.2.6	Click "continue" button	User click the continue button on wrong scene.	Proceed to next scene narration.	Success	Pass 		
14.2.7	Click "continue" button	User click the continue button for next scene narration.	Proceed to Game Over scene.	Success	Pass 		
14.2.8	Scene presses the space bar	User successfully pick up the garbage.	Scene will change to a scene containing success/correct message and information background.	Success	Pass 		
14.2.9	Click "continue" button	User click the continue button on correct scene.	Proceed to Congratulatory Scene.	Success	Pass 		
14.3.0	Click "continue" button	User click the restart button.	Proceed to Pre-play scene.	Success	Pass 		
Test Case ID		014	Test Item				
			Module	Game (Escape Room)			
Pre-conditions			User Click the game in navigation bar.				
Verification Steps							
Created By			Reviewed By	Vincent Regala	Date Tested		
02-03-2023							
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)		
14.1	Press any key to start	User Press any key	Scene will change to pre-play scene	Success	Pass 		
14.2	Press the arrow keys/WASD keys	User press arrow keys/WASD keys towards the character narrators	Scene will display the Game instructions.	Success	Pass 		
14.3	Click continue button	User Click continue button	Scene will change the background and display the narration of the game scene 1.	Success	Pass 		
14.4	Click the continue button	User Click continue button	Scene will be directed to scene 1 game.	Success	Pass 		
14.5	Scene 1 press the arrow keys/WASD	User failed to gather litter within the give time frame.	Scene will change to a scene containing wrong message and information background and heart point will decrease.	Success	Pass 		
14.6	Scene 1 press the arrow keys/WASD	User successfully gathered the litter within the give time frame.	Scene will change to correct scene message and information background.	Success	Pass 		
14.7	Click "skip" button	User failed to gather litter within the give time frame scene 1	Proceed to scene 2	Success	Pass 		
14.8	Click "skip" button	User successfully gathered the litter within the give time frame scene 1	Proceed to scene 2	Success	Pass 		

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14.9	Scene 2 press the arrow keys/WASD	User failed to gather litter within the give time frame.	Scene will change to a scene containing wrong message and information background and heart point will decrease.	Success	Pass
14.0.1	Scene 2 press the arrow keys/WASD	User successfully gathered the litter within the give time frame.	Scene will change to correct scene message and information background.	Success	Pass
14.0.2	Click "skip" button	User failed to gather litter within the give time frame scene 2	Proceed to scene 3	Success	Pass
14.0.3	Click "skip" button	User successfully gathered the litter within the give time frame scene 2	Proceed to scene 3	Success	Pass
14.0.4	Scene 3 press the arrow keys/WASD	User failed to gather litter within the give time frame.	Scene will change to a scene containing wrong message and information background and heart point will decrease.	Success	Pass
14.0.5	Scene 3 press the arrow keys/WASD	User successfully gathered the litter within the give time frame.	Scene will change to correct scene message and information background.	Success	Pass
14.0.6	Click "skip" button	User failed to gather litter within the give time frame scene 3	Proceed to scene 4	Success	Pass
14.0.7	Click "skip" button	User successfully gathered the litter within the give time frame scene 3	Proceed to scene 4	Success	Pass
14.0.8	Scene 4 press the arrow keys/WASD	User failed to gather litter within the give time frame.	Scene will change to a scene containing wrong message and information background and heart point will decrease.	Success	Pass
14.0.9	Scene 4 press the arrow keys/WASD	User successfully gathered the litter within the give time frame.	Scene will change to correct scene message and information background.	Success	Pass
14.1.0	Click "skip" button	User failed to gather litter within the give time frame scene 4	Proceed to scene 5	Success	Pass
14.1.1	Click "skip" button	User successfully gathered the litter within the give time frame scene 4	Proceed to scene 5	Success	Pass
14.1.2	Scene 5 press the arrow keys/WASD	User failed to gather litter within the give time frame.	Scene will change to a scene containing wrong message and information background and heart point will decrease.	Success	Pass
14.1.3	Scene 5 press the arrow keys/WASD	User successfully gathered the litter within the give time frame.	Scene will change to correct scene message and information background.	Success	Pass
14.1.4	Click "skip" button	User failed to gather litter within the give time frame scene 5	Proceed to scene Game over scene	Success	Pass
14.1.5	Click "skip" button	User successfully gathered the litter within the give time frame scene 5	Proceed to Congratulatory scene	Success	Pass

Test Case ID	015	Test Item	Elements		
Module		Self-Assessment			
Pre-conditions	Navigate to the Self-Assessment page.				
Verification Steps	User navigates the Self-Assessment page.				
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala		
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)

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15.1	No options are selected to all questions.	User Submit without answering all questions	Error notification will be shown, requiring all questions to be answered before submitting.	Success	Pass
15.2	Incomplete answer selected.	User Submit Question with Incomplete Answer	Error notification will be shown, requiring the field to be answered	Success	Pass
15.3	Selected the wrong answer.	User Submit Question with Wrong Answer	Shows successful submitted notification with Score and Review form button.	Success	Pass
15.4	Selected the correct answer.	User Submit Question with Correct Answer	Shows successfully submitted notification with Score and Review form button.	Success	Pass
15.5	Click the review form button	User clicked Review form	It displays the form answered by the user, providing a preview of the details of their answers, and a play again button will be shown below.	Success	Pass
15.6	Click the play again button	User clicked Play again	Will be reset, and the user can answer again.	Success	Pass
15.7	Click the reset button.	User clicked Reset	A notification will be shown that the response has been reset.	Success	Pass

Test Case ID	016	Test Item	Elements		
Module		Admin News			
Pre-conditions	Test various Admin News page functionalities.				
Verification Steps	Must have login success				
Created By	Karl Marx Roxas	Reviewed By	Vincent Regala		
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)
16.1	Add News with empty field	Do not put any input in any or some fields.	Error notification will be shown, saying some fields are empty	Success	Pass
16.2	Add News with <script> tag or harmful character	Put <script> tag or harmful characters in any fields.	Error notification will be shown, saying it contains harmful characters	Success	Pass
16.3	Edit News with no changes	Edit the news without editing anything	No notification will be shown, saying no changes were made	Success	Pass
16.4	Edit News with <script> tag or harmful character	Edit the news with editing any fields with <script> tag or any harmful character	Error notification will be shown, saying Invalid characters detected in one or more input fields. Please remove them and try again.	Success	Pass
16.5	Edit news with some changes	Edit news with changes	Success notification will be shown, saying updated successfully	Success	Pass

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16.6	Delete news	Delete news	Success notification will be shown, saying successfully deleted	Success	Pass
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Test Case ID	017	Test Item Module	Buttons and Elements	Date Tested	03-03-2023
Pre-conditions		Test various Admin Accounts page functionalities.			
Verification Steps		Must have login success			
Created By	Karina Dela Cruz	Reviewed By	Vincent Regala		
ID	Action	Data (Input Value)	Expected Results	Actual Results	Status (Pass/Fail)
17.1	Click "New Admin" button	Close the form.	View existing list of accounts.	Success	Pass
17.2	Click "New Admin" button	Input fields = incomplete	Error will display on the right end of fields indicating "Required fields" and create account button will not be clickable.	Success	Pass
17.3	Click "New Admin" button	Input fields = invalid inputs	Error message should be displayed, it should provide instruction for required valid inputs, and create account button will not be clickable.	Success	Pass
17.4	Click "New Admin" button	Input fields = valid inputs	The input field will become green and will have checkmark on the right, indicating valid input. The Create Account button will now be clickable. - Upon clicking the creation of account is success and a notification will be displayed for email verification of the account.	Success	Pass
17.5	Click "Update Info" button	Close the form.	View existing list of accounts.	Success	Pass
17.6	Click "Update Info" button	Input fields = no changes	Success notification of updated info.	Success	Pass
17.7	Click "Update Info" button	Input fields = Changes made	Success notification of updated info.	Success	Pass
17.8	Click "Reset Password" button	Input fields = invalid	Error message should be displayed, it should provide instruction for required valid inputs and reset button will not be clickable.	Success	Pass

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17.9	Click "Reset Password" button	Input fields = valid	The input field will become green and will have checkmark on the right, indicating valid input. The "Reset" button will now be clickable. - Upon clicking the reset button, a success reset notification will be displayed.	Success	Pass
17.0.1	Click "Delete" button	Close the deletion of account dialog.	View existing list of accounts.	Success	Pass
17.0.2	Click "Delete" button	Click the delete button on the dialog.	A success notification of account deletion will be displayed.	Success	Pass

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APPENDIX F.

FUNCTIONAL TEST

REPORT



FUNCTIONAL TEST

Test Case ID	001	Module	Login
Test Description	Test various Login functionalities.		
Pre-conditions	Navigate to the Login page using /login URL		
Created By	Karl Marx Roxas	Reviewed By	Bonafide
Test Case(s)	Action	Expected System Response	Number of Execution
Login Account	Submit Login Request	Successful notification should be shown	1
Login Invalid Account	Submit Login Request using wrong credentials	Login Failed notification should be shown	1
			Pass

Test Case ID	002	Module	Admin Current Issues
Test Description	Test various Admin Current Issues functionalities		
Pre-conditions	Must have login success		
Created By	Karl Marx Roxas	Reviewed By	Bonafide
Test Case(s)	Action	Expected System Response	Number of Execution
Publish without changes	Click publish button without changing anything	No changes were made notification	1
Publish with changes	Click publish button without changing anything	Data successfully updated notification	1
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	1
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1
			Pass

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Test Case ID	003	Module	Admin Assessment
Test Description	Test various Admin Assessment functionalities		
Pre-conditions	Must have login success		
Created By	Karl Marx Roxas	Reviewed By	Bonafide
Test Case(s)	Action	Expected System Response	Number of Execution
Publish without changes	Click publish button without changing anything	No changes were made notification	1
Publish with changes	Click publish button without changing anything	Data successfully updated notification	1
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	1
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1
			Pass

Test Case ID	004	Module	Admin Cases
Test Description	Test various Admin Cases functionalities		
Pre-conditions	Must have login success		
Created By	Karl Marx Roxas	Reviewed By	Bonafide
Test Case(s)	Action	Expected System Response	Number of Execution
Publish without changes	Click publish button without changing anything	No changes were made notification	1
Publish with changes	Click publish button without changing anything	Data successfully updated notification	1
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	1
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1
			Pass

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Test Case ID	005	Module	Admin Case 1					
Test Description	Test various Admin Case 1 functionalities							
Pre-conditions	Must have login success							
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023			
Test Case(s)	Action	Expected System Response		Number of Execution	Status (Pass/Fail)			
Publish without changes	Click publish button without changing anything	No changes were made notification		1	Pass			
Publish with changes	Click publish button without changing anything	Data successfully updated notification		1	Pass			
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed		1	Pass			
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed		1	Pass			

Test Case ID	006	Module	Admin Case 2					
Test Description	Test various Admin Case 2 functionalities							
Pre-conditions	Must have login success							
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023			
Test Case(s)	Action	Expected System Response		Number of Execution	Status (Pass/Fail)			
Publish without changes	Click publish button without changing anything	No changes were made notification		1	Pass			
Publish with changes	Click publish button without changing anything	Data successfully updated notification		1	Pass			
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed		1	Pass			

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Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1	Pass		
Test Case ID	007	Module	Admin Case 3			
Test Description	Test various Admin Case 3 functionalities					
Pre-conditions	Must have login success					
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested		
Test Case(s)	Action	Expected System Response		Number of Execution		
Publish without changes	Click publish button without changing anything	No changes were made notification		1		
Publish with changes	Click publish button without changing anything	Data successfully updated notification		1		
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed		1		
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed		1		

Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1	Pass		
Test Case ID	008	Module	Admin Case 4			
Test Description	Test various Admin Case 4 functionalities					
Pre-conditions	Must have login success					
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested		
Test Case(s)	Action	Expected System Response		Number of Execution		
Publish without changes	Click publish button without changing anything	No changes were made notification		1		
Publish with changes	Click publish button without changing anything	Data successfully updated notification		1		

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Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	1	Pass
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1	Pass

Test Case ID	009	Module	Admin Solutions					
Test Description	Test various Admin Solutions functionalities							
Pre-conditions	Must have login success							
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023			
Test Case(s)	Action	Expected System Response			Number of Execution			
Publish without changes	Click publish button without changing anything	No changes were made notification			1			
Publish with changes	Click publish button without changing anything	Data successfully updated notification			1			
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed			1			
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed			1			

Test Case ID	010	Module	Admin Solution 1					
Test Description	Test various Admin Solution 1 functionalities							
Pre-conditions	Must have login success							
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023			
Test Case(s)	Action	Expected System Response			Number of Execution			
Publish without changes	Click publish button without changing anything	No changes were made notification			1			

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Publish with changes	Click publish button without changing anything	Data successfully updated notification	1	Pass
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	1	Pass
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1	Pass

Test Case ID	011	Module	Admin Solution 2					
Test Description	Test various Admin Solution 2 functionalities							
Pre-conditions	Must have login success							
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023			
Test Case(s)	Action	Expected System Response			Number of Execution			
Publish without changes	Click publish button without changing anything	No changes were made notification			1			
Publish with changes	Click publish button without changing anything	Data successfully updated notification			1			
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed			1			
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed			1			

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Test Case ID	012	Module	Admin Solution 3					
Test Description	Test various Admin Solution 3 functionalities							
Pre-conditions	Must have login success							
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023			
Test Case(s)	Action	Expected System Response		Number of Execution	Status (Pass/Fail)			
Publish without changes	Click publish button without changing anything	No changes were made notification		1	Pass			
Publish with changes	Click publish button without changing anything	Data successfully updated notification		1	Pass			
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed		1	Pass			
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed		1	Pass			

Test Case ID	013	Module	Logout					
Test Description	Test various Logout functionalities							
Pre-conditions	Must have login success							
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023			
Test Case(s)	Action	Expected System Response		Number of Execution	Status (Pass/Fail)			
Logout	Click Logout button	Administrator will redirect to login page		1	Pass			

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Test Case ID	014	Module	Game (Escape Room)					
Test Description	Test various Game functionalities							
Pre-conditions	Click games in navigation bar							
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023			
Test Case(s)	Action	Expected System Response		Number of Execution	Status (Pass/Fail)			
Default Scene	Press any key to start	Scene will change to pre-play		1	Pass			
Pre-play	Click the 'X' or close button	Scene will change to scene 1 or level 1		1	Pass			
Scene 1 Wrong Choice	Click the wrong answer	Scene will change to wrong answer scene 1 and heart point will decrease		1	Pass			
Scene 1 Correct Choice	Click the correct answer	Scene will change to correct answer 1		1	Pass			
Wrong answer scene 1	Click the 'X' or close button	Proceed to scene 2		1	Pass			
Correct answer scene 1	Click the 'X' or close button	Proceed to scene 2		1	Pass			
Scene 2 Wrong Choice	Click the wrong answer	Scene will change to wrong answer scene 2 and heart point will decrease		1	Pass			
Scene 2 Correct Choice	Click the correct answer	Scene will change to correct answer 2		1	Pass			
Wrong answer scene 2	Click the 'X' or close button	Proceed to scene 3		1	Pass			
Correct answer scene 2	Click the 'X' or close button	Proceed to scene 3		1	Pass			
Scene 3 Wrong Choice	Click the wrong answer	Scene will change to wrong answer scene 3 and heart point will decrease. If the heart points are all consumed, scene will change to game over scene		1	Pass			
Scene 3 Correct Choice	Click the correct answer	Scene will change to correct answer 3		1	Pass			
Wrong answer scene 3	Click the 'X' or close button	Proceed to scene 4		1	Pass			
Correct answer scene 3	Click the 'X' or close button	Proceed to scene 4		1	Pass			
Scene 4 Wrong Choice	Click the wrong answer	Scene will change to wrong answer scene 4 and heart point will decrease. If the heart points are all consumed, scene will change to game over scene		1	Pass			
Scene 4 Correct Choice	Click the correct answer	Scene will change to correct answer 4		1	Pass			
Wrong answer scene 4	Click the 'X' or close button	Proceed to scene 5		1	Pass			
Correct answer scene 4	Click the 'X' or close button	Proceed to scene 5		1	Pass			

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Scene 5 Wrong Choice	Click the wrong answer	Scene will change to Wrong answer scene 5 and heart point will decrease. If the heart points are all consumed, scene will change to game over scene	1	Pass
Scene 5 Correct Choice	Click the correct answer	Scene will change to correct answer 5	1	Pass
Wrong answer scene 5	Click the 'X' or close button	Proceed to congratulation scene	1	Pass
Correct answer scene 5	Click the 'X' or close button	Proceed to congratulation scene	1	Pass
Game over scene	Click the 'X' or close button	Proceed to pre-play scene	1	Pass
Congratulation scene	Click the 'X' or close button	Proceed to pre-play scene	1	Pass

Test Case ID	015	Module	User Assessment (Trivia Game)			
Test Description	Test various Assessment page functionalities.					
Pre-conditions	Navigate to the Assessment page Trivia Game.					
Created By	Karina Dela Cruz	Reviewed By	Bonafide	Date Tested		
Test Case(s)	Action	Expected System Response	Number of Execution	Status (Pass/Fail)		
Submit Trivia Game without answering all questions	No options are selected to all questions.	Error notification will be shown, requiring all questions to be answered before submitting.	1	Pass		
Submit Trivia Game Question with Incomplete Answer	Incomplete answer selected.	Error notification will be shown, requiring the field to be answered	1	Pass		
Submit Trivia Game Question with Wrong Answer	Selected the wrong answer.	Shows successfully submitted notification with Trivia Game Score and Review form button.	1	Pass		
Submit Trivia Game Question with Correct Answer	Selected the correct answer.	Shows successfully submitted notification with Trivia Game Score and Review form button.	1	Pass		
Review Trivia Game form	Click the review form button	It displays the trivia game form answered by the user, providing a preview of the details of their answers, and a play again button will be shown below.	2	Pass		
Play again Trivia Game	Click the play again button	The Trivia Game will be reset, and the user can answer Trivia Game again.	1	Pass		

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Test Case ID	016	Module	User Assessment (Pop Quiz)			
Test Description	Test various Assessment page functionalities.					
Pre-conditions	Navigate to the Assessment page Pop Quiz.					
Created By	Karina Dela Cruz	Reviewed By	Bonafide	Date Tested		
Test Case(s)	Action	Expected System Response	Number of Execution	Status (Pass/Fail)		
Submit Pop Quiz without answering all questions	No options are selected to all questions.	Error notification will be shown, requiring all questions to be answered before submitting.	1	Pass		
Submit Pop Quiz Question with Incomplete Answer	Incomplete options selected.	Error notification will be shown, requiring the field to be answered	1	Pass		
Submit Pop Quiz Question with Wrong Answer	Selected the wrong answer.	Shows successfully submitted notification with Pop Quiz Score and Review form button.	1	Pass		
Submit Pop Quiz Question with Correct Answer	Selected the correct answer.	Shows successfully submitted notification with Pop Quiz Score and Review form button.	1	Pass		
Review Pop Quiz form	Click the review form button	It displays the Pop Quiz form answered by the user, providing a preview of the details of their answers, and a play again button will be shown below.	2	Pass		
Play again Pop Quiz	Click the play again button	The Pop Quiz will be reset, and the user can answer Pop Quiz again.	1	Pass		
Reset Pop Quiz	Click reset button.	A notification will be shown that the response has been reset.	1	Pass		

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FUNCTIONAL TEST

Test Case ID	001	Module	Login		
Test Description	Test various Login functionalities.				
Pre-conditions	Navigate to the Login page using /login URL				
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023
Test Case(s)	Action	Expected System Response		Number of Execution	Status (Pass/Fail)
Login Account	Submit Login Request	Successful notification should be shown		1	Pass
Login Invalid Account	Submit Login Request using wrong credentials	Login Failed notification should be shown		1	Pass

Test Case ID	002	Module	Admin Current Issues		
Test Description	Test various Admin Current Issues functionalities				
Pre-conditions	Must have login success				
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023
Test Case(s)	Action	Expected System Response		Number of Execution	Status (Pass/Fail)
Publish without changes	Click publish button without changing anything	No changes were made notification		1	Pass
Publish with changes	Click publish button without changing anything	Data successfully updated notification		1	Pass
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed		1	Pass
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed		1	Pass

Test Case ID	003	Module	Admin Self-Assessment		
Test Description	Test various Admin Self-Assessment functionalities				
Pre-conditions	Must have login success				
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023
Test Case(s)	Action	Expected System Response		Number of Execution	Status (Pass/Fail)
Publish without changes	Click publish button without changing anything	No changes were made notification		1	Pass

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Publish with changes	Click publish button without changing anything	Data successfully updated notification	1	Pass
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	1	Pass
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1	Pass

Test Case ID	004	Module	Admin Climate Action SDG13		
Test Description	Test various Admin Climate Action SDG13 functionalities				
Pre-conditions	Must have login success				
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023
Test Case(s)	Action	Expected System Response		Number of Execution	Status (Pass/Fail)
Publish without changes	Click publish button without changing anything	No changes were made notification		1	Pass
Publish with changes	Click publish button without changing anything	Data successfully updated notification		1	Pass
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed		1	Pass
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed		1	Pass

Test Case ID	005	Module	Admin Overview		
Test Description	Test various Admin Overview functionalities				
Pre-conditions	Must have login success				
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023
Test Case(s)	Action	Expected System Response		Number of Execution	Status (Pass/Fail)
Publish without changes	Click publish button without changing anything	No changes were made notification		1	Pass
Publish with changes	Click publish button without changing anything	Data successfully updated notification		1	Pass
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed		1	Pass
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed		1	Pass

Test Case ID	006	Module	Admin Target & Indicators		
Test Description	Test various Admin Target & Indicators functionalities				
Pre-conditions	Must have login success				
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023

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Test Case(s)	Action	Expected System Response	Number of Execution	Status (Pass/Fail)
Publish without changes	Click publish button without changing anything	No changes were made notification	1	Pass
Publish with changes	Click publish button without changing anything	Data successfully updated notification	1	Pass
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	1	Pass
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1	Pass

Test Case ID	Module	Admin Progress & Info		
Test Description	Test various Admin Progress & Info functionalities			
Pre-conditions	Must have login success			
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested
Test Case(s)	Action	Expected System Response	Number of Execution	Status (Pass/Fail)
Publish without changes	Click publish button without changing anything	No changes were made notification	1	Pass
Publish with changes	Click publish button without changing anything	Data successfully updated notification	1	Pass
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	1	Pass
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1	Pass

Test Case ID	Module	Admin Related Topics		
Test Description	Test various Admin Related Topics functionalities			
Pre-conditions	Must have login success			
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested
Test Case(s)	Action	Expected System Response	Number of Execution	Status (Pass/Fail)
Publish without changes	Click publish button without changing anything	No changes were made notification	1	Pass
Publish with changes	Click publish button without changing anything	Data successfully updated notification	1	Pass
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	1	Pass
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1	Pass

Test Case ID	Module	Admin Solutions		
Test Description	Test various Admin Solutions functionalities			

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Pre-conditions	Must have login success			
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested
Test Case(s)	Action	Expected System Response	Number of Execution	Status (Pass/Fail)
Publish without changes	Click publish button without changing anything	No changes were made notification	1	Pass
Publish with changes	Click publish button without changing anything	Data successfully updated notification	1	Pass
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	1	Pass
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1	Pass

Test Case ID	Module	Admin Solution 1		
Test Description	Test various Admin Solution 1 functionalities			
Pre-conditions	Must have login success			
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested
Test Case(s)	Action	Expected System Response	Number of Execution	Status (Pass/Fail)
Publish without changes	Click publish button without changing anything	No changes were made notification	1	Pass
Publish with changes	Click publish button without changing anything	Data successfully updated notification	1	Pass
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	1	Pass
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1	Pass

Test Case ID	Module	Admin Solution 2		
Test Description	Test various Admin Solution 2 functionalities			
Pre-conditions	Must have login success			
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested
Test Case(s)	Action	Expected System Response	Number of Execution	Status (Pass/Fail)
Publish without changes	Click publish button without changing anything	No changes were made notification	1	Pass
Publish with changes	Click publish button without changing anything	Data successfully updated notification	1	Pass
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	1	Pass
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1	Pass

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FUNCTIONAL TEST

Test Case ID	001	Module	Login					
Test Description	Test various Login functionalities.							
Pre-conditions	Navigate to the Login page using /login URL							
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023			
Test Case(s)	Action	Expected System Response		Number of Execution	Status (Pass/Fail)			
Login Account	Submit Login Request	Successful notification should be shown		1	Pass ✓			
Login Invalid Account	Submit Login Request using wrong credentials	Login Failed notification should be shown		1	Pass ✓			

Test Case ID	002	Module	Admin Current Issues					
Test Description	Test various Admin Current Issues functionalities							
Pre-conditions	Must have login success							
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023			
Test Case(s)	Action	Expected System Response		Number of Execution	Status (Pass/Fail)			
Publish without changes	Click publish button without changing anything	No changes were made notification		1	Pass ✓			
Publish with changes	Click publish button without changing anything	Data successfully updated notification		1	Pass ✓			

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Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	1	Pass ✓
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1	Pass ✓

Test Case ID	003	Module	Admin Self-Assessment					
Test Description	Test various Admin Self-Assessment functionalities							
Pre-conditions	Must have login success							
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023			
Test Case(s)	Action	Expected System Response		Number of Execution	Status (Pass/Fail)			
Publish without changes	Click publish button without changing anything	No changes were made notification		1	Pass ✓			
Publish with changes	Click publish button without changing anything	Data successfully updated notification		1	Pass ✓			
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed		1	Pass ✓			
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed		1	Pass ✓			

Test Case ID	004	Module	Admin Climate Action SDG13					
Test Description	Test various Admin Climate Action SDG13 functionalities							
Pre-conditions	Must have login success							

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Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023
Test Case(s)	Action	Expected System Response		Number of Execution	Status (Pass/Fail)
Publish without changes	Click publish button without changing anything	No changes were made notification		1	Pass
Publish with changes	Click publish button without changing anything	Data successfully updated notification		1	Pass
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed		1	Pass
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed		1	Pass

Test Case ID	005	Module	Admin Overview					
Test Description	Test various Admin Overview functionalities							
Pre-conditions	Must have login success							
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023			
Test Case(s)	Action	Expected System Response		Number of Execution	Status (Pass/Fail)			
Publish without changes	Click publish button without changing anything	No changes were made notification		1	Pass			
Publish with changes	Click publish button without changing anything	Data successfully updated notification		1	Pass			
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed		1	Pass			

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Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1	Pass
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Test Case ID	006	Module	Admin Target & Indicators					
Test Description	Test various Admin Target & Indicators functionalities							
Pre-conditions	Must have login success							
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023			
Test Case(s)	Action	Expected System Response		Number of Execution	Status (Pass/Fail)			
Publish without changes	Click publish button without changing anything	No changes were made notification		1	Pass			
Publish with changes	Click publish button without changing anything	Data successfully updated notification		1	Pass			
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed		1	Pass			
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed		1	Pass			

Test Case ID	007	Module	Admin Progress & Info					
Test Description	Test various Admin Progress & Info functionalities							
Pre-conditions	Must have login success							
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023			

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Test Case(s)	Action	Expected System Response	Number of Execution	Status (Pass/Fail)
Publish without changes	Click publish button without changing anything	No changes were made notification	1	Pass ✓
Publish with changes	Click publish button without changing anything	Data successfully updated notification	1	Pass ✓
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	1	Pass ✓
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1	Pass ✓

Test Case ID	008	Module	Admin Related Topics					
Test Description	Test various Admin Related Topics functionalities							
Pre-conditions	Must have login success							
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023			
Test Case(s)	Action	Expected System Response	Number of Execution	Status (Pass/Fail)				
Publish without changes	Click publish button without changing anything	No changes were made notification	1	Pass ✓				
Publish with changes	Click publish button without changing anything	Data successfully updated notification	1	Pass ✓				
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	1	Pass ✓				
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1	Pass ✓				

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Test Case ID	009	Module	Admin Solutions					
Test Description	Test various Admin Solutions functionalities							
Pre-conditions	Must have login success							
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023			
Test Case(s)	Action	Expected System Response	Number of Execution	Status (Pass/Fail)				
Publish without changes	Click publish button without changing anything	No changes were made notification	1	Pass ✓				
Publish with changes	Click publish button without changing anything	Data successfully updated notification	1	Pass ✓				
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	1	Pass ✓				
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1	Pass ✓				

Test Case ID	010	Module	Admin Solution 1					
Test Description	Test various Admin Solution 1 functionalities							
Pre-conditions	Must have login success							
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023			
Test Case(s)	Action	Expected System Response	Number of Execution	Status (Pass/Fail)				

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Publish without changes	Click publish button without changing anything	No changes were made notification	1	Pass ✓
Publish with changes	Click publish button without changing anything	Data successfully updated notification	1	Pass ✓
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	1	Pass ✓
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1	Pass ✓

Test Case ID	011	Module	Admin Solution 2					
Test Description	Test various Admin Solution 2 functionalities							
Pre-conditions	Must have login success							
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023			
Test Case(s)	Action	Expected System Response	Number of Execution	Status (Pass/Fail)				
Publish without changes	Click publish button without changing anything	No changes were made notification	1	Pass ✓				
Publish with changes	Click publish button without changing anything	Data successfully updated notification	1	Pass ✓				
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	1	Pass ✓				
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1	Pass ✓				

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Test Case ID	012	Module	Admin Solution 3					
Test Description	Test various Admin Solution 3 functionalities							
Pre-conditions	Must have login success							
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023			
Test Case(s)	Action	Expected System Response	Number of Execution	Status (Pass/Fail)				
Publish without changes	Click publish button without changing anything	No changes were made notification	1	Pass ✓				
Publish with changes	Click publish button without changing anything	Data successfully updated notification	1	Pass ✓				
Click publish button with empty text area	Fields = empty	Validation error notification will be displayed	1	Pass ✓				
Click publish button with <script> tag or any harmful characters	Fields = harmful characters	Validation error notification will be displayed	1	Pass ✓				

Test Case ID	013	Module	Logout					
Test Description	Test various Logout functionalities							
Pre-conditions	Must have login success							
Test Case ID	013	Module	Logout					
Test Description	Test various Logout functionalities							
Pre-conditions	Must have login success							

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Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Sept-2023
Test Case(s)	Action	Expected System Response		Number of Execution	Status (Pass/Fail)
Logout	Click Logout button	Administrator will redirect to login page		1	Pass ✓

Test Case ID	014	Module	Game (Escape Room)					
Test Description	Test various Game functionalities							
Pre-conditions	Click games in navigation bar							
Created By	Karina Dela Cruz	Reviewed By	Bonafide	Date Tested	3/6/2024			
Test Case(s)	Action	Expected System Response		Number of Execution	Status (Pass/Fail)			
Press any key to start	User Press any key	Scene will change to pre-play scene		1	Pass ✓			
Press the arrow keys/WASD keys (Pre-play)	User press arrow keys/WASD keys towards the character narrators	Scene will display the Game instructions.		1	Pass ✓			
Click continue button	User Click continue button	Scene will change the background and display the narration of the game scene 1.		1	Pass ✓			
Click the continue button	User Click continuo button	Scene will be directed to scene 1 game.		1	Pass ✓			

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Scene 1 press the arrow keys/WASD	User press arrow keys/WASD keys to move the character.	The game character will move accordingly.	1	Pass ✓
Scene 1 presses the space bar	User failed to pick up the garbage.	Scene will change to a scene containing failed/wrong message and information background and heart point will decrease.	1	Pass ✓
Click "continue" button	User click the continue button on wrong scene.	Proceed to next scene narration.	1	Pass ✓
Click "continue" button	User click the continue button for next scene narration.	Proceed to next game scene 2.	1	Pass ✓
Scene 1 presses the space bar	User successfully pick up the garbage.	Scene will change to a scene containing success/correct message and information background.	1	Pass ✓
Click "continue" button	User click the continue button on correct scene.	Proceed to next scene narration.	1	Pass ✓
Click "continue" button	User click the continue button for next scene narration.	Proceed to next game scene 2.	1	Pass ✓
Scene 2 press the arrow keys/WASD	User press arrow keys/WASD keys to move the character.	The game character will move accordingly.	1	Pass ✓
Scene 2 presses the space bar	User failed to pick up the garbage.	Scene will change to a scene containing failed/wrong message and information background and heart point will decrease.	1	Pass ✓
Click "continuo" button	User click the continue button on wrong scene.	Proceed to next scene narration.	1	Pass ✓
Click "continuo" button	User click the continue button for next scene narration.	Proceed to next game scene 3.	1	Pass ✓
Scene 2 presses the space bar	User successfully pick up the garbage.	Scene will change to a scene containing success/correct message and information background.	1	Pass ✓
Click "continuo" button	User click the continue button on correct scene.	Proceed to next scene narration.	1	Pass ✓
Click "continuo" button	User click the continue button for next scene narration.	Proceed to next game scene 3.	1	Pass ✓

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Scene 3 press the arrow keys/WASD	User press arrow keys/WASD keys to move the character.	The game character will move accordingly.	1	Pass ✓
Scene 3 presses the space bar	User failed to pick up the garbage.	Scene will change to a scene containing failed/wrong message and information background and heart point will decrease.	1	Pass ✓
Click "continue" button	User click the continue button on wrong scene.	Proceed to next scene narration.	1	Pass ✓
Click "continue" button	User click the continue button for next scene narration.	Proceed to next game scene 4.	1	Pass ✓
Scene 3 presses the space bar	User successfully pick up the garbage.	Scene will change to a scene containing success/correct message and information background.	1	Pass ✓
Click "continue" button	User click the continue button on correct scene.	Proceed to next scene narration.	1	Pass ✓
Click "continue" button	User click the continue button for next scene narration.	Proceed to next game scene 4.	1	Pass ✓
Scene 4 press the arrow keys/WASD	User press arrow keys/WASD keys to move the character.	The game character will move accordingly.	1	Pass ✓
Scene 4 presses the space bar	User failed to pick up the garbage.	Scene will change to a scene containing failed/wrong message and information background and heart point will decrease.	1	Pass ✓
Click "continue" button	User click the continue button on wrong scene.	Proceed to next scene narration.	1	Pass ✓
Click "continue" button	User click the continue button for next scene narration.	Proceed to next game scene 5.	1	Pass ✓
Scene 4 presses the space bar	User successfully pick up the garbage.	Scene will change to a scene containing success/correct message and information background.	1	Pass ✓
Click "continue" button	User click the continue button on correct scene.	Proceed to next scene narration.	1	Pass ✓
Click "continue" button	User click the continue button for next scene narration.	Proceed to next game scene 5.	1	Pass ✓

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Scene 5 press the arrow keys/WASD		The game character will move accordingly.	1	Pass ✓
Scene 5 presses the space bar	User failed to pick up the garbage.	Scene will change to a scene containing failed/wrong message and information background and heart point will decrease.	1	Pass ✓
Click "continue" button	User click the continue button on wrong scene.	Proceed to next scene narration.	1	Pass ✓
Click "continue" button	User click the continue button for next scene narration.	Proceed to Game Over scene.	1	Pass ✓
Scene 5 presses the space bar	User successfully pick up the garbage.	Scene will change to a scene containing success/correct message and information background.	1	Pass ✓
Click "continue" button	User click the continue button on correct scene.	Proceed to Congratulatory Scene.	1	Pass ✓
Click "continue" button	User click the restart button.	Proceed to Pre-play scene.	1	Pass ✓

Test Case ID	015	Module	Self-Assessment
Test Description	Test various Self-Assessment page functionalities.		

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Pre-conditions		Navigate to the Self-Assessment page.			
Created By	Karina Dela Cruz	Reviewed By	Bonafide	Date Tested	26-Sept-2023
Test Case(s)	Action	Expected System Response		Number of Execution	Status (Pass/Fail)
Submit without answering all questions	No options are selected to all questions.	Error notification will be shown, requiring all questions to be answered before submitting.		1	Pass ✓
Submit Question with Incomplete Answer	Incomplete options selected.	Error notification will be shown, requiring the field to be answered		1	Pass ✓
Submit Question with Wrong Answer	Selected the wrong answer.	Shows successfully submitted notification with Score and Review form button.		1	Pass ✓
Submit Question with Correct Answer	Selected the correct answer.	Shows successfully submitted notification with Score and Review form button.		1	Pass ✓
Review form	Click the review form button	It displays the form answered by the user, providing a preview of the details of their answers, and a play again button will be shown below.		1	Pass ✓
Play again	Click the play again button	The self-assessment will be reset, and the user can answer again.		1	Pass ✓
Reset	Click reset button.	A notification will be shown that the response has been reset.		1	Pass ✓

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Test Case ID	016	Module	Admin News					
Test Description	Test various Admin News page functionalities.							
Pre-conditions	Must have login success							
Created By	Karl Marx Roxas	Reviewed By	Bonafide	Date Tested	26-Oct-2023			
Test Case(s)	Action	Expected System Response		Number of Execution	Status (Pass/Fail)			
Add News with empty field	Do not put any input in any or some fields.	Error notification will be shown, saying some field are empty		1	Pass ✓			
Add News with <script> tag or harmful character	Put <script> tag or harmful characters in any fields.	Error notification will be shown, saying it contains harmful characters		1	Pass ✓			
Edit News with no changes	Edit the news without editing anything	Info notification will be shown, saying no changes were made		1	Pass ✓			
Edit News with <script> tag or harmful character	Edit the news with editing any fields with <script> tag or any harmful character	Error notification will be shown, saying Invalid characters detected in one or more input fields. Please remove them and try again.		1	Pass ✓			
Edit news with some changes	Edit news with changes	Success notification will be shown, saying updated successfully		1	Pass ✓			
Delete news	Delete news	Success notification will be shown, saying successfully deleted		1	Pass ✓			

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Test Case ID	017	Module	Admin Account			
Test Description	Test various Admin Account page functionalities.					
Pre-conditions	Must have login success					
Created By	Karina Dela Cruz	Reviewed By	Bonafide	Date Tested		
Test Case(s)	Action	Expected System Response	Number of Execution	Status (Pass/Fail)		
Click "New Admin" button	Close the form.	View existing list of accounts.	1	Pass ✓		
Click "New Admin" button	Input fields = incomplete	Error will display on the right end of fields indicating "required fields" and create account button will not be clickable.	1	Pass ✓		
Click "New Admin" button	Input fields = invalid inputs	Error message should be displayed, it should provide instruction for required valid inputs and create account button will not be clickable.	1	Pass ✓		
Click "New Admin" button	Input fields = valid inputs	The input field will become green and will have checkmark on the right, indicating valid input.	1	Pass ✓		

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		The "Create Account" button will now be clickable. Upon clicking the creation of account is success and a notification will be displayed for email verification of the account.		
Click "Update Info" button	Close the form.	View existing list of accounts.	1	Pass ✓
Click "Update Info" button	Input fields = no changes	Success notification of updated info.	1	Pass ✓
Click "Update Info" button	Input fields = Changes made	Success notification of updated info.	1	Pass ✓
Click "Reset Password" button	Input fields = invalid	Error message should be displayed, it should provide instruction for required valid inputs and reset button will not be clickable.	1	Pass ✓
Click "Reset Password" button	Input fields = valid	The input field will become green and will have checkmark on the right, indicating valid input. The "Reset" button will now be clickable. Upon clicking the reset button, a success reset notification will be displayed.	1	Pass ✓
Click "Delete" button	Close the deletion of account dialog.	View existing list of accounts.	1	Pass ✓

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APPENDIX G.

INTEGRATION

TEST REPORT

INTEGRATION TEST

TEST CASE NAME 01
PROJECT Ecotopia: A Parallax Enabled Website About Climate Change Awareness with Interactive Mini Arcade Game (Web Application)
CREATOR Karina Dela Cruz
REVIEWER Vincent Regala
REVIEW DATE October 08, 2023

Module No.	Module Name	Action (Description)	Expected Result	Status	Comments
As App User (Web application)					
1	Access the URL	Open the browser and enter the URL as []	Landing Page/Homepage should be displayed.	Passed	
2	Landing Page Parallax Effect	Scroll down the page.	Scrolling Parallax Effect should be shown on the displayed images.	Passed	
3	MDRRMO Thumbnail	Click the MDRRMO thumbnail.	The Facebook page of MDRRMO should be displayed.	Passed	
4	Climate Escape Thumbnail	Click the Climate Escape thumbnail.	The game should be displayed.	Passed	
5	Materials	Click the Materials in navigation bar.	Materials page should be displayed.	Passed	
6	Current Issues	Click the Current Issues under the Materials in navigation bar.	Current Issues page should be displayed.	Passed	
7	Climate Action SDG 13	Click the Climate Action SDG 13 under the Materials in navigation bar.	Climate Action SDG 13 should be displayed.	Passed	
8	Overview	Click the know more button in the lower right corner of overview container box.	Overview about the UN SDG No. 13 should be displayed.	Passed	
9	Target and Indicators	Click the know more in the lower right corner of Target and Indicators container box.	Target and Indicators information page should be displayed.	Passed	

10	Progress and Info	Click the know more in the lower right corner of the Progress and Info container box.	Progress and Info page should be displayed	Passed	
11	Related Topics	Click the know more in the lower right corner of Related Topics container box.	Related Topic page should be displayed.	Passed	
12	Solutions	Click the Solutions under the Materials in navigation bar.	Solution page should be displayed.	Passed	
13	Why We Should Take Actions	Click the learn more in the lower right corner of Why We Should Take Actions thumbnail.	Why We Should Take Actions page should be displayed.	Passed	
14	What are the Other Solutions to Climate Change	Click the learn more in the lower right corner of What are the Other Solutions to Climate Change thumbnail.	What are the Other Solutions to Climate Change page should be displayed.	Passed	
15	Responding to Climate Change	Click the learn more in the lower right corner of Responding to Climate Change thumbnail.	Responding to Climate Change page should be displayed.	Passed	
16	Sustainability and Government Resources	Click the learn more in the lower right corner of Sustainability and Government Resources thumbnail.	Sustainability and Government Resources should be displayed.	Passed	
17	Overview of Climate Change	Click on the Overview of Climate Change in navigation under Materials.	Overview of Climate Change should be displayed.	Passed	
18	Evidence	Click on the Evidence thumbnail in the Overview of Climate Change	Evidence page should be displayed.	Passed	
19	Causes	Click on the Causes thumbnail in the Overview of Climate Change.	Causes page should be displayed.	Passed	

20	Effects	Click on the Effects thumbnail in the Overview of Climate Change.	Effects page should be displayed	Passed	
21	Solutions	Click on the Solutions thumbnail in the Overview of Climate Change.	Solutions page should be displayed.	Passed	
22	Related News and Features	Click specific news and features in the lower part of the Overview of Climate Change	User should be directed to the main link of the selected news and features.	Passed	
23	Self-Assessment	Click the Self-Assessment under the Materials in navigation bar.	Self-Assessment page should be displayed containing quizzes.	Passed	
24	Submit and Reset Button in Self-Assessment Page	Click the submit and reset button.	<ul style="list-style-type: none"> - User completed the answer and click the submit button, the score should be displayed as well as the review button otherwise a notification for a required answered should be displayed. - <u>User</u> click the reset button, a notification for successful reset will be shown. 	Passed	
25	News	Click the News in the navigation bar.	News page should be displayed.	Passed	
26	Game	Click the Game in the navigation bar.	Game should be displayed.	Passed	
27	About Us	Click the About Us in the navigation bar.	About Us page should be displayed.	Passed	
28	Footer Navigation	Click specific page in the footer menu	Specific page should be displayed.	Passed	

29	Social Media Icons	Click specific social media icon in the footer.	Specific social media platform should be displayed.	Passed	
As Administrator					
1	Access URL	Open the browser and enter the URL as []	Admin Login page should be displayed.	Passed	
2	Login Button	Insert credentials and click login button.	Admin Panel Should be displayed with successful notification. Otherwise, wrong credentials will display a login failed notification.	Passed	
3	News	Click the admin News in the admin panel navigation bar.	Admin News should be displayed.	Passed	
4	Current Issues	Click the admin Current Issues in the admin panel navigation bar.	Admin Current Issues should be displayed.	Passed	
5	Self-Assessment	Click the admin Self-Assessment in the admin panel navigation bar.	Admin Self-Assessment should be displayed.	Passed	
6	Climate Action SDG 13	Click the admin Climate Action SDG 13 in the admin panel navigation bar.	Admin Climate Action SDG 13 should be displayed.	Passed	
7	Overview	Click the Overview in the admin panel navigation bar.	Admin Overview should be displayed.	Passed	
8	Target and Indicators	Click the Target and Indicators in the admin panel navigation bar.	Admin Target and Indicators should be displayed.	Passed	
9	Progress and Info	Click the Progress and Info in the admin panel navigation bar.	Admin Progress and Info should be displayed.	Passed	
10	Related Topics	Click the Related Topics in the admin panel navigation bar.	Admin Related Topics should be displayed.	Passed	
11	Solutions			Passed	

		Click the Solutions in the admin panel navigation bar.	Admin Solutions should be displayed.		
12	Solution 1	Click the Solution 1 in the admin panel navigation bar.	Admin Solution 1 should be displayed.	Passed	
13	Solution 2	Click the Solution 2 in the admin panel navigation bar.	Admin Solution 2 should be displayed.	Passed	
14	Solution 3	Click the Solution 3 in the admin panel navigation bar.	Admin Solution 3 should be displayed.	Passed	
15	Publish Buttons	Click the publish button.	Successful notifications should be displayed if changes were made and if no changes were made, a notification stating 'No changes were made' will be shown. Otherwise, including harmful characters and empty textbox will result in a validation error notification.	Passed	
16	Logout Button	Click the logout in the admin panel navigation bar.	Login page should be displayed.	Passed	

INTEGRATION TEST

TEST CASE NAME 02
PROJECT Ecotopia: A Parallax Enabled Website About Climate Change Awareness with Interactive Mini Arcade Game (Web Application)
CREATOR Karina Dela Cruz
REVIEWER Vincent Regala
REVIEW DATE

Module No.	Module Name	Action (Description)	Expected Result	Status	Comments
As App User (Web application)					
1	Access the URL	Open the browser and enter the URL as []	Landing Page/Homepage should be displayed.	Passed <i>[Signature]</i>	
2	Landing Page Parallax Effect	Scroll down the page.	Scrolling Parallax Effect should be shown on the displayed images.	Passed <i>[Signature]</i>	
3	MDRRMO Thumbnail	Click the MDRRMO thumbnail.	The Facebook page of MDRRMO should be displayed.	Passed <i>[Signature]</i>	
4	Climate Escape Thumbnail	Click the Climate Escape thumbnail.	The game should be displayed.	Passed <i>[Signature]</i>	
5	Materials	Click the Materials in navigation bar.	Materials page should be displayed.	Passed <i>[Signature]</i>	
6	Current Issues	Click the Current Issues under the Materials in navigation bar.	Current Issues page should be displayed.	Passed <i>[Signature]</i>	
7	Climate Action SDG 13	Click the Climate Action SDG 13 under the Materials in navigation bar.	Climate Action SDG 13 should be displayed.	Passed <i>[Signature]</i>	
8	Overview	Click the know more button in the lower right corner of overview container box.	Overview about the UN SDG No. 13 should be displayed.	Passed <i>[Signature]</i>	
9	Target and Indicators	Click the know more in the lower right corner of Target and Indicators container box.	Target and Indicators information page should be displayed.	Passed <i>[Signature]</i>	

10	Progress and Info	Click the know more in the lower right corner of the Progress and Info container box.	Progress and Info page should be displayed	Passed <i>✓</i>	
11	Related Topics	Click the know more in the lower right corner of Related Topics container box.	Related Topic page should be displayed.	Passed <i>✓</i>	
12	Solutions	Click the Solutions under the Materials in navigation bar.	Solution page should be displayed.	Passed <i>✓</i>	
13	Why We Should Take Actions	Click the learn more in the lower right corner of Why We Should Take Actions thumbnail.	Why We Should Take Actions page should be displayed.	Passed <i>✓</i>	
14	What are the Other Solutions to Climate Change	Click the learn more in the lower right corner of What are the Other Solutions to Climate Change thumbnail.	What are the Other Solutions to Climate Change page should be displayed.	Passed <i>✓</i>	
15	Responding to Climate Change	Click the learn more in the lower right corner of Responding to Climate Change thumbnail.	Responding to Climate Change page should be displayed.	Passed <i>✓</i>	
16	Sustainability and Government Resources	Click the learn more in the lower right corner of Sustainability and Government Resources thumbnail.	Sustainability and Government Resources should be displayed.	Passed <i>✓</i>	
17	Overview of Climate Change	Click on the Overview of Climate Change in navigation under Materials.	Overview of Climate Change should be displayed.	Passed <i>✓</i>	
18	Evidence	Click on the Evidence thumbnail in the Overview of Climate Change	Evidence page should be displayed.	Passed <i>✓</i>	
19	Causes	Click on the Causes thumbnail in the Overview of Climate Change.	Causes page should be displayed.	Passed <i>✓</i>	

20	Effects	Click on the Effects thumbnail in the Overview of Climate Change.	Effects page should be displayed	Passed <i>[Signature]</i>	
21	Solutions	Click on the Solutions thumbnail in the Overview of Climate Change.	Solutions page should be displayed.	Passed <i>[Signature]</i>	
22	Related News and Features	Click specific news and features in the lower part of the Overview of Climate Change	User should be directed to the main link of the selected news and features.	Passed <i>[Signature]</i>	
23	Self-Assessment	Click the Self-Assessment under the Materials in navigation bar.	Self-Assessment page should be displayed containing quizzes.	Passed <i>[Signature]</i>	
24	Submit and Reset Button in Self-Assessment Page	Click the submit and reset button.	<ul style="list-style-type: none"> - User completed the answer and click the submit button, the score should be displayed as well as the review button otherwise a notification for a required answered should be displayed. - User click the reset button, a notification for successful reset will be shown. 	Passed <i>[Signature]</i>	
25	News	Click the News in the navigation bar.	News page should be displayed.	Passed <i>[Signature]</i>	
26	Game	Click the Game in the navigation bar.	Game should be displayed.	Passed <i>[Signature]</i>	
27	About Us	Click the About Us in the navigation bar.	About Us page should be displayed.	Passed <i>[Signature]</i>	
28	Footer Navigation	Click specific page in the footer menu	Specific page should be displayed.	Passed <i>[Signature]</i>	

29	Social Media Icons	Click specific social media icon in the footer.	Specific social media platform should be displayed.	Passed <i>[Signature]</i>	
As Administrator					
1	Access URL	Open the browser and enter the URL as []	Admin Login page should be displayed.	Passed <i>[Signature]</i>	
2	Login Button	Insert credentials and click login button.	Admin Panel should be displayed with successful notification. Otherwise, wrong credentials will display a login failed notification.	Passed <i>[Signature]</i>	
3	News	Click the admin News in the admin panel navigation bar.	Admin News should be displayed.	Passed <i>[Signature]</i>	
4	Current Issues	Click the admin Current Issues in the admin panel navigation bar.	Admin Current Issues should be displayed.	Passed <i>[Signature]</i>	
5	Self-Assessment	Click the admin Self-Assessment in the admin panel navigation bar.	Admin Self-Assessment should be displayed.	Passed <i>[Signature]</i>	
6	Climate Action SDG 13	Click the admin Climate Action SDG 13 in the admin panel navigation bar.	Admin Climate Action SDG 13 should be displayed.	Passed <i>[Signature]</i>	
7	Overview	Click the Overview in the admin panel navigation bar.	Admin Overview should be displayed.	Passed <i>[Signature]</i>	
8	Target and Indicators	Click the Target and Indicators in the admin panel navigation bar.	Admin Target and Indicators should be displayed.	Passed <i>[Signature]</i>	
9	Progress and Info	Click the Progress and Info in the admin panel navigation bar.	Admin Progress and Info should be displayed.	Passed <i>[Signature]</i>	
10	Related Topics	Click the Related Topics in the admin panel navigation bar.	Admin Related Topics should be displayed.	Passed <i>[Signature]</i>	

11	Solutions	Click the Solutions in the admin panel navigation bar.	Admin Solutions should be displayed.	Passed <i>[Signature]</i>	
12	Solution 1	Click the Solution 1 in the admin panel navigation bar.	Admin Solution 1 should be displayed.	Passed <i>[Signature]</i>	
13	Solution 2	Click the Solution 2 in the admin panel navigation bar.	Admin Solution 2 should be displayed.	Passed <i>[Signature]</i>	
14	Solution 3	Click the Solution 3 in the admin panel navigation bar.	Admin Solution 3 should be displayed.	Passed <i>[Signature]</i>	
15	Publish Buttons	Click the publish button.	Successful notifications should be displayed if changes were made and if no changes were made, a notification stating 'No changes were made' will be shown. Otherwise, including harmful characters and empty textbox will result in a validation error notification.	Passed <i>[Signature]</i>	
16	Logout Button	Click the logout in the admin panel navigation bar.	Login page should be displayed.	Passed <i>[Signature]</i>	
As Super Admin					
1	New Admin Button	Click the new admin button on the admin accounts module.	Form field should be displayed	Passed <i>[Signature]</i>	
2	Create Account Button	Click the Create Account button in the form field displayed.	Account Verification notification should be displayed.	Passed <i>[Signature]</i>	
3	Close Button	Click the Close button in the form field displayed.	Will be directed back on the existing list of account display.	Passed <i>[Signature]</i>	
4	Update Info Button	Click the Update Info on the admin accounts module	Form field should be displayed.	Passed <i>[Signature]</i>	
5	Update Button	Click the Update button on the form fields.	Success Update notification should be displayed.	Passed <i>[Signature]</i>	
6	Close Button	Click the close button on the form field.	Will be directed back on the existing list of account display.	Passed <i>[Signature]</i>	
7	Reset Password Button	Click the Reset Password on the admin accounts module	Form field should be displayed.	Passed	

8	Reset Button	Click the reset button on the form field.	Success notification of password reset should be displayed.	Passed <i>[Signature]</i>	
9	Close Button	Click the close button on the form field.	Will be directed back on the existing list of account display.	Passed <i>[Signature]</i>	
10	Delete Button	Click the delete button.	Account Deletion Dialog should be displayed.	Passed <i>[Signature]</i>	
11	Delete Button	Click the delete button on the account deletion dialog.	A success account deletion notification should be displayed.	Passed <i>[Signature]</i>	
12	Close Button	Click the close button on the account deletion dialog.	Will be directed back to the existing list of accounts.	Passed <i>[Signature]</i>	

APPENDIX H.

GT METRIX

REPORT



Performance Report for:

https://ecotopiabeta.live/

Report generated: Sun, Oct 15, 2023 2:59 AM -0700

Test Server Location: CA Vancouver, Canada

Using: Chrome (Desktop) 117.0.0.0, Lighthouse 11.0.0

E	Performance 46%	Structure 58%	L. Contentful Paint 5.7s	T. Blocking Time 0ms	C. Layout Shift 0.22
---	--------------------	------------------	-----------------------------	-------------------------	-------------------------

Top Issues

IMPACT	AUDIT	
High	Avoid enormous network payloads <small>LCP</small>	Total size was 13.9MB
High	Properly size images	Potential savings of 5.02MB
High	Enable text compression <small>FCP LCP</small>	Potential savings of 4.32MB
Med	Eliminate render-blocking resources <small>FCP LCP</small>	Potential savings of 549ms
Med	Avoid chaining critical requests <small>FCP LCP</small>	10 chains found

Page Details



Total Page Size - 14.1MB



Total Page Requests - 28



HTML JS CSS IMG Video Font Other

How does this affect me?

Today's web user expects a fast and seamless website experience. Delivering that fast experience can result in increased visits, conversions and overall happiness.

As if you didn't need more incentive, Google has announced that they are using page speed in their ranking algorithm.

About GTmetrix

CARBON 60
THE MANAGED CLOUD COMPANY

GTmetrix is developed by the good folks at Carbon60, a Canadian hosting company with over 27 years experience in web technology.

<https://carbon60.com/>



Performance Report for:

<https://ecotopia.live/>

Report generated: Thu, Oct 26, 2023 3:10 AM -0700

Test Server Location: Vancouver, Canada

Using: Chrome (Desktop) 117.0.0.0, Lighthouse 11.0.0

E	Performance 52%	Structure 47%	L. Contentful Paint 9.5s	T. Blocking Time 143ms	C. Layout Shift 0
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Top Issues

IMPACT	AUDIT	
High	Avoid enormous network payloads	Total size was 31.6MB
High	Enable text compression	Potential savings of 15.5MB
High	Properly size images	Potential savings of 5.62MB
High	Avoid chaining critical requests	14 chains found
Med-High	Minify JavaScript	Potential savings of 6.77MB

Page Details



Total Page Size - 31.9MB



Total Page Requests - 47



HTML JS CSS IMG Video Font Other

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<https://carbon60.com/>



Performance Report for: https://ecotopia.live/

Report generated: Thu, Oct 26, 2023 10:49 PM -0700

Test Server Location: CA Vancouver, Canada

Using: Chrome (Desktop) 117.0.0.0, Lighthouse 11.0.0



Top Issues

IMPACT AUDIT

High	Avoid enormous network payloads <small>FCP LCP</small>	Total size was 25.2MB
High	Enable text compression <small>FCP LCP</small>	Potential savings of 15.5MB
High	Avoid chaining critical requests <small>FCP LCP</small>	12 chains found
Med-High	Minify JavaScript <small>FCP LCP</small>	Potential savings of 6.77MB
Med-High	Eliminate render-blocking resources <small>FCP LCP</small>	Potential savings of 628ms

Page Details



Total Page Size - 25.3MB



Total Page Requests - 44



HTML JS CSS IMG Video Font Other

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<https://carbon60.com/>



Performance Report for:

<https://ecotopia.live/>

Report generated: Sat, Oct 28, 2023 7:51 AM -0700

Test Server Location: CA Vancouver, Canada

Using: Chrome (Desktop) 117.0.0.0, Lighthouse 11.0.0



Top Issues

IMPACT	AUDIT		
High	Avoid enormous network payloads <small>LCP</small>	Total size was 21.0MB	
Med-High	Avoid chaining critical requests <small>FCP LCP</small>	10 chains found	
Med-High	Minify JavaScript <small>FCP LCP</small>	Potential savings of 6.61MB	
Med	Eliminate render-blocking resources <small>FCP LCP</small>	Potential savings of 502ms	
Med	Use explicit width and height on image elements <small>CLS</small>	7 images found	

Page Details



Total Page Size - 21.1MB



Total Page Requests - 41



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Performance Report for: https://ecotopia.live/

Report generated: Sat, Oct 28, 2023 8:56 PM -0700

Test Server Location: 🇨🇦 Vancouver, Canada

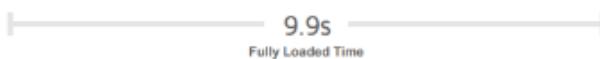
Using: 🌐 Chrome (Desktop) 117.0.0.0, Lighthouse 11.0.0



Top Issues

IMPACT	AUDIT	
High	Avoid enormous network payloads <small>LCP</small>	Total size was 21.0MB
High	Avoid chaining critical requests <small>FCP LCP</small>	10 chains found
Med-High	Minify JavaScript <small>FCP LCP</small>	Potential savings of 6.61MB
Med-High	Eliminate render-blocking resources <small>FCP LCP</small>	Potential savings of 662ms
Med	Use explicit width and height on image elements <small>CLS</small>	7 images found

Page Details



Total Page Size - 21.1MB



Total Page Requests - 41



HTML JS CSS IMG Video Font Other

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<https://carbon60.com/>



Performance Report for:

https://ecotopia.live/

Report generated: Sat, Oct 28, 2023 9:03 PM -0700

Test Server Location: CA Vancouver, Canada

Using: Chrome (Desktop) 117.0.0.0, Lighthouse 11.0.0

E

Performance

53%

Structure

57%

L. Contentful Paint

8.5s

T. Blocking Time

131ms

C. Layout Shift

0

Top Issues

IMPACT

AUDIT

High

Avoid enormous network payloads

LCP

Total size was 21.0MB

High

Enable text compression

FCP LCP

Potential savings of 14.9MB

Med-High

Avoid chaining critical requests

FCP LCP

10 chains found

Med-High

Minify JavaScript

FCP LCP

Potential savings of 6.61MB

Med-High

Eliminate render-blocking resources

FCP LCP

Potential savings of 655ms

Page Details

9.4s

Fully Loaded Time

Total Page Size - 21.1MB



Total Page Requests - 41



HTML JS CSS IMG Video Font Other

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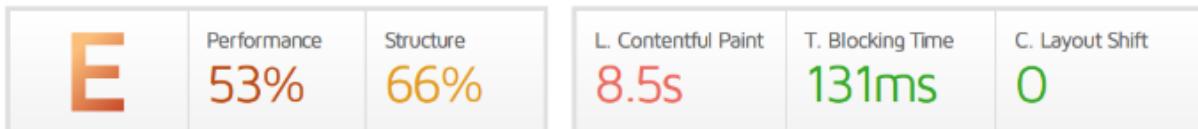


Performance Report for: https://ecotopia.live/

Report generated: Sat, Oct 28, 2023 9:07 PM -0700

Test Server Location: CA Vancouver, Canada

Using: Chrome (Desktop) 117.0.0.0, Lighthouse 11.0.0



Top Issues

IMPACT	AUDIT	
High	Avoid enormous network payloads <small>LCP</small>	Total size was 21.0MB
Med-High	Avoid chaining critical requests <small>FCP LCP</small>	10 chains found
Med-High	Minify JavaScript <small>FCP LCP</small>	Potential savings of 6.61MB
Med-High	Eliminate render-blocking resources <small>FCP LCP</small>	Potential savings of 657ms
Med	Use explicit width and height on image elements <small>CLS</small>	7 images found

Page Details



Total Page Size - 21.1MB



Total Page Requests - 41



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<https://carbon60.com/>



Performance Report for: https://ecotopia.live/

Report generated: Sat, Oct 28, 2023 9:11 PM -0700

Test Server Location: Vancouver, Canada

Using: Chrome (Desktop) 117.0.0.0, Lighthouse 11.0.0

E	Performance 53%	Structure 66%	L. Contentful Paint 8.3s	T. Blocking Time 122ms	C. Layout Shift 0
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Top Issues

IMPACT	AUDIT	
High	Avoid enormous network payloads <small>LCP</small>	Total size was 21.0MB
Med-High	Avoid chaining critical requests <small>FCP LCP</small>	10 chains found
Med-High	Minify JavaScript <small>FCP LCP</small>	Potential savings of 6.61MB
Med-High	Eliminate render-blocking resources <small>FCP LCP</small>	Potential savings of 568ms
Med	Use explicit width and height on image elements <small>CLS</small>	7 images found

Page Details



Total Page Size - 21.1MB



Total Page Requests - 41



HTML JS CSS IMG Video Font Other

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<https://carbon60.com/>



Performance Report for:

<https://ecotopia.live/>

Report generated: Sat, Oct 28, 2023 9:13 PM -0700

Test Server Location: Vancouver, Canada

Using: Chrome (Desktop) 117.0.0.0, Lighthouse 11.0.0

E	Performance 51%	Structure 63%	L. Contentful Paint 9.8s	T. Blocking Time 158ms	C. Layout Shift 0
----------	---------------------------	-------------------------	------------------------------------	----------------------------------	-----------------------------

Top Issues

IMPACT	AUDIT	
High	Avoid enormous network payloads <small>LCP</small>	Total size was 21.0MB
High	Avoid chaining critical requests <small>FCP LCP</small>	10 chains found
Med-High	Minify JavaScript <small>FCP LCP</small>	Potential savings of 6.61MB
Med-High	Eliminate render-blocking resources <small>FCP LCP</small>	Potential savings of 570ms
Med	Use explicit width and height on image elements <small>CLS</small>	7 images found

Page Details



Total Page Size - 21.1MB



Total Page Requests - 41



HTML JS CSS IMG Video Font Other

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<https://carbon60.com/>



Performance Report for:

<https://ecotopia.live/>

Report generated: Sat, Oct 28, 2023 9:13 PM -0700

Test Server Location: Vancouver, Canada

Using: Chrome (Desktop) 117.0.0.0, Lighthouse 11.0.0

E	Performance 51%	Structure 63%	L. Contentful Paint 9.8s	T. Blocking Time 158ms	C. Layout Shift 0
----------	---------------------------	-------------------------	------------------------------------	----------------------------------	-----------------------------

Top Issues

IMPACT	AUDIT	
High	Avoid enormous network payloads <small>LCP</small>	Total size was 21.0MB
High	Avoid chaining critical requests <small>FCP LCP</small>	10 chains found
Med-High	Minify JavaScript <small>FCP LCP</small>	Potential savings of 6.61MB
Med-High	Eliminate render-blocking resources <small>FCP LCP</small>	Potential savings of 570ms
Med	Use explicit width and height on image elements <small>CLS</small>	7 images found

Page Details



Total Page Size - 21.1MB



Total Page Requests - 41



HTML JS CSS IMG Video Font Other

How does this affect me?

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<https://carbon60.com/>

APPENDIX I.

OWASP ZAP TEST

Untitled Session - ZAP 2.14.0

File Edit View Analyse Report Tools Import Export Online Help

Standard Mode

Sites +

Contexts Default Context

Sites

Automated Scan

This screen allows you to launch an automated scan against an application - just enter its URL below and press 'Attack'.

Please be aware that you should only attack applications that you have been specifically given permission to test.

URL to attack: Select...

Use traditional spider:

Use ajax spider: with Firefox Headless

Attack Stop

Progress: Attack complete - see the Alerts tab for details of any issues found

History Search Alerts Spider Active Scan

Alerts (10)

- > CSP: Wildcard Directive (3)
- > CSP: script-src unsafe-eval
- > CSP: script-src unsafe-inline
- > CSP: style-src unsafe-inline
- > Cross-Domain Misconfiguration (11)
- > Server Leaks Information via "X-Powered-By" HTTP Response Header (12)
- > Timestamp Disclosure - Unix (12)
- > Information Disclosure - Suspicious Comments (29)
- > Modern Web Application
- > Re-examine Cache-control Directives

Full details of any selected alert will be displayed here.

You can manually add alerts by right clicking on the relevant line in the history and selecting 'Add alert'.

You can also edit existing alerts by double clicking on them.

Alerts 0 5 2 3 Main Proxy: localhost:8080

Current Scans 0 0 0 0 0 0 0 0 0 0 0 0

History Search Alerts Spider Active Scan +

Alerts (10)

- > CSP: Wildcard Directive (3)
- > CSP: script-src unsafe-eval
- > CSP: script-src unsafe-inline
- > CSP: style-src unsafe-inline
- > Cross-Domain Misconfiguration (11)
- > Server Leaks Information via "X-Powered-By" HTTP Response Header (12)
- > Timestamp Disclosure - Unix (12)
- > Information Disclosure - Suspicious Comments (29)
- > Modern Web Application
- > Re-examine Cache-control Directives

Full details of any selected alert will be displayed here.

You can manually add alerts by right clicking on the relevant line in the history and selecting 'Add alert'.

You can also edit existing alerts by double clicking on them.

Alerts 0 5 2 3 Main Proxy: localhost:8080

APPENDIX J.

SECURITY

HEADERS REPORT

Security Headers

Powered by  Probely

Scan your site now

Hide results Follow redirects

Security Report Summary

A	
Site:	https://ecotopia.live/
IP Address:	3.226.182.14
Report Time:	27 Oct 2023 07:15:43 UTC
Headers:	<input checked="" type="checkbox"/> Referer-Policy <input checked="" type="checkbox"/> Content-Security-Policy <input checked="" type="checkbox"/> Strict-Transport-Security <input checked="" type="checkbox"/> X-Content-Type-Options <input checked="" type="checkbox"/> X-Frame-Options <input checked="" type="checkbox"/> Permissions-Policy
Warning:	Grade capped at A, please see warnings below.
Advanced:	Great grade! Perform a deeper security analysis of your website and APIs: Try Now

APPENDIX K.

SUPPORTABILITY

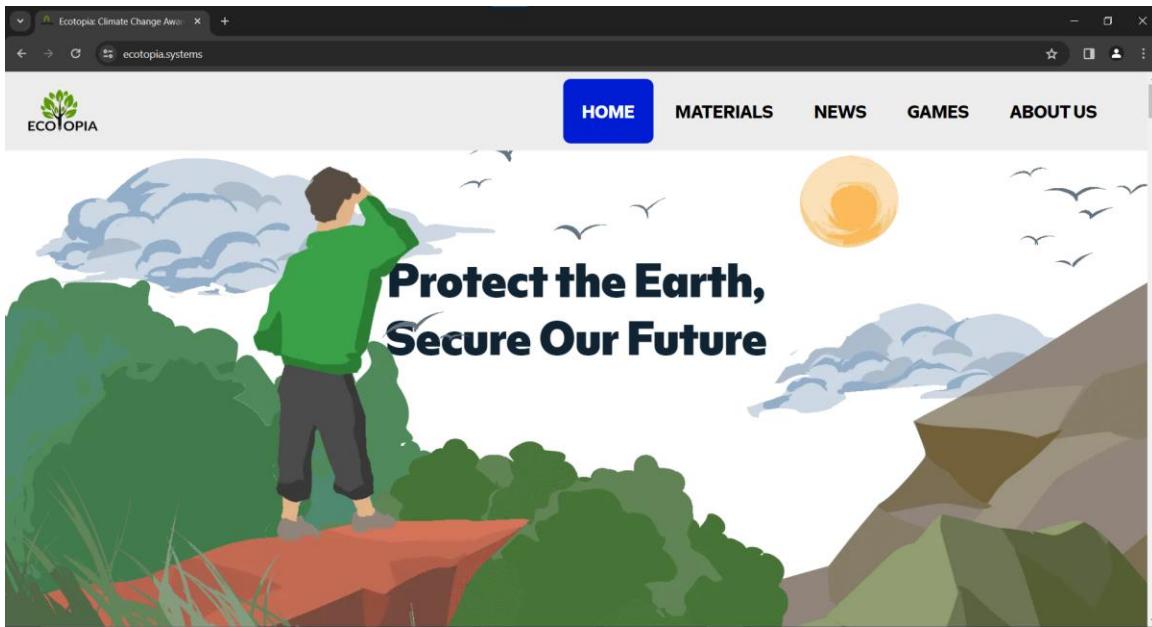
TEST

ECOTOPIA WEB APP SUPPORTABILITY TEST

Web Browser Compatibility (Supports Web GL)

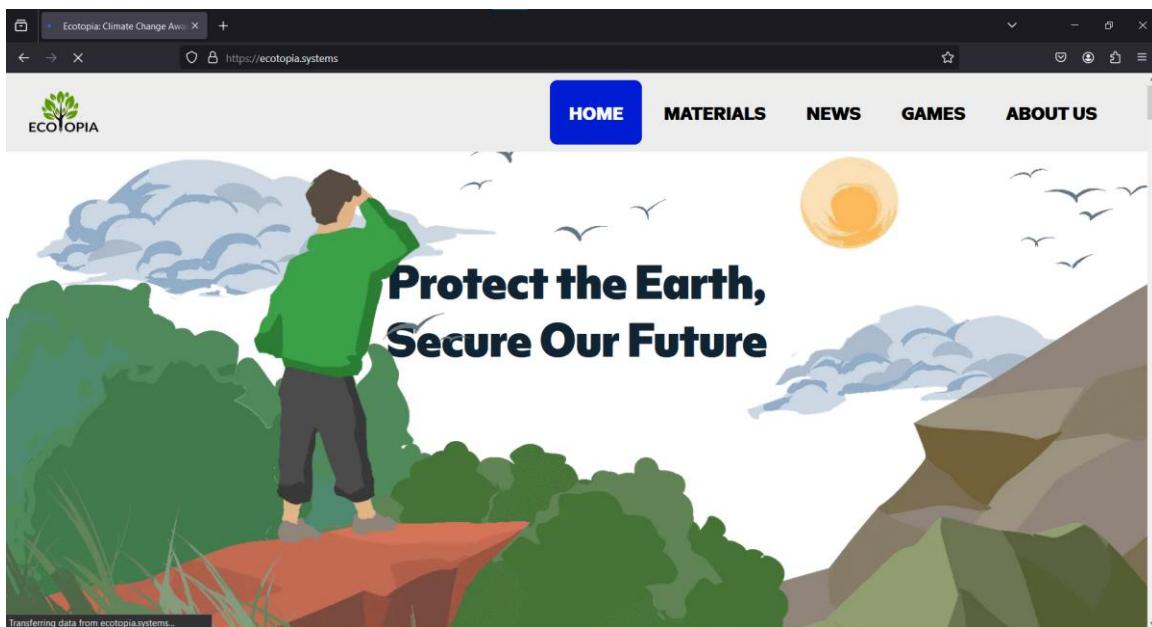
Google Chrome

(Chrome 75 and later, Chrome 70 to 74, Chrome 60 to 69, Chrome 50 to 59)



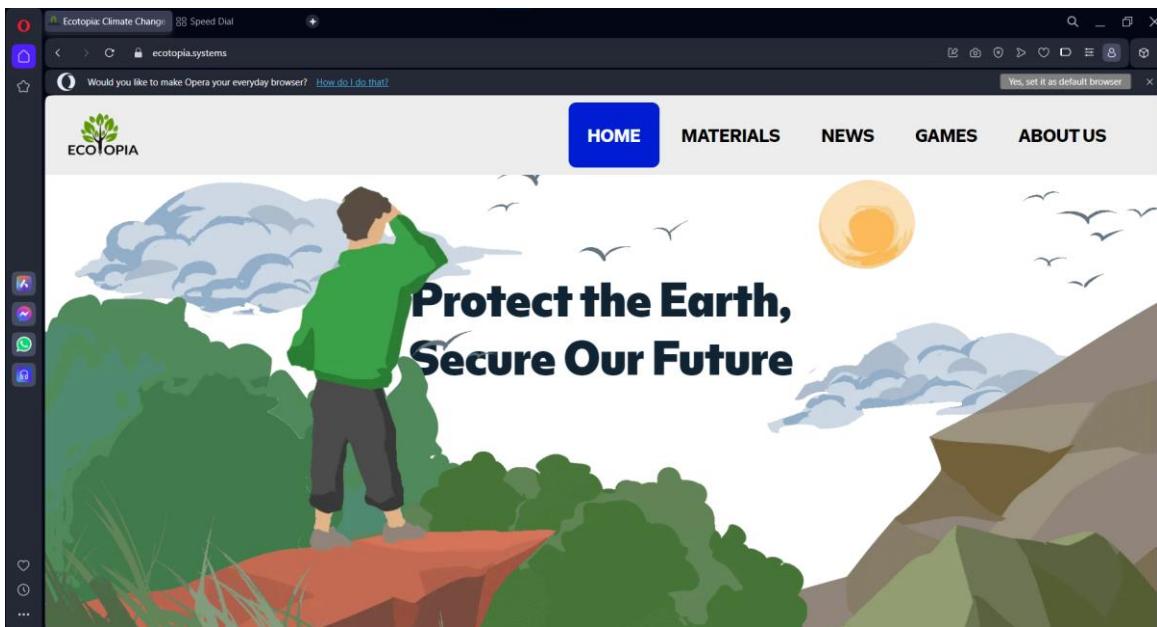
Mozilla Firefox

(Mozilla Firefox 93 and later, Mozilla Firefox 89 to 92, Mozilla Firefox 85 to 88, Mozilla Firefox 80 to 84)



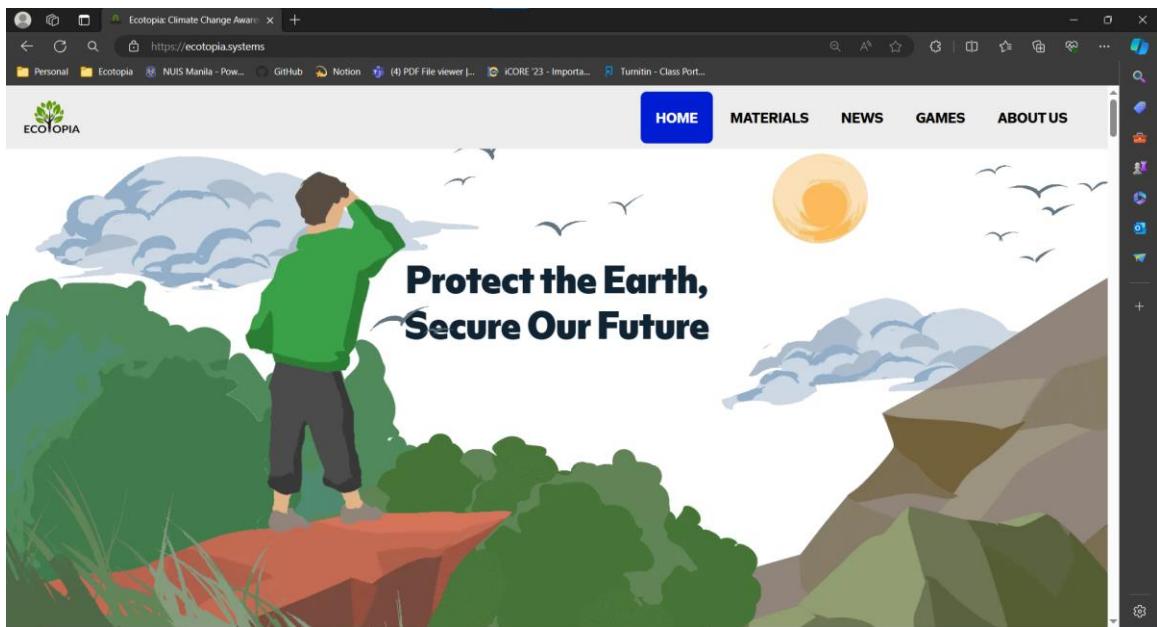
Opera

(Opera 78 and later, Opera 75 to 77, Opera 72 to 74, Opera 69 to 71)



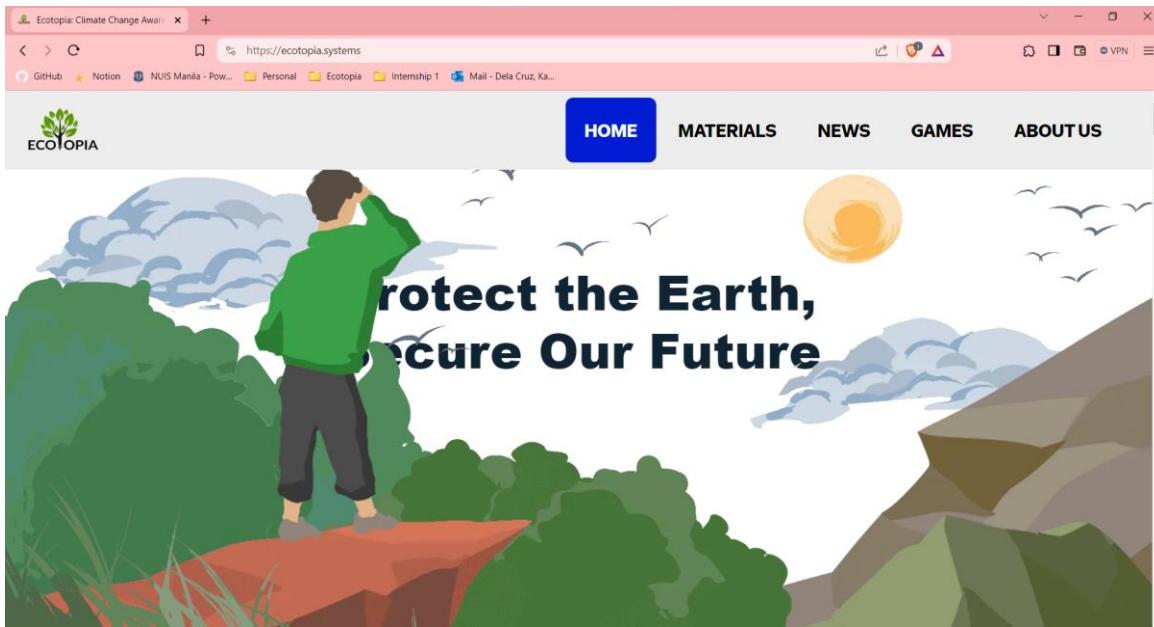
Microsoft Edge

(Microsoft Edge 88 and later, Microsoft Edge 85 to 87, Microsoft Edge 80 to 84, Microsoft Edge 75 to 79)



Brave

(Brave 1.18.75 and later, Brave 1.17.75 to 1.18.74, Brave 1.16.68 to 1.17.74, Brave 1.15.75 and earlier)



APPENDIX L.

OWASP SECURE

CODING

PRACTICES

CHECKLIST

Input Validation

- Conduct all data validation on a trusted system (e.g., The server)
- There should be a centralized input validation routine for the application.
- All validation failures should result in input rejection.
- Validate all client provided data before processing, including all parameters, URLs and HTTP header content (e.g. Cookie names and values). Be sure to include automated post backs from JavaScript, Flash or other embedded code.

Authentication and Password Management:

- All authentication controls must be enforced on a trusted system.
- All authentication controls should fail securely.
- If your application manages a credential store, it should ensure that only cryptographically strong one-way salted hashes of passwords are stored and that the table/file that stores the passwords.
- Password hashing must be implemented on a trusted system (e.g., The server).
- Authentication failure responses should not indicate which part of the authentication data was incorrect. For example, instead of "Invalid username" or "Invalid password", just use "Invalid username and/or password" for both. Error responses must be truly identical in both display and source code.
- Use only HTTP POST requests to transmit authentication credentials.
- Password entry should be obscured on the user's screen. (e.g., on web forms use the input type "password")
- Enforce account disabling after an established number of invalid login attempts (e.g., five attempts are common). The account must be disabled for a period of time sufficient to discourage brute force guessing of credentials, but not so long as to allow for a denial-of-service attack to be performed.

Session Management:

- Use the server or framework's session management controls. The application should only recognize these session identifiers as valid.
 - Session identifier creation must always be done on a trusted system (e.g., The server)
 - Session management controls should use well vetted algorithms that ensure sufficiently random session identifiers.
 - Set the domain and path for cookies containing authenticated session identifiers to an appropriately restricted value for the site.
 - Logout functionality should fully terminate the associated session or connection.
-
- Establish a session inactivity timeout that is as short as possible, based on balancing risk and business functional requirements. In most cases it should be no more than several hours

Access Control:

- Use only trusted system objects, e.g. server-side session objects, for making access authorization decisions.
- Restrict access to protected URLs to only authorized users.
- Restrict access to services to only authorized users.

Cryptographic Practices:

- All cryptographic functions used to protect secrets from the application user must be implemented on a trusted system (e.g., The server)
- All random numbers, random file names, random GUIDs, and random strings should be generated using the cryptographic module's approved random number generator when these random values are intended to be un-guessable.
- Do not disclose sensitive information in error responses, including system details, session identifiers or account information.

- Use error handlers that do not display debugging or stack trace information.

Error Handling and Logging

- Do not disclose sensitive information in error responses, including system details, session identifiers or account information.
- Use error handlers that do not display debugging or stack trace information.
- The application should handle application errors and not rely on the server configuration.
- All logging controls should be implemented on a trusted system (e.g., The server)

System Configuration:

- Ensure servers, frameworks and system components are running the latest approved version.
- Ensure servers, frameworks and system components have all patches issued for the version in use.
- Restrict the web server, process and service accounts to the least privileges possible.
- When exceptions occur, fail securely.
- Turn off directory listings.
- Remove all unnecessary functionality and files.
- Remove test code or any functionality not intended for production, prior to deployment.
- Prevent disclosure of your directory structure in the robots.txt file by placing directories not intended for public indexing into an isolated parent directory. Then "Disallow" that entire parent directory in the robots.txt file rather than disallowing each individual directory.
- Remove unnecessary information from HTTP response headers related to the OS, web-server version, and application frameworks.
- Isolate development environments from the production network and provide access only to authorized development and test groups. Development environments are often configured less

securely than production environments and attackers may use this difference to discover shared weaknesses or as an avenue for exploitation.

Database Security:

- Utilize input validation and output encoding and be sure to address meta characters. If these fail, do not run the database command.
- Use secure credentials for database access.
- Connection strings should not be hard coded within the application. Connection strings should be stored in a separate configuration file on a trusted system, and they should be encrypted.
- Remove or change all default database administrative passwords. Utilize strong passwords/phrases or implement multi-factor authentication.
- Turn off all unnecessary database functionality (e.g., unnecessary stored procedures or services, utility packages, install only the minimum set of features and options required (surface area reduction))

APPENDIX M.

DATA PRIVACY

POLICY

Privacy Policy

Last updated: September 24, 2023

Ecotopia (referred to as "we," "us," or "our"). Your privacy is important to us, and we are committed to promoting the free exchange of knowledge and information while respecting your privacy and personal information. This Privacy Policy outlines our practices regarding the collection, use, and protection of your personal information. We firmly believe that users should not be required to provide personal information to participate in the free knowledge movement.

Information We Collect

We do not collect personal information from users unless it is voluntarily provided for specific purpose, like for concern, or question you may contact the developers using the contact details provided.

How We Use Your Information

We may use the information we collect if you voluntarily provide your email address by sending us emails, we may use it to respond to inquiries.

Sharing Your Information

We do not sell, rent, or trade your personal information to third parties for marketing purposes. We may share your information with third-party service providers who assist us in delivering our services, but they are contractually bound to protect your information and may only use it for the purposes specified.

Data Security

We take reasonable measures to protect your personal information from unauthorized access, disclosure, or alteration. However, no data transmission over the internet is completely secure, and we cannot guarantee the security of your information.

Changes to this Policy

We reserve the right to update this Privacy Policy to reflect changes in our practices or legal requirements.

Contact Us

If you have questions or concerns about this Privacy Policy or your personal information, please contact us at ecotopia2023@outlook.com

By using the Ecotopia services, you agree to the terms outlined in this Privacy Policy. Your continued use of our services signifies your acceptance of any updates to this policy.

APPENDIX N. ACCESSIBILITY COMPLIANCE

WEB APPLICATION ACCESSIBILITY COMPLIANCE

Landing Page

Level AA

The screenshot shows the ACHECKER Web Accessibility Checker interface. At the top, there are 'Login' and 'Register' links, the ACHECKER logo, and a link to 'Subscribe for automatic accessibility monitoring with ACHECKS!'. Below the header, there's a form titled 'Check Accessibility By:' with three options: 'URL' (selected), 'Upload', and 'Markup'. An 'Address:' field contains 'https://ecotopiabeta.live/'. A 'Check It' button is below the address field. To the right of the form is a link to 'Options'. Underneath, a section titled 'Accessibility Review' displays 'Guidelines: WCAG 2.0 (Level AA)'. It shows 'Known Problems(0)', 'Likely Problems (0)', 'Potential Problems (28)', 'HTML Validation', and 'CSS Validation'. A green message at the bottom says 'Congratulations! No known problems.' At the very bottom of the page, it says 'Web site engine's code is copyright © 2023' and features a small blue logo.

Level AAA

This screenshot is identical to the one above, showing the ACHECKER Web Accessibility Checker landing page for Level AA compliance. The interface, guidelines, review results, and footer information are all the same, indicating no changes between the two levels for this specific website.

Materials

Level AA

ACHECKER®

Subscribe for automatic accessibility monitoring with ACHECKS!

Check Accessibility By:

URL Upload Markup

Address:

Check It

Options

Accessibility Review (Guidelines: WCAG 2.0 (Level AA))

Known Problems (0) | Likely Problems (0) | Potential Problems (28) | HTML Validation | CSS Validation

Congratulations! No known problems.

Web site engine's code is copyright © 2023

Level AAA

ACHECKER®

Subscribe for automatic accessibility monitoring with ACHECKS!

Check Accessibility By:

URL Upload Markup

Address:

Check It

Options

Accessibility Review (Guidelines: WCAG 2.0 (Level AAA))

Known Problems (0) | Likely Problems (0) | Potential Problems (30) | HTML Validation | CSS Validation

Congratulations! No known problems.

Web site engine's code is copyright © 2023

Current Issues

Level AA

The screenshot shows the ACHECKER Web Accessibility Checker interface. At the top, there are 'Login' and 'Register' buttons, followed by the 'ACHECKER®' logo and a link to 'Subscribe for automatic accessibility monitoring with ACHECKS!'. Below this is a section titled 'Check Accessibility By:' with three tabs: 'URL' (selected), 'Upload', and 'Markup'. A text input field shows the URL 'https://ecotopialbeta.live/currentissue'. A 'Check It!' button is below the input field. To the right of the input field is a link to 'Options'. Below this is a section titled 'Accessibility Review' with the sub-section 'Accessibility Review (Guidelines: WCAG 2.0 (Level AA))'. It displays the following counts: Known Problems(0), Likely Problems (0), Potential Problems (28), HTML Validation, and CSS Validation. A green message at the bottom states 'Congratulations! No known problems.' At the bottom of the page, it says 'Web site engine's code is copyright © 2023' and features a small blue logo.

Level AAA

This screenshot is identical to the one above, showing the ACHECKER Web Accessibility Checker interface for the same URL. The 'Known Problems(0)', 'Likely Problems (0)', and 'Potential Problems (30)' counts are clearly visible. The 'HTML Validation' and 'CSS Validation' links are also present. The 'Congratulations! No known problems.' message is displayed. The footer and logo are consistent with the previous screenshot.

Climate Action SDG 13

Level AA

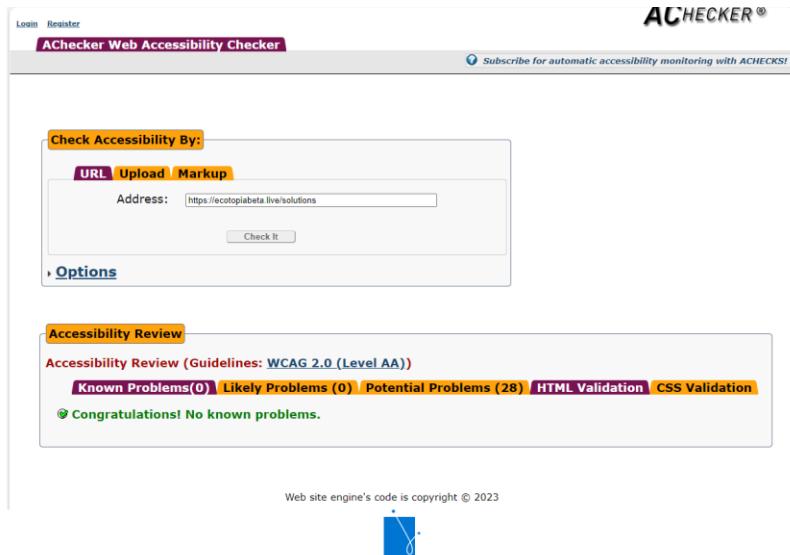
The screenshot shows the ACHECKER Web Accessibility Checker interface. At the top, there are 'Login' and 'Register' links, the ACHECKER logo, and a link to 'Subscribe for automatic accessibility monitoring with ACHECKS!'. Below this is a 'Check Accessibility By:' section with 'URL', 'Upload', and 'Markup' options, and an 'Address' input field containing 'https://ecotopiabeta.live/problems'. A 'Check It!' button is below the address field. To the right of this is an 'Options' link. Below this is an 'Accessibility Review' section titled 'Accessibility Review (Guidelines: WCAG 2.0 (Level AA))'. It displays statistics: 'Known Problems(0)', 'Likely Problems (0)', 'Potential Problems (28)', 'HTML Validation', and 'CSS Validation'. A green message says 'Congratulations! No known problems.' At the bottom of the page, it says 'Web site engine's code is copyright © 2023' and features a small blue logo.

Level AAA

This screenshot is identical to the one above, showing the ACHECKER Web Accessibility Checker interface for Level AA. The only difference is the 'Known Problems(0)' statistic, which is now explicitly labeled as '(0)' in the 'Known Problems' section of the 'Accessibility Review' panel.

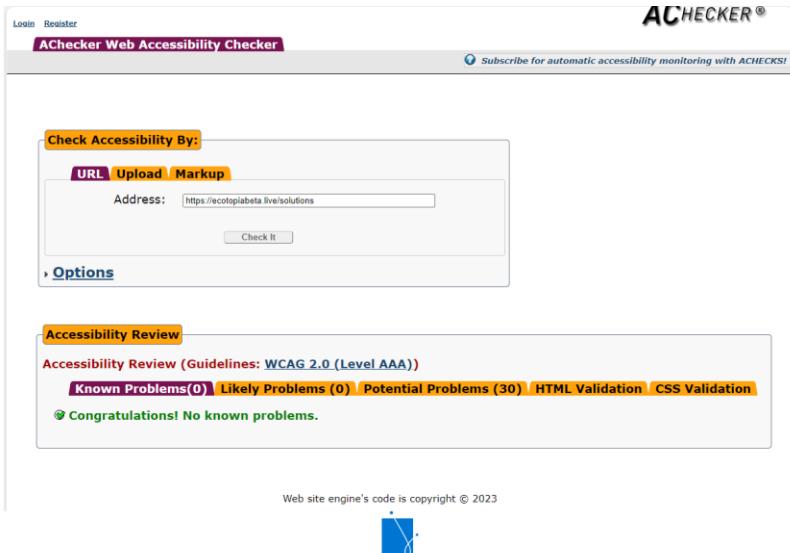
Solution

Level AA



The screenshot shows the ACHECKER Web Accessibility Checker interface. At the top, there are 'Login' and 'Register' links, the ACHECKER logo, and a 'Subscribe for automatic accessibility monitoring with ACHECKS!' button. The main area has a 'Check Accessibility By:' section with 'URL', 'Upload', and 'Markup' options, and an 'Address' input field containing 'https://ecotopiabeta.live/solutions'. Below this is an 'Options' link. To the right, an 'Accessibility Review' section displays 'WCAG 2.0 (Level AA)' guidelines. It shows 'Known Problems(0)', 'Likely Problems (0)', 'Potential Problems (28)', 'HTML Validation', and 'CSS Validation'. A green message says 'Congratulations! No known problems.' At the bottom, it states 'Web site engine's code is copyright © 2023' and features a small blue logo.

Level AAA



This screenshot is identical to the one above, showing the ACHECKER interface for Level AA. The only difference is in the 'Accessibility Review' section, which now indicates 'WCAG 2.0 (Level AAA)' guidelines. The 'Known Problems(0)', 'Likely Problems (0)', 'Potential Problems (30)', 'HTML Validation', and 'CSS Validation' counts have increased from 28 to 30. The rest of the interface, including the address bar, options, and footer, remains the same.

Overview of Climate Change

Level AA

The screenshot shows the ACHECKER Web Accessibility Checker interface. At the top, there are 'Login' and 'Register' links, the ACHECKER logo, and a link to 'Subscribe for automatic accessibility monitoring with ACHECKS!'. Below this is a 'Check Accessibility By:' section with 'URL', 'Upload', and 'Markup' options. An 'Address:' field contains the URL <https://ecotopiabeta.live/overviewOfClimateChange>, and a 'Check It!' button is below it. A 'Options' link is also present. In the main content area, a 'Accessibility Review' section indicates 'Guidelines: WCAG 2.0 (Level AA)'. It shows 'Known Problems(0)', 'Likely Problems (0)', 'Potential Problems (28)', 'HTML Validation', and 'CSS Validation'. A green message says 'Congratulations! No known problems.' At the bottom, a copyright notice reads 'Web site engine's code is copyright © 2023' and features a small blue logo.

Level AAA

This screenshot is identical to the one above, showing the ACHECKER interface for Level AA compliance. The only difference is in the 'Accessibility Review' section, which now indicates 'Guidelines: WCAG 2.0 (Level AAA)'. The 'Potential Problems' count has increased to 30, while 'Known Problems' and 'Likely Problems' remain at 0. The rest of the interface, including the address bar, check buttons, and success message, remains the same.

Self-Assessment

Level AA

The screenshot shows the ACHECKER Web Accessibility Checker interface. At the top, there are 'Login' and 'Register' links, the ACHECKER logo, and a link to 'Subscribe for automatic accessibility monitoring with ACHECKS!'. Below the header, the title 'ACHECKER Web Accessibility Checker' is displayed. In the main area, there's a form titled 'Check Accessibility By:' with three tabs: 'URL' (selected), 'Upload', and 'Markup'. The 'Address:' field contains 'https://ecotopiabeta.live/assessment'. A 'Check It' button is below the address field. To the right of the form, there's a link to 'Options'. Below the form, a section titled 'Accessibility Review' is shown with the sub-titler 'Guidelines: WCAG 2.0 (Level AA)'. It displays the following counts: Known Problems(0), Likely Problems (0), Potential Problems (28), HTML Validation, and CSS Validation. A green message says 'Congratulations! No known problems.' At the bottom of the page, a copyright notice reads 'Web site engine's code is copyright © 2023' and features a small blue logo.

Level AAA

This screenshot is identical to the one above, showing the ACHECKER Web Accessibility Checker interface for Level AA assessment. The only difference is the 'Guidelines' section which now specifies 'WCAG 2.0 (Level AAA)' instead of 'WCAG 2.0 (Level AA)'. The rest of the interface, including the form, review results, and footer, remains the same.

News

Level AA

The screenshot shows the AChecker Web Accessibility Checker interface. At the top, there are 'Login' and 'Register' links, the AChecker logo, and a link to 'Subscribe for automatic accessibility monitoring with ACHECKS!'. Below the header, the main content area has a title 'Check Accessibility By:' with tabs for 'URL', 'Upload', and 'Markup'. An 'Address' field contains the URL 'https://ecotopiabeta.live/newsFeatures'. A 'Check It' button is below the address field. To the right of the address field is a link to 'Options'. Underneath this section is a yellow-bordered box titled 'Accessibility Review' with the sub-titler 'Accessibility Review (Guidelines: WCAG 2.0 (Level AA))'. It displays statistics: 'Known Problems(0)', 'Likely Problems (0)', 'Potential Problems (28)', 'HTML Validation', and 'CSS Validation'. A green message at the bottom of this box says 'Congratulations! No known problems.' At the very bottom of the page, a small note reads 'Web site engine's code is copyright © 2023' next to a blue circular logo.

Level AAA

This screenshot of the AChecker interface is identical to the one above it, showing the same layout and results for the 'newsFeatures' page. The 'Accessibility Review' section indicates 'Potential Problems (30)' instead of (28), which corresponds to the Level AAA guidelines. The rest of the interface, including the 'Check Accessibility By:' form and the 'Accessibility Review' summary, remains the same.

Game

Level AA

The screenshot shows the ACHECKER Web Accessibility Checker interface. At the top, there are 'Login' and 'Register' links, the ACHECKER logo, and a link to 'Subscribe for automatic accessibility monitoring with ACHECKS!'. Below this is a 'Check Accessibility By:' section with 'URL', 'Upload', and 'Markup' options. A URL input field contains 'https://ecotopia.systems/games'. A 'Check It' button is below the input field. To the right of the input field is a link to 'Options'. Below this is an 'Accessibility Review' section. It states 'Accessibility Review (Guidelines: WCAG 2.0 (Level AA))' and lists 'Known Problems(0)', 'Likely Problems (0)', 'Potential Problems (31)', 'HTML Validation', and 'CSS Validation'. A green message at the bottom says 'Congratulations! No known problems.'

Level AAA

The screenshot shows the ACHECKER Web Accessibility Checker interface, identical to the previous one but for Level AAA. The 'Check Accessibility By:' section and 'Accessibility Review' section are the same, including the URL 'https://ecotopia.systems/games', the 'Check It' button, the 'Options' link, and the green message 'Congratulations! No known problems.'

About us

Level AA

The screenshot shows the ACHECKER Web Accessibility Checker interface. At the top, there are 'Login' and 'Register' links, the 'ACHECKER Web Accessibility Checker' logo, and a 'Subscribe for automatic accessibility monitoring with ACHECKS!' button. Below the header, the 'Check Accessibility By:' section has tabs for 'URL', 'Upload', and 'Markup'. The 'Address:' field contains the URL <https://ecotopiabeta.live/aboutus>. A 'Check It' button is below the address field. To the right of this section is a link to 'Options'. The 'Accessibility Review' section indicates 'Guidelines: WCAG 2.0 (Level AA)'. It shows 'Known Problems(0)', 'Likely Problems (0)', 'Potential Problems (28)', 'HTML Validation', and 'CSS Validation'. A green message says 'Congratulations! No known problems.' At the bottom of the review section, it says 'Web site engine's code is copyright © 2023' and features a small blue logo.

Level AAA

This screenshot is identical to the one above, showing the ACHECKER Web Accessibility Checker interface for the 'About us' page. It displays the same 'Check Accessibility By:' section, 'Accessibility Review' section with 'WCAG 2.0 (Level AA)' guidelines, and the same green message: 'Congratulations! No known problems.'. The footer also includes the copyright notice 'Web site engine's code is copyright © 2023' and the blue logo.

Admin Login

Level AA

ACHECKER®

Subscribe for automatic accessibility monitoring with ACHECKS!

Check Accessibility By:

URL Upload Markup

Address:

Check It

Options

Accessibility Review (Guidelines: WCAG 2.0 (Level AA))

Known Problems(0) Likely Problems (0) Potential Problems (28) HTML Validation CSS Validation

Congratulations! No known problems.

Web site engine's code is copyright © 2023

Level AAA

ACHECKER®

Subscribe for automatic accessibility monitoring with ACHECKS!

Check Accessibility By:

URL Upload Markup

Address:

Check It

Options

Accessibility Review (Guidelines: WCAG 2.0 (Level AAA))

Known Problems(0) Likely Problems (0) Potential Problems (30) HTML Validation CSS Validation

Congratulations! No known problems.

Web site engine's code is copyright © 2023

Admin Accounts

Level AA

ACHECKER®

AChecker Web Accessibility Checker

Login Register

Subscribe for automatic accessibility monitoring with ACHECKS!

Check Accessibility By:

URL Upload Markup

Address:

Check It

› Options

Accessibility Review (Guidelines: WCAG 2.0 (Level AA))

Known Problems (0) Likely Problems (0) Potential Problems (31) HTML Validation CSS Validation

Congratulations! No known problems.

Level AAA

ACHECKER®

AChecker Web Accessibility Checker

Login Register

Subscribe for automatic accessibility monitoring with ACHECKS!

Check Accessibility By:

URL Upload Markup

Address:

Check It

› Options

Accessibility Review (Guidelines: WCAG 2.0 (Level AAA))

Known Problems (0) Likely Problems (0) Potential Problems (33) HTML Validation CSS Validation

Congratulations! No known problems.

Admin News

Level AA

The screenshot shows the ACHECKER Web Accessibility Checker interface. At the top, there's a header with 'ACHECKER' and a 'Subscribe for automatic accessibility monitoring with ACHECKS!' button. Below the header is a navigation bar with 'Login' and 'Register' links. The main content area has a title 'Check Accessibility By:' with three tabs: 'URL' (selected), 'Upload', and 'Markup'. A text input field shows the address 'https://ecotopia.live/admin-news'. A 'Check It' button is below the input field. To the right of the input field is a link 'Options'. Below this section is another titled 'Accessibility Review' with the sub-titler 'Guidelines: WCAG 2.0 (Level AA)'. It displays the following counts: Known Problems(0), Likely Problems (0), Potential Problems (31), HTML Validation, and CSS Validation. A green success message 'Congratulations! No known problems.' is shown.

Level AAA

This screenshot shows the same ACHECKER interface as the previous one, but with different results. The 'Known Problems(0)', 'Likely Problems (0)', and 'Potential Problems (33)' counts are displayed under the 'Accessibility Review' section. The green success message 'Congratulations! No known problems.' is present.

Admin Current Issues

Level AA

The screenshot shows the ACHECKER Web Accessibility Checker interface. At the top, there are 'Login' and 'Register' links, the ACHECKER logo, and a link to 'Subscribe for automatic accessibility monitoring with ACHECKS!'. Below this is a 'Check Accessibility By:' section with 'URL', 'Upload', and 'Markup' options, and an 'Address' input field containing 'https://ecotopiabeta.live/admin-current-issues-ph'. A 'Check It!' button is below the address field. To the right of this is an 'Options' link. Below this is an 'Accessibility Review' section titled 'Accessibility Review (Guidelines: WCAG 2.0 (Level AA))'. It displays statistics: 'Known Problems(0)', 'Likely Problems (0)', 'Potential Problems (28)', 'HTML Validation', and 'CSS Validation'. A green message says 'Congratulations! No known problems.' At the bottom of the page, it says 'Web site engine's code is copyright © 2023' and features a small blue logo.

Level AAA

The screenshot shows the ACHECKER Web Accessibility Checker interface, identical to the previous one but with different results. The 'Accessibility Review' section now shows 'Known Problems(0)', 'Likely Problems (0)', 'Potential Problems (30)', 'HTML Validation', and 'CSS Validation'. The green message at the bottom still says 'Congratulations! No known problems.' The rest of the interface is the same, including the copyright notice and logo.

Admin Self-Assessment

Level AA

The screenshot shows the ACHECKER Web Accessibility Checker interface. At the top, there are 'Login' and 'Register' links, the 'ACHECKER®' logo, and a link to 'Subscribe for automatic accessibility monitoring with ACHECKS!'. Below this is a 'Check Accessibility By:' section with 'URL', 'Upload', and 'Markup' options, and an 'Address' input field containing 'https://ecotopiabeta.live/admin-assessment'. A 'Check It!' button is below the address field. To the right of this is an 'Options' link. Below this is an 'Accessibility Review' section titled 'Accessibility Review (Guidelines: WCAG 2.0 (Level AA))'. It displays 'Known Problems(0)', 'Likely Problems (0)', 'Potential Problems (28)', 'HTML Validation', and 'CSS Validation'. A green message says 'Congratulations! No known problems.' At the bottom of the page, it says 'Web site engine's code is copyright © 2023' and features a small blue logo.

Level AAA

The screenshot shows the ACHECKER Web Accessibility Checker interface, identical to the previous one but for Level AAA. The 'Check Accessibility By:' section and 'Address' input field ('https://ecotopiabeta.live/admin-assessment') are present. The 'Accessibility Review' section is titled 'Accessibility Review (Guidelines: WCAG 2.0 (Level AAA))'. It displays 'Known Problems(0)', 'Likely Problems (0)', 'Potential Problems (30)', 'HTML Validation', and 'CSS Validation'. A green message says 'Congratulations! No known problems.' At the bottom of the page, it says 'Web site engine's code is copyright © 2023' and features a small blue logo.

Admin Cases (Climate Action SDG 13)

Level AA

The screenshot shows the ACHECKER Web Accessibility Checker interface. At the top, there are 'Login' and 'Register' links, the 'ACHECKER Web Accessibility Checker' logo, and a link to 'Subscribe for automatic accessibility monitoring with ACHECKS!'. Below this is a form titled 'Check Accessibility By:' with three options: 'URL', 'Upload', and 'Markup'. The 'Address:' field contains the URL <https://ecotopiabeta.live/admin-cases>. A 'Check it' button is below the address field. To the right of the form is a link to 'Options'. Under the 'Accessibility Review' section, it says 'Guidelines: WCAG 2.0 (Level AA)'. It displays 'Known Problems(0)', 'Likely Problems (0)', 'Potential Problems (28)', 'HTML Validation', and 'CSS Validation'. A green message at the bottom states 'Congratulations! No known problems.' At the bottom of the page, it says 'Web site engine's code is copyright © 2023' and features a small blue logo.

Level AAA

The screenshot shows the ACHECKER Web Accessibility Checker interface, identical to the previous one but for Level AAA. The 'Address:' field still contains the URL <https://ecotopiabeta.live/admin-cases>. In the 'Accessibility Review' section, it says 'Guidelines: WCAG 2.0 (Level AAA)'. It displays 'Known Problems(0)', 'Likely Problems (0)', 'Potential Problems (30)', 'HTML Validation', and 'CSS Validation'. A green message at the bottom states 'Congratulations! No known problems.' The footer and logo are also identical to the Level AA version.

Admin Case 1 (Overview)

Level AA

ACHECKER®

Login Register

AChecker Web Accessibility Checker

Subscribe for automatic accessibility monitoring with ACHECKS!

Check Accessibility By:

URL Upload Markup

Address:

Check It

Options

Accessibility Review (Guidelines: WCAG 2.0 (Level AA))

Known Problems(0) Likely Problems (0) Potential Problems (28) HTML Validation CSS Validation

Congratulations! No known problems.

Web site engine's code is copyright © 2023

Level AAA

ACHECKER®

Login Register

AChecker Web Accessibility Checker

Subscribe for automatic accessibility monitoring with ACHECKS!

Check Accessibility By:

URL Upload Markup

Address:

Check It

Options

Accessibility Review (Guidelines: WCAG 2.0 (Level AAA))

Known Problems(0) Likely Problems (0) Potential Problems (30) HTML Validation CSS Validation

Congratulations! No known problems.

Web site engine's code is copyright © 2023

Admin Case 2 (Target and Indicators)

Level AA

The screenshot shows the ACHECKER Web Accessibility Checker interface. At the top, there are 'Login' and 'Register' links, the ACHECKER logo, and a link to 'Subscribe for automatic accessibility monitoring with ACHECKS!'. Below the header, the title 'AChecker Web Accessibility Checker' is displayed. The main area has a 'Check Accessibility By:' section with tabs for 'URL', 'Upload', and 'Markup'. The 'Address:' field contains 'https://ecotopiabeta.live/admin-case-2'. A 'Check It!' button is below the address field. To the right of this section is a 'Options' link. Below this is an 'Accessibility Review' section titled 'Accessibility Review (Guidelines: WCAG 2.0 (Level AA))'. It shows 'Known Problems(0)', 'Likely Problems (0)', 'Potential Problems (28)', 'HTML Validation', and 'CSS Validation'. A green message says 'Congratulations! No known problems.' At the bottom of the page, it says 'Web site engine's code is copyright © 2023' and features a small blue logo.

Level AAA

This screenshot is identical to the one above, showing the ACHECKER Web Accessibility Checker interface for Admin Case 2 at Level AA. The layout, fields, and results for the accessibility review are the same, indicating no known problems at this level.

Admin Case 3 (Progress and Info)

Level AA

The screenshot shows the ACHECKER Web Accessibility Checker interface. At the top, there are 'Login' and 'Register' links, the ACHECKER logo, and a link to 'Subscribe for automatic accessibility monitoring with ACHECKS!'. The main area has a 'Check Accessibility By:' section with 'URL', 'Upload', and 'Markup' options, and an 'Address:' field containing 'https://ecotopiabeta.live/admin-case-3'. Below this is a 'Check It!' button and a 'Options' link. To the right, there's a 'Accessibility Review' section titled '(Guidelines: WCAG 2.0 (Level AA))' with links for 'Known Problems(0)', 'Likely Problems (0)', 'Potential Problems (28)', 'HTML Validation', and 'CSS Validation'. A green message at the bottom says 'Congratulations! No known problems.'

Level AAA

This screenshot is identical to the one above, showing the ACHECKER interface for Level AA. The URL 'https://ecotopiabeta.live/admin-case-3' is entered in the address bar, and the results show 0 known problems, 0 likely problems, and 28 potential problems. A green message at the bottom says 'Congratulations! No known problems.'

Admin Case 4 (Related Topics)

Level AA

ACHECKER®

Login Register

AChecker Web Accessibility Checker

Subscribe for automatic accessibility monitoring with ACHECKS!

Check Accessibility By:

URL Upload Markup

Address:

Check It

Options

Accessibility Review

Accessibility Review (Guidelines: WCAG 2.0 (Level AA))

Known Problems(0) Likely Problems (0) Potential Problems (28) HTML Validation CSS Validation

Congratulations! No known problems.

Web site engine's code is copyright © 2023

Level AAA

ACHECKER®

Login Register

AChecker Web Accessibility Checker

Subscribe for automatic accessibility monitoring with ACHECKS!

Check Accessibility By:

URL Upload Markup

Address:

Check It

Options

Accessibility Review

Accessibility Review (Guidelines: WCAG 2.0 (Level AAA))

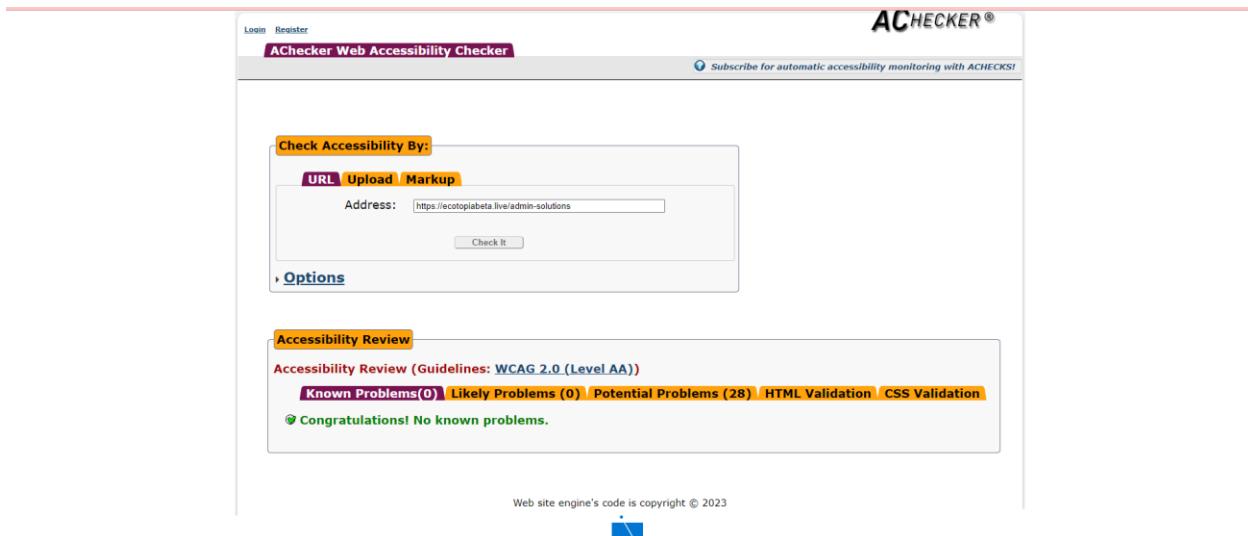
Known Problems(0) Likely Problems (0) Potential Problems (30) HTML Validation CSS Validation

Congratulations! No known problems.

Web site engine's code is copyright © 2023

Solutions

Level AA



ACHECKER®

Login Register

AChecker Web Accessibility Checker

Check Accessibility By:

URL Upload Markup

Address:

Check It

Options

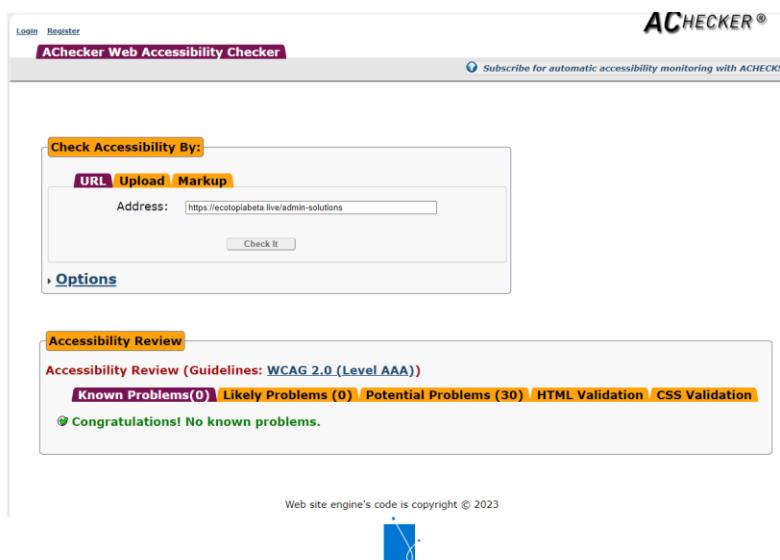
Accessibility Review (Guidelines: WCAG 2.0 (Level AA))

Known Problems(0) Likely Problems (0) Potential Problems (28) HTML Validation CSS Validation

Congratulations! No known problems.

Web site engine's code is copyright © 2023

Level AAA



ACHECKER®

Login Register

AChecker Web Accessibility Checker

Check Accessibility By:

URL Upload Markup

Address:

Check It

Options

Accessibility Review (Guidelines: WCAG 2.0 (Level AAA))

Known Problems(0) Likely Problems (0) Potential Problems (30) HTML Validation CSS Validation

Congratulations! No known problems.

Web site engine's code is copyright © 2023

Solution 1

Level AA

The screenshot shows the ACHECKER Web Accessibility Checker interface. At the top, there are 'Login' and 'Register' links, the ACHECKER logo, and a link to 'Subscribe for automatic accessibility monitoring with ACHECKS!'. Below the header, the title 'AChecker Web Accessibility Checker' is displayed. The main area has a 'Check Accessibility By:' section with tabs for 'URL', 'Upload', and 'Markup'. The 'Address:' field contains 'https://ecotopiabeta.live/admin-solution-1'. A 'Check It' button is present. To the right, there is an 'Options' link. Below this, an 'Accessibility Review' section indicates 'Guidelines: WCAG 2.0 (Level AA)'. It shows 'Known Problems(0)', 'Likely Problems (0)', 'Potential Problems (28)', 'HTML Validation', and 'CSS Validation'. A green message says 'Congratulations! No known problems.' At the bottom, a copyright notice reads 'Web site engine's code is copyright © 2023' and features a small blue logo.

Level AAA

This screenshot of the ACHECKER interface shows the same layout as the previous one, but with different results for Level AAA. The 'Accessibility Review' section now indicates 'Guidelines: WCAG 2.0 (Level AAA)'. It shows 'Known Problems(0)', 'Likely Problems (0)', 'Potential Problems (30)', 'HTML Validation', and 'CSS Validation'. A green message says 'Congratulations! No known problems.' The copyright notice at the bottom remains the same.

Solution 2

Level AA

The screenshot shows the ACHECKER Web Accessibility Checker interface. At the top, there are 'Login' and 'Register' links, the ACHECKER logo, and a link to 'Subscribe for automatic accessibility monitoring with ACHECKS!'. Below the header, the title 'AChecker Web Accessibility Checker' is displayed. A 'Check Accessibility By:' section contains three buttons: 'URL' (highlighted in orange), 'Upload', and 'Markup'. An 'Address:' input field contains the URL 'https://ecotopiabeta.live/admin-solution-2'. A 'Check It' button is below the address field. To the right of this section is a link to 'Options'. Below this is an 'Accessibility Review' section titled 'Accessibility Review (Guidelines: WCAG 2.0 (Level AA))'. It displays the following statistics: Known Problems(0), Likely Problems (0), Potential Problems (28), HTML Validation, and CSS Validation. A green message at the bottom of this section says 'Congratulations! No known problems.' At the bottom of the page, a copyright notice reads 'Web site engine's code is copyright © 2023' and features a small blue circular logo.

Level AAA

The screenshot shows the ACHECKER Web Accessibility Checker interface, identical in layout to the previous one but for Level AAA compliance. The 'Check Accessibility By:' section has the 'URL' button highlighted in orange. The 'Address:' field contains the same URL. The 'Check It' button is present. To the right is a link to 'Options'. The 'Accessibility Review' section is titled 'Accessibility Review (Guidelines: WCAG 2.0 (Level AAA))'. It displays the following statistics: Known Problems(0), Likely Problems (0), Potential Problems (30), HTML Validation, and CSS Validation. A green message at the bottom of this section says 'Congratulations! No known problems.' At the bottom of the page, a copyright notice reads 'Web site engine's code is copyright © 2023' and features a small blue circular logo.

Solution 3

Level AA

The screenshot shows the ACHECKER Web Accessibility Checker interface. At the top, there are 'Login' and 'Register' links, the ACHECKER logo, and a link to 'Subscribe for automatic accessibility monitoring with ACHECKS!'. The main area has a 'Check Accessibility By:' section with 'URL', 'Upload', and 'Markup' options, and an 'Address' input field containing 'https://ecotopiabeta.live/admin-solution-3'. Below this is a 'Check It' button and an 'Options' link. To the right is an 'Accessibility Review' section titled 'Accessibility Review (Guidelines: WCAG 2.0 (Level AA))'. It displays 'Known Problems(0)', 'Likely Problems (0)', 'Potential Problems (28)', 'HTML Validation', and 'CSS Validation'. A green message says 'Congratulations! No known problems.' At the bottom, it says 'Web site engine's code is copyright © 2023' and features a blue circular logo with a stylized 'E'.

Level AAA

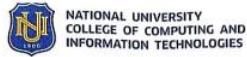
This screenshot is identical to the one above, showing the ACHECKER Web Accessibility Checker interface for Level AA. The only difference is in the 'Accessibility Review' section, which now specifies 'Guidelines: WCAG 2.0 (Level AAA)'. The rest of the interface, including the check form, review summary, and footer, remains the same.

APPENDIX O.

USER

ACCEPTANCE

TEST



USER ACCEPTANCE TEST
Based on Client Requirements Specification

Title: Ecotopia: A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Arcade Game

Date: October 18, 2023

CR	Requirement Description	Category	Business Critical		Acceptance Criteria	Result	Comment(s)
			YES	NO			
1	Admin must effectively modify the content in the Admin Page Modules	Functionality			Functional Completeness	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAILED	include image.
1.1	Landing Page must be responsive with smooth and professional transitions and animations					<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAILED	Include logos of city of manila and mdrpmo
1.2	Users can access and navigate the Materials section, including all its dropdown menu items					<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAILED	
1.3	News module must display news related to climate change.					<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAILED	Auto update news.
1.4	Game must be working correctly with five scenes					<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAILED	
1.5	About Us must provide accurate team description and partner detail					<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAILED	Include emergency numbers /mission and vision
2	System must show consistent performance without crashes, errors, or unexpected downtime	Reliability			System should run as it is	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAILED	
3	Website must be user-friendly with a clear and easy to use interface	Usability			System should display user-friendly UI	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAILED	
3.1	User must easily find and access information in website				System should display information in an accessible manner	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAILED	Shorten the website link.
4	Website must load fast and perform task without significant delays or lag	Efficiency			System should load fast depending on the Internet connection	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAILED	

551 M.F. Jhocson St., Sampaloc, Manila | nuccit@national-u.edu.ph | +63 2 8712-1900 loc 1415, 1456



NATIONAL UNIVERSITY
COLLEGE OF COMPUTING AND
INFORMATION TECHNOLOGIES

4.1	System resources must use efficiently, avoiding excessive CPU or memory usage				System should not slow down when accessing pages	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAILED	
5	Website must be accessible and functional across various devices and web browsers	Portability			System should be accessible to different devices and browsers	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAILED	
5.1	Website must be usable to different screen sizes ensuring a consistent experience				System should be accessible to different screen resolution	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAILED	
6	Assessment Admin Module must have format for editing correct answer		Supportability		Format should be displayed under correct answer	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAILED	
7	System must be done according to original objectives and needs	Time			System should be completed	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAILED	
8	System login for admin must be secured to prevent unauthorized access	Security/Compliance			System should block malicious input and <3 login attempts	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAILED	
8.1	Admin Pages must block malicious and null input	Security/Compliance			System should not proceed with saving the content	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAILED	Include forgot password

Prepared by:
Karl Marx V. Roxas

Project Manager
Signature over Printed Name

Administered by
Veronica Simea

Software Quality Assurance
Signature over Printed Name

Conforme:
Mr. Christian John V. Evangelista

Client Representative/Owner
Signature over Printed Name

APPENDIX P.

SOFTWARE

QUALITY

EVALUATION TEST

REPORT

SYSTEM EVALUATION QUESTIONNAIRE

(Based on ISO 9126 Software Quality Standard and Jacob Nielsen's Usability)

Date _____
 Name (optional) _____
 Profession _____
 Role _____ Years of Experience ___

Direction: Please evaluate the developed system based on the specification(s) provided using the scoring below.

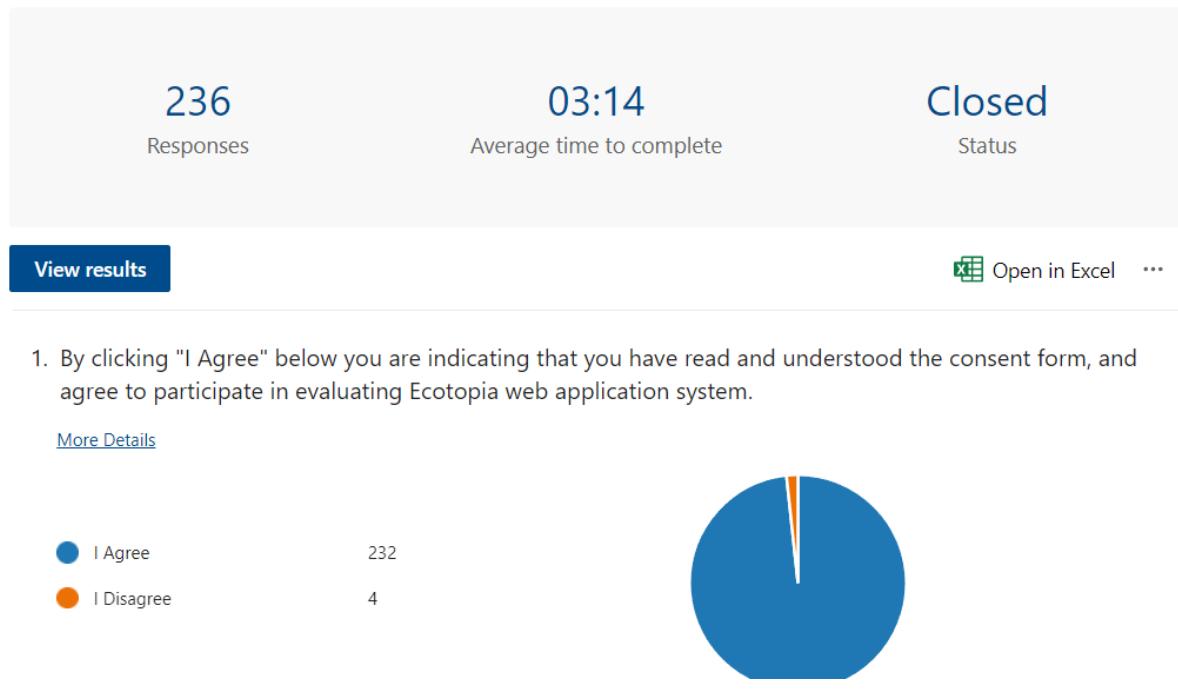
Legend

- | | |
|--|---|
| 1 Strongly Disagree
2 Disagree
3 Partially Disagree | 4 Partially Agree
5 Agree
6 Strongly Agree |
|--|---|

Software Quality Metrics		RATING					
		1	2	3	4	5	6
Functionality							
System (web/mobile) have adequate set of functions for specified tasks and user objectives.							
System (web/mobile) perform the task or functions as required.							
System (web/mobile) interact seamlessly from one another.							
System (web/mobile) accurately provide the right or agreed output results or effects.							
System (web/mobile) prevent unintended access and resist deliberate attacks intended to gain unauthorized access to confidential information.							
Reliability							
System (web/mobile) provide the available information as requested.							
System (web/mobile) is capable of handling errors.							
System (web/mobile) is robust such that it still can continue working after an error or failure happens.							
Performance Efficiency							
System (web/mobile) quickly responds to users' intended transactions or tasks.							
System (web/mobile) and other components load in reasonable time.							
System (web/mobile) operates smoothly even with large number of user access at the same time.							
Compliance							
System (web/mobile) have data privacy statement for compliance to existing laws or regulations.							
System (web/mobile) have provided a safe and trusted user's experience.							
Usability							
Learnability	I found the system simple to use and information provided within the system is easy to understand.						
	I think that I would not need to learn a lot of things before I could get going with the system.						
Efficiency	I easily found the information I am looking for.						
	I was able to quickly complete my task with this system.						

Memorability	The organization of information in the system screens is clear. I think that I would not need assistance to be able to use the system.					
Error Protection	The interface is designed such that I know what to do to avoid mistakes. The system gives error messages that clearly tell me the problem when interacting with the interface.					
Satisfaction	I found the system's interface design is pleasant. I found the system has the functions and performs tasks as what I expected.					

Ecotopia User Evaluation Form for SHS Students (Web Application)



2. Name (Optional)

[More Details](#) [Insights](#)

119 Responses

Latest Responses
"Jude Gabriel P Escalera"
"Julie Ann Jamison "

[Update](#)

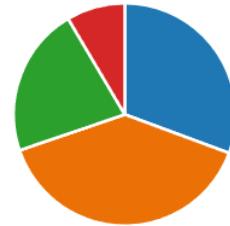
4 respondents (4%) answered **Anne** for this question.

Janine D Callanta Gelsey Anne Emmanuel A Villarino Allen Regala
Santos Santos John Anne Mae Reyes
Jaden Crisa John Anne Mae Reyes
Deuzef T Ende Jan Amplayo Norileen Sy F Santos
B Visda Paul Denver Kayla Hidalgo Shamel Manloza

3. Age

[More Details](#)  Insights

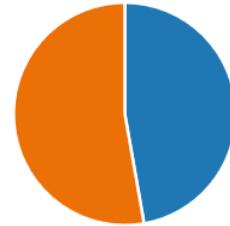
16 years old	72
17 years old	92
18 years old	51
19 and above	20



4. Grade Level

[More Details](#)  Insights

Grade 11	111
Grade 12	124



5. FUNCTIONALITY

[More Details](#)

■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6

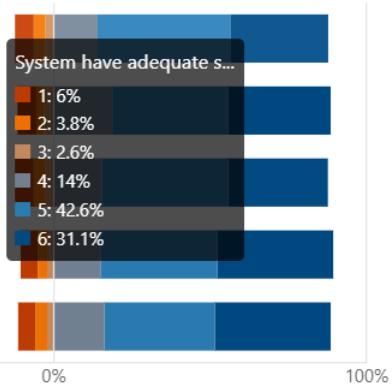
System have adequate set of functions for specified tasks and user objectives.

System perform the task or functions as required.

System interact seamlessly from one another.

System accurately provide the right or agreed output results or effects

System prevent unintended access and resist deliberate attacks intended to gain unauthorized...

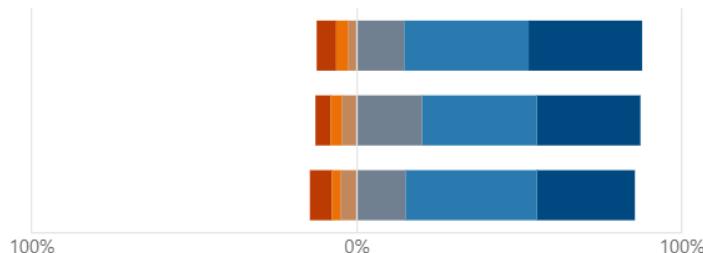


6. RELIABILITY

[More Details](#)

■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6

System provide the available information as requested.

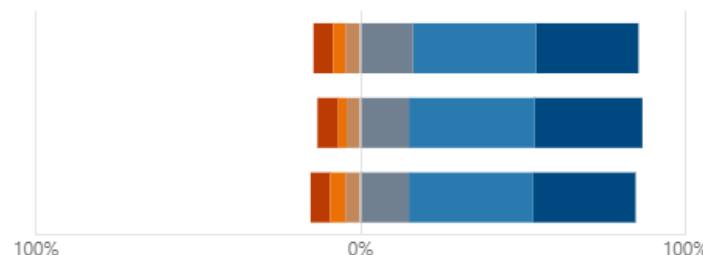


7. PERFORMANCE EFFICIENCY

[More Details](#)

■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6

System quickly responds to users' intended transactions or tasks.

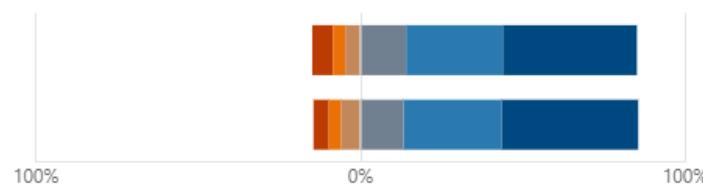


8. COMPLIANCE

[More Details](#)

■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6

System have data privacy statement for compliance to existing laws or regulations.

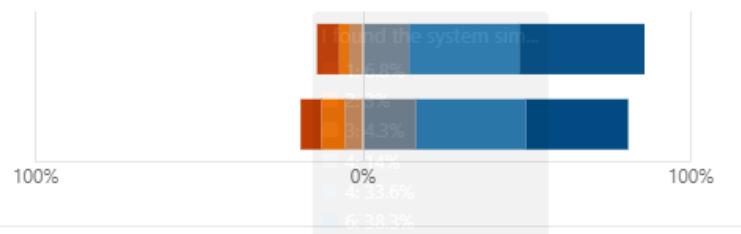


9. USABILITY Learnability

[More Details](#)

■ 1 ■ 2 ■ 3 ■ 4 ■ 4 ■ 6

I found the system simple to use and information provided within the system is easy to understand.



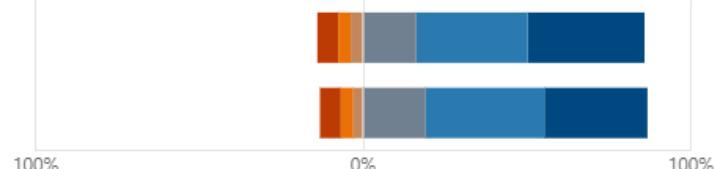
I think that I would not need to learn a lot of things before I could get going with the system.

10. USABILITY Efficiency

[More Details](#)

■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6

I easily found the information I am looking for.



I was able to quickly complete my task with this system.

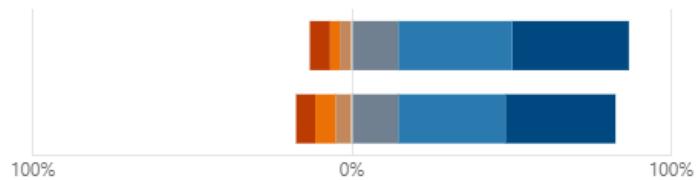
11. USABILITY Memorability

[More Details](#)

■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6

The organization of information in the system screens is clear.

I think that I would not need assistance to be able to use the system.



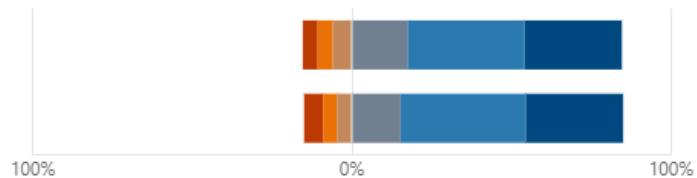
12. USABILITY Error Protection

[More Details](#)

■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6

The interface is designed such that I know what to do to avoid mistakes.

The system gives error messages that clearly tell me the problem when interacting with the interface.



13. USABILITY Satisfaction

[More Details](#)

■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6

I found the system's interface design is pleasant.



I found the system has the functions and performs tasks as what I expected.

100%

0%

100%

14. Comments and Suggestions

[More Details](#)

Insights

51
Responses

Latest Responses

"n/a"

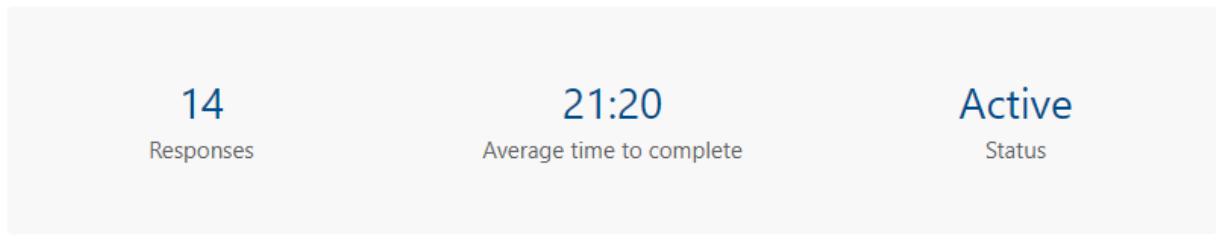
Update

24 respondents (48%) answered **None** for this question.

...

gadgets other than desktops **current issues**
mga viewers **site** **artstyle and the information**
attractive rin **sa research**
trouble **game accessible** **mga information**
system effective **looking forward** **working smoothly** **features of the web**
sa game **sa context** **high quality**
easily understand

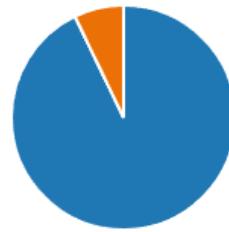
Ecotopia User Evaluation Form for IT Professionals (Web Application)

[View results](#)[Open in Excel](#) ...

1. By clicking "I Agree" below you are indicating that you have read and understood the consent form, and agree to participate in evaluating Ecotopia web application system.

[More Details](#)

●	I Agree	13
●	I Disagree	1



2. Name (Optional)

[More Details](#)[Insights](#)

9

Latest Responses
"Tristan Bautista"

2. Name (Optional)

[More Details](#) 

9
Responses

Latest Responses

"Tristan Bautista"

"Chacha"

 Update

1 respondents (13%) answered **Nante Salaysay** for this question.

...

John Serrano Mark Noreen
Chacha Nante Salaysay Jean
Louis Peter Mendoza Norberto Rueda

1 respondents (13%).

3. No. of Years of Experience

[More Details](#) 

 2 years	5
 3 years and above	6
 Other	3



4. Profession

[More Details](#)[💡 Insights](#)

11

Responses

Latest Responses

*"IT Helpdesk Support"**"QA"**"Multimedia Artist"*[⟳ Update](#)

3 respondents (30%) answered **Multimedia Artist** for this question.

...

Software

3 respondents (30%).

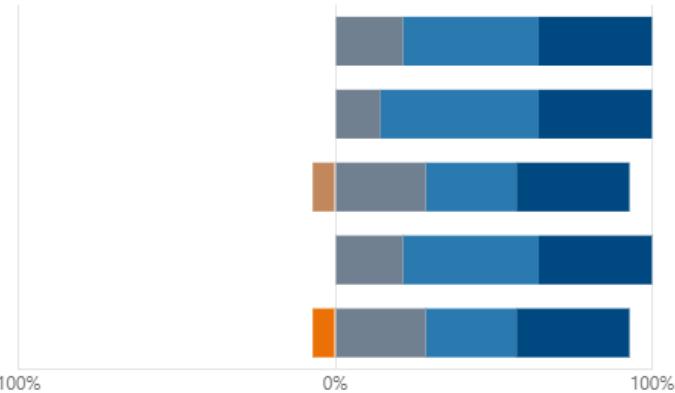
Consultant**IT****QA****Multimedia Artist****Stack Web****Web Developer**

5. FUNCTIONALITY

[More Details](#)

■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6

System have adequate set of functions for specified tasks and user objectives.

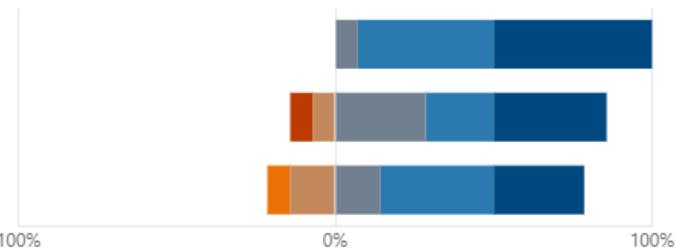


6. RELIABILITY

[More Details](#)

■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6

System provide the available information as requested.



7. PERFORMANCE EFFICIENCY

[More Details](#)

■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6

System quickly responds to users' intended transactions or tasks.

System quickly responds to users' intended transactions or tasks.

4: 35.7%
5: 14.3%
6: 50%

System and other components load in reasonable time.

System operates smoothly even with large number of user access at the same time.

100% 0% 100%

8. COMPLIANCE

[More Details](#)

■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6

System have data privacy statement for compliance to existing laws or regulations.

System have data privacy statement for compliance to existing laws or regulations.

4: 35.7%
5: 14.3%
6: 50%

System have provided a safe and trusted user's experience.

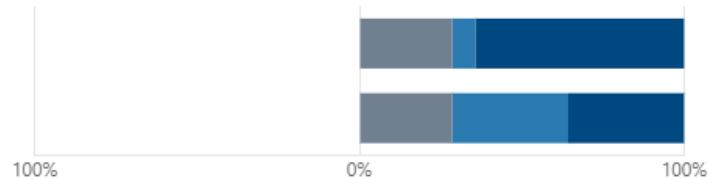
100% 0% 100%

9. USABILITY Learnability

[More Details](#)

■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6

I found the system simple to use and information provided within the system is easy to understand.



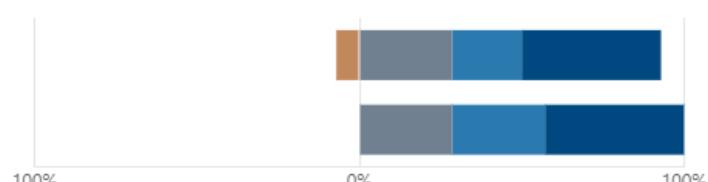
I think that I would not need to learn a lot of things before I could get going with the system.

10. USABILITY Efficiency

[More Details](#)

■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6

I easily found the information I am looking for.



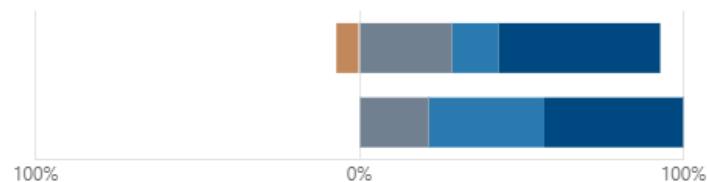
I was able to quickly complete my task with this system.

11. USABILITY Memorability

[More Details](#)

■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6

The organization of information in the system screens is clear.



I think that I would not need assistance to be able to use the system.

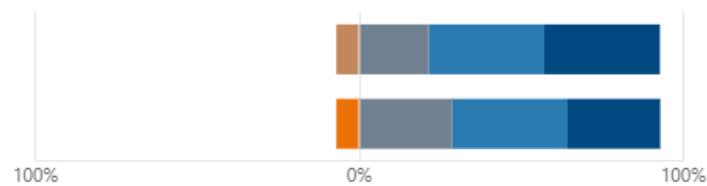
100% 0% 100%

12. USABILITY Error Protection

[More Details](#)

■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6

The interface is designed such that I know what to do to avoid mistakes.



The system gives error messages that clearly tell me the problem when interacting with the interface.

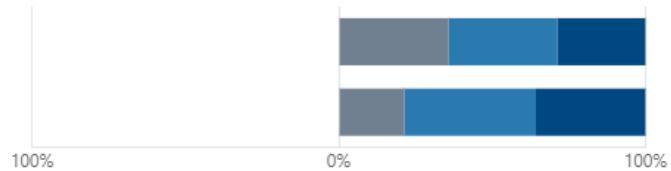
100% 0% 100%

13. USABILITY Satisfaction

[More Details](#)

■ 1 ■ 2 ■ 3 ■ 4 ■ 5 ■ 6

I found the system's interface design is pleasant.



I found the system has the functions and performs tasks as what I expected.

14. Comments and Suggestions

[More Details](#)

Insights

10
Responses

Latest Responses

"I like how they used original art in their project and I love that the focus of t...
"The graphics in the website are good. Would be better to improve the desig...

Update

5 respondents (56%) answered **good** for this question.

...

page is too long

page **good** **website**

images in some pages

information

APPENDIX Q.

CLIENT

ACCEPTANCE

REPORT



CLIENT ACCEPTANCE FORM

Purpose: The Acceptance form signifies accomplishment of the delivered solution; it verifies what deliverables are being turned over to the client and that the client has accepted / approved those deliverables. This form would be completed during the Close phase of a project where the project team is handing over a solution/deliverable to the client.

Project Name	Ecotopia: A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Arcade Game
Project Members	Dela Cruz, Karina B.
	Regala, Vincent B.
	Roxas, Karl Marx V.
	San Roque, Maura Elaine I.
Project Description	Ecotopia is a website focused on raising awareness about climate change. This website is designed to enlighten users about the causes, effects, and possible solutions to climate change. The study implements a parallax effect on the landing page, creating an interactive and visually appealing browsing experience. Functioning as information hub, the website provides users with the opportunity to access current information and materials pertaining to climate change, effectively tackling one of the most pressing challenges of our era. The research target audience focuses on senior high school students, with the goal of enhancing consciousness and promoting proactive initiatives to confront the climate emergency. The objectives include developing a comprehensive web application with interactive elements and a retro mini arcade game focusing water pollution within the context of climate change and lastly, an admin module for modifying selected contents.
Important Notes for Completing this Document. Each section of the Acceptance Form must be completed in full. If a particular section is not applicable to this project, then you must write <i>Not Applicable</i> and provide a reason. Important Note: No sections are to be deleted from this document. Text contained within <> provides information on how to complete that section and can be deleted once the section has been completed.	

LIST OF CLIENT DELIVERABLES

Deliverables	
	1. Has developed an Interactive and Multimedia element in a parallax effect.

LIST OF CLIENT DELIVERABLES	
	<ul style="list-style-type: none">2. Has developed a web-based self-assessment module to measures the user's understanding of learning content.3. Has developed a website with admin module to update necessary content.4. Has developed a mini-arcade game module related to the issue of water pollution within the context of climate change.
Acceptance Response	<input checked="" type="checkbox"/> Accepted <input type="checkbox"/> Not Accepted until below issues are addressed. <input type="checkbox"/> Accepted provided below issues are addressed.
Issues	
Additional Comments	

PREPARED BY		
Project Manager	Roxas, Karl Marx V. (name)	11/7/23 (signature)  (date)
REVIEWED BY		
Client	Mr. Christian John V. Evangelista (name)	11/7/23 (signature)  (date)
APPROVED BY		
Client	Mr. Christian John V. Evangelista (name)	11/7/23 (signature)  (date)

ACCEPTANCE TESTING	Pass/Fail	Date	Initials
STANDARD MODULES			
1. Can you access all the modules?	P	11/7/23	CJVE
2. Are there appropriate menu options available?	P	11/7/23	CJVE
3. Are there appropriate buttons available?	P	11/7/23	CJVE
4. Does the system produce relevant and reliable information?	P	11/7/23	CJVE
5. Do all the information display correctly?	P	11/7/23	CJVE
6. Are the contents appropriate to the target audience?	P	11/7/23	CJVE
7. Does error notification appear whenever error occur?	P	11/7/23	CJVE
8. Does error notification give useful information?	P	11/7/23	CJVE
9. Is the system easy to navigate and understand?	P	11/7/23	CJVE
10. Do the graphics and assets appear clearly and on time?	P	11/7/23	CJVE
11. Does the system and its component load in reasonable time?	P	11/7/23	CJVE
12. Does the system give accurate result in relevance with the overall objectives of the project?	P	11/7/23	CJVE
FUNCTIONAL MODULES			
1. Does the system provide a parallax scrolling effect on the landing page/homepage?	P	11/7/23	CJVE
2. Can the user navigate the mini arcade game?	P	11/7/23	CJVE
3. Does the mini arcade game provide clear instructions?	P	11/7/23	CJVE
4. Can the user select option on the mini arcade game?	P	11/7/23	CJVE
5. Does the mini arcade game question relevant and clear?	P	11/7/23	CJVE
6. Does the mini arcade game provide necessary trivia information?	P	11/7/23	CJVE
7. Is the heart life reduced when the answer is wrong in the mini arcade game?	P	11/7/23	CJVE

8. Does the mini arcade game provide information when the answer is wrong?	P	11/7/23	Q	CWE
9. Can you navigate and access the login page for admin?	P	11/7/23	Q	CWE
10. Can you login the provided admin credentials?	P	11/7/23	Q	CWE
11. Can you successfully access the admin page?	P	11/7/23	Q	CWE
12. Can the admin access and navigate the admin panel?	P	11/7/23	Q	CWE
13. Can the admin modify the selected contents and text box?	P	11/7/23	Q	CWE
14. Does the publish button work?	P	11/7/23	Q	CWE
15. Does an error message/notification appear whenever error occurs in the admin?	P	11/7/23	Q	CWE

APPENDIX R.

SOFTWARE

PROGRESS

REPORTS

SOFTWARE PROGRESS REPORT

System Submission (51% to 75% System Functionalities)

Date: September 13, 2023	System Status: <u>64.22%</u>
Capstone Title: Ecotopia: A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Game	Researchers: 13. Dela Cruz, Karina B. 14. Regala, Vincent B. 15. Roxas, Karl Marx V. 16. San Roque, Maura Elaine I.

System Update

MODULES (Checklist)	LIST OF ITEMS ACCOMPLISHED (DESCRIPTION)	ACCOMPLISHED RATING (%)	REVISIONS NEEDED
Landing Page	<input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Responsive Landing Page. <input checked="" type="checkbox"/> Short Descriptions for Climate Change Solutions <input checked="" type="checkbox"/> Parallax Effects	100%	No Revision Needed
Materials <ul style="list-style-type: none"> ▪ Current Issues ▪ Cases ▪ Solutions ▪ Overview of Climate Change ▪ Assessment 	Materials <input checked="" type="checkbox"/> Responsive Web Modules <input checked="" type="checkbox"/> Backend Current Issues <input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Contents Cases <input checked="" type="checkbox"/> UI/UX Solutions <input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Contents Overview of Climate Change	90%	Current Issues Module <ul style="list-style-type: none"> • Reformat Layout Content • Insert Problem Images • Include Ocean Acidification Issue Cases Module <ul style="list-style-type: none"> • Revise Cases Content into UN SDG no. 13 Overview of Climate Change Module <ul style="list-style-type: none"> • Update Overview of Climate Change Statistics into 2020 data

	<input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Contents Assessment <input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Trivia Game <input checked="" type="checkbox"/> Pop Quiz		
News	<input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> News Contents <input checked="" type="checkbox"/> Responsive Webpage <input checked="" type="checkbox"/> Backend	99%	<ul style="list-style-type: none"> • News Image Thumbnails
About Us	<input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Contents <input checked="" type="checkbox"/> Responsive Webpage <input checked="" type="checkbox"/> Backend	99%	<ul style="list-style-type: none"> • Beneficiary Logo
Escape Room	<input checked="" type="checkbox"/> Level 1 <input checked="" type="checkbox"/> Level 2	80%	<ul style="list-style-type: none"> • Revise Level 2 Trivia Measurement Information
Admin	<input checked="" type="checkbox"/> Current Issues UI/UX <input checked="" type="checkbox"/> 4 Cases UI/UX <input checked="" type="checkbox"/> 3 Solutions UI/UX <input checked="" type="checkbox"/> Assessment UI/UX <input checked="" type="checkbox"/> Backend <input checked="" type="checkbox"/> Login UI/UX <input checked="" type="checkbox"/> Responsive Webpage <input checked="" type="checkbox"/> Input Validation	100%	No Revisions Needed
Security	<input checked="" type="checkbox"/> Encrypt admin password in Database.	10%	No Revisions Needed

Hosting	No Accomplishment	0%	No Revisions Needed
Dockerize/Containerize	No Accomplishment	0%	No Revisions Needed

Checked by:



RYAN RICHARD H. GUADANA
Adviser

Signature over printed Name

Date : 09/15/23

Noted by:

EMELIZA R. YABUT

Capstone Teacher

Signature over printed name

Date : _____

SOFTWARE PROGRESS REPORT

System Submission (76% to 100% System Functionalities)

Date: October 19, 2023	System Status: 91.25%
Capstone Title: Ecotopia: A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Game	Researchers: 5. Dela Cruz, Karina B. 6. Regala, Vincent B. 7. Roxas, Karl Marx V. 8. San Roque, Maura Elaine I.

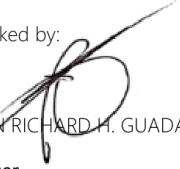
System Update

MODULES (Checklist)	LIST OF ITEMS ACCOMPLISHED (DESCRIPTION)	ACCOMPLISHED RATING (%)	REVISIONS NEEDED
Landing Page	<input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Responsive Landing Page. <input checked="" type="checkbox"/> Short Descriptions for Climate Change Solutions	70%	<ul style="list-style-type: none"> • Parallax Effect
Materials <ul style="list-style-type: none"> ▪ Current Issues ▪ Cases ▪ Solutions ▪ Overview of Climate Change ▪ Assessment 	Materials <input checked="" type="checkbox"/> Responsive Web Modules <input checked="" type="checkbox"/> Backend Current Issues <input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Contents Cases <input checked="" type="checkbox"/> UI/UX Solutions <input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Contents Overview of Climate Change	100%	No Revision Needed

	<input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Contents Assessment <input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Trivia Game <input checked="" type="checkbox"/> Pop Quiz		
News	<input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> News Contents <input checked="" type="checkbox"/> Responsive Webpage <input checked="" type="checkbox"/> Backend	100%	No Revision Needed
About Us	<input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Contents <input checked="" type="checkbox"/> Responsive Webpage <input checked="" type="checkbox"/> Backend	100%	No Revision Needed
Escape Room	<input checked="" type="checkbox"/> Scene 1 <input checked="" type="checkbox"/> Scene 2 <input checked="" type="checkbox"/> Scene 3 <input checked="" type="checkbox"/> Scene 4 <input checked="" type="checkbox"/> Scene 5	70%	<ul style="list-style-type: none"> • Add Storyline • Add Mechanics
Admin	<input checked="" type="checkbox"/> Current Issues UI/UX <input checked="" type="checkbox"/> 4 Cases UI/UX <input checked="" type="checkbox"/> 3 Solutions UI/UX <input checked="" type="checkbox"/> Assessment UI/UX <input checked="" type="checkbox"/> Backend <input checked="" type="checkbox"/> Login UI/UX <input checked="" type="checkbox"/> Responsive Webpage	100%	No Revisions Needed

	<input checked="" type="checkbox"/> Input Validation		
Security	<input checked="" type="checkbox"/> Encrypt admin password in Database.	90%	Tweaking
Hosting	<input checked="" type="checkbox"/> The website is deployed with Heroku.	100%	No Revisions Needed

Checked by:



RYAN RICHARD H. GUADANA
Adviser

Signature over printed Name

Date : 10/18/23

Noted by:

EMELIZA R. YABUT

Capstone Teacher

Signature over printed name

Date : _____

3/13/2024 SOFTWARE PROGRESS REPORT

System Submission (76% to 100% System Functionalities)

Date: October 19, 2023	System Status: <u>98.75%</u>
Capstone Title: Ecotopia: A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Game	Researchers: 9. Dela Cruz, Karina B. 10. Regala, Vincent B. 11. Roxas, Karl Marx V. 12. San Roque, Maura Elaine I.

System Update

MODULES (Checklist)	LIST OF ITEMS ACCOMPLISHED (DESCRIPTION)	ACCOMPLISHED RATING (%)	REVISIONS NEEDED
Landing Page	<input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Responsive Landing Page. <input checked="" type="checkbox"/> Short Descriptions for Climate Change Solutions <input checked="" type="checkbox"/> Parallax Effects	100%	No Revision Needed
Materials <ul style="list-style-type: none"> ▪ Current Issues ▪ Cases ▪ Solutions ▪ Overview of Climate Change ▪ Assessment 	Materials <input checked="" type="checkbox"/> Responsive Web Modules <input checked="" type="checkbox"/> Backend Current Issues <input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Contents Cases <input checked="" type="checkbox"/> UI/UX Solutions <input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Contents Overview of Climate Change	100%	No Revision Needed

	<input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Contents Assessment <input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Trivia Game <input checked="" type="checkbox"/> Pop Quiz		
News	<input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> News Contents <input checked="" type="checkbox"/> Responsive Webpage <input checked="" type="checkbox"/> Backend	100%	No Revision Needed
About Us	<input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Contents <input checked="" type="checkbox"/> Responsive Webpage <input checked="" type="checkbox"/> Backend	100%	No Revision Needed
Escape Room	<input checked="" type="checkbox"/> Scene 1 <input checked="" type="checkbox"/> Scene 2 <input checked="" type="checkbox"/> Scene 3 <input checked="" type="checkbox"/> Scene 4 <input checked="" type="checkbox"/> Scene 5	100%	No Revision Needed
Admin	<input checked="" type="checkbox"/> Current Issues UI/UX <input checked="" type="checkbox"/> 4 Cases UI/UX <input checked="" type="checkbox"/> 3 Solutions UI/UX <input checked="" type="checkbox"/> Assessment UI/UX <input checked="" type="checkbox"/> Backend <input checked="" type="checkbox"/> Login UI/UX <input checked="" type="checkbox"/> Responsive Webpage	100%	No Revisions Needed

	<input checked="" type="checkbox"/> Input Validation		
Security	<input checked="" type="checkbox"/> Encrypt admin password in Database.	90%	Tweaking
Hosting	<input checked="" type="checkbox"/> The website is deployed with Heroku.	100%	No Revisions Needed

Checked by:



RYAN RICHARD H. GUADANA
Adviser

Signature over printed Name

Date : 10/18/23

Noted by:

EMELIZA R. YABUT

Capstone Teacher

Signature over printed name

Date : _____

SOFTWARE PROGRESS REPORT

System Submission (76% to 100% System Functionalities)

Date: November 3, 2023	System Status: 100%
Capstone Title: Ecotopia: A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Game	Researchers: 1. Dela Cruz, Karina B. 2. Regala, Vincent B. 3. Roxas, Karl Marx V. 4. San Roque, Maura Elaine I.

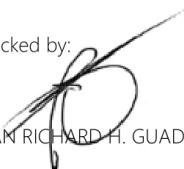
System Update

MODULES (Checklist)	LIST OF ITEMS ACCOMPLISHED (DESCRIPTION)	ACCOMPLISHED RATING (%)	REVISIONS NEEDED
Landing Page	<input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Responsive Landing Page. <input checked="" type="checkbox"/> Short Descriptions for Climate Change Solutions <input checked="" type="checkbox"/> Parallax Effect <input checked="" type="checkbox"/> Images	100%	No Revision Needed
Materials <ul style="list-style-type: none"> ▪ Current Issues ▪ Cases ▪ Solutions ▪ Overview of Climate Change ▪ Self-Assessment 	Materials <input checked="" type="checkbox"/> Responsive Web Modules <input checked="" type="checkbox"/> Backend Current Issues <input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Contents Cases <input checked="" type="checkbox"/> UI/UX Solutions <input checked="" type="checkbox"/> UI/UX	100%	No Revision Needed

	<input checked="" type="checkbox"/> Contents Overview of Climate Change <input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Contents Self-Assessment <input checked="" type="checkbox"/> UI/UX		
News	<input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> News Contents <input checked="" type="checkbox"/> Responsive Webpage <input checked="" type="checkbox"/> Backend	100%	No Revision Needed
About Us	<input checked="" type="checkbox"/> UI/UX <input checked="" type="checkbox"/> Contents <input checked="" type="checkbox"/> Responsive Webpage <input checked="" type="checkbox"/> Backend	100%	No Revision Needed
Escape Room	<input checked="" type="checkbox"/> Scene 1 <input checked="" type="checkbox"/> Scene 2 <input checked="" type="checkbox"/> Scene 3 <input checked="" type="checkbox"/> Scene 4 <input checked="" type="checkbox"/> Scene 5 <input checked="" type="checkbox"/> Storyline <input checked="" type="checkbox"/> Scoring <input checked="" type="checkbox"/> Mechanics	100%	No Revision Needed
Admin	<input checked="" type="checkbox"/> Current Issues UI/UX <input checked="" type="checkbox"/> 4 Cases/Climate Action SDG 13 UI/UX <input checked="" type="checkbox"/> 3 Solutions UI/UX <input checked="" type="checkbox"/> Self-Assessment UI/UX		

	<input checked="" type="checkbox"/> Backend <input checked="" type="checkbox"/> Login UI/UX <input checked="" type="checkbox"/> Responsive Webpage <input checked="" type="checkbox"/> Input Validation <input checked="" type="checkbox"/> News	100%	No Revisions Needed
Security	<input checked="" type="checkbox"/> Encrypt admin password in Database.	100%	No Revision Needed
Hosting	<input checked="" type="checkbox"/> The website is deployed with Heroku.	100%	No Revisions Needed

Checked by:



RYAN RICHARD H. GUADANA
Adviser

Signature over printed Name

Date : 11/3/23

Noted by:

EMELIZA R. YABUT
Capstone Teacher

Signature over printed name

Date : _____

APPENDIX S.

LETTERS

Request for Demonstration

 Dela Cruz, Karina
To: mdrmo@manila.gov.ph; officialmaniladrrmo@gmail.com
Cc: Roxas, Karl Marx; Regala, Vincent; San Roque, Maura Elaine
Manila DRRMO
September 5, 2023

Tue 9/5/2023 2:27 PM

Respected Mr. Amel Eustacio M. Angeles

Greetings! We are fourth year BSIT-MAA students from National University Manila, and we have written this letter to present our Capstone project. Our project is concerned with climate change, titled "ECOTOPIA: A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Arcade Game", and we had concluded that our system would be most useful to your department as it aligns with the agency's goals of reducing and managing disaster risks.

Our system consists of a responsive website with professional transitions, an admin module for editing and inputting new contents, a mini arcade game module, and an updatable assessment module. Most of the contents used are from reputable news sources, and can be updated for more relevant issues related to climate change.

We hope that you would consider to accept our proposal, as we believe it is mutually beneficial that your department is involved in our project as a client, as we also need your expertise and experience with working in the field to be able to create a more effective system that the public can benefit from. We would appreciate the opportunity to be able to discuss the further concerns and questions about the project.

Inclined with this proposal, we are requesting for live demonstration of our website today September 05, 2023 at 3:30pm. Apologies for very short notice. Our team can be reach out to this email delacruzkb@students.national-u.edu.ph and through our Team Leader mobile phone 09266614869. Thank you for your kind consideration.

Dela Cruz, Karina B.
NU Manila
BSIT-MAA, INF203
+63 995 464 6819

① Retention: National University Operations (15 years) Expires: Wed 9/1/2038 2:31 PM

 **Manila DRRMO** <mdrmo@manila.gov.ph>
To: Dela Cruz, Karina
Cc: officialmaniladrrmo@gmail.com; Roxas, Karl Marx; Regala, Vincent; San Roque, Maura Elaine

Tue 9/5/2023 2:31 PM

Request for Consultation Meeting

① Retention: National University Operations (15 years) Expires: Tue 9/7/2038 4:48 PM

 Dela Cruz, Karina
To: officialmaniladrrmo@gmail.com; **Manila DRRMO** <mdrmo@manila.gov.ph>
Cc: Roxas, Karl Marx; Regala, Vincent; San Roque, Maura Elaine

Mon 9/11/2023 4:48 PM

Good day, Madam/Sir,

I am writing to request a consultation regarding the "Ecotopia" particularly focused on raising awareness about climate change. Our specific areas of interest pertain to the software agreement associated with the project and the branding aspects.

We would like to propose a consultation session for tomorrow morning, September 12, 2023, at 10 am. However, if this time does not work for you, we are flexible and open to scheduling a meeting at your earliest convenience. We trust that this email finds you well, and we would greatly appreciate your kind consideration.

Please inform us of your availability for a consultation. You can reach out to us via this email or by calling 09266614869 to coordinate the details of the meeting.

Thank you for taking our request into account.

Best regards,

Dela Cruz, Karina B.
NU Manila
BSIT-MAA, INF203
+63 995 464 6819

[Reply](#) [Reply all](#) [Forward](#)

User Acceptance Test

To: officialmaniladrrmo@gmail.com; Manila MDRRMO <mdrrmo@manila.gov.ph>
Cc: Roxas, Karl Man; Regala, Vincent; San Roque, Maura Elaine
Sun 10/15/2023 2:13 PM

Dear, Ma'am/Sir

I hope this email finds you well. We are excited to inform you that we are nearing the final stages of development for **Ecotopia: A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Arcade Game** and we are now preparing for the crucial User Acceptance Testing (UAT) phase. Your expertise and feedback are invaluable to us, and we would like to invite you to participate in the UAT process.

In order to make sure the project fulfills the standards and expectations of our end-users, UAT is an essential phase. Your participation will assist us in identifying any potential problems, evaluating the usability and functionality, and confirming that the product complies with the requirements.

We would like to propose a meeting on **Wednesday October 18, 2023, at 3:00 pm**. However, if this time does not work for you, please let us know your availability for the UAT sessions, and we will do our best to accommodate your schedule.

Your feedback is vital in ensuring that we deliver a high-quality project to our users. We truly appreciate your participation and assistance in this endeavor.

If you have any questions or need further information about the UAT process, please feel free to reach out to us.

Thank you for your continued support and collaboration. We look forward to working with you during the User Acceptance Testing phase.

Best regards,

Dela Cruz, Karina B.
NU Manila
BSIT-MAA, INF203
+63 995 464 6819

MM Manila MDRRMO Mon 10/16/2023 4:51 AM

Confirming receipt of your email. Thank you.

MO Manila DRRM Office Mon 10/16/2023 9:16 AM

Got this, thanks.

Ecotopia

Hello, good day.

We would like to request the link to your website for future references. Thank you

--

Regards,
Research and Planning Division

CITY OF MANILA
MANILA DISASTER RISK REDUCTION AND MANAGEMENT OFFICE



0932-662-2322
mdrrmo.rp@gmail.com
officialmaniladrrmo@gmail.com
Manila DRRM Office
4th Fl. Rm. 449 Manila City Hall Bldg.
Padre Burgos, Ermita, Mia

Retention: National University Operations (15 years) Expires: Sat 10/16/2038 1:42 PM

Dela Cruz, Karina
To: Manila DRRM - Research and Planning Division <mdrrmo.rp@gmail.com>



Fri 10/20/2023 1:42 PM

Greetings!

I apologize for the delayed response. Here's the link to the website: 'ecotopiabeta.live' the comments that you provided are still in progress, and we will update you once they have been implemented. Additionally, we would like to request the details of your organization, such as a brief description and the organization's mission and vision. Thank you.

Respectfully,
Dela Cruz, Karina B.
NU Manila
BSIT-MAA, INF203

Ecotopia Survey Evaluation Form for IT Professionals

Dela Cruz, Karina
To: Manila MDRRMO <mdrrmo@manila.gov.ph>; Manila DRRMO - Research and Planning Division <mdrrmo.rp@gmail.com>

Wed 10/25/2023 7:29 PM

Greetings,

We, fourth-year students the developers and researchers from the National University - Manila of College of Computing and Information Technology majoring in Multimedia Arts and Animation, are currently developing a capstone project entitled "**Ecotopia: A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Arcade Game.**" is designed to promote awareness of climate change.

We are calling for the help of IT professionals to evaluate our system through the evaluation form. Please rest assured that all information gathered will be treated with the utmost confidentiality. Your data will not be shared or used for anything other than to enhance our web application. The survey will remain open until October 27, 2023, and we encourage them to complete it at their earliest convenience. Your time and effort hold significant weight in the progression of this project. We extend our sincere gratitude, and may you be blessed.

Note: if an error is encountered in the web app like "cannot get" just re-enter the ecotopia.live as we, the developers, are still fixing this bug. Thank you for your patience and understanding.

Instruction for Evaluating Ecotopia Web Application

Please follow the steps below to navigate the system and complete the evaluation form.

- Access the Web Application:** Open your web browser and go to the URL: [\[ecotopia.live\]](http://ecotopia.live). You will be directed to the homepage of the Ecotopia web application.
- Explore the Web Application:** Spend some time navigating through the different sections of the application. Pay attention to the content, features, and user interface.
- Evaluate the Content:** Assess the quality and relevance of the information provided about climate change. Consider the accuracy of the data and the effectiveness of conveying awareness.
- Test Features and Functionality:** Try out the various features available on the web application, such as materials, self-assessment, news, game and admin page.

Ecotopia Survey Evaluation Form for IT Professionals

game and admin page.

Admin page: ecotopia.live/login

Login Credentials:

Username: itprofessional

Password: itprofessional

5. User Experience: Share your thoughts on the user experience. Evaluate the ease of navigation, site speed, and overall design.

6. Complete the Evaluation Form: After exploring the application, please complete the evaluation form. Click on the provided link, which will direct you to the form where you can give feedback.

Evaluation Form Link:
<https://forms.office.com/r/8meYdgN9vX>

7. Submit your Evaluation: Once you have completed the evaluation form, click the "Submit" button to submit your feedback. Your input is precious in helping us enhance our web application.

Thank you for your time and valuable input in assessing our Ecotopia web application. Your feedback will contribute to the ongoing development of our platform and our commitment to raising awareness about this critical issue.

Warm Regards,

Dela Cruz, Karina B.
NU Manila
BSIT-MAA, INF203
+63 995 464 6819

MM Manila MDRRMO
Acknowledged.

Thu 10/26/2023 8:16 AM

Permission to Conduct Survey

① Retention: National University Operations (15 years) Expires: Sat 10/16/2038 10:22 AM

 Dela Cruz, Karina
To: Catherine C. Ruiz
Cc: Roxas, Karl Marx; Regala, Vincent; San Roque, Maura Elaine

Fri 10/20/2023 10:22 AM

Good day, Ma'am Ruiz! I hope this email finds you well. I am a 4th-year student at the College of Computer and Information Technology (CCIT) currently enrolled in the capstone course, guided by Mr. Ryan Richard Guadaña. I am reaching out to you today to inquire about the possibility of conducting a survey focused on senior high school students in the Nazareth community.

Our project, titled 'Ecotopia: A Parallax-Enabled Website for Climate Change Awareness with an Interactive Mini Arcade Game,' aims to raise awareness about climate change through an interactive platform. We believe that understanding the perspectives and opinions of senior high school students in Nazareth will provide valuable insights into developing our project to be more relevant and engaging for our target audience.

Our group is targeting to conduct a survey on Tuesday, October 24, 2023, which will require 20-30 minutes of the participants' time. In addition to this, our team is interested in obtaining data regarding the total population of Senior High School students enrolled in your institution for the current school year.

We kindly request your permission to engage with Nazareth's senior high school students for this survey. Your guidance and support in facilitating this research would be greatly appreciated and instrumental in the success of our project. Please let us know your thoughts on this proposal, and if there are any specific guidelines or procedures, we should follow in obtaining permission or conducting the survey.

Thank you for considering our request, and we look forward to your response. If you require any additional information or details about our project, please do not hesitate to contact us.

Best Regards,

Dela Cruz, Karina B.
NU Manila
BSIT-MAA, INF203
+63 995 464 6819

Permission to Conduct Survey on Senior High School Students

① Retention: National University Operations (15 years) Expires: Tue 10/19/2038 9:46 AM

 Dela Cruz, Karina
To: Christchelle G. Mondano
Cc: Roxas, Karl Marx; Regala, Vincent; San Roque, Maura Elaine

Mon 10/23/2023 9:46 AM

Good day! I hope this email finds you well. We are 4th-year student at the College of Computer and Information Technology (CCIT) currently enrolled in the capstone course, guided by Mr. Ryan Richard Guadaña. I am reaching out to you today to inquire about the possibility of conducting a survey focused on senior high school students in the Nazareth community.

Our project, titled 'Ecotopia: A Parallax-Enabled Website for Climate Change Awareness with an Interactive Mini Arcade Game,' aims to raise awareness about climate change through an interactive platform. We believe that understanding the perspectives and opinions of senior high school students in Nazareth will provide valuable insights into developing our project to be more relevant and engaging for our target audience.

Our group is targeting to conduct a survey on Tuesday, October 24, 2023, which will require 20-30 minutes of the participants' time. In addition to this, our team is interested in obtaining data regarding the total population of Senior High School students enrolled in your institution for the current school year.

We kindly request your permission to engage with Nazareth's senior high school students for this survey. Your guidance and support in facilitating this research would be greatly appreciated and instrumental in the success of our project. Please let us know your thoughts on this proposal, and if there are any specific guidelines or procedures, we should follow in obtaining permission or conducting the survey.

Thank you for considering our request, and we look forward to your response. If you require any additional information or details about our project, please do not hesitate to contact us.

Regards,

Dela Cruz, Karina B.
NU Manila
BSIT-MAA, INF203
+63 995 464 6819

Permission to Conduct Survey on Senior High School Students

Dela Cruz, Karina
Good day! I hope this email finds you well. We are 4th-year student at the College of Computer and Information Technology (CCIT) currently enrolled in the cap... Sat 10/21/2023 12:13 PM

Christchelle G. Mondano
Good day. May I request for a copy of your survey questionnaire? Thank you. Christchelle G. Mondano, MAEd SHS Principal Mon 10/23/2023 4:02 PM

Retention: National University Operations (15 years) Expires: Tue 10/19/2038 4:30 PM

Dela Cruz, Karina
To: Christchelle G. Mondano

SYSTEM EVALUATION QUEST...
267 KB

Hello, here is the link to our form that we will use for conducting our survey: <https://forms.office.com/r/qcmFYE4c2N>. Additionally, the document is attached in this email with the questions used in the Microsoft Form. Thank you.

Dela Cruz, Karina B.
NU Manila
BSIT-MAA, INF203
+63 995 464 6819

...

Reply Forward

Ecotopia Survey Evaluation

Dela Cruz, Karina
To: Jaime Rhosse M. Dela Cruz
Cc: Roxas, Karl Marx; Regala, Vincent; San Roque, Maura Elaine Thu 10/26/2023 10:23 AM

Hello,

We hope this email finds you in good health. We are fourth-year students at the College of Computer and Information Technology (CCIT), specializing in multimedia arts and animation. Our capstone project, "Ecotopia: A Parallax-Enabled Website for Climate Change Awareness with an Interactive Mini Arcade Game," is designed to promote awareness of climate change.

We are writing this email to kindly request your assistance in conducting a survey targeting senior high school students. Their participation is vital as they will evaluate our system and provide valuable insights. Taking just a few minutes to complete our survey will help us better understand their preferences.

The survey will remain open until October 27, 2023, and we encourage them to complete it at their earliest convenience. Their feedback is important to us, and we eagerly anticipate hearing their thoughts and suggestions.

To access the survey and the web application, please click on the following links: <ecotopia.live> and <https://forms.office.com/r/qcmFYE4c2N>. These links will also be included in the instructions sent in a separate email.

Additionally, we would like to note that if an error is encountered in the web app like "cannot get" just re-enter the <ecotopia.live>. As we, the developers, are still fixing this bug.

Lastly, we kindly request access to data regarding the total number of senior high school students enrolled this school year.

Your assistance is instrumental in making the Ecotopia web app even better. Thank you and God bless.

Warm regards,

Survey Evaluation Instruction

 Dela Cruz, Karina
To: Jaime Rhosse M. Dela Cruz
Cc: Regala, Vincent; Roxas, Karl Marx; San Roque, Maura Elaine

Thu 10/26/2023 10:24 AM

Greetings,

We, the developers and researchers from the National University - Manila of College of Computing and Information Technology majoring in Multimedia Arts and Animation, are currently developing a capstone project entitled "**Ecotopia: A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Arcade Game.**"

Kindly evaluate our system through the evaluation form. Please rest assured that all information gathered will be treated with the utmost confidentiality. Your data will not be shared or used for anything other than to enhance our web application. Your time and effort hold significant weight in the progression of this project. We extend our sincere gratitude, and may you be blessed.

Note: if an error is encountered in the web app like "cannot get" just re-enter the ecotopia.live. As we, the developers, are still fixing this bug. Thank you for your patience and understanding.

Instruction for Evaluating Ecotopia Web Application

Please follow the steps below to navigate the system and complete the evaluation form.

- Access the Web Application:** Open your web browser and go to the URL: ecotopia.live. You will be directed to the homepage of the Ecotopia web application.
- Explore the Web Application:** Spend some time navigating through the different sections of the application. Pay attention to the content, features, and user interface.
- Evaluate the Content:** Assess the quality and relevance of the information provided about climate change. Consider the accuracy of the data and the effectiveness of conveying awareness.
- Test Features and Functionality:** Try out the various features available on the web application, such as materials, self-assessment, news, and game.

Survey Evaluation Instruction

features, and user interface.

- Evaluate the Content:** Assess the quality and relevance of the information provided about climate change. Consider the accuracy of the data and the effectiveness of conveying awareness.
- Test Features and Functionality:** Try out the various features available on the web application, such as materials, self-assessment, news, and game.
- User Experience:** Share your thoughts on the user experience. Evaluate the ease of navigation, site speed, and overall design.
- Complete the Evaluation Form:** After exploring the application, please complete the evaluation form. Click on the provided link, which will direct you to the form where you can give feedback.

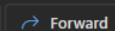
Evaluation Form Link: <https://forms.office.com/r/qcmFYE4c2N>

- Submit your Evaluation:** Once you have completed the evaluation form, click the "Submit" button to submit your feedback. Your input is precious in helping us enhance our web application.

Thank you for your time and valuable input in assessing our Ecotopia web application. Your feedback will contribute to the ongoing development of our platform and our commitment to raising awareness about this critical issue.

Regards,

Dela Cruz, Karina B.
NU Manila
BSIT-MAA, INF203
+63 995 464 6819

 Reply  Reply all  Forward



September 13, 2023

MR. ARNEL EUSTACIO M. ANGELES, MPA

Director

Manila Disaster Risk Management Reduction and Management Office

Dear Director Angeles:

We are writing this letter for your confirmation on accepting our proposal with regards to our project about Climate Change which is entitled “Ecotopia: A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Arcade Game” that was held on September 05, 2023, at 3:30pm.

With a focus on this project, this letter aims to formalize the agreement, organization branding and outline the scope and delimitation of the software functionality. The details of the software are elaborated below.

Scope

1. The project consists of 11 web modules.
 - **Admin Page** for modifying contents. The admin is exclusive to updating the content of Current Issues, Cases, Solutions and Assessment Module.
 - **Landing Page** that features light and professional transitions and animation on a responsive webpage
 - **Materials** section with a drop-down menu containing:
 - o **Current Issues** related to climate change challenges in the Philippines.
 - o **Cases** that provide details on the UN Sustainable Goal number 13 about taking urgent action to combat climate change and its impacts.
 - o **Solutions** module containing data on potential solutions for addressing climate change.
 - o **Overview of Climate Change** information contents.
 - o **Assessment** designed to evaluate users' knowledge gained from using the website.
 - **News** module that provides the news related to climate change.
 - **Games** that integrate a three-level *Mini Arcade Game* for users to engage with and learn from.
 - **About Us** that contains team description and beneficiary details.

Delimitations

1. The game is a traditional mini arcade game without any features for individual user account management or dashboard monitoring learning progress.
2. The game is limited to desktop and laptop devices that can cater 800*600px resolution only and it is not responsive.
3. No personalized game progress tracking, dashboard, or report summaries available.
4. Admin could modify the material except for government resources and the overview of climate change.
5. The structure of the admin updatable module is not editable.
6. News and features can be edited directly on the database. No version history provided, preventing the tracking of edits and contributors.
7. Published changes cannot be undone, and there are no draft-saving options during content updates.
8. Admin page can only be accessed through desktop devices.
9. The project is not a learning management software nor a formal E-learning tool.

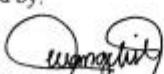
We are excited with the opportunity to work with you on this project. Thank you so much for providing this golden chance to us. Should you have any questions, concerns, or any assistance, please do not hesitate to reach out to us.

Sincerely,


KARL MARX ROXAS

Team Leader

Reviewed by:


CHRISTIAN JOHN V. EVANGELISTA
Resident Meteorologist
Deputy Chief, Research and Planning Division

Meeting Request for Client Acceptance Form

Dela Cruz, Karina
To: Manila DRRMO - Research and Planning Division <mdrrmo.rp@gmail.com>; +1 other

Fri 11/3/2023 6:41 PM

Good day,

We hope you are doing well. We would like to meet to discuss the Client Acceptance Form, a crucial step in our ongoing project. As we near the final stage of the project, it is necessary to review and finalize this document to ensure a successful completion.

We proposed a meeting on November 7, 2023, at 10:00 a.m. Please let us know your availability or if the proposed date and time work for you. If there is a better time for you, please don't hesitate to suggest an alternative, as we are flexible to accommodate your schedule.

Thank you for your attention, and we look forward to your prompt response.

Regards,
Dela Cruz, Karina B.
NU Manila
BSIT-MAA
+63 995 464 6819

MM Manila MDRRMO

Received, thank you.

Mon 11/6/2023 9:21 AM

Dela Cruz, Karina
To: Manila MDRRMO <mdrrmo@manila.gov.ph>; +1 other
Cc: Roxas, Karl Marx; Regala, Vincent; San Roque, Maura Elaine

Fri 11/10/2023 10:05 AM

Client Acceptance Form.pdf 287 KB

Project Acceptance Letter.pdf 127 KB

User Acceptance Test.pdf 678 KB

3 attachments (1 MB) Save all to OneDrive - National University Download all

Good day,

I trust that this email finds you well. I'm writing to inform you of the updated link to the Ecotopia web application. I've included the link below to access the web application.

Web link: ecotopia.live

Also, I have attached a copy of the signed documents related to our project testing and agreements. If you have any concerns or clarification, please do not hesitate to contact us. Thank you!

Dela Cruz, Karina B.
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MM Manila MDRRMO

Received, thank you.

Fri 11/10/2023 10:40 AM

APPENDIX T.

TRANSCRIPTS OF

INTERVIEW

TRANSCRIBE OF INTERVIEW

Date: September 5, 2023

Interviewer: Dela Cruz, Karina B.

Regala, Vincent B.

Roxas, Karl Marx V.

San Roque, Maura Elaine I.

Interviewee: Mr. Christian John V. Evangelista

Venue: Manila DRRM Office

Mode of Interview: Face-to-Face

Roxas: Good afternoon Ma'am and Sir. We are honored to be here and present our Capstone Project to your organization. My name is Karl Marx Roxas the Team Leader of the group, together with Mr. Regala, Ms. Dela Cruz and Ms. San Roque. We are here because we have concluded that our system would be most useful to your organization as it aligns with the agency's goals of reducing and managing disaster risk.

Mr. Evangelista: Good afternoon to all of you. So, first of all let me introduce to you myself. I'm Christian John Evangelista the Resident Meteorologist here in this department. Nice to meet you guys, actually tamang tama ang dating niyo dahil about sa climate change ang study ko specifically about ocean acidification. Ang galing! BSIT kayo right? Yung laging nakatutok sa computer? Hahahaha... Ito si ma'am IT rin siya. Fourth year so parang thesis ito no? Anyway, goodluck and let's proceed with the presentation.

Roxas: Ang title po ng aming project ay Ecotopia: A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Arcade Game. Mag uumpisa po ako sa aming system. Ito po ang aming landing page, lahat po ng makikita niyong images are provided by our team specially created by our artists. Ang landing page po namin ay consist of a feature of a parallax effect, light scrolling effect po. Sa landing page rin po makikita ang overall summary ng aming system like yung information about climate change and yung game which is escape room kung tawagin namin. Next is yung sa materials page po may drop-down menu na nagcoconsist of Current issues, Cases, Solutions, Overview of Climate Change and yung Assessment po. Sa current issues diyan po makikita yung mga issues na kinakaharap ng ating bansa patungkol sa climate

change, ang nacover lang po naming na issues ay yung typhon, extreme weather events, sea level rise, coastal erosion, biodiversity, ecosystem loss, agriculture, food security, health risk, and water scarcity po. Ginather naming data ay in the Philippines lang po since masyadong malawak po ang problem ng climate change pag worldwide.

Mr. Evangelista: Yung data niyo san galing yan?

Dela Cruz: Nag research po kami online and we make sure po na reliable and trusted website po ang aming pinagkuhanan like government agencies po.

Roxas: Pag-aso and DOST po, at nirereference po naming sila every pages na may content or information na nakuha po kami para po pwedeng idouble check ni user kung totoo po ba talaga yung mga nilalagay namin dito.

Mr. Evangelista: Anong plano niyo after mavalidate yang system. Ipopost niyo ba iyan sa public? Pano pag gusto naming ipublic? Kaso hindi naming babayaran yan kasi wala naman kaming budget for that. Kumbaga ano ba gagawin? Certification ba na Manila DRRMO has partnered with Manila National University that they have developed a system about climate change? Ano ba? Sorry, kasi gusto ko direct to the point e.

Roxas: Depende po. Pero yes po it will be hosted and made for public po.

Mr. Evangelista: So ano ba ang basically na tinatackle ng system niyo? How do you battle climate change?

Regala: Climate Change Awareness po.

Mr. Evangelista: Current Issues mas better if include niyo ang Ocean Acidification, very good kasi ininclude niyo ang biodiversity. Biodiversity refers to maraming type of species sa maraming area. Alam niyo naman na sakop si Philippines ng biodiversity, nandyan si Indonesia, so diverse ang ating species matatay ang isang species may papalit kaya siya biodiverse. Kaya Maganda sa mga issues lagyan niyo siya ng images. Kaya ba?

Regala & Roxas: Kaya po.

Mr. Evangelista: Approved sakin yung system Maganda siya diyan palang sa part na yan. Proceed.

Roxas: Sa cases, may 4 cases lang po kaming ininclude. Yung problem of picking up trash, outdated engine, causes and effects po.

Mr. Evangelista: Ayan ang comment ko diyan, instead of tackling those topics. Change it to UN SDG's that addresses climate change. Alam niyo yung UN SDG's?

Team: Opo.

Roxas: Next po nagprovide din kami ng mga solutions po. Why we should take actions, what are the other solutions, Responding to climate change and Sustainability and Government Resources po.

San Roque: Sa government resources po nilagay naming lahat ng pwedeng puntahan ng users kung may ibang information pa silang gustong malaman about sa climate change po. Bali diyan din po kami kumukuha ng mga resources.

Mr. Evangelista: Pag hinover ba siya and clinick madidirect siya sa website?

Roxas: Hindi po.

Mr. Evangelista: Mas maganda kung madidirect siya sa website.

Roxas: Sige po, and overview of climate change po. Actually po ang data na makikita niyo dito ay hindi sa Philippines, Globally po siya galing sa NASA.

Mr. Evangelista: Kailan ang data niyo? 2020 ba? 1.3 ang global temperature. So might as well also include kung ano yung contribution natin sa climate change. Halimbawa global warming, isa ba tayo sa bansa na nag nagproduce ng carbon dioxide o green house gas? Diba hindi.

Roxas: Usually po richest country po ang pinakamataas.

Mr. Evangelista: Yes yung mga highly industrialized country like China, Europe, and America ang nasa top 1-5. Ang Pilipinas wala naman doon pero isa tayo sa naapektuhan diba. So tayo konti ang project ng government ng Pilipinas konti ang mitigation, more on adaptation tayo kasi wala naman tayong imimitigate masyado e like oo meron tayong outdated jeeps pero in a global scale konti lang ang ambag natin tapos isa tayo sa pinaka naapektuhan so dapat adaptation dapat tayo. So ilagay niyo lang din siya.

Roxas: Isa po sa nagcocontribute ng or cause ng climate change ay yung fracking tower, Galing po siya National Geographic.

Mr. Evangelista: Ano yon? Ano siya?

San Roque: Nagdidrill po

Roxas: Nagdidrill po siya sa ilalim tapos nag eemit po siya ng mga gas.

Mr. Evangelista: Nagdidrill siya sa ilalim?

San Roque: For fuel po.

Mr. Evangelista: Ah okay, type siya ng driller to extract oil sa lupa. Okay dagdag kaalaman. Then yung what's climate change, causes, solutions and evidence pag clinick may lalabas?

Roxas: Yes po.

Mr. Evangelista: Si climate change gasgas nayan e, hindi naman kasi magagawa yan ng isang bansa lang. Sige proceed.

Regala: Yung news and feature po, kinuha lang din naming sa reputable resources. Yung sa assessment naman po it consists of Trivia game and pop quiz po which is yung questions ay kinuha po naming sa content namin.

Mr. Evangelista: Sige nga ma'am sagutan natin hahah sige na proceed.

Regala: Proceed sa News, same lang po sa kanina kaso nga lang mas emphasize siya, pareparehas yung picture kasi hindi pa po nababago pero babaguhin po namin siya.

Roxas: Sa game naman po ang target naming ay 5 levels and ang nagagawa palang po naming ay dalawa and its all about climate escape. In development pa po yung 3 levels. Medyo mabagal po yung game siguro kasi sa internet.

Mr. Evangelista: Sige ok lang gets naman namin. Pero ano yung plano niyo sa tatlo?

Roxas: Pinag uusapan pa po namin.

Mr. Evangelista: Okay

Roxas: Yung last page po naming ay About Us that provides the details about the team and the beneficiary po. Also, it includes the objective of the project. So ang kagandahan sa website po namin pag tinurn over namin siya. Pwede po siya mabago ang content kahit hindi marunong magcode, kahit itype nalang sa administrator page. Pero yung mismong structure po ay hindi na mababago.

Mr. Evangelista: Siguro sa current issues gawin niyo siyang by tab instead of nandito siya sa baba.

Regala: Okay po sige po, and bali po material lang po ang nababago ng admin at magrereflect agad once na mapublish, other pages po ay hindi na as ease na po siya.

Roxas: To summarize po ang aming scope ng system may ten important modules yun ay ang Admin page, landing page, materials, current issues, cases, solutions, overview of climate change, assessment, news, at game. Sa landing page po it consists of a light scrolling parallax effect, yung game consist of 5 level game. May admin module po to modify materials content. Sa limitation naman po, ang game namin ay traditional arcade game module siya na walang individual user account management or dashboard for monitoring. Walang personalized game progress tracking or report summaries. Ang mamodify na content lang po ng admin ay materials except sa government resources and the overview of climate change and yung news po ay direct lang siyang maeedit sa database at walang version history and changes cannot be undone, inshort walang draft saving option. Lastly po maaaccess lang ang admin through desktop devices and walang admin user creation of account and management po. So ayun lang po ang aming project and system.

Mr. Evangelista: Okay goods wala naman na akong ibang comment kasi habang nagsasalita kayo ay nagrerecommend and comment na ako. Overall Goods! So, may survey ba akong kailangan na sagutan or what?

Roxas: Wala naman po, actually po naghahanap po kami ng beneficiary. Isa po kayo sa naisip naming since gusto naming may mapuntahan ang project namin. Nilapitan po namin kayo para alukin na maging client.

Mr. Evangelista: Eto si ma'am ang magdedecide hahaha, hindi. Goods naman actually diba I mentioned earlier na ayan nga nag hinahanap namin aside sa study ko about climate change, inadapt din namin yung innovation ngayon especially about climate change topic niyo. Yun nalang include niyo yung mga comment ko and dagdag ko lang na yung theme ng system niyo ay iakma niyo sa aming logo or might as well check niyo ang aming page and magbase kayo sa pinopost ng graphic designer namin whenever we post images and paki include ang aming logo. Tapos goods, wala naman na akong sasabihin nasabi ko na lahat.

Roxas: Kung may gusto po kayong idagdag pwede niyo po kaming icontact para mapag usapan kung kaya pa po ng time frame namin since konti nalang po ang aming oras para sa project na ito.

Mr. Evangelista: Okay, so far wala naman na goods na. Yon sige. Goods na, may pipirmahan ba ako?

Roxas: Meron po itong software agreement po.

Mr. Evangelista: Goods, okay na so punta lang kayo dito at mag email for consultation if ever needed, hanapin niyo lang ito si ma'am.

Dela Cruz: Thank you po ma'am and Sir Christian, pwede po ba kaming magpapicture sainyo for documentation po?

Mr. Evangelista: Sure, sure.

Roxas, Regala, Dela Cruz, and San Roque: Thank you po ma'am and sir.

APPENDIX U.

PHOTO

DOCUMENTATION



APPENDIX V.

IEEE PUBLISHED

FULL PAPER

Ecotopia: A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Arcade Game

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Abstract— The study presents a website focused on raising awareness about climate change. This website is designed to enlighten users about the causes, effects, and possible solutions to climate change. It is important to note that climate change is a long-term phenomenon caused by both human activities and natural factors, and it is different from rapid weather changes. The proposed study implements a parallax effect, creating an interactive and visually appealing browsing experience. Functioning as information hub, the website provides users with the opportunity to access current information and materials pertaining to climate change, effectively tackling one of the most pressing challenges of our era. The research targeted audience is on senior high school students, with the goal of enhancing consciousness and promoting proactive initiatives to confront the climate emergency. The objectives include developing a comprehensive web application with interactive elements and a retro mini arcade game focusing water pollution within the context of climate change to enhance engagement. However, the scope is limited to light transitions, and the admin module enables content editing without individual user account management or progress tracking. Despite these limitations, the study holds significant value in empowering individuals to take meaningful actions toward a sustainable future.

Keywords— Climate Change Education, Parallax Website, Parallax Effect, Mini Arcade Game, Information Awareness.

I. INTRODUCTION

The sudden increase in the pace of climate change has raised immediate concerns about the future of our planet. With the ongoing alteration of Earth's weather trends and temperatures, the necessity for thorough education and heightened consciousness becomes more vital than at any other time. This study delves into the purpose behind creating a parallax enabled website that serves as a powerful tool to provide information on climate change and empower individuals to respond effectively to this global crisis.

Climate change, characterized by prolonged alterations in weather patterns and temperatures, predominantly results from human activities such as industrial emissions and fossil fuel consumption. Distinguishing itself from ordinary weather fluctuations, climate change unfolds gradually over extended periods, spanning hundreds or even millions of years, as opposed to abrupt shifts occurring within mere hours. Its repercussions are far-reaching, encompassing rising sea levels, extreme weather phenomena, and adverse effects on human health [1].

To address this pressing issue, the proposed study showcases a parallax effect in a website that educates users on responding to climate change. It explains the significance of climate change as a long-term and urgent global issue caused by both natural phenomena and human activities. The study showcases implementing a parallax effect, a web design technique that enhances user experience. The project aims to create an e-learning website that offers education and resources on climate change and is of particular importance given the critical nature of climate change.

The context of the project is set within the framework of addressing climate change awareness and education, with the Manila Disaster Risk Reduction Management Office (MDRRMO) as the project's client. The MDRRMO aims to strengthen community resilience, promote sustainability, and encourage active participation among senior high school students in Manila.

The choice of senior high school students as the target audience is justified by their potential to act as change agents in their communities and their formative years for developing lifelong environmentally responsible habits. This project aims to engage, educate, and inspire these students through a parallax-enabled web application with an interactive mini-arcade game to combat climate change and contribute to a sustainable future.

The purpose and description of the project, known as Ecotopia, is to inspire senior high school students by providing resources and a visually captivating learning experience. It uses a parallax scrolling effect and an

interactive mini-arcade game to simplify complex climate information and motivate environmental action.

The study's objectives are outlined, emphasizing the development of interactive multimedia elements, self-assessment modules, an admin module for updating content, and a mini arcade game addressing water pollution within the context of climate change. The study aims to align the system with crucial evaluation principles such as functionality, usability, reliability, performance, and supportability. This project aims to impart knowledge, empower individuals, and mobilize meaningful actions to combat climate change and create a more sustainable future.

II. REVIEW OF RELATED LITERATURE

The researcher investigates subjects related to climate change, the parallax effect, and mini games to present justifying data for the proposed study and to analyze them. Below are summaries of several studies that the researcher has compiled.

A. Climate Change

Through cognitive reappraisal and climate change awareness, mindfulness is a key factor in fostering pro-environmental behavior. This study emphasizes how changing the way we think about climate change-related behaviors can raise awareness and improve behavioral decisions. A sense of connection to nature also affects pro-environmental attitudes, stressing the opportunity for personal accountability and beneficial environmental contributions. Cognitive reappraisal helps people manage their emotions related to climate change [2].

The urgency of the matter necessitates that the educational system addresses it by imparting knowledge about the impacts and potential remedies for climate change to students. The current lack of attention towards greenhouse gas emissions makes it imperative to both decrease these emissions promptly and prepare for the repercussions of climate change. It is crucial for public education to instill in students and the public a sense of duty to confront this global crisis through informed choices and sustainable behaviors, considering its evident effects on various aspects of life [3].

The focal point of the analysis lies in strategies to mitigate climate change, with a strong emphasis on the severe outcomes of climate change-induced disasters and the pressing need for immediate action. To lower greenhouse gas emissions and maintain control over global warming, the article examines traditional methods, negative emissions technology, and geoengineering approaches. This underscores the significance of effective strategies, points out the absence of a lasting remedy, and underscores the importance of assessing the feasibility and effectiveness of the suggested solutions [4].

This research delves into the consequences of climate change on ecosystems, considering elements like shifts in usual weather trends, the acidification of oceans, and the volume of carbon dioxide in the air. It examines how well ecosystems can withstand changes, their ability to mitigate the progress of climate change, and the intricate variety of their responses. The conversation underscores the importance of investigating adaptable ecosystems and outlines goals for both theoretical exploration and practical implementation. These aims are intended to safeguard a diverse and robust

biosphere in light of the challenges posed by climate change [5].

B. Parallax Web Design

The parallax effect focuses on the transition of static text and images into more interactive elements using HTML5, JavaScript, and CSS3 technologies. A popular method for producing eye-catching visual effects in web sites is called parallax scrolling, which uses layers with different movement rates. Because these technologies can now be used to create compelling and dynamic online content without the usage of plugins, user experiences have improved because of their adoption [6]. The research investigates the effect of parallax scrolling in web design on user experience. While parallax scrolling is often thought to increase engagement, a study involving 86 people found that it did not significantly improve overall user experience. However, it had a favorable impact on some factors such as "fun" and the sense of an aesthetically appealing site, indicating possible benefits in certain areas. While the study does not clearly prove its large impact, it does recommend that parallax scrolling be refined to optimize user engagement, emphasizing a nuanced awareness of its influence on numerous user experience characteristics for site designers [7].

A study entitled "How Does Parallax Scrolling Influence User Experience? A Test of TIME (Theory of Interactive Media Effects)" discusses that scrolling is a widely used web technique in product presentation websites, creating a captivating 3D effect by moving foreground objects faster than the background. Its popularity is attributed to the dimensionality and scrolling interactivity it offers, appealing to both web developers and users. A study with 295 participants investigated the impact of parallax scrolling on user engagement using a between-subjects design. It revealed two routes through which parallax scrolling influences user engagement: the cue route, involving perceived cohesiveness and vividness, and the action route, including natural mapping and perceived ease of use. The study emphasizes the potential of parallax scrolling to captivate users through its visual cues and interactive nature, fostering positive attitudes and intentions towards websites and showcased products. Web developers can leverage these findings to create immersive and engaging online experiences that resonate with users on an emotional level [8].

Parallax scrolling is a popular web design technique believed to enhance user engagement and satisfaction. A comprehensive study with 86 participants compared websites with and without parallax scrolling to assess its impact on various variables like usability, satisfaction, enjoyment, fun, and visual appeal. Statistical analysis revealed that parallax scrolling did not significantly improve the overall user experience as commonly believed. However, it did have positive effects on specific aspects, particularly increasing the "fun" factor and perception of a more professionally designed and visually appealing website. Further exploration and refinement of parallax scrolling implementation are recommended to optimize user engagement and satisfaction. Web designers should approach its use with a nuanced understanding of its influence on different aspects of the user experience [9].

C. Arcade Game

The research introduces an innovative online game inspired by a competitive board game, aiming to enhance students' learning outcomes in web-based problem-solving tasks. The game employs strategic actions involving information-searching questions and interactive mini-games. An elementary school experiment demonstrated significant improvements in student engagement, learning attitudes, interest, and achievements in web-based problem-solving activities. This study underscores the effectiveness of incorporating gamification elements to enrich educational experiences and achieve positive learning outcomes, suggesting its potential adaptation across diverse educational contexts [10].

A study about "Assessing the Usefulness of Mini-Games as Educational Resources" discusses the growing interest in educational gaming, particularly in lightweight educational mini-games, and raises questions about their actual educational value and potential shallowness. It takes a comprehensive approach by examining existing researchers proposed educational requirements to establish a solid foundation for analysis. The study investigates around 30 educational mini-games and highlights the contrasting experiences they offer, with some being captivating and informative, while others appear lackluster and formulaic. The paper aims to empower educators to make informed decisions about incorporating educational mini games into their teaching strategies. By understanding the strengths and weaknesses of these games, educators can tailor their approaches to better align with their educational objectives, ensuring maximum benefits for their learners [11].

Recent studies on climate change have not only deepened our understanding of its complex and far-reaching impacts but have also uncovered the intricate parallax effects within the Earth's dynamic systems. As researchers work to clarify the interconnectedness of environmental processes, innovative approaches such as incorporating mini games into educational platforms have emerged. The mini games serve to not just increase public participation and consciousness, but also provide interactive means to grasp the pressing need for tackling climate-related issues. This ultimately nurtures a worldwide community that is better informed and empowered to take sustainable actions.

III. METHODOLOGY

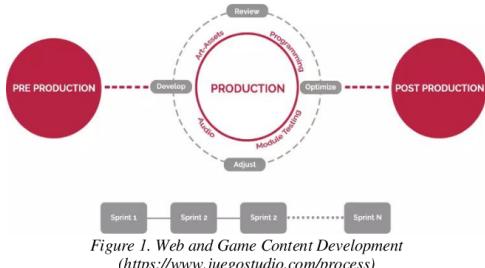


Figure 1 highlights the production process model of parallax web development and the various phases involved in game development, including pre-production and post-production phases. These processes are suitable for the production stage of a parallax website with mini arcade game.



*Figure 2. Outlined Web and Game Phases
(<https://www.juegostudio.com/process>)*

Conceptualization phases begin with establishing a clear vision or the direction of the implementation, ultimately it is the setting stage for the successful execution of the project.

Pre-production started with brainstorming, drafting concepts, scenario writing, research, and content gathering since ideas needed to be finalized before production started. The finalizing of the concepts is followed by the drafts of the content and assets themselves.

Production phase are clearly defined tasks. These tasks include executing the scenarios that have been outlined, creating objects, images, backgrounds, and sounds to be used in the game, and filtering the gathered data in addressing the topic.

Post-production is the last phase, considering that revisions are also done during the production phase and thus there aren't major adjustments needed aside from resizing assets, adjusting formats, minor changes on the web content or adjusting some web UI.

IV. SYSTEM DEVELOPMENT

A. System Architecture

Figure 3 shows the system architecture of the Ecotopia. The Web pages consists of parallax-enabled landing page, current issues in the Philippines, climate action SDG 13, solutions, overview of climate change, assessment, news, game, and about us. The current issues, climate action SDG 13, solutions, and assessments content are stored in MongoDB. In game, Escape Room, it will have a 5 scene that user can play. In admin module, the news, climate action, solutions, and assessment are editable by administrator.

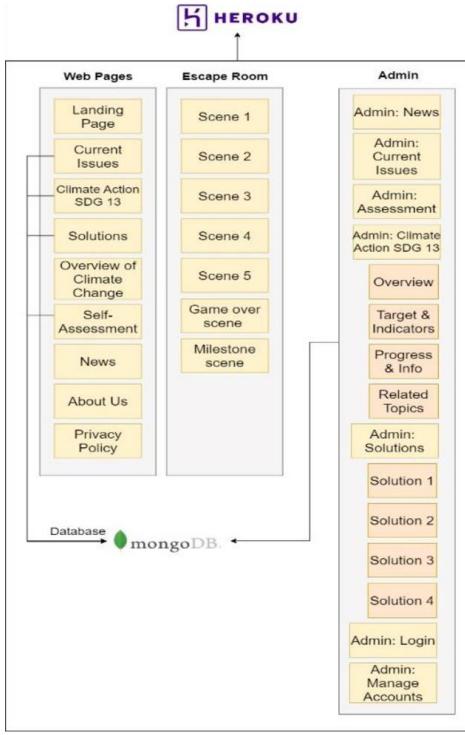


Figure 3. System Architecture

B. Use Case Diagram

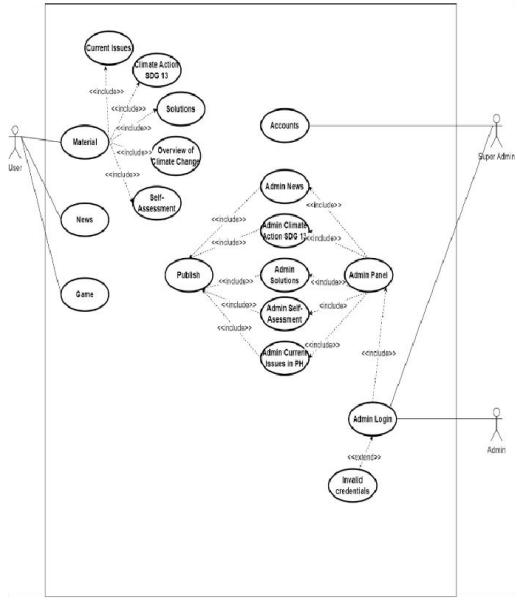


Figure 4. Use Case Diagram

Figure 4 illustrates the use case diagram of the system. It enables the analysts to recognize the system requirements and demonstrates the procedures that should be possible inside the system's limit. It additionally includes the two actors in the system. The actors of the system are the user, and administrator. The user can directly access the Material, and in the material, there are items that user can choose from. There are current issues, climate action SDG 13, solutions, overview of climate change, and self-assessment. Moreover, user can access news and lastly, they can play the game. A user cannot directly access the admin panel without logging in first.

The administrator can login in admin login, and it will redirect to admin panel which contains links for different admin pages like admin news, admin current issue, admin climate action SDG 13, admin SDG 13, admin overview, admin target and indicators, admin progress and info, admin related topics, admin solutions, admin solution 1, admin solution 2, and admin solution 3. Once done editing, admin can click the publish to publish the modified content. If invalid credentials, admin cannot login.

C. System Sitemap

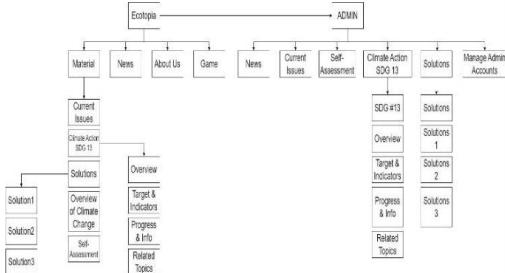


Figure 5. System Sitemap

Figure 5 shows the sitemap. Is thoughtfully structured, beginning with the landing page that features a navigation bar which includes key sections like materials, news, about us, games. This intuitive layout extends to the materials area, where a dropdown menu provides access to various pages such as current issues, climate action SDG 13, solutions, overview of climate change, and self-assessment. Furthermore, the climate action SDG 13 and solutions categories offer additional dropdown menus, enhancing user experience by facilitating easy exploration of related content within these topics.

D. Game

Game Mechanics: To progress to the game and ultimately "escape," the player must complete each challenge successfully by picking the trash using "space bar" and "arrow keys/WASD key." These challenges are essentially "rooms" within the larger game environment that the player needs to navigate and solve.

Educational Component: The game can also serve as an educational experience, highlighting the real-world issue of pollution and the importance of taking action to address it. By connecting the challenges to the title "Escape Room," you emphasize that the player's actions are not only about personal escape but also about making a positive impact on the environment.

E. Web Modules

1. Admin Login



Figure 6. Admin Login

Figure 6 shows the admin login module, exclusively accessible to the page's admin. This page serves as a platform for the admin to login the account and modify contents on specific pages of the website.

2. Landing Page



Figure 7. Landing Page Module

Figure 7 shows the initial point of entry for visitors as they arrive on a website. It offers a warm welcome to the visitors. Within this section, it presents the primary page that features the distinctive tagline and employs parallax effects, providing a concise overview of the complete website's content.

3. Material

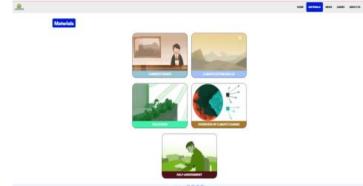


Figure 8. Material Page Module

Figure 8 shows the material page where it features a drop-down menu button where you can find the cases, current, issues, solutions, overview of climate change and the assessment module.

4. Game

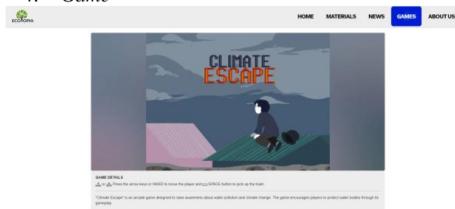


Figure 9. Game (Escape Room)

Figure 9 shows the game titled "Climate Escape," where users can engage in a mini arcade experience comprising five levels.

5. Assessment



Figure 10. Self-Assessment Page Module

Figure 10 shows the assessment module, which includes quiz. This will assess their knowledge gained in relation to Materials content.

6. Accounts

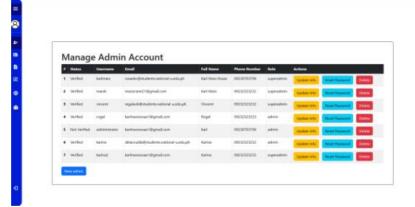


Figure 11. Management of Accounts Module

Figure 11 shows the managing of accounts module, which only the super admins can navigate and use the CRUD functionality of account management.

V. RESULTS AND DISCUSSION

The researchers conducted a survey evaluation among their target audience, which included senior high school students and gathered it from NU Nazareth students and IT professionals, to assess and evaluate the system. A total of two hundred (200) senior high school students participated as respondents, along with ten (10) IT professionals.

Table 1. Result Summary of Ecotopia Web App Evaluated by SHS Students

Criteria	Mean	SD	Interpretation
Functionality	4.77	1.32	Partially Agree
Reliability	4.73	1.32	Partially Agree
Performance Efficiency	4.70	1.37	Partially Agree
Security	4.80	1.41	Partially Agree
Usability	4.62	1.39	Partially Agree
GRAND MEAN	4.60	1.36	Partially Agree

The table shown above represents the summary of the Ecotopia Web Application evaluated by Senior High School students of NU Nazareth. As assessed by SHS students, it is evident that all the criteria meet the level of agreement of "Partially Agree".

Table 2. Result Summary of Ecotopia Web App Evaluated by IT Professionals

Criteria	Mean	SD	Interpretation
Functionality	5.18	0.87	Agree
Reliability	4.82	1.12	Partially Agree
Performance	4.92	0.88	Partially Agree
Efficiency			
Security	5.27	1.48	Agree
Usability	5.00	1.29	Partially Agree
GRAND MEAN	5.04	1.13	Agree

The table shown above represents the summary of the Ecotopia Web Application evaluated by IT Professionals. As assessed by IT Professionals, it is evident that the grand mean of the criteria meets the level of agreement of "Agree".

VI. SUMMARY, CONCLUSION AND RECOMMENDATIONS

Amid the pressing climate crisis, this study underscores the importance of empowering young individuals to grasp the intricacies of climate change and the actions needed for mitigation and adaptation. It advocates for meaningful discussions, scientific collaboration, and addressing misconceptions to enhance students' awareness of climate change and foster hope. Additionally, the study highlights the effectiveness of integrating the parallax effect into educational websites, improving user focus, engagement, and information retention. This immersive design, combined with mini-games, adds an interactive dimension to learning and promotes active participation, resulting in more engaging, effective, and memorable e-learning experiences. Ecotopia's innovative project exemplifies this approach by combining the parallax effect with interactive mini-arcade games to make climate change education informative and captivating, aiming to inspire environmentally conscious individuals who are well-informed and passionate about addressing climate change concerns.

CONCLUSION

With thorough investigation and testing, the researchers conclude the following:

1. The researcher developed a web application that aligns with the objective established in the study.
2. The researcher provides information about climate change to mobilize individuals to take meaningful actions toward combating climate change and creating a more sustainable future.
3. Ecotopia provides a parallax effect for the users to have a captivating experience while using the web application.
4. Ecotopia provides a mini arcade game that imparts knowledge, empowers, and mobilizes individuals to take meaningful actions towards water pollution in the context of climate change.

RECOMMENDATION

The following are the list of recommendation that the developers would like to contribute to future researchers.

1. We recommend that future researchers develop this application for the Android-based mobile and IOS platforms to cater to more users.

2. The web application focuses on Philippine issues regarding climate change. We recommend that future researchers consider widening the application's scope to include a broader range of environmental challenges and areas, increasing its impact and usefulness worldwide.
3. We recommend that future researchers incorporate more interactive games and have more challenging levels to make the platform more engaging and effective for the users.
4. We recommend that future researchers enrich the content by integrating more images and including videos to enhance the learning experience and have a more comprehensive and engaging understanding of the subject matter.
5. Lastly, we recommend that the future researchers will improve the web application's user interface by implementing a uniform design and theme, creating a more visually appealing user experience.

REFERENCES

- [1] "The Nature Conservancy," [Online]. Available: https://www.nature.org/en-us/what-we-do/our-priorities/tackle-climate-change/climate-change-stories/climate-change-frequently-asked-questions/?fbclid=IwAR0idbNBpw3RnrbcfRIWmKZwYnGhwCOINUGIH9IOCKV_VnS52vCDN7KMM#humans..
- [2] A. U. S. D. A. e. a. Shahzad, "Nexus on climate change: agriculture and possible solution to cope future climate change stresses," *Environmental Science and Pollution Research*, vol. 28, p. 14211–14232 , 2021.
- [3] K. Facer, "ResearchGate," April 202. [Online]. Available: [https://www.researchgate.net/publication/340547681_Climate_Change_How_should_public_education_respond](https://www.researchgate.net/publication/340547681_Climate_Change_How_should_public_education_respond_Climate_Change_How_should_public_education_respond). [Accessed April 2023].
- [4] A. I. O. J. D. & D. W. R. Sameer Fawzy, "Strategies for mitigation of climate change: a review," *Environmental Chemistry Letters*, vol. 18, p. 2069–2094, 2020.
- [5] J. F. N. S. M. S. M. G. T. C. B. F. a. N. K. Yadvinder Malhi, "Climate change and ecosystems: threats, opportunities and solutions," vol. 375, no. 1794, 2020.
- [6] S.-N. W. & F.-M. Shyu, "Study on Parallax Scrolling Web Page Conversion Module," in *Springer, Cham*.
- [7] S. H. Ab Rahim, "UiTMIR," 2015. [Online]. Available: <https://ir.uitm.edu.my/id/eprint/63842/>. [Accessed 4 August 2023].
- [8] R. Wang and S. Sundar, "How does Parallax Scrolling Influence User Experience? A Test of TIME (Theory of Interactive Media Effects)," *International Journal of Human-Computer Interaction*, vol. 34, no. 6, pp. 533-543 , 2018.
- [9] D. Frederick, "ResearchGate," February 2015. [Online]. Available: https://www.researchgate.net/publication/273440419_The_Effects_of_Parallax_Scrolling_on_User_Experience_in_Web_Design#:~:text=T his%20scrolling%20technique%20creates%20the,that%20it%20improves%20User%20experience.. [Accessed 2023].
- [10] P.-H. W. C.-C. C. Gwo-Jen Hwang, "An online game approach for improving students' learning performance in web-based problem-solving activities," *Computers & Education*, vol. 59, no. 4, pp. 1246-1256, 2012.
- [11] A. A. D. a. W. G. Frazer, "University of Southampton Institutional Repository," 2007. [Online]. Available: <https://eprints.soton.ac.uk/264174/>. [Accessed 2023].
- [12] R. R. H. Guadana, J. R. D. Bermudez, E. Q. Ramirez and A. E. U. Tong, "Drafting a Comprehensive Schema for the Development of Gamified Learning Application for National University," in *Association for Computing Machinery*, New York, NY, United States, 2020.
- [13] "Game Design and Development Process: Pre to Postproduction," [Online]. Available: <https://logicsimplified.com/newgames/looking-to-hire-get-in-touch/>. [Accessed 18 September 2023].

APPENDIX W.

PANELS APPROVAL

CERTIFICATE AND

RECOMMENDATIONS



PANEL'S RECOMMENDATION/REVISION LIST FORM

DATE / TIME OF DEFENSE	November 15, 2023 8:00 am – 11:00 am
COURSE	<input type="checkbox"/> BS Computer Science <input type="checkbox"/> Digital Forensics <input type="checkbox"/> Machine Learning <input checked="" type="checkbox"/> BS Information Technology <input type="checkbox"/> Mobile and Web Applications <input checked="" type="checkbox"/> Multimedia Arts and Animations
RESEARCH TITLE	Ecotopia: A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Arcade Game
TERM / ACADEMIC YEAR	1 st Term A.Y 2023 - 2024
VERDICT	APPROVED with <input type="checkbox"/> Minor Revisions <input checked="" type="checkbox"/> Major Revisions <input type="checkbox"/> RE-ORAL Verdict after Re-defense: _____
PANEL'S NAME / Signature	
Mr. Eliseo Q. Ramirez	

Here are the recommendations during the Thesis /Capstone defense:

No.	DOCUMENTATION: RECOMMENDATION / COMMENTS
1	Check diagrams for missing components.
2	Diagrams should reflect revised website content.
3	
4	
5	

Fill out this portion only if the final output is part of the major requirement of the course (esp. IT courses)

No.	PROTOTYPE / SYSTEM / PRODUCT: RECOMMENDATION / COMMENTS
1	Revise uploading of assets particularly pictures
2	Revise creation of admin accounts.
3	Apply HCI component to your website.
4	Assets should be "original".
5	You should apply game components in your mini-game.



PANEL'S RECOMMENDATION/REVISION LIST FORM

DATE / TIME OF DEFENSE	November 15, 2023 8:00 am – 11:00 am
COURSE	<input type="checkbox"/> BS Computer Science <input type="checkbox"/> Digital Forensics <input type="checkbox"/> Machine Learning <input checked="" type="checkbox"/> BS Information Technology <input type="checkbox"/> Mobile and Web Applications <input checked="" type="checkbox"/> Multimedia Arts and Animations
RESEARCH TITLE	Ecotopia: A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Arcade Game
TERM / ACADEMIC YEAR	1 st Term A.Y 2023 - 2024
VERDICT	APPROVED with <input type="checkbox"/> Minor Revisions <input checked="" type="checkbox"/> Major Revisions <input type="checkbox"/> RE-ORAL Verdict after Re-defense: _____
PANEL'S NAME / Signature	
Mr. Rogel M. Labanan	

Here are the recommendations during the Thesis /Capstone defense:

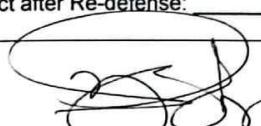
No.	DOCUMENTATION: RECOMMENDATION / COMMENTS
1	modify the specific objectives (at least 4 or 5 only).
2	Illustration, Programs label must be readable)
3	Test conducted must be stand-off by the reviewer / tester .
4	Provide additional proofs on the tests conducted in the appendix .
5	Present wireframe illustration as part of your appendix .

Fill out this portion only if the final output is part of the major requirement of the course (esp. IT courses)

No.	PROTOTYPE / SYSTEM / PRODUCT: RECOMMENDATION / COMMENTS
1	system must have the ability to manage the user (admin) w/ roles in the system .
2	product should have the facility to manage contents of the site (pictures) ,
3	
4	
5	



PANEL'S RECOMMENDATION/REVISION LIST FORM

DATE / TIME OF DEFENSE	November 15, 2023 8:00 am – 11:00 am
COURSE	<input type="checkbox"/> BS Computer Science <input type="checkbox"/> Digital Forensics <input type="checkbox"/> Machine Learning <input checked="" type="checkbox"/> BS Information Technology <input type="checkbox"/> Mobile and Web Applications <input checked="" type="checkbox"/> Multimedia Arts and Animations
RESEARCH TITLE	Ecotopia: A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Arcade Game
TERM / ACADEMIC YEAR	1 st Term A.Y 2023 - 2024
VERDICT	APPROVED with <input type="checkbox"/> Minor Revisions <input checked="" type="checkbox"/> Major Revisions <input type="checkbox"/> RE-ORAL Verdict after Re-defense: _____
PANEL'S NAME / Signature	 Mr. Roben A. Juanatas

Here are the recommendations during the Thesis /Capstone defense:

No.	DOCUMENTATION: RECOMMENDATION / COMMENTS
1	refer to the comment in your document.
2	
3	
4	
5	

Fill out this portion only if the final output is part of the major requirement of the course (esp. IT courses)

No.	PROTOTYPE / SYSTEM / PRODUCT: RECOMMENDATION / COMMENTS
1	
2	
3	
4	
5	



THESIS/CAPSTONE COMPLIANCE REPORT

PROGRAM/SPECIALIZATION	Bachelor of Science in Information Technology with specialization in Multimedia Arts and Animation
RESEARCH TITLE	Ecotopia: A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Arcade Game
DATE/TIME OF ORAL DEFENSE	November 15, 2023 (10:00 am to 12:00 pm)
VERDICT	Approved with <input type="checkbox"/> Minor Revision <input checked="" type="checkbox"/> Major Revision <input type="checkbox"/> Re-Oral

DOCUMENTATION			
Recommendation	Action Taken (Provide an explanation or justification for not addressing the recommendation)	Location (Page and Paragraph number)	Complied? (Yes / No)
1. Check diagrams for missing components.	Added missing components on diagrams specifically, Use case diagrams, functional decomposition diagram, system framework, and system flowchart.	Page 81, 95, 96, 98, 99, and 100	Yes
2. Diagrams should reflect the revised website content.	Revise all diagrams according to the revised website content. (Use case diagrams, functional decomposition diagram, system framework, and system flowchart.)	Page 81, 95, 96, 98, 99, and 100	Yes
3. Modify the specific objectives (at least 4 to 5 only)	Modified the specific objectives in to four and paraphrase its fluency.	Page 5	Yes
4. Illustration, diagram label must be readable.	Resized fonts on illustrations and diagrams.	Page 81, 95, 96, 98, 99, and 100	Yes
5. Test conducted must be signed off by the reviewer/tester.	Revised testing with the testers sign.	Page 242 - 279	Yes



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6. Provide addition proofs of the test conducted in the appendix.	Conducted another testing for the revised system.	Page 242 - 279	Yes
7. Present wireframe illustration as part of your appendix.	Remove the wireframe in chapter 4 and move in appendices.	Page 172 - 189	Yes

PROTOTYPE / SYSTEM / FINAL OUTPUT			
Recommendation	Action Taken (Provide explanation or justification for not addressing the recommendation)	Screenshot (Attach properly labeled screenshot/s in separate sheet/s)	Complied? (Yes / No)
1. Revise uploading of assets particularly pictures.	Created a function for uploading particular assets of the system.		Yes
2. Revise creation of admin accounts.	Added a super admin role to manage the admin accounts.		Yes
3. Apply HCI components to your website.	Added admin uploading of pictures.		Yes
4. Assets should be original	We excluded the pictures from NASA on our system, instead we make it a text information with proper references.		Yes
5. You should apply game components in your mini-game.	Revised the game. Instead of question type game, we made it more engaging by having an interaction with the user/player by picking up the trash on each scene of the game and including game scores, life and narrations.		Yes
6. System must have the ability to manage the user (admin) with roles in the system.	Added super admin module and role for managing the accounts. Only the super admin can navigate the module.		Yes



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INFORMATION TECHNOLOGIES

7. System should have the facility to manage contents of the site (pictures).	Provide a function to manage the original assets of the system.			Yes
---	---	---	---	-----

This is to certify that the above-mentioned list of revisions was met and complied with by the developers/designers as reflected on their prototype/system / product.


Mr. Elfred Q. Ramirez
Printed Name and Signature
Panel Member


Mr. Rogel M. Obanan
Printed Name and Signature
Panel Member


Dr. Robin A. Juanatas
Printed Name and Signature
Panel Chair

APPENDIX X.

CURRICULUM

VITAE



Karl Marx Roxas

Aspiring Developer with a Foundation in Full stack development, Angular, Node.js, and Java, Enthusiastic about Contributing to the IT Industry.

📍 Philippines 📞 09239703709 🎙 karlm.roxas@gmail.com

Profiles	in km-roxas LinkedIn	GitHub Karlxoxas21
Summary	I bring a strong work ethic, a commitment to continuous learning, and a drive to collaborate with teams in creating innovative and user-centric web solutions. Open to new challenges and excited to grow as a professional in the field.	
Experience	Achieve Without Borders Full Stack Developer Intern <ul style="list-style-type: none">Develop and customize custom odoo 15 & 17 appsScrum Agile MethodologyPerformed manual testingDesigned a website for E-commerceOdoo Framework, Python, PostgreSQL	December 2023- February 2024 Makati City
	National Mapping and Resource Information Authority Computer Programmer Intern 🔗 https://namria.gov.ph/ Develop a custom web application for Geospatial Systems Development Division (GSDD) to track employees' whereabouts, status and updates from scratch. <ul style="list-style-type: none">Angular 15ExpressJSNodeJSMicrosoft SQL Server.NET 6	March 2024 - June 2024 Taguig City
Education	National University Manila Bachelor of Science in Information Technology <ul style="list-style-type: none">Tech lead at Google Developers Student ClubJunior Philippine Computer Society of the Philippines - NU MemberNU Safe MaintainerBlue Scholar of National University	August 2020 - June 2024 Information Technology

Projects	<p>Ecotopia A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Arcade Game 🔗 <u>https://ecotopia.systems</u> A capstone project that presents a website focused on raising awareness about climate change Climate Change, Parallax Effect, Mini-arcade game, Content Management</p> <p>Point of Sales A CRUP Java App with SQL Server using SSMS Final project in Information Management SQL, SSMS, Java, Swing</p>	<p>BBQ House Blogsite Blogsite implementing OWASP Secure Coding Practices Final project in Information Assurance and Security Security, OWASP Secure Coding Practices</p> <p>Among Us Wiki A wiki about Among Us game My first website project created using plain HTML and CSS HTML, CSS</p>
Skills	<p>Web Development Angular, NodeJs, MongoDB, .NET 6 MVC, Phaser.js</p> <p>Software Engineering Algorithms, Data Structure, Object-oriented Programming, Secure Software Development Life Cycle, Agile Methodology, Scrum, Git</p> <p>Odoo v15, v17</p>	
Certifications	Backend Development and APIs Certificate freeCodeCamp 🔗 <u>https://www.freecodecamp.org/certification/fcc28b946f6-a530-4de7-8823-102f7eed7fc8/back-end-development-and-apis</u>	March 2024
Publications	Ecotopia: A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Arcade Game IEEE 🔗 <u>https://ecotopia.systems</u> Accepted at HNICEM 2023 and waiting to be published	

REGALA VINCENT B.

FRONTEND DEVELOPER



PERSONAL SUMMARY

A BSIT-MAA student at the National University - Manila where I learned how to be agile and tenacious. Very willing to join a company where I can establish long and good relationships with customers and my colleagues.

PERSONAL INFORMATION



+6396-8527-0234



B4 L27 B. Doña Maria Subd., Burgos, Rodriguez, Rizal



regalavince0@gmail.com



<https://vincent-star-hub.github.io/MyPortfolio/>

EDUCATIONAL BACKGROUND

College

National University | 2020 - present

Senior High School

Sta. Cecilia Parochial School | 2018 - 2020

Junior High School

Sta. Cecilia Parochial School | 2014 - 2018

Elementary

Burgos Elementary School | 2008 - 2014

WORK EXPERIENCE

Philippine National Police

2024

Mobile Developer

- Developed mobile version of the PNP clearance application.
- Developed PNP PDF File Manager application.
- Developed an online ticketing system.

Computer Laboratory

2018 - 2021

Student assistant

- Give instructions to the students regarding the correct usage of the computers.
- Provide assistance on computer troubleshooting
- Assist students on using software programs and fixing hardware issues.
- Maintaining properly all the laboratory electronics.
- Files reports asks by the superior.

ACHIEVEMENTS

- Completed TechnoFlash computer curriculum and obtaining the skills to create short animations and interactive presentations using Adobe Commercial and ActionScript (**March 2016**)
- Completed TechnoRobot computer curriculum and obtaining skills to construct and program different machines and robots with the use of LEGO Mindstorms NXT (**April 2018**)
- Microsoft Office Specialist for Office Excel 2016 (**2019**)

AFFILIATION

- Member, Computer Club
Sta. Cecilia Parochial School (S.Y. 2014-2020)

SKILLS

- Building Website
- Video Editing
- Knowledgeable in computer application such as:
MS Word, MS PowerPoint, and MS Excel
- Photography
- Graphic Design & UI/UX

CHARACTER REFERENCE

- | | |
|---|--|
| • Mr. Rogel Labanan
Professor at National University
rmlaban@national-u.edu.ph | • Mr. Ryan Richard Guadaña
Professor at National University
rrhguadana@national-u.edu.ph |
|---|--|



Maura Elaine San Roque

FREELANCE ARTIST

Aspiring animator and character designer, looking forward to more opportunities to learn and grow in the animation industry.

Contact

- 0922 363 8191
- 274 Maronquillo, San Rafael, Bulacan
- linkedin.com/in/maura-san-roque-b544102b8/

Education

Bachelor of Science, Information Technology specializing in Multimedia Arts and Animation
National University Manila, 2024

Skills

- Free-hand sketching and coloring
- Digital drawing, illustration
- Character design and concept sketching
- Toon Boom Harmony
- Clip Studio Paint
- RETAS STUDIO PaintMan
- Adobe Photoshop

Work Experience

Snipple Animation

April 2024 to Present

- Worked as DIP Intern as part of the requirements for the term.
- Learned to use ToonBoom Harmony as well as programs that allows for remote access to other computers.

Studio 9 Lives

December 2023 to March 2024

- Started as a DIP Intern, handling hand drawn cuts.
- Learned the basics of RETAS STUDIO PaintMan, and assembling cuts with Clip Studio Paint.
- Painted animation frames per cut, includes characters and special effects.

Freelance Illustrator

February 2024

- Drew and colored in a personalized illustration upon the commissioner's request.

KARINA B. DELA CRUZ

Marilao, Bulacan, Philippines

delacruzkb01@gmail.com | +639954646819



PERSONAL SUMMARY:

Aspiring Visual and Graphic Designer with keen eye for detail and a drive for creativity. Has a strong communication skills and ability to collaborate with the team members to bring ideas to life. Dedicated to staying updated on trends and continuously refining skills. Eager to contribute innovative designs to excel in this dynamic field.

EXPERIENCES:

SM PRIME HOLDING INC.

Pasay, Metro Manila

Graphic Designer Intern

March 2024 – June 2024

- Provide assistance on creating/designing marketing collaterals such as brochures, poster, and billboards.

STUDIO 9 LIVES

Diliman, Quezon City

IT Support/Color Artist Intern

December 2023 – February 2024

- Provide technical support on hardware/software concerns.
- Assist on DIP color and animation production.
- Created UI design for payroll web development and assist on creation of front-end.

CALOOCAN CITY HALL

Grace Park East, Caloocan City

Accounting Intern

October 2019 – November 2019

- Assist on handling administrative tasks such as filing and organizing financial records.

PROJECTS:

EAT N' GO

- Created a Point of Sales (POS) Cash Register System using Java programming language.

Car Rental System

- Created a Car Rental Software Application using Java Programming language.

Axie Web Application

- Created an Axie Web Application using basic HTML and CSS.

Ecotopia

- A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Arcade Game.
- Technical Writer and Assistant Artist.

EDUCATION:**NATIONAL UNIVERSITY – MANILA**

Sampaloc, Manila

BS Information Technology with Specialization in MAA

August 2020 – Present

Academic Dean Lister (3rd – 4th year)**AMA COMPUTER COLLEGE CALOOCAN**

Samson Rd, Caloocan City

ABM (Accountancy, and Business Management)

2018 - 2020

Grade 12 with Honors

PUBLICATION:

- Ecotopia: A Parallax Enabled Website for Climate Change Awareness with Interactive Mini Arcade Game (IEEE)
 - To Published on 2024 HNICEM

Coron, Palawan, Philippines

November 19-23, 2023

SKILLS:

- Graphic Design
- UI/UX Design
- Canva
- Figma
- HTML/CSS

- Adobe Photoshop
- Adobe Illustrator
- MS Office
- Teamwork
- Communication

REFERENCES:**Mr. Ryan Richard Guadaña**

Professor – MAA Specialization Head

National University - Manila

rrhgudana@national-u.edu.ph

Mr. Rogel M. Labanan

Professor – Faculty

National University - Manila

rmlaban@national-u.edu.ph