DEVELOP A PLANT AND COMMUNITY FOR ENVIROMENT SAFE WEBSITE

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DEVELOP A PLANT AND COMMUNITY FOR ENVIROMENT SAFE WEBSITE

AHMED FADHIL MOHAMMED

A thesis submitted in fulfilment of the
requirements for the award of the degree of
Bachelor of Computer Science (Software Engineering)

School of Computing
Faculty of Engineering
Universiti Teknologi Malaysia

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I declare that this thesis entitled *"DEVELOP A PLANT AND COMMUNITY FOR ENVIROMENT SAFE WEBSITE"* is the result of my own research except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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DEDICATION

This thesis is dedicated to my father, who taught me that the best kind of knowledge to have is that which is learned for its own sake. It is also dedicated to my mother, who taught me that even the largest task can be accomplished if it is done one step at a time.

ACKNOWLEDGEMENT

I spoke with a lot of scholars, academicians, and practitioners as I was putting this thesis together. They have helped me to comprehend and think. I want to convey my profound gratitude to Dr. KARZAN HUSSEIN, who served as my primary thesis supervisor, for his support, direction, criticism, and friendship. This thesis would not have been the same without their ongoing assistance and attention.

It is also appropriate to thank my fellow student for their assistance. All of my co-workers and the individuals who have helped on various times have my genuine gratitude. Their opinions and advice are really helpful. Unfortunately, there isn't enough room to mention them all. I am appreciative of every member of my family.

ABSTRACT

According to the National Organization of world health organization (WHO), each year two million people are dying because of climate change and environmental issues. Climate change is the changes that are affecting nature that humans mostly cause and those changes include deforestation, etc. Climate change has been an important topic for many nations around the world. The problem arises because this will not apply to our country Iraqi Kurdistan as data show that the rate of natural resources has seen a massive decrease in Kurdistan in the last decades. The purpose of this research is to keep our environment safe and prevent climate change by increasing the rate of planting trees. The proposed system is building a website that provides a helping hand to the organizations to increase the rate of planting trees and increase our community's awareness about climate change. This website will be built in a way that can be easy, to make it easier for them to participate in making the environment green again. The chosen methodology is the agile model in the software development lifecycle depending on the project’s need and after reading all software development methodologies reaching that point the Agile development method is a suitable methodology for the project. Agile is a suitable software methodology because it allows for new software management enhancements and adjustments, no space for speculation with direct customer response, and a constant input. In conclusion building, this website will have an impact on our environment and our planet, hopefully, it will be used by many people and plant as many trees as we can.

ABSTRAK

Menurut Pertubuhan Kebangsaan Pertubuhan Kesihatan Sedunia (WHO), setiap tahun dua juta orang mati akibat perubahan iklim dan isu alam sekitar. Perubahan iklim ialah perubahan yang menjejaskan alam semula jadi yang kebanyakannya disebabkan oleh manusia dan perubahan tersebut termasuk penebangan hutan, dsb. Perubahan iklim telah menjadi topik penting bagi banyak negara di seluruh dunia. Masalahnya timbul kerana ini tidak akan berlaku kepada negara kita Kurdistan Iraq kerana data menunjukkan bahawa kadar sumber asli telah menyaksikan penurunan besar-besaran di Kurdistan dalam beberapa dekad yang lalu. Tujuan penyelidikan ini adalah untuk memastikan alam sekitar kita selamat dan mencegah perubahan iklim dengan meningkatkan kadar penanaman pokok. Sistem yang dicadangkan sedang membina laman web yang memberikan bantuan kepada organisasi untuk meningkatkan kadar penanaman pokok dan meningkatkan kesedaran masyarakat kita tentang perubahan iklim. Laman web ini akan dibina dengan cara yang mudah, untuk memudahkan mereka mengambil bahagian dalam menjadikan alam sekitar kembali hijau. Metodologi yang dipilih ialah model tangkas dalam kitaran hayat pembangunan perisian bergantung kepada keperluan projek dan selepas membaca semua metodologi pembangunan perisian mencapai tahap itu kaedah pembangunan Agile adalah metodologi yang sesuai untuk projek. Agile ialah metodologi perisian yang sesuai kerana ia membenarkan penambahbaikan dan pelarasan pengurusan perisian baharu, tiada ruang untuk spekulasi dengan tindak balas pelanggan langsung dan input yang berterusan. Kesimpulannya, laman web ini akan memberi impak kepada alam sekitar dan planet kita, semoga ia dapat digunakan oleh ramai orang dan menanam seberapa banyak pokok yang boleh.

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Chapter 1

Introduction

1.1. Introduction

Nowadays, the climate change term is one of the issues of the world, especially in the middle east because of human activities day by day the world temperature will be higher and higher, and the number of plants and forests in the world also in the middle east (Iraqi Kurdistan) will decrease it means deforestation is high. To avoid this issue many ways can be applied to keep our nature safe and keep preventing it from climate change so, starting with the ways that keep our environment safe and prevent it from climate change is by increasing the rate of planting trees and reducing the poisonous gases in our air, also spreading awareness about climate change. to keep our environment safe and prevent it from climate change by increasing the rate of planting trees. The proposed system is building a website that provides a helping hand to the organizations to increase the rate of planting trees and increase our community's awareness about climate change. this website will be built in a way that can be easy, to make it easier for them to participate in making the environment green again.

1.2. Problem background

Despite having many environmental organizations in the Kurdistan region but Kurdistan's environment has not only progressed but it is too late. and climate changes are clearly felt that the rate of raining has decreased a lot according to the latest government data Kurdistan region and snowfall a lot, and this tells us that Kurdistan is a dry environment because of human activity and a large number of cars and factories which is a dangerous sign that the face of Kurdistan. And another problem is the low rate of trees in The Kurdistan Region and the high rate of cutting trees that

have caused the forests to be destroyed. The lack of a bridge between environmental organizations and the people of Kurdistan that can help more actively make Kurdistan's environment and work more modern to protect Kurdistan's environment. and slow the way the organization work is another problem, not everyone can help its environment because of having many obstacles, another problem is not being brittle full awareness about the rapid environmental changes in this region the lack of full assistance from the KRG (Kurdistan Region Government) deepens the problem.

1.3. Project aim

The aim of this website is to develop and protect the forests of the Kurdistan Region and create community for environmentalist people and a conscious people in order to increase awareness of Kurdistan' community about the environment and climate change.

1.4. Objectives

The objectives of the project are:

- To analyze the requirements of a develop a plant and community for environment safe website.
- To design a website that provides collecting money for nature organizations by donations, publishing news about the nature.
- To develop a plant and community for environment safe website for people in Kurdistan that focus on nature's need which is based on specific design and requirement gathered.
- To test and evaluate the developed a plant and community for environment safe website in Kurdistan.

1.5. Scopes

The scopes of the project are:

1. This website will be available for all people.
2. The target user of this application will include all the ages and people from Iraqi Kurdistan.
3. This website will be available in English language.

1.6. Project Importance

Without protecting and taking care of our environment will put so many lives in danger such as animals, plants and crops, and even our own. so, by the building is website can save our environment and reduce the deforestations effects and plant trees easily and fast. the number of trees in Kurdistan will increase the environment will be cleaner. this website can make people educated about nature and climate change by creating a community for them.it helps nature organizations to create fundraising for collecting money in a much easier way.

1.7. Organization of the Report

In this chapter have talked about an introduction about my project and problem background and what was the project aim and project objectives and scopes then importance of the project and finally report organization, in the next chapter which is literature view will discussed about (Introduction, inter-organization, current system analysis, compare between current system, literature review on tech used).

Chapter 2

Literature Review

2.1. Introduction

In Kurdistan, the development of the environment is very weak and the techniques that they use are old and not up to date, the environment of Kurdistan is getting worse and the environmental changes will be faster in this way, the environment of Kurdistan is far behind compared to the other countries It has gone and the trees and forests are going to be destroyed in the cities and towns.

So, by having a website to solve those issues that are very common in Kurdistan with using this website people will be aware of the problem that are currently common, and environmentalists and activists will get benefit from using this website this will help them with protecting forests and develop them and increase speed of the rate of planting trees.

First in Sulaymaniyah and then in other cities of Kurdistan, now there are some organizations in the world that work on the environment and this specific field but unfortunately, it is not available in Kurdistan that's why there is a gab of those organizations and we will fill it by local organizations.

In this chapter, we will talk about those needs to create our application and talk about the other organizations are working around the world to make our environment safer and better for our future.

2.2. Case Study (If any)

Survey for getting user requirements and in survey we ask very important and questions and the survey include 11 questions and this is a question:

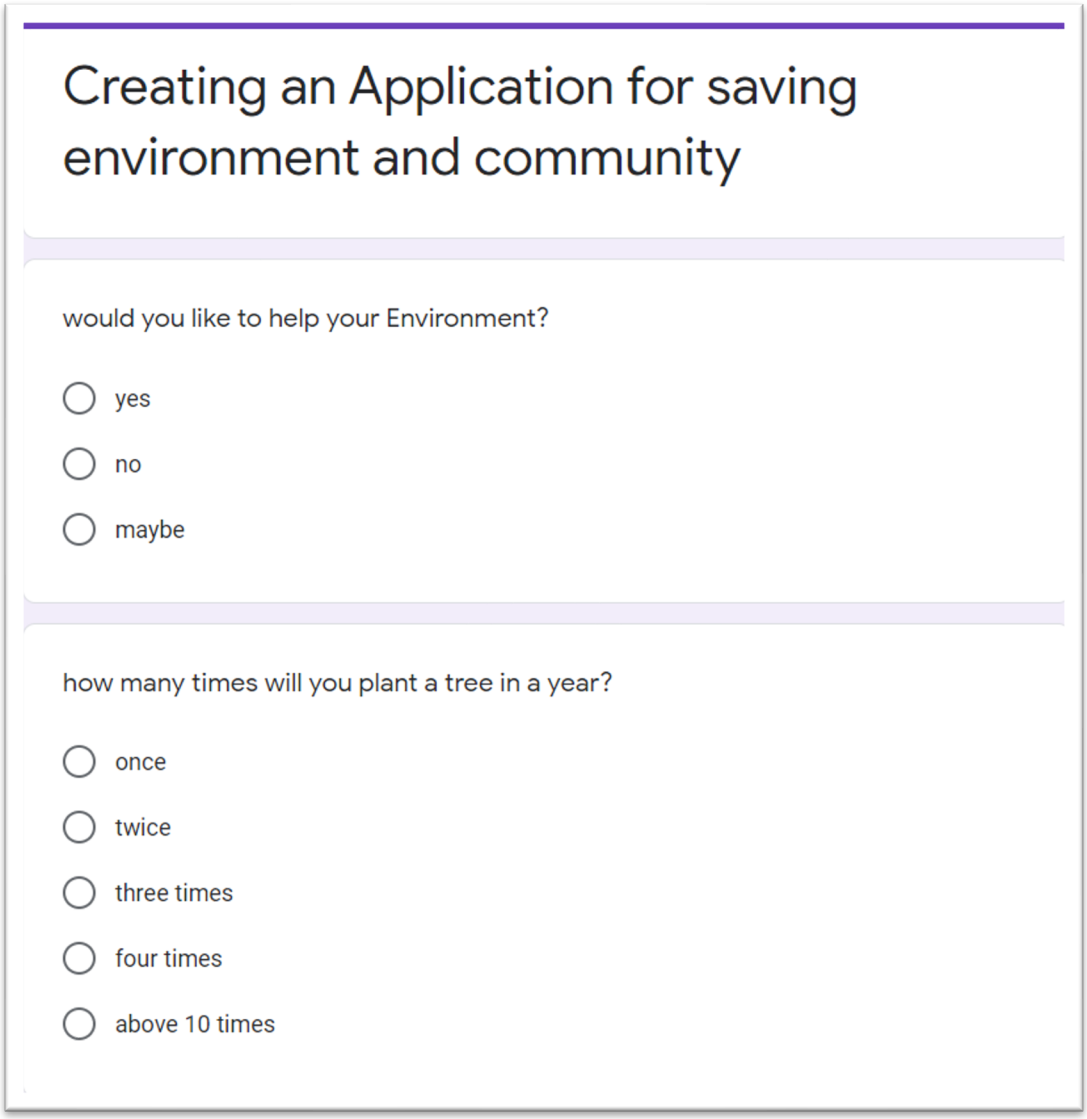

Figure 2-1 Survey

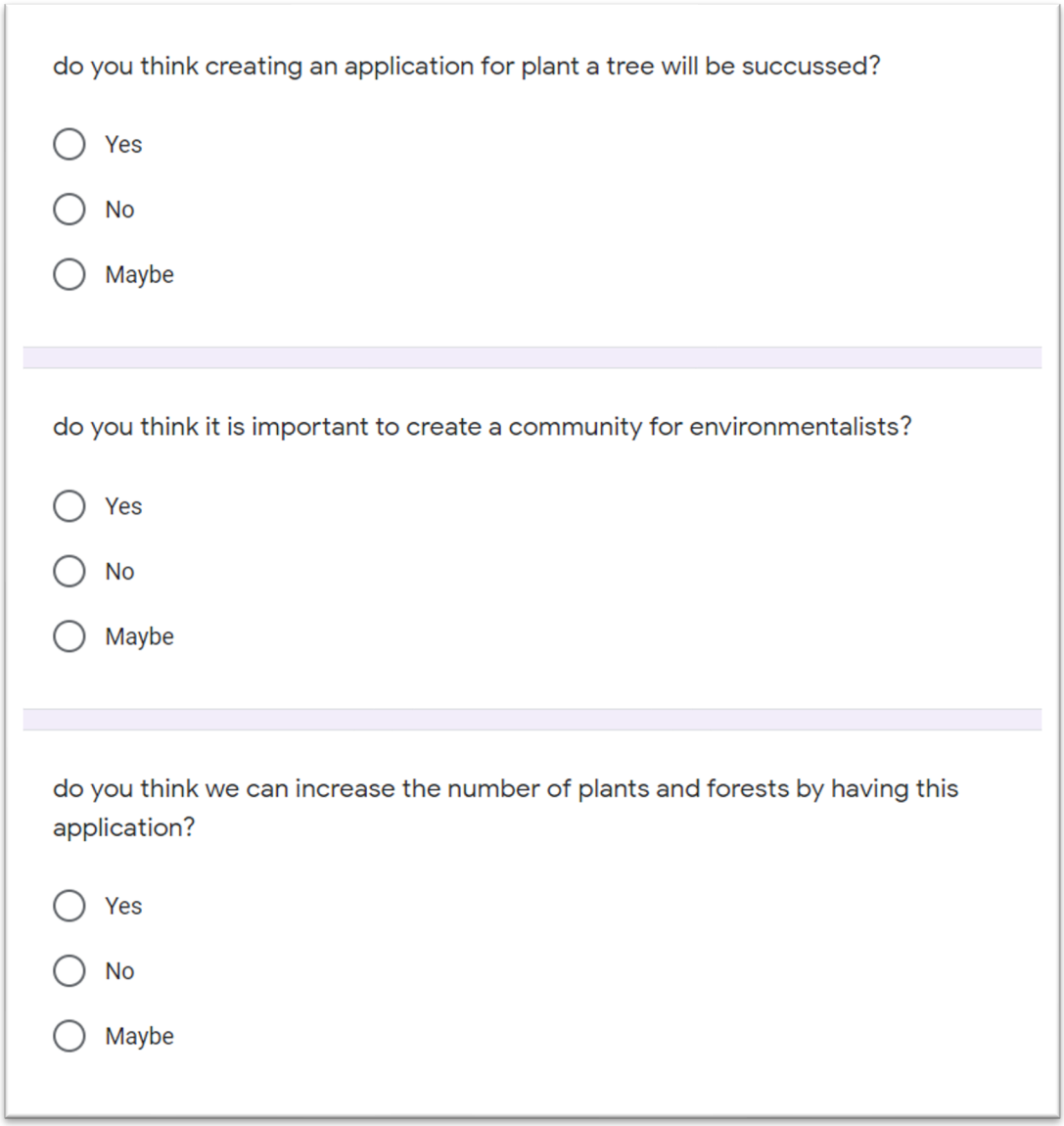

Figure 2-2 Survey

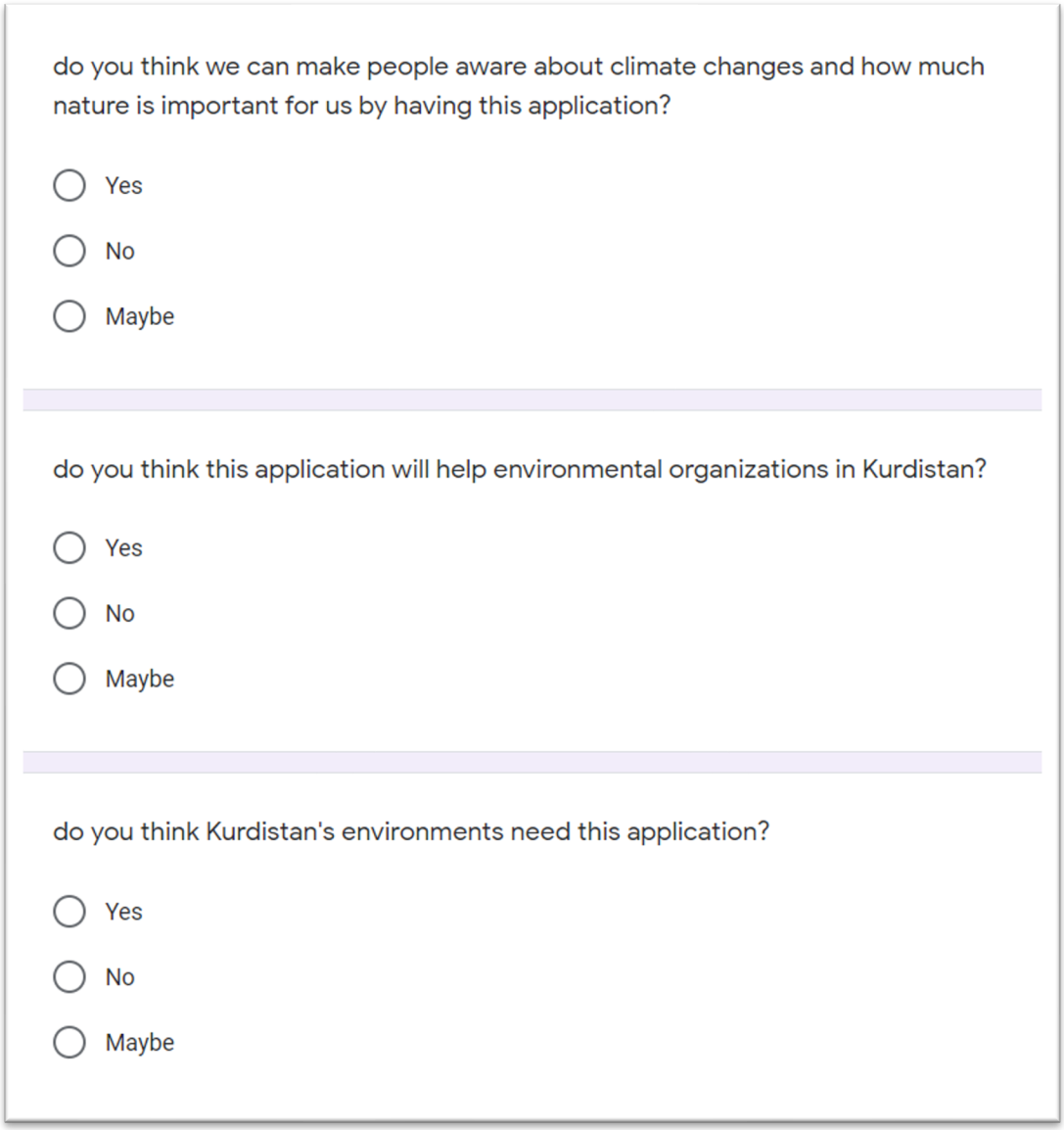

Figure 2-3 Survey

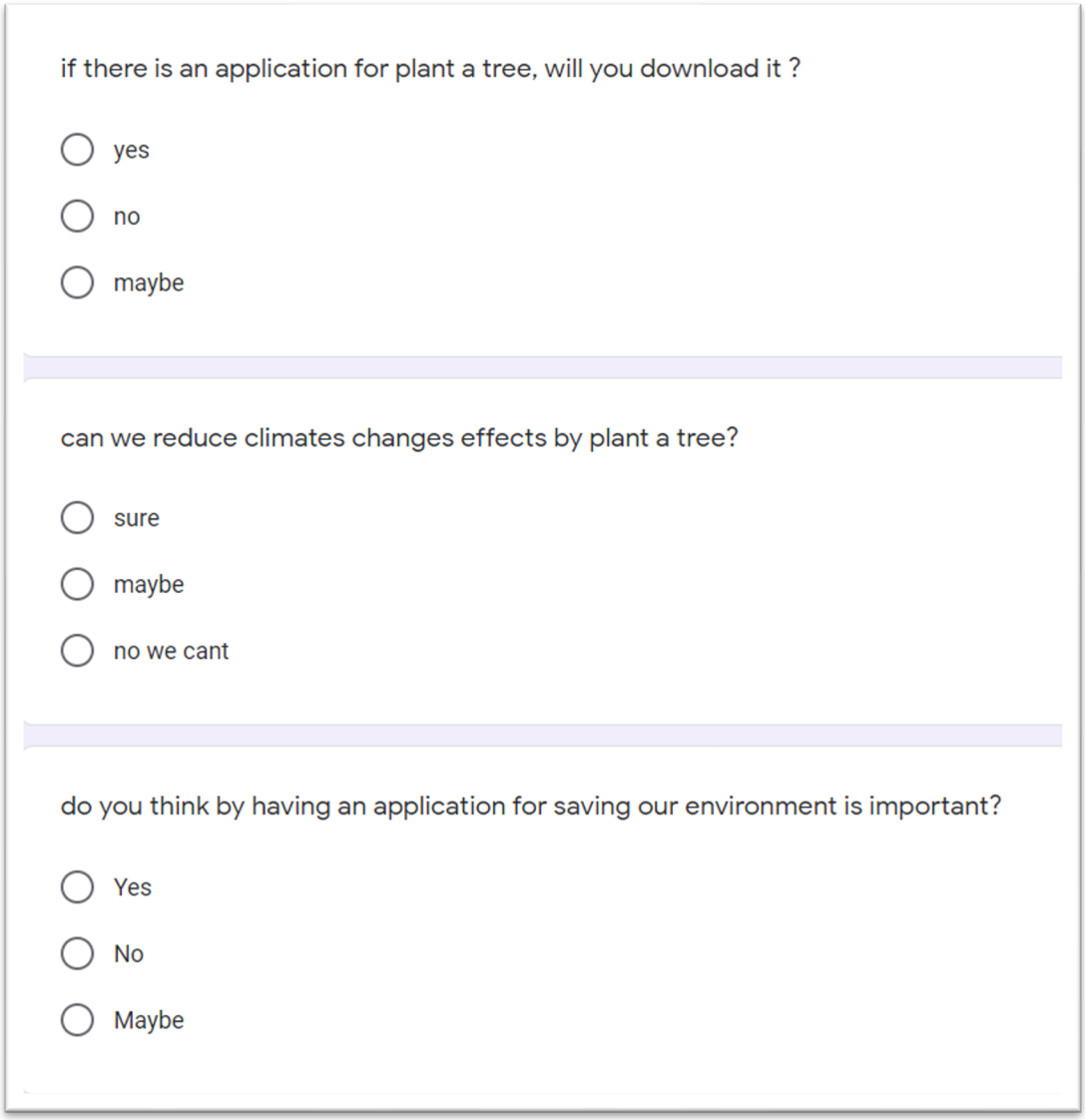

Figure 2-4 Survey

And from the result we reach that point this application will be very important, helpful and will great impact to make people aware about nature and try to save the forest and reforesting the forests and increasing the number of the plants. And our stockholders are environmental organization in Kurdistan.

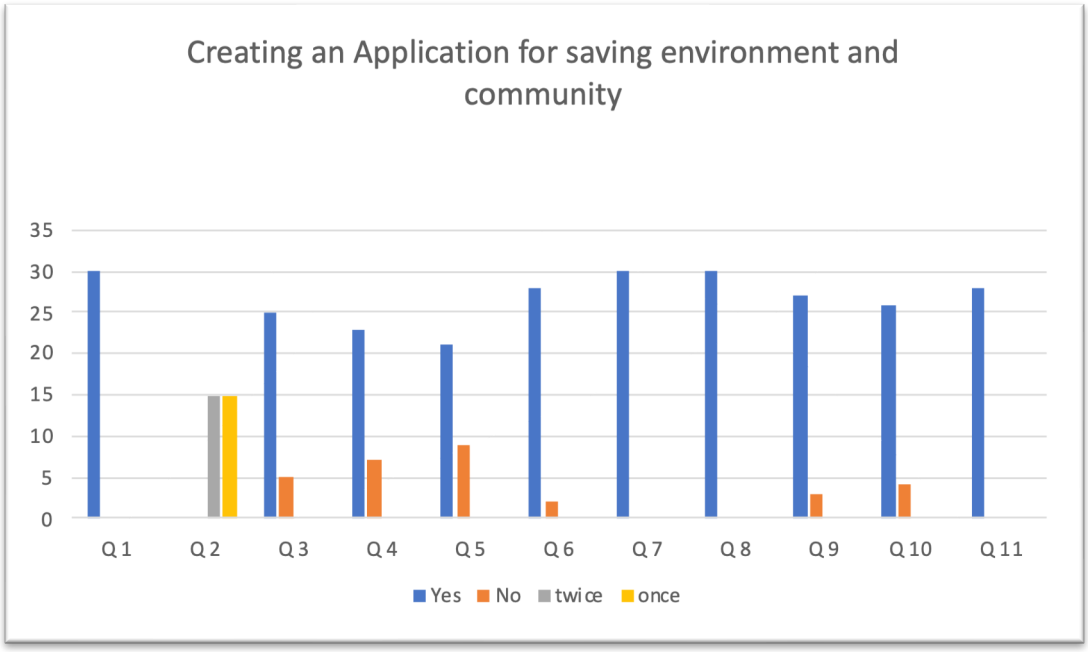

Figure 2-5 Result of Survey

2.3. Current System Analysis

2.3.1. Local Environmental Organization

About the environmental organization in Kurdistan, there are many organizations that work in the field of environment but they are still unable to solve many environmental problems in Kurdistan and work very simply and are much lower than the level of international organizations and are much slower.

2.3.2. International Environmental Organization

savingnature.com: Saving Nature is an environmental group that will help endangered and threatened species avoid extinction by reconnecting fragmented ecosystems. Furthermore, the woods that the group creates aid in the fight against

climate change. Our wildlife corridors' natural trees absorb carbon dioxide and produce oxygen as they regrow. Importantly, we collaborate with local conservation organizations that have the knowledge and experience needed to properly restore forests, engage with local communities, and track progress.

clickatree.com: Click a Tree is a non-profit environmental group dedicated to making sustainability easier. This group actively combats climate change by planting trees, as well as creating habitat for endangered animal species and full-time jobs for local populations. This organization's mission is to make planting trees a daily habit. It helps to make our earth a better, lighter, and healthier habitat for all living things.

Treeapp – Plant a Tree for Free, Every Day: Tree app is an Android and iOS application that allows you to plant trees anywhere in the globe for free, whenever you want, with only a few touches on your phone. The purpose of this software is to allow anyone to make a difference for free while also helping the environment by planting trees where they are most needed. On the app's marketplace, you can also find sustainable brands and shop for your values. This app will assist you in living a more sustainable lifestyle by providing vegan, plastic-free, and ethically sourced products.

2.4. Comparison between existing systems

Table 2-1 Comparison between existing systems

	Tree app	Clicktree.com	Savingnature.com	This project
User	Whole world expects Kurdistan	Whole world expects Kurdistan	Whole world expects Kurdistan	Only in Kurdistan
Service scope	Increase planting tree	Increase planting tree	Increase planting tree	Increase planting tree & awareness of community
Platform	Mobile application	website	website	website
User registration and login	Compulsory	Compulsory	Compulsory	Compulsory
Internet access	Required	Required	Required	Required

In conclusion, the comparison above demonstrates that each of the three systems has its own set of features and availability, for availability none of the above systems are available in Kurdistan to regret this project. About the features, all the above systems are for increasing the planting tree, also this project will increase awareness of the community about nature and for each system users need to have an account, for the platforms Tree app is a mobile application and Clicktree.com with Savingnature.com is a website. Getting access to all the above systems needs internet access.

2.5. Literature Review of Technologies Used

Database: The relational database management system MySQL is built on the SQL (Structured Query Language) language. Data warehousing, e-commerce, and logging applications are just a few of the many uses for the application. MySQL, however, is most frequently utilized as an online database. From a single piece of information to a whole inventory of goods for an online business, it may be used to store anything. It is possible to develop websites that will interact in real-time with a MySQL database to quickly show classified and searchable information to website users when used in conjunction with a scripting language like PHP or Perl (both of which are available on our hosting accounts).

Web Server: The Apache web server, MySQL database (really MariaDB), PHP, and Perl (as command-line executables and Apache modules) are all included in the XAMPP software installation. It works with Windows, MAC, and Linux operating systems. The integration of PHP and MySQL does not require any settings. It offers a pretty straightforward installation and method to handle the configuration changes, making it a wonderful fit for this project. PhpMyAdmin, a GUI utility for managing your MySQL databases, is additionally available.

2.6. Chapter Summary

In this chapter talked about the introduction about the application that be used for environment field and analyzing the current systems and explained three applications that used nowadays then compare existing application with the application and last one talked about those technology that be used for building this application

Chapter 3

SYSTEM DEVELOPMENT METHODOLOGY

3.1. Introduction

This chapter will talk about the which methodology that going to be use and justify why use this methodology and explain and modify the methodology that going to use. and talk about the methodology's phases that need to be implemented and talk about each phase clearly and explain it well and draw suitable UML for the project, talk about the tools that need for the system development which tools going to use and why and the last one is system requirement analysis which is that requirement needs for using the application by a stockholder and talking about both software requirement and hardware requirement then a summary about this chapter.

3.2. Methodology Choice and Justification

As a software engineer to develop this application have to find the right software development methodology. all methodology has their strengths and weaknesses and have been developed for a variety of application scenarios. Depending on the project's need and after reading all software development methodologies reach that point the ''Agile development method'' is a suitable methodology for our project. and the reasons why agile is the suitable software methodology It allows for new software management enhancements and adjustments .and no space for speculation with direct customer response and constant input. And agile is a great solution since it features short iterations, simple testing, and bug-free support. And the budget has been properly calculated.

3.3.Phases of the Chosen Methodology

Agile development lifecycle is a structured series of phases that the application goes through and it consists of five phases which are requirements, design, development and Testing, implantation and review and talk about all the phases in detail.

3.3.1. Define Requirements

Gathering project requirements is the first and most crucial phase in agile development. In a typical software development strategy, all needs are identified, appraised, and anticipated before the outset of the project. Once it has been finalized and authorized, stakeholders sign off on it, which means it can no longer be changed. Any change in the requirements is treated as an outlier, and it is dealt with as soon as it occurs, regardless of time, complexity, or financial constraints.

3.3.2. Design

The creation of a prototype for the future application is the third phase of the agile software life cycle. Designing a clickable prototype that includes both the user interface and the user journey is critical and very important.

The client may be pleased with the design, or the client may suggest minor changes to what the client feels to be the ideal. Designers use design to demonstrate how an app will perform in real life before putting it into production. This allows the team to make any modifications that are required without having to rewrite the code and waste time.

3.3.3. Development and Testing

After the client and the development team have agreed on the application's plan and needs, the development team constructs it. The app is launched in stages, with each sprint aimed towards improving the current version. In order to improve the initial version, many adjustments are expected to be done. improve the application's functionality and provide new features and updates. Testing is part of each cycle, and the final application must also be put through its paces. Scrum and the Kanban technique can be used by software teams.

Because the application is now fully accessible, to ensure that the program is fully working, the developer team must execute a series of tests. Which are unit test which is examines the application’s internal logic and how the code implements any logical errors, and integration testing, which examines how the code implements any logical errors.

This test is most likely system testing of the technologies or services that were utilized to implement this code, The developer team will address any potential defects or flaws as soon as they are detected. At this time, they also took user comments.

3.3.4. Deployment

Because the application has been fully deployed to the client, customers can now access it. As a result of this effort, it is presently in the maintenance phase. The software development team provides ongoing assistance during this phase to ensure that the program continues to function properly and that any new faults are rectified. It is possible to upgrade a current application or add new features in subsequent versions.

3.3.5. Review

At this time, the Agile development cycle comes to an end. After completing all previous rounds of development, the development team displays the owner the outcome achieved in meeting the requirements. If a new iteration is required, the Agile software development phases will proceed to the next step and scale Agile.

3.3.6. Design model

A use case diagram helps developers to understand how a user might interact with the application who designed while by developers and using the Unified Modeling Language (UML) it should assist in the definition and organization of requirements within your team.

However, with a few tweaks, use case diagrams may be used to illustrate any system in which actors collaborate to achieve a goal outside of software engineering. You'll want to keep your information basic, as with many diagrams and layouts.

3.4. Gantt Chart

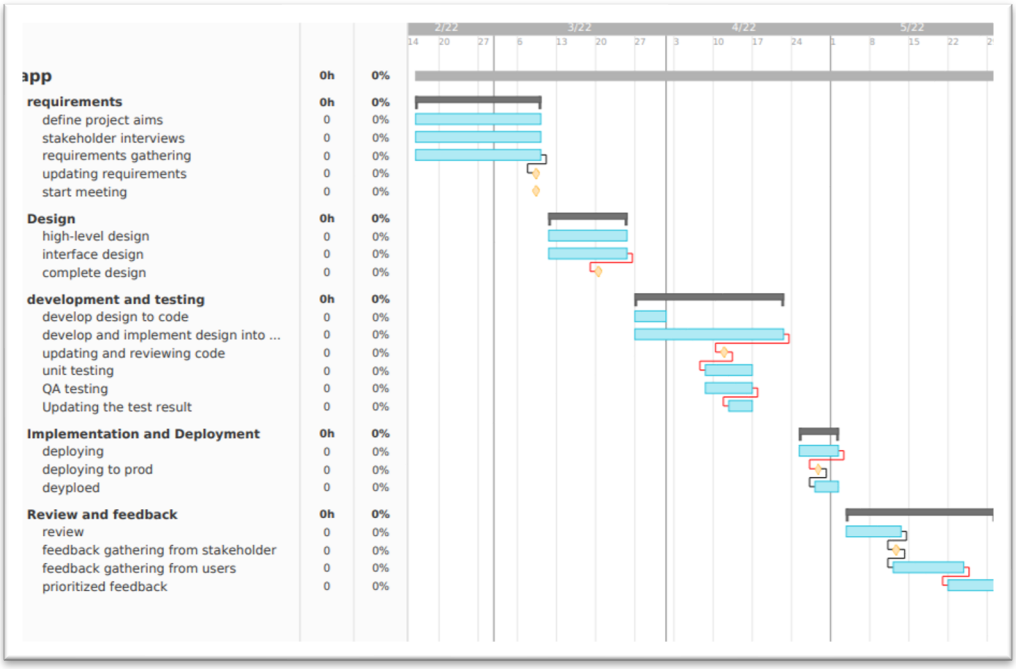

Figure 3-1 Gant chart

3.5. Technology Used Description

Database: The relational database management system MySQL is built on the SQL (Structured Query Language) language. Data warehousing, e-commerce, and logging applications are just a few of the many uses for the application. MySQL, however, is most frequently utilized as an online database. From a single piece of information to a whole inventory of goods for an online business, it may be used to store anything. It is possible to develop websites that will interact in real-time with a mySQL database to quickly show classified and searchable information to website users when used in conjunction with a scripting language like PHP or Perl (both of which are available on our hosting accounts).

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3.6. System Requirement Analysis

3.6.1. Hardware requirement

Minimum hardware requirement for website:

- Processor GHz – A10 Bionic / MSM8255
- Hard Drive: 250 MB
- Ram: 2 GB

3.6.2. Software Requirements

The software requirement for website application all devices can access it.

3.7. Chapter Summary

In this chapter have talked about an introduction about chapter three what going to do then talked about the methodology that going to use for this project and why we chose this methodology which was agile software development method and justification about it and talk about pros and cons of the agile methodology then talk about Agile development lifecycle which is a structured series of phases consist of five phases which are requirements, design, development, and Testing, implantation, and review and after that having gang chart for our project then talked about those tools which need to for the application then talk about the design modeling which model going to use then design tool used lucid chart for this project and talk about that requirement which user need in order to use the application which consist of software requirements and hardware requirements and that all those tasks that have to be finished for chapter three.

Chapter 4

REQUIREMENTS ANALYSIS AND DESIGN

4.1. Introduction

This chapter will talk about the requirement analysis for this project which includes building use case diagram, sequence diagram, and activity diagram than for design include building class diagram and building system architecture and then designing database and then normalized and then building interface design which building menu and screen design and system navigation and content design and last one a summary about this chapter in general.

4.2. Requirements Analysis

4.2.1. Use Case Diagram

This is a use case diagram for this project which include two user types user and admin. Admin can manage and add the news and user can donate the project and seen the news and events.

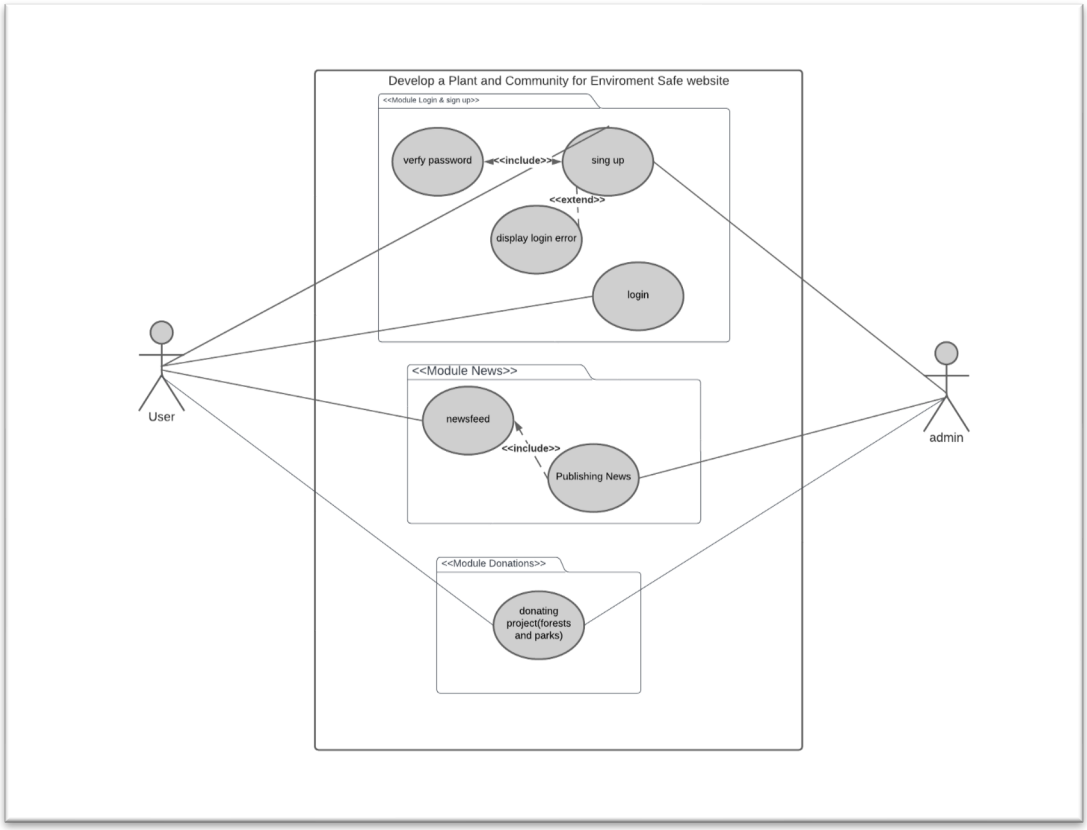

Figure 4-1 Use case Diagram

4.2.2. Sequence Diagram

This is a sequence diagram for this project there are two activity diagrams one is for user and another one is for admin.

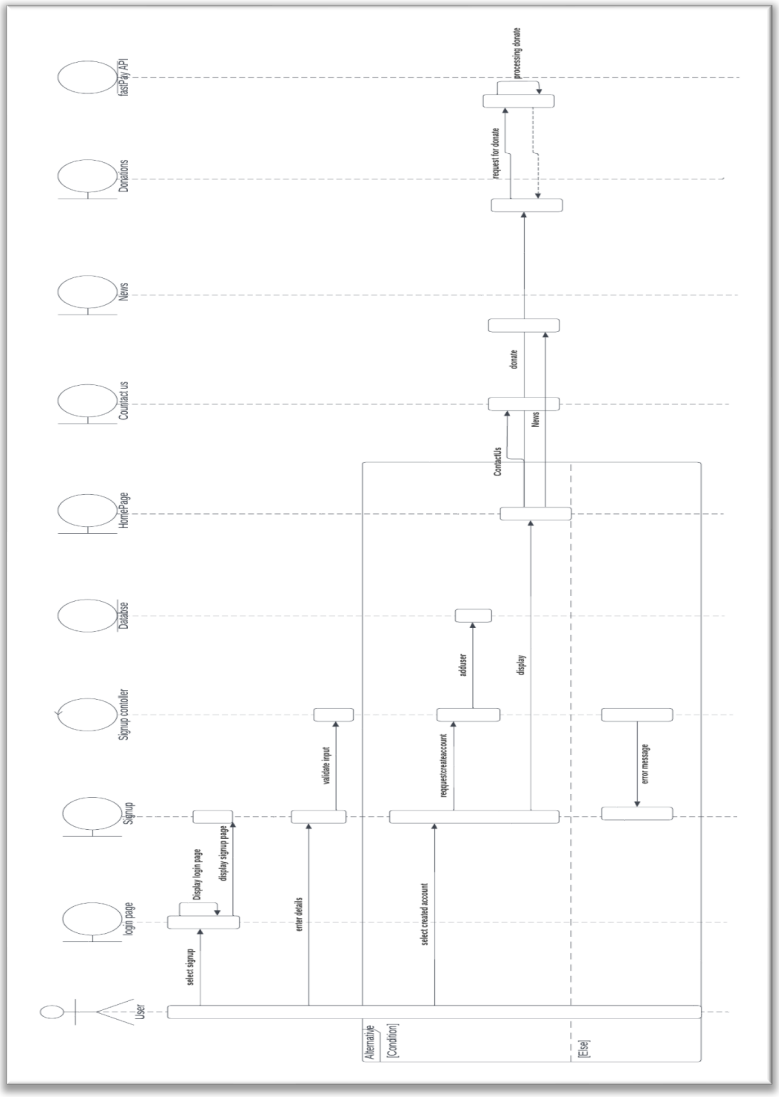

Figure 4-2 Sequence diagram For user

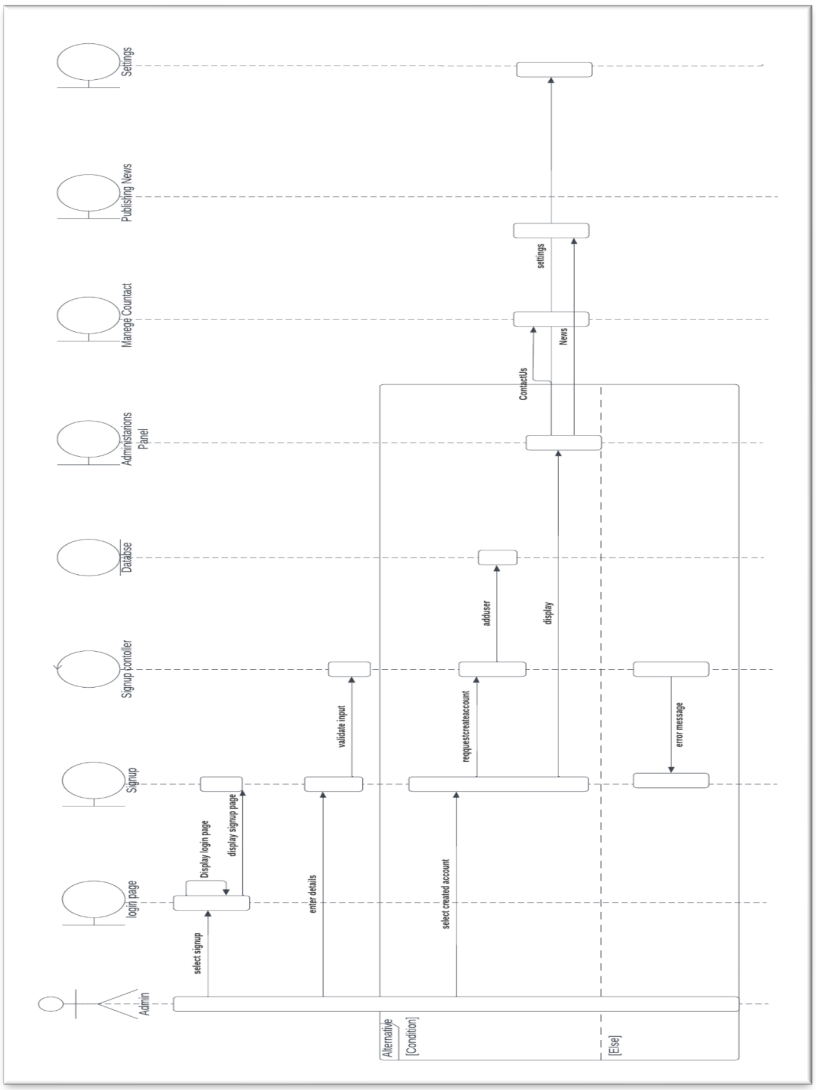

Figure 4-3 Sequence diagram for admin

4.2.3. Activity Diagram

This is an activity diagram for this project there are two activity diagrams one is for user and another one is for admin.

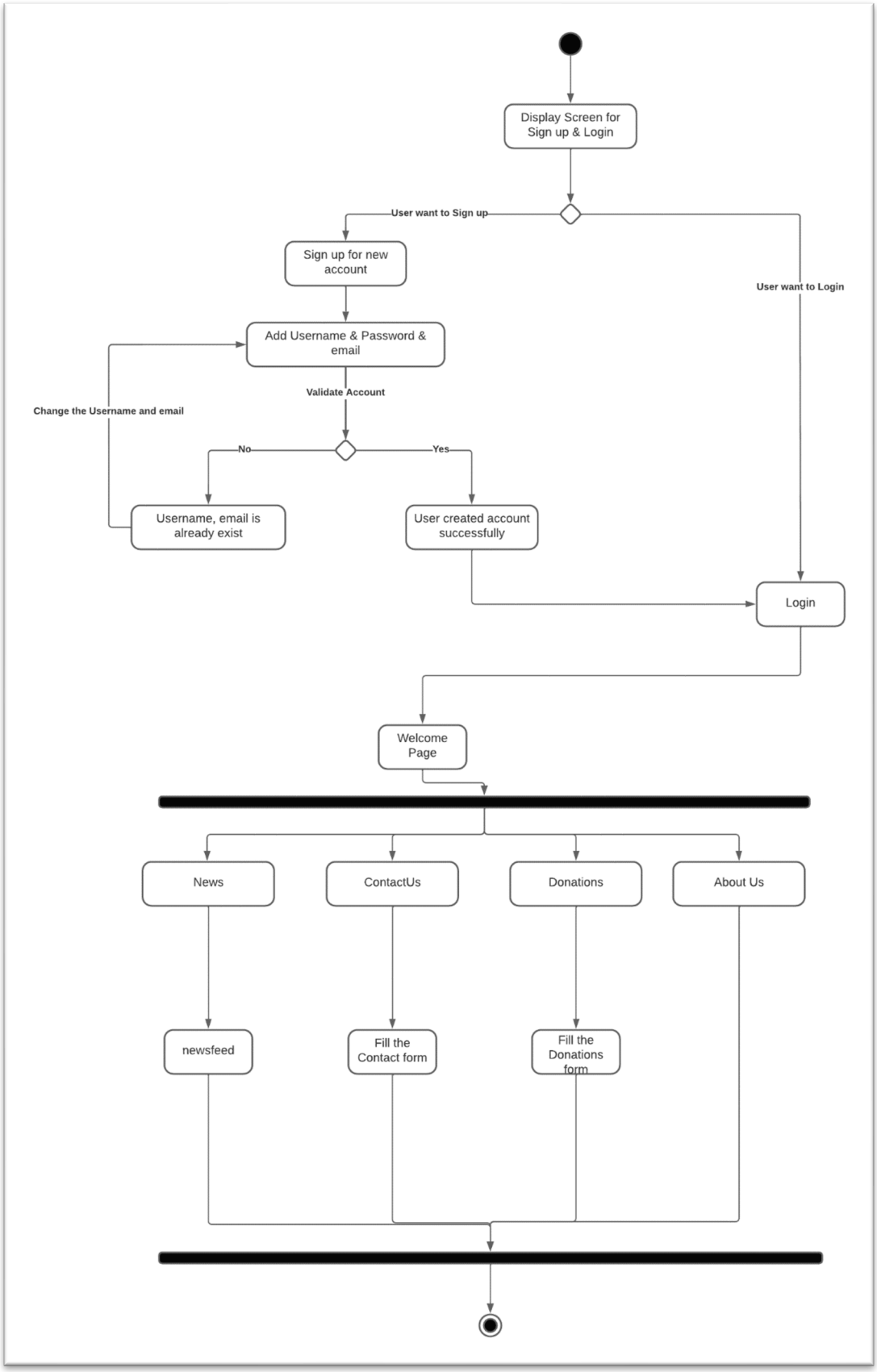

Figure 4-4 Activity diagram for user

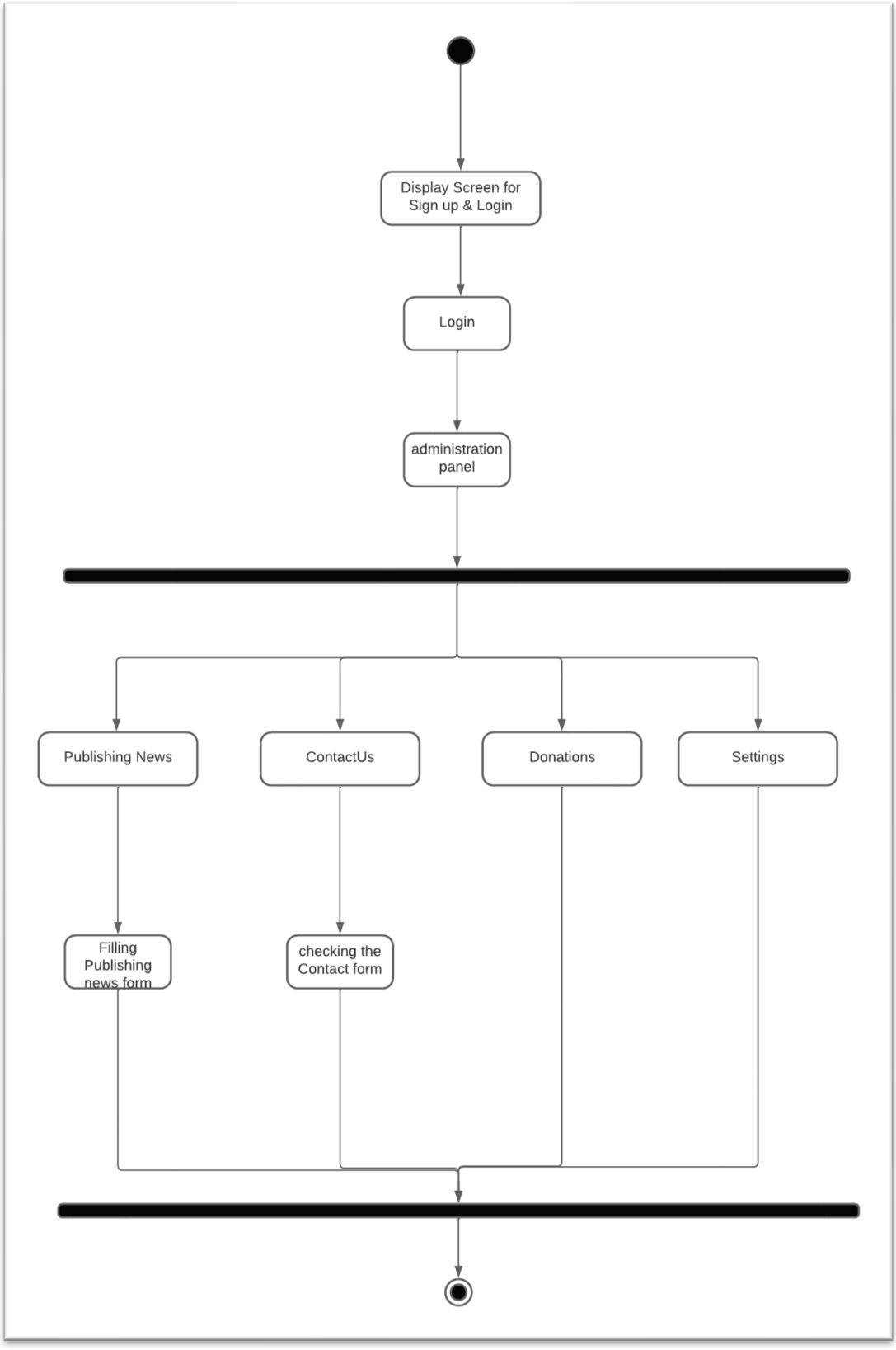

Figure 4-5 activity diagram for admin

4.3. Project Design

4.3.1. System architecture

This is a system architecture of the project, for creating the build front end of the website use HTML, CSS, JavaScript, bootstrap and angular languages because its easy to build and need the database for the application which use the MySQL, PHP for it and need internet to use the application.

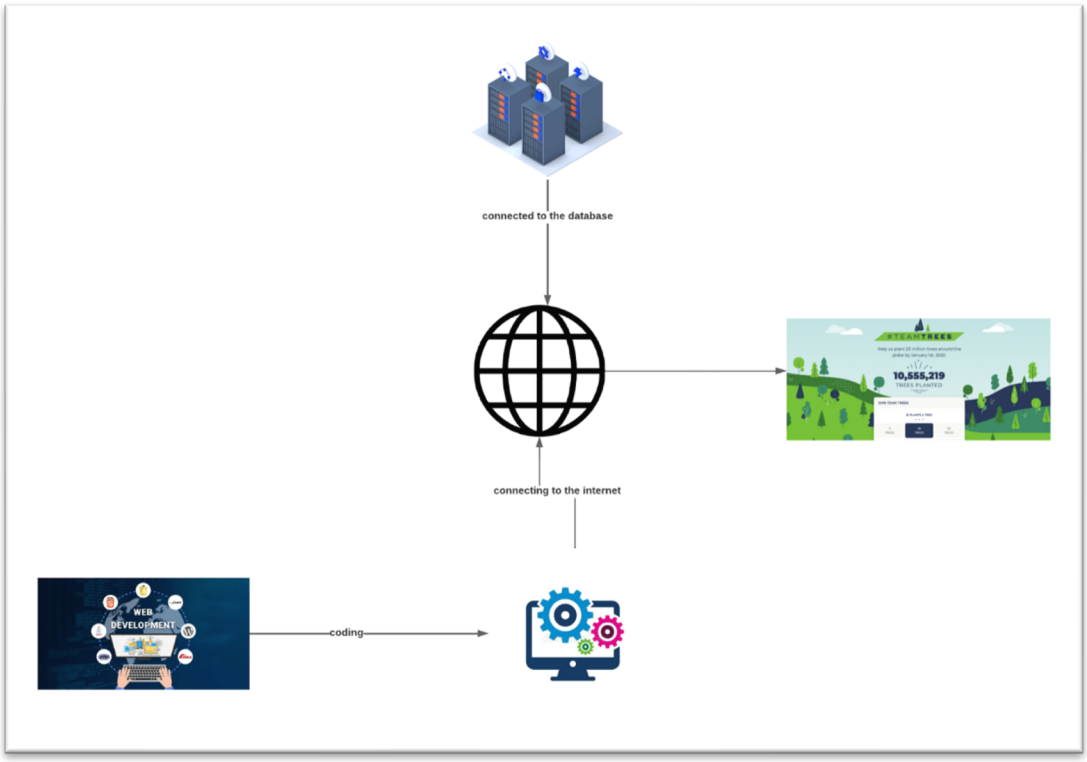

Figure 4-6 system architecture

4.3.2. Class Diagram

This is a class diagram of the project which consist of the four classes a class for environmentalist and admin that are a user and a class for publishing news.

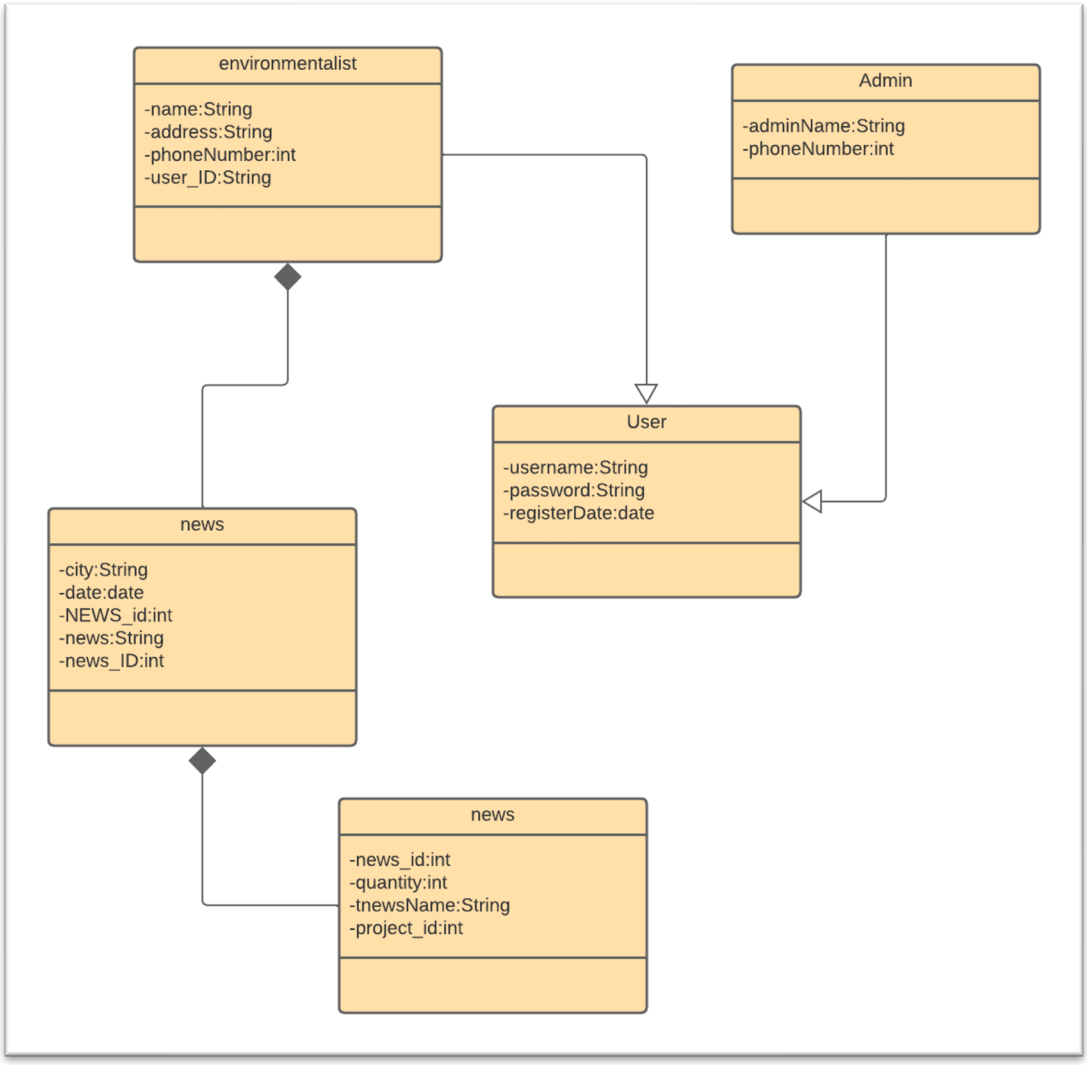

Figure 4-7 Class diagram

4.4. Database Design

This is a design of the project database which consist of four classes a class for user and a class for publishing news to save the news. And a class to save all information that relate to the website's database.

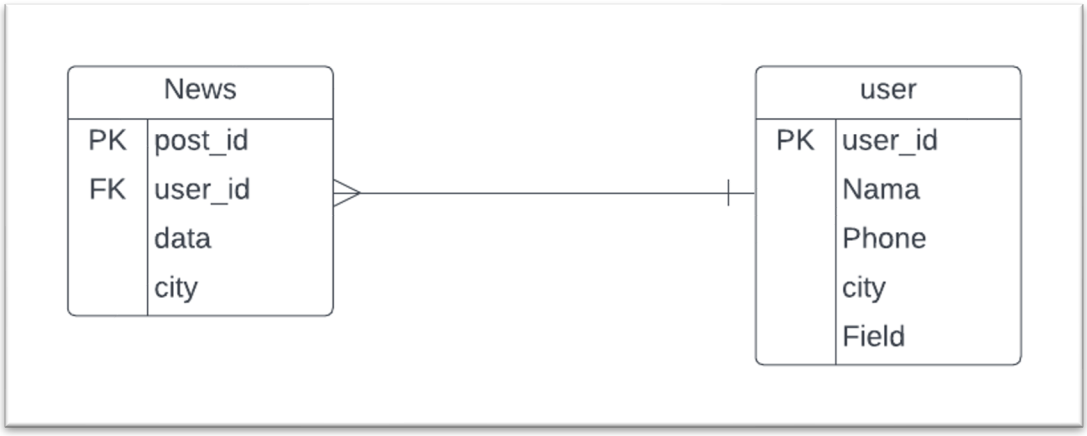

Figure 4-8 Database Design

4.5. Interface Design

This interface of Develop a plant and community for environment safe website consist of 7 pages, both interface user and administrations panel pages.

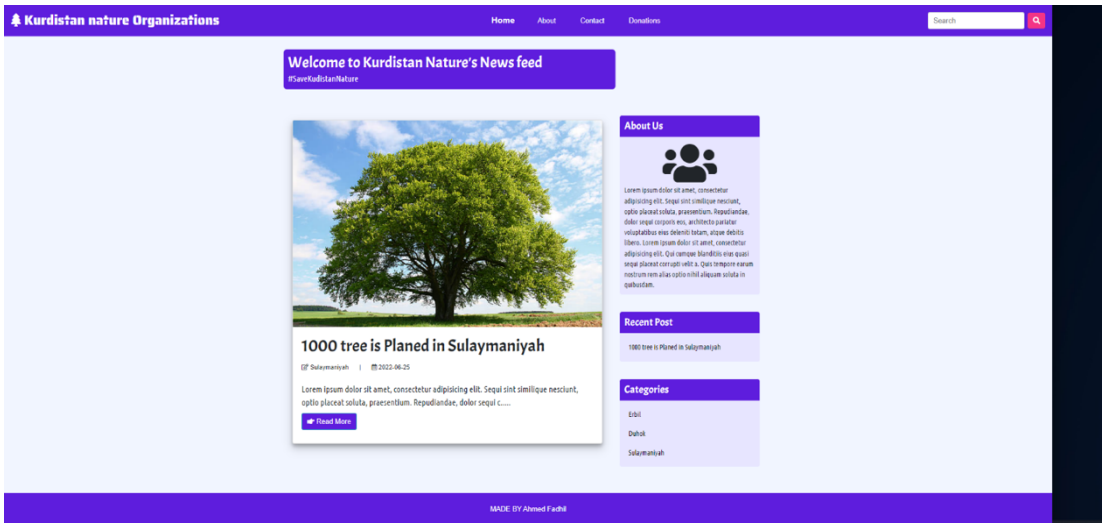

Figure 4-9 Home page - Interface

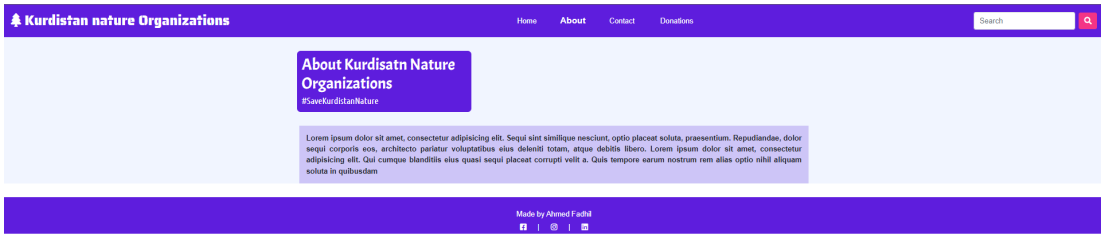

Figure 4-10 about page - Interface 2

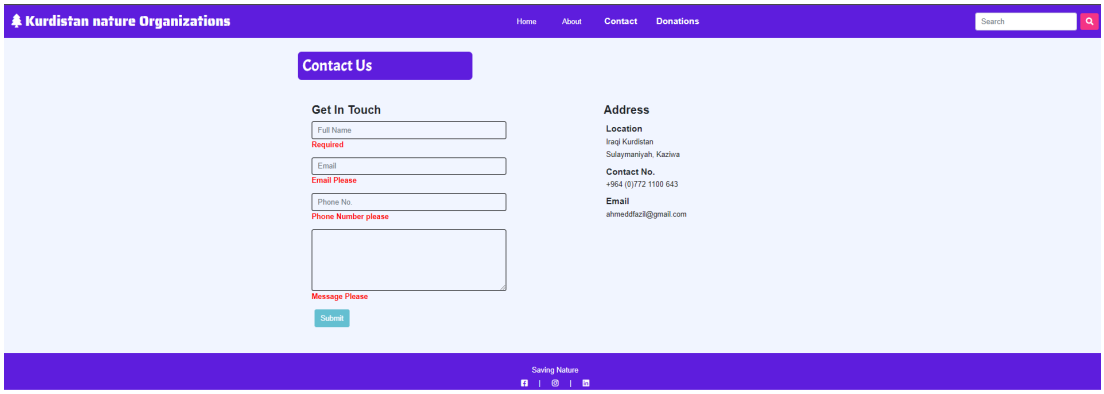

Figure 4-11 contact page - Interface 3

Figure 4-12 administrations panel page - Interface 4

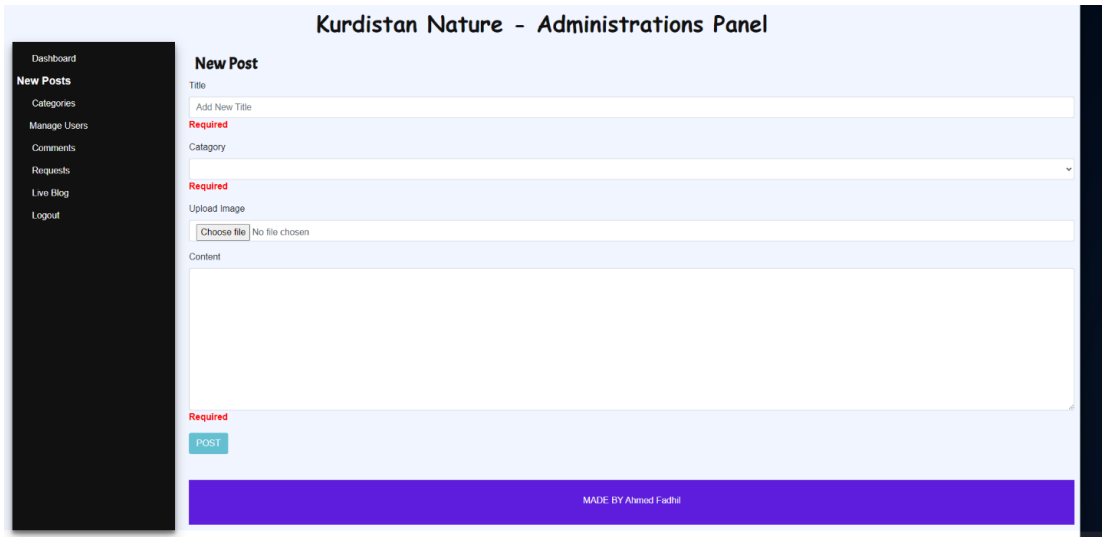

Figure 4-13 administrations panel news posts page - Interface 5

Figure 4-14 administrations panel contact page - Interface 6

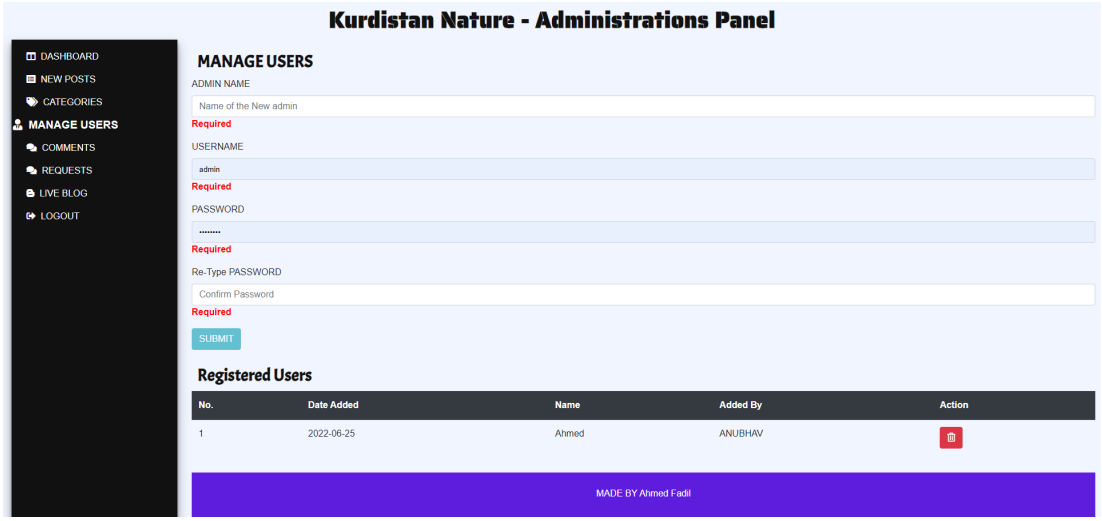

Figure 4-15 administrations panel manage admin page - interface 7

4.6. Chapter Summary

Finally, the functionality of every entity of the in-development system has been covered throughout this chapter, beginning with the use case diagram, which was used to analyze how the components will be structured and what will be included in the system in relation to user interactions after finishing with the use case diagram. The next step is the sequence diagram, which shows how those components will interact with each other for each different user, followed by the activity diagram, which shows how those components will flow step by step, and finally the design phase, which includes class diagrams and entity relationships. The first step in understanding the overall design of the system is to construct a class diagram, which is mostly for developers to understand what classes will be generated, how the database will be built, and how the system architecture will be structured in the overall design of the system.

Chapter 5

IMPLEMENTATION, AND TESTING

5.1. Introduction

This chapter covers how to implement the Develop a plant and community for environment safe website in accordance with the system development methodology, requirements analysis, and design outlined in the earlier chapters of this document. The outcomes of several tests are also described in this chapter.

5.2. System Implementation

The results of the architectural design and system analysis are used early on in a project's life cycle to decide how this project should be developed to fulfill the needs of its stakeholders.

5.2.1. System Architecture

The MVC system architecture was selected for the Develop a plant and community for environment safe website in FYP1 and put into practice in the initial phases of development in accordance with the provided specifications. However, it was found throughout system development that MVC was not a successful implementation in this system due to the numerous UI changes needed. We substituted an MVVM framework for a conventional architecture as a result of these design adjustments. Figure uses MVVM to display the classroom functionality.

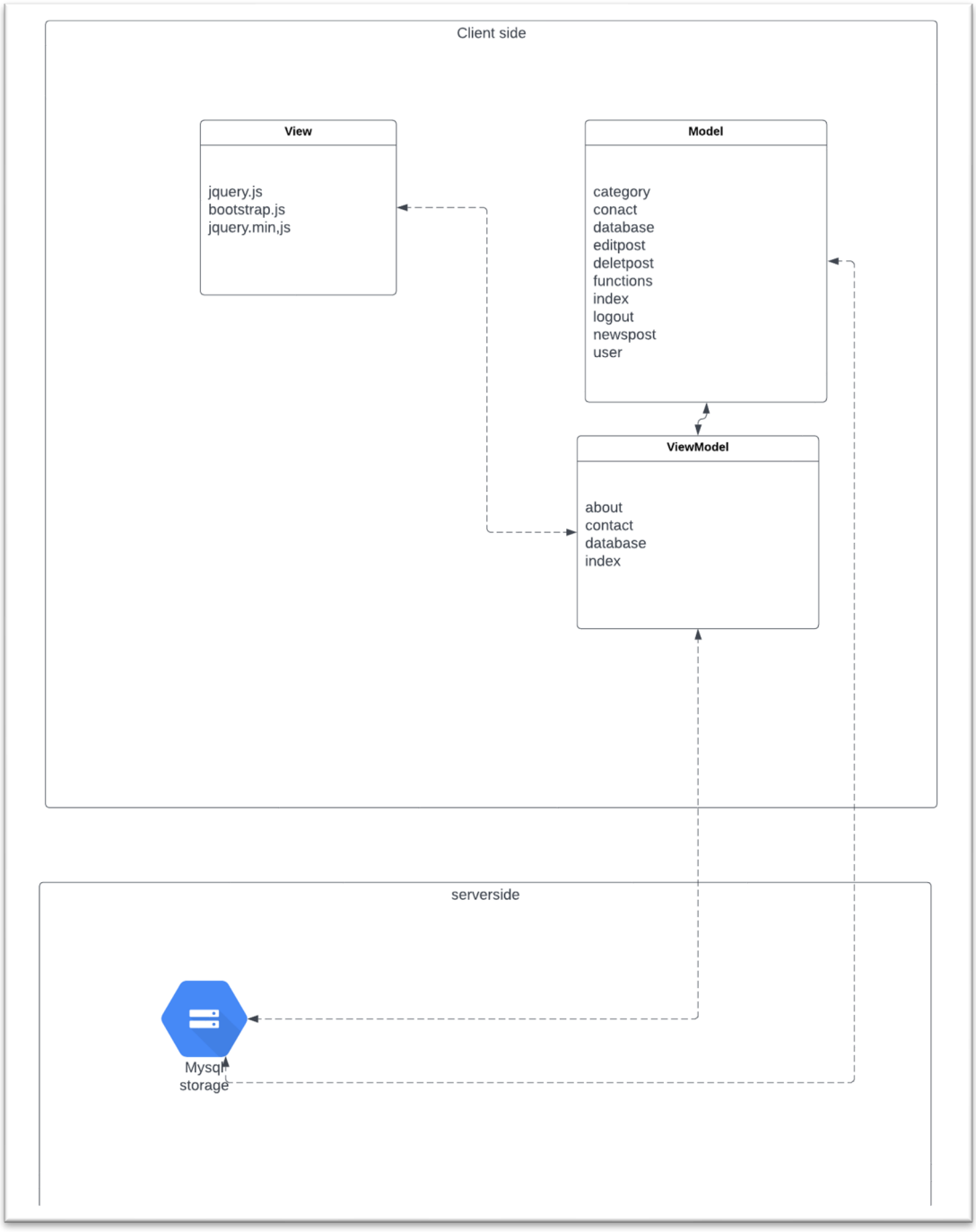

Figure 5-1 MVVM ARCHITECTURE

5.2.2. Database Management System (DBMS)

Database Management System (DBMS) is a system that stored and handled collection of data that for a certain system. And for the Develop a plant and community for environment safe website. And I used MySQL for it.

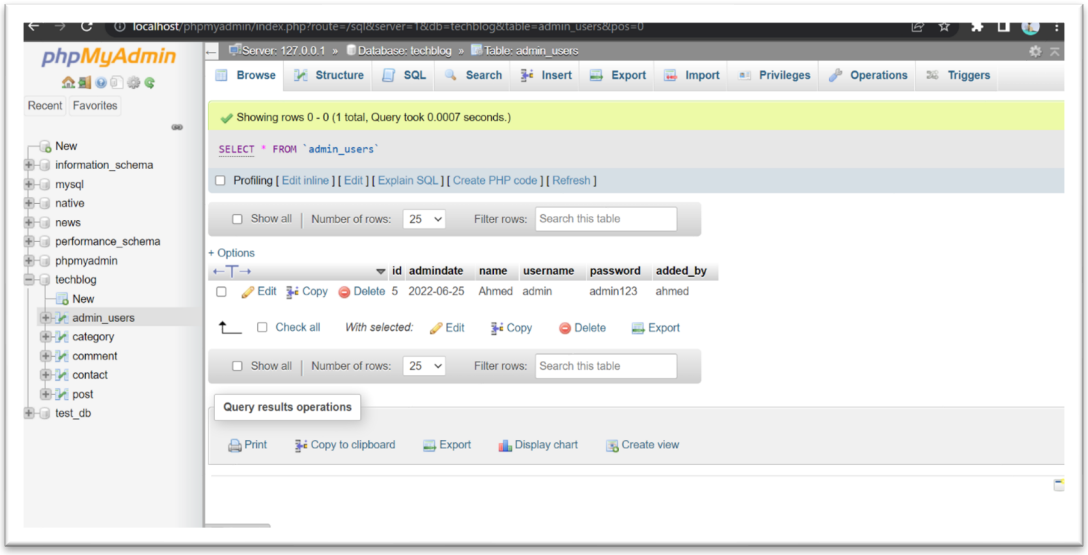

Figure 5-2 DATABASE 1

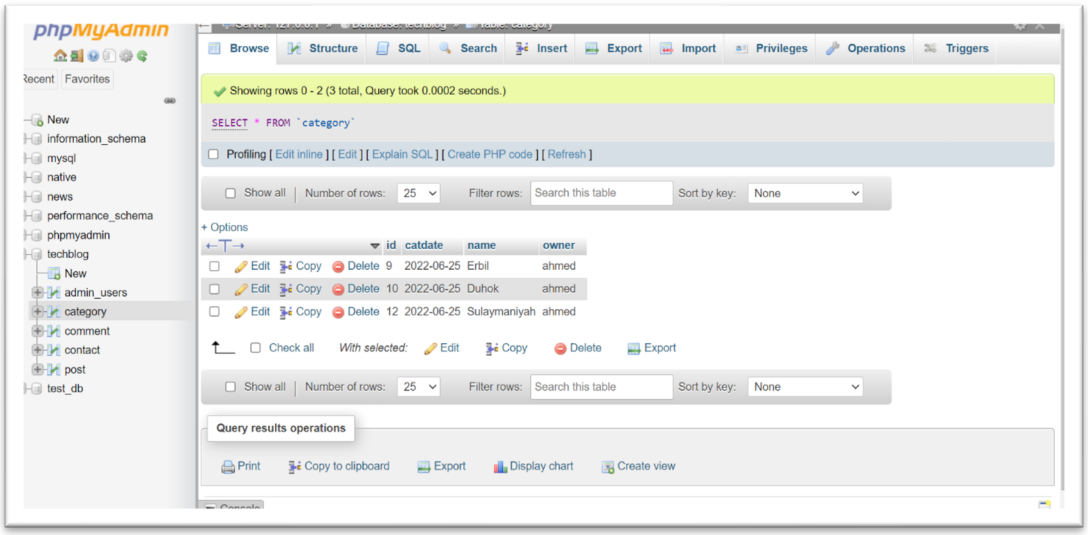

Figure 5-3 DATABASE 2

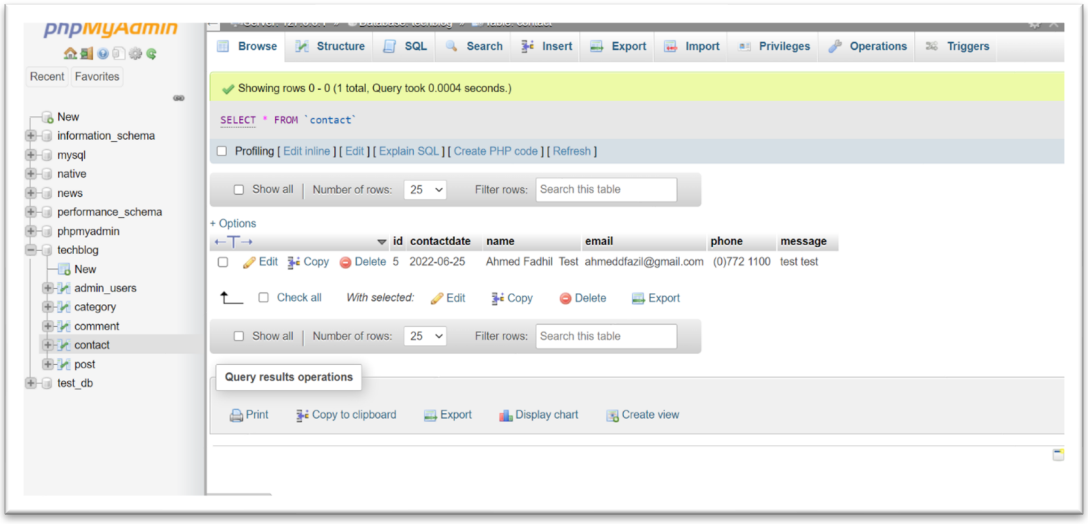

Figure 5-4 DATABASE 3

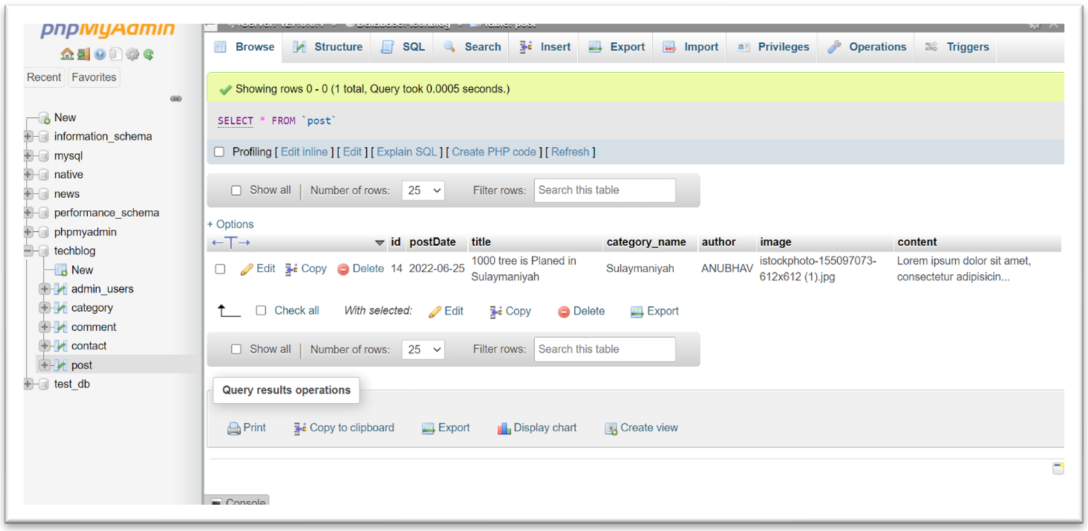

Figure 5-5 DATABASE 4

5.3. System Testing

The MVC system architecture was selected for the Develop a plant and community for environment safe website in FYP1 and put into practice in the initial phases of development in accordance with the provided specifications. However, it was found throughout system development that MVC was not a successful implementation in this system due to the numerous UI changes needed. We substituted

an MVVM framework for a conventional architecture as a result of these design adjustments. Figure uses MVVM to display the classroom functionality.

5.3.1. Black-Box Testing

Software testing methods known as "Black Testing" are used to test a system's functioning without consulting the system's code structure. Without having any internal knowledge of the system, it operates by concentrating on the output that the system produces based on the input entered. Black Box Testing, as a result, is only concerned with the system's usability from the user's perspective.

This entire implementation and testing procedure was carried out in accordance with the methodology, specifications, and design that were established. In this chapter, the procedure is described and recorded. The project's end will be covered in the following chapter. The Develop a plant and community for environment safe website's black box testing has gone well. The test scenario for the account login function is shown in Figure. APPENDIX D - STD contains the test case design for the Develop a plant and community for environment safe website.

Table 5-1 test scenario

Test Case ID	TC01 – 01	TC02 – 02	TC03 – 03	TC04 – 04	TC05 – 05	TC06 – 06	TC07 – 07
Inputs and Actions							
Email		ahmed	ahmedfazil@gmail.com	ahmedfazil@gmail.com	ahmedfazil@gmail.com	ahmedfazil@gmail.com	ahmedfazil@gmail.com
Password					5678	12345678	12345678
Expected Result	Actual Result						
Error Message on invalid email address	✓	✓					

Error message on empty password	✓		✓				
Error message on wrong Email or password					✓		
Redirect User to homepage							✓
Test Results							
	Pass	Pass	Pass	Pass	Pass	Pass	Pass

5.4. Chapter Summary

This entire implementation and testing procedure was carried out in accordance with the methodology, specifications, and design that were established. In this chapter, the procedure is described and recorded. The project's end will be covered in the following chapter.

Chapter 6

Conclusion

6.1. Introduction

This chapter will talk about the conclusion of the project. and achievement of the project objectives and suggestions for future improvement for example what are those features will be added to the application and updating the current features of the application which include helping projects in Kurdistan, publishing news, and user's impact each those features have a great effect on the user and by publishing news about the environment that make increase community awareness and by helping projects the reforestation of the forests will be increase and the cites will be green again.

6.2. Achievement of Project Objectives

Saving our environment and the reforestations of the forests and increasing community awareness about the environment and climate change are the achievement of the project. by helping projects in the Kurdistan through this application the cities will be green again and that make our environment more be safer and cleaner.

Through this application by publishing news by environmentalists, it can spread awareness in the community that means each person will be more responsible about nature and nations that live in.

6.3. Suggestions for Future Improvement

About suggestions for future improvement of this application first after implementing the application for Kurdistan one of the suggestions is to make the application available for the whole of Iraq and available in all cites these suggestions will take the application into another step. And another suggestion is to help multiple environmental organizations in Iraq and get a helping hand in order to make our nations green again. And another suggestion is by doing surveys and questioners in order to get the result from the user of the application to reach the standards of the user needs.

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tree-nation.com. (n.d.). *Plant and offer trees to reforest the world*. [online] Available at: https://tree-nation.com/plant-citizens?gclid=Cj0KCQiAmKiQBhClARIsAKtSj-mVQaHweP6VZDTyyQQe7SVZhebuSgJmVlln0-teKNh4GN4goI-kUvwaAu5eEALw_wcB.

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Appendix A

SOFTWARE REQURIMENT SPECIFICATIONS (SRS)

Introduction

Developing a plant and community for environment safe website is described in this Software Requirements Specification (SRS), which includes both functional and non-functional requirements, and goes into great detail. It represents the interaction between the user and the system using a set of use cases, activity diagrams, and sequence diagrams. Both an activity diagram and a sequence diagram are available to depict the system's flow and the declared objects.

Purpose

- The purpose of this SRS:
- To identify and assess both the system's functional and non-functional needs
- To describe the system's general flow
- To serve as an input to the Software Design Document (SDD)
- To serve as a validation check for the software product

Scope

Develop a plant and community for environment safe website it is a website for the people who want to donate to plant trees and help the environment through this website and knowing the latest news about nature and climate changes.

The target user of this website is the people from the Iraqi Kurdistan region. They are two categories of users who are Admin, and people. Admin will manage and publish the news about the nature and latest news of climate change and manage the donations. the people will donate to planting a tree and seeing the news. This system will be developed as a website for the users.

The website's main goal is to increase the planting of a tree in the Iraqi Kurdistan region. And publishing the news of nature climate change.

Definitions, Acronyms and Abbreviation

Term	Definition
KRG	Kurdistan Region Government
FR	Functional Requirement
NFR	Non-Functional Requirement
SDD	Software Design Document
SRS	Software Requirement Specification

References

Sommerville. "Software Engineering", 10th Edition, Addison Wesley.

Overview

This document is organized into three sections, each of which has multiple subsections. The following are the key sections:

- Introduction: The SRS is described in this section as a whole.
- Overall Description : This section explains how the software product is affected by many circumstances. It serves as a backdrop for the system's requirements
- Specific Requirements : This part delves into the specific requirements of the system to be constructed, as well as the user-system interaction.

Overall Description

The actors of the system are admin, user. The use case this divvied in to three modules which are Module login & sign up, Module news and Module donations. Figure one shows the use case diagram of the Develop a plant and community for environment safe website.

Figure 6 Use case diagram

Product Perspective

Developing a plant and community for environment safe website is created so that a user, whether an admin or a normal user, can donate to saving Kurdistan's nature and seeing the latest news about nature and climate change. Admin in the admin panel can add and manage the news list and category can add and delete and update the news, and about donations, the best solution is using fast pay for the money.

Product Functions

The functionalities provided by the system are shown as follows:

i) Module login & sign up:

- UCO1 – Login

  This use case allows user to login in to the website after signup to the website.

- UCO2 – signup

  This use case allows user to sign up in to the website and create a new account on Develop a plant and community for environment safe website.

ii) Module news:

- UCO3 – Publishing News

  This use case allows admin to publish, manage the news list.

- UCO4 – seen the newsfeed

  This use case allows user to see the news which added by the admin.

iii) Module donations:

- UCO5 – Donations

  This use case allows user to donate for planting tree by using fast pay API.

User Characteristics

This section describes all the actors of the system. The main actors of the system are Admin, User (People from Kurdistan).

Admin

Admin is a user who register as Admin. Admin can add, update and delete the news list in admin panel, and checking donations money in fast pay account.

User (People from Kurdistan)

User is can through donate can help the nature for planting tree, and can seeing the news and events on the website which uploaded by the admin.

Specific Requirement

This section describes the functional and non-functional requirements of the system. Use case specification and respective sequence diagram and activity diagram for each use case are also presented in this section. Figure 2 shows the domain model of the system.

System Features

This subsection describes the function requirements of each module with respective use case specifications, sequence diagram and activity diagram.

Module login & sign up

Figure 3 shows the use case diagram of Module User in the system.

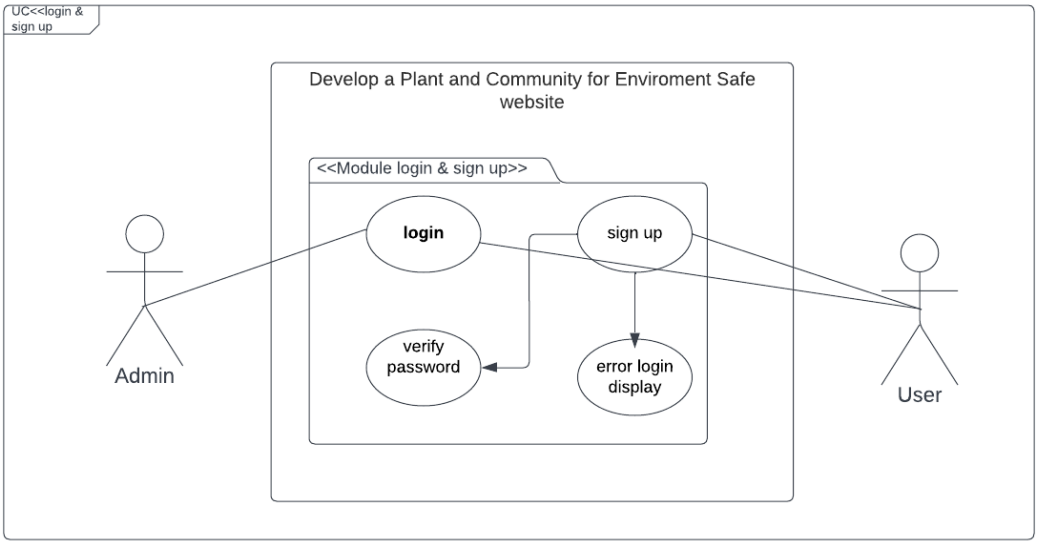


Figure 7 Use Case Diagram of Module login & sign up

The functional requirements of Module login & sign up:

FR001 – login : The system shall allow user to login into the website to gain access of the website functionalities for example donations and newsfeed.

FR002 – Sign up : The system shall allow user to register an account with the system to become the website's user.

Table 2 use case description for sign up

Use case ID	UC01
Use Case Name	sign up
Brief Description	This use case allows user to create a new account.
Actors(s)	User
Pre-condition	Internet is connected to the device that run the system.
Normal Flow	1. The use case starts when the user opens the website. 2. The use case starts when user selects "Sign Up". 3. System displays sign up page containing sign up form. 4. User enters their sign-up details in the form. 5. User selects "Sign Up".

	6. System validates the user input. If the validation fails, Exception Flow1 is performed. 7. System saves user account into account database. 8. The use case ends.
Alternative Flow	User created an account
Exception Flow	1. Validation fails 1.1 System displays error message. 1.2 The use case resumes at Normal Flow 3.
Post-condition	1. Successful Completion 1.1 User account is added in account database. 1.2 User redirect to the homepage. 2. Failure Condition 2.1 System displays error message.

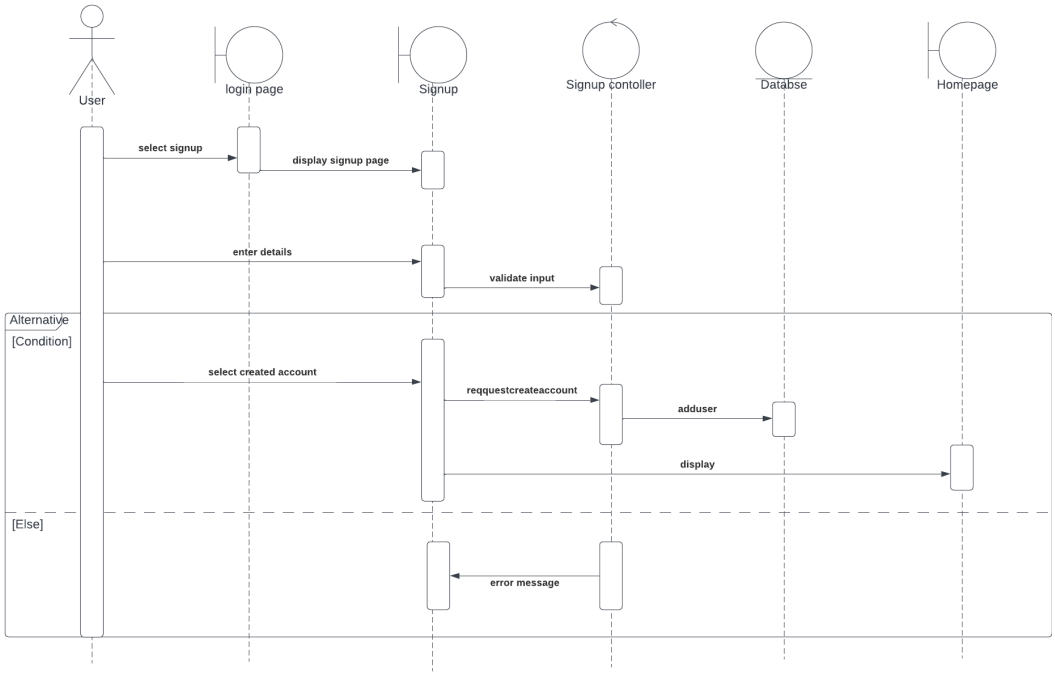


Figure 8 Sequence Diagram of Sign up

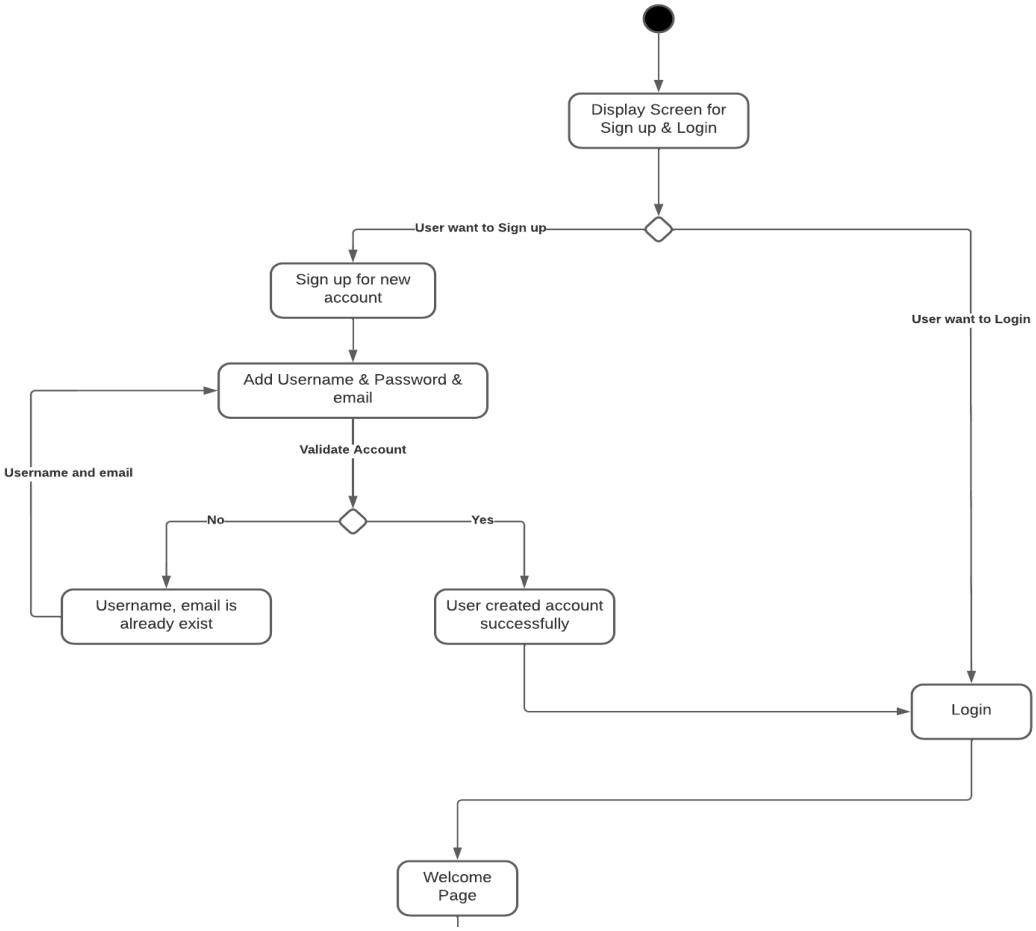
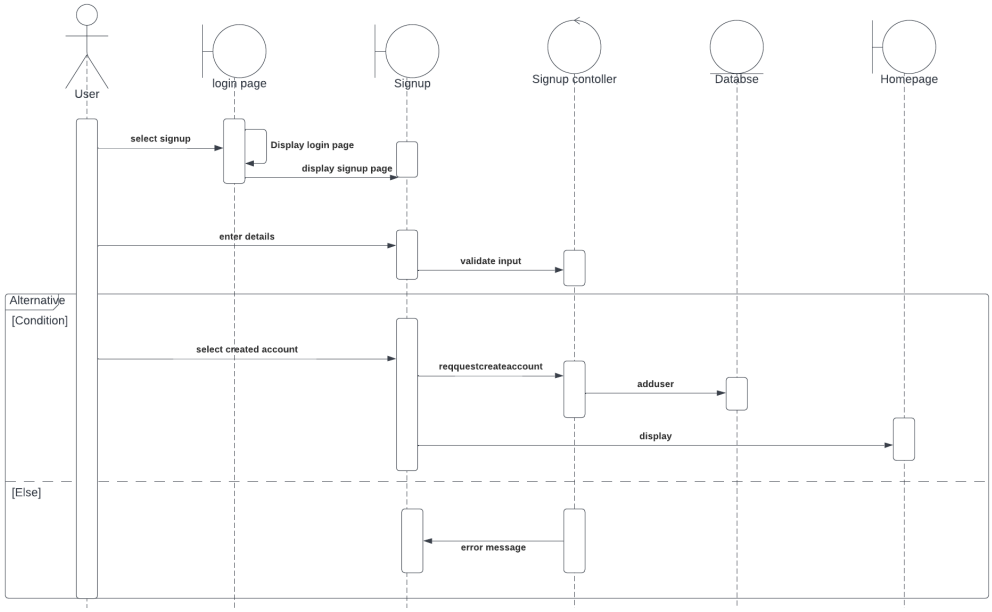


Figure 9 Activity Diagram of Sign up

Table 3 use case description for login

Use case ID	UC01
Use Case Name	login
Brief Description	This use case allows user to login in to the website
Actors(s)	User & admin
Pre-condition	1.Internet is connected to the device that run the system. 2.The user account is already successfully created.
Normal Flow	1.The use case starts when the user opens the website. 2, The use case starts when user selects “Login”. 3. System displays login page containing login form. 4. User enters their login details in the form. 5. User selects “login”. 6. System validates the user authentication. If the authentication fails, Exception Flow1 is performed. 7. System saves user account into account database. 8. The use case ends.
Alternative Flow	User login in to the website
Exception Flow	1. Validation fails 1.1 System displays error message.

	1.2 The use case resumes at Normal Flow 3.
Post-condition	1. Successful Completion 1.1 User successfully login in to the system 1.2 User redirect to the homepage. 2. Failure Condition 2.1 System displays error message.



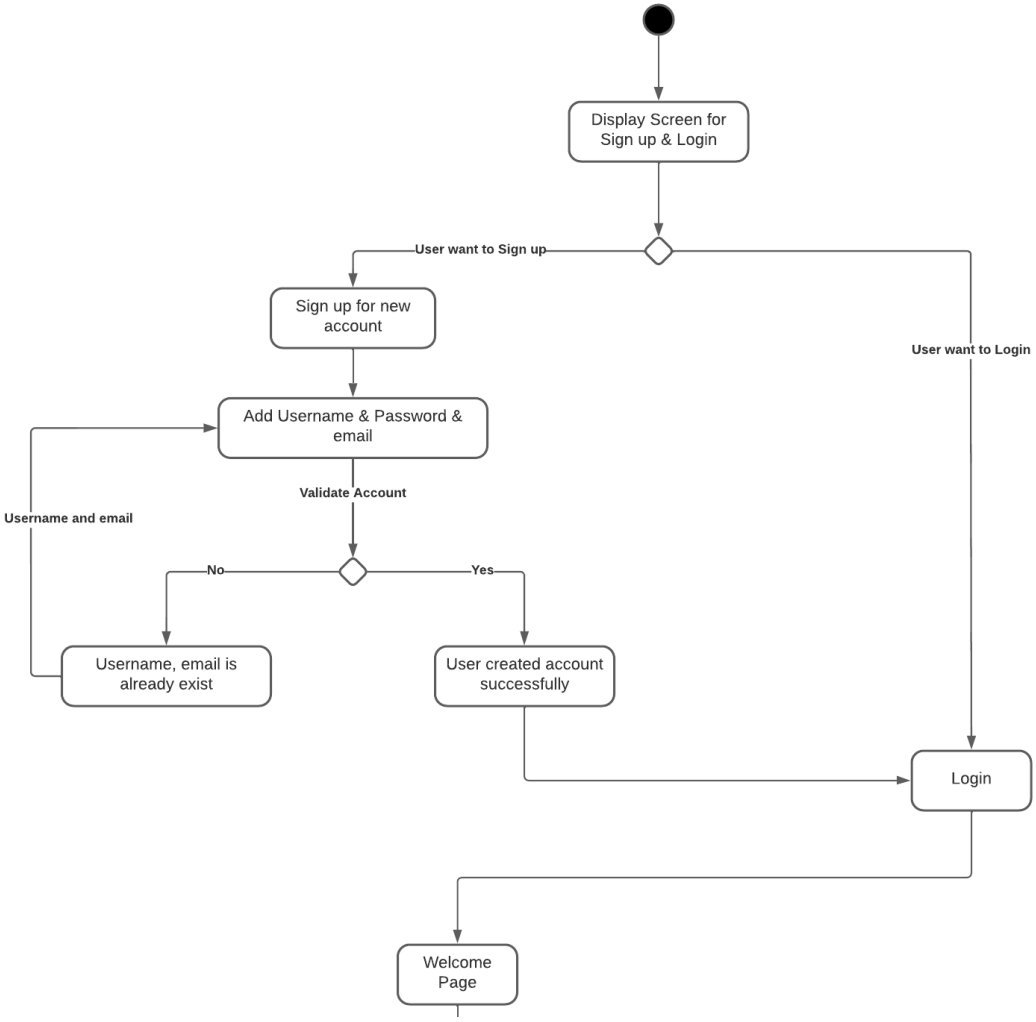


Figure 10 Activity Diagram of Login

Module news

Figure 4 shows the use case diagram of Module news in the system.

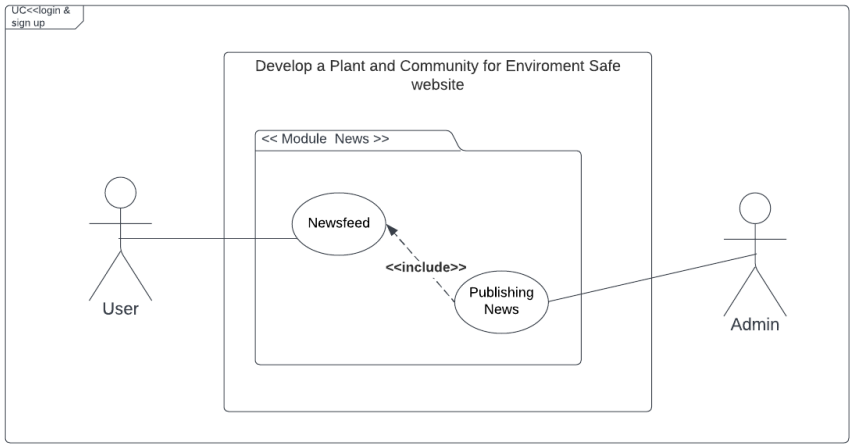


Figure 11 Use Case Diagram of Module News

The functional requirements of Module News:

FR001 – publishing News: After login to the system, the system shall allow Admin to publish the news in the admin panel, and the user will see it in the news feed.

Use case ID	UC03
Use Case Name	Publishing news
Brief Description	This use case allows admin to publishing news.
Actors(s)	Admin & User
Pre-condition	1.Internet is connected to the device that run the system. 2.The admin is login into the system.
Normal Flow	1. The use case starts when the user opens the website. 2. The use case starts when user selects “login”. 3. System displays login page containing login form. 4. User enters their login details in the form. 5. User selects “login”. 6. System validates the user input. If the validation fails, Exception Flow1 is performed. 7. the admin will select the news features and fill the news form in details then publish the news, and user can see it in newsfeed. 8. The use case ends.
Alternative Flow	Admin will publish the news Admin will not publish the news
Exception Flow	1. Validation fails 1.1 System displays error message. 1.2 The use case resumes at Normal Flow 3. 2. Publishing fails
Post-condition	1. Successful Completion 1.2 User redirect to the homepage.

	1.3 publishing news is Successful 2. Failure Condition 2.1 System displays error message.

Figure 12 use case description for publishing news

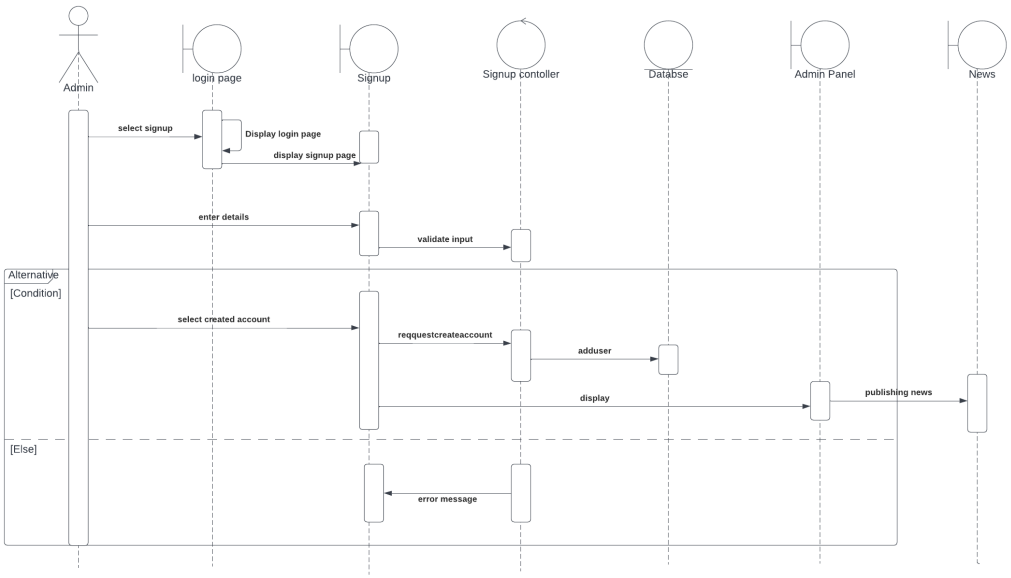


Figure 13 Sequence Diagram of News

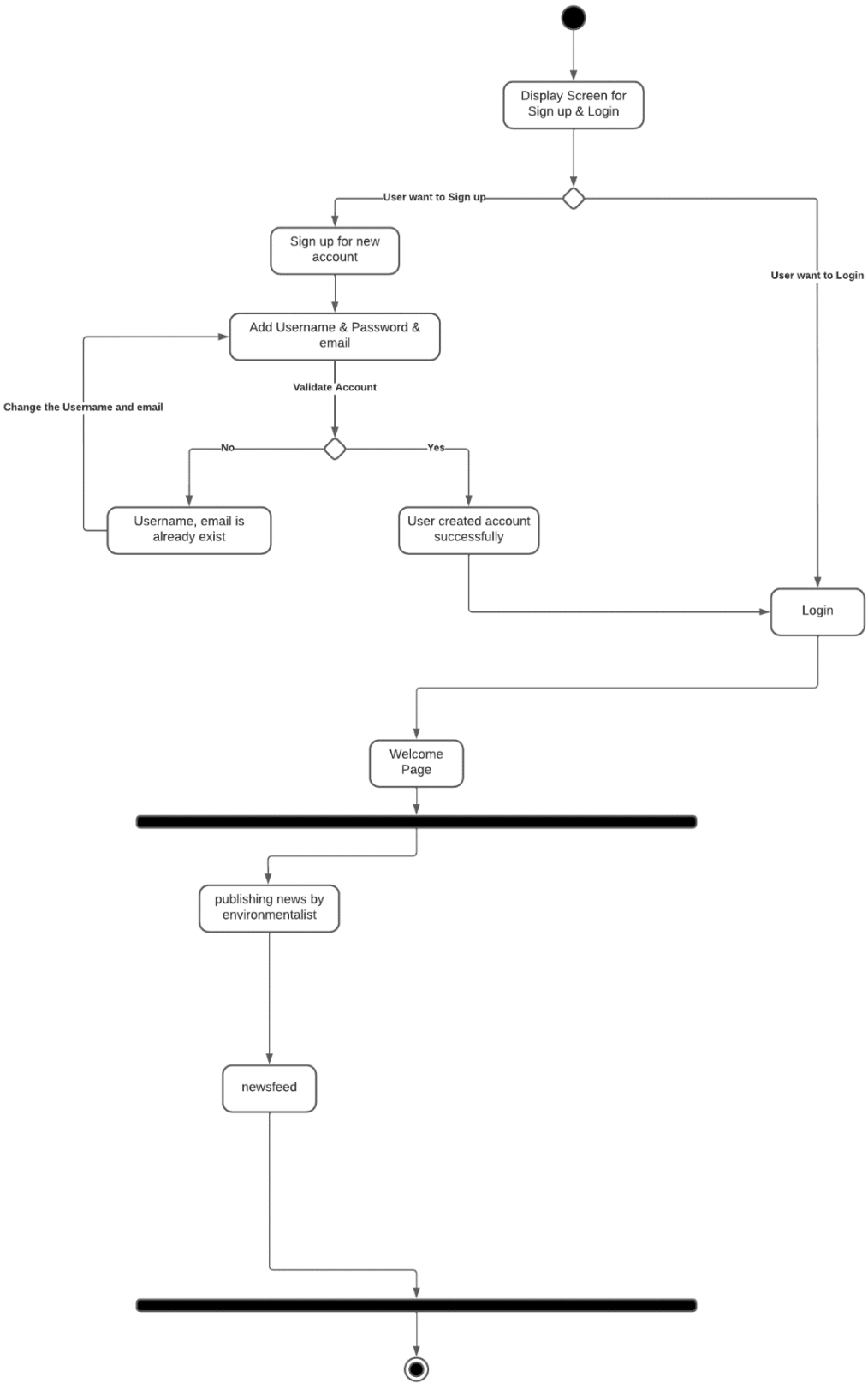


Figure 14 Activity Diagram of News

Module donations

Figure 5 shows the use case diagram of Module donations in the system.

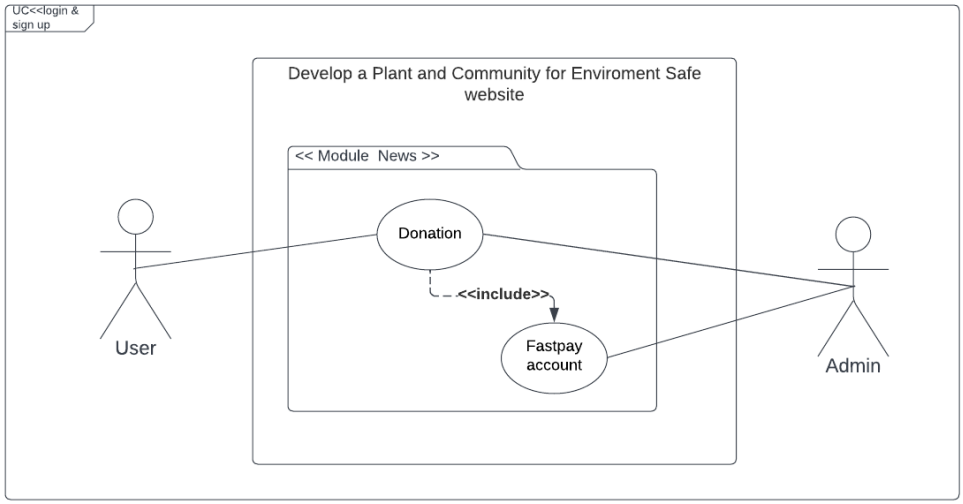


Figure 15 Use Case Diagram of Module Donations

The functional requirements of Module donations:

FR001 – donations: After login to the system, the system shall allow user to donate and help the nature through Fast pay API.

Use case ID	UC03
Use Case Name	Publishing news
Brief Description	This use case allows admin to publishing news.
Actors(s)	Admin & User
Pre-condition	1.Internet is connected to the device that run the system. 2.The admin is login into the system.
Normal Flow	1. The use case starts when the user opens the website. 2. The use case starts when user selects “login”. 3. System displays login page containing login form. 4. User enters their login details in the form. 5. User selects “login”. 6. System validates the user input. If the validation fails, Exception Flow1 is performed. 7. user will fill donations form for donate 8. The use case ends.

Alternative Flow	user will donate user will not donate
Exception Flow	1. Validation fails 1.1 System displays error message. 1.2 The use case resumes at Normal Flow 3. 2. Publishing fails
Post-condition	1. Successful Completion 1.2 User redirect to the homepage. 1.3 donating will Successful 2. Failure Condition 2.1 System displays error message.

Table 4 use case description for donations

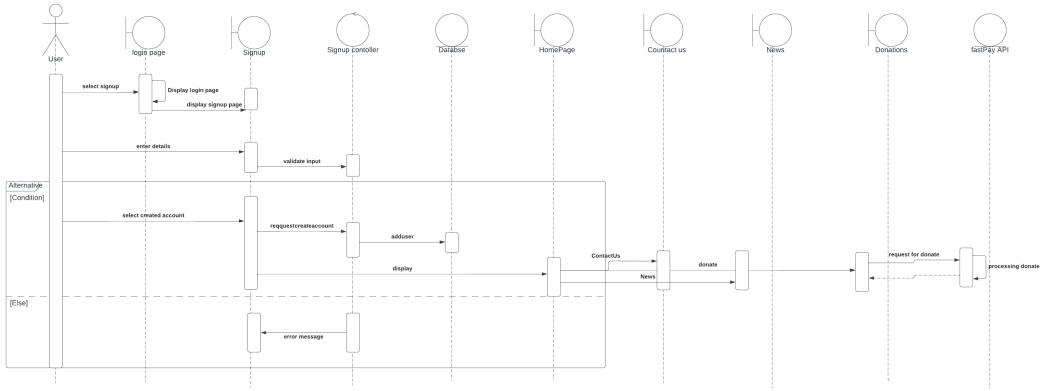


Figure 16 Sequence Diagram of Donations

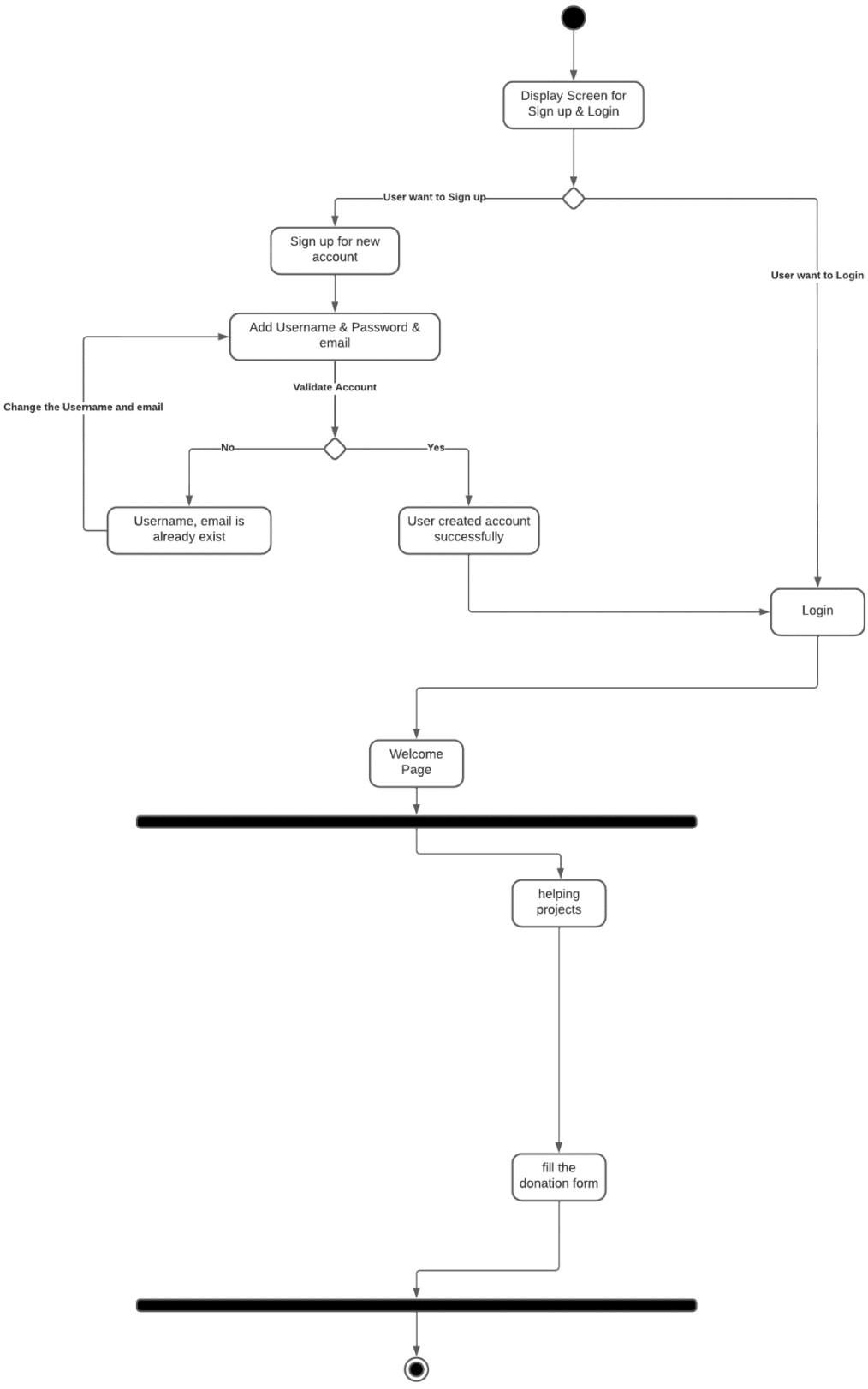


Figure 17 Activity Diagram of Donations

Performance Requirement

Reliability

NFR001 – Operability: The system shall be able to operate for at most 99% of the time.

Maintainability

NFR002 – Maintenance: The system shall be maintained and updated at least once for every 2 months.

Usability

NFR003 – Learnability: 99 % of the user shall be able to operate the system without any given special training.

Security

NFR004 – Data Protection: The system shall secure user data by implementing a strong authentication method provided by fast pay Authentication service for donations.

Design Constraints

Portability

NFR005 – Website: The system shall be able to operate in all devices.

Appendix B

SOFTWARE DESIGN DOCUMENT (SDD)

Introduction

This Software Design Document (SDD) describes develop a plant and community for environment safe website's architecture design, database design and user interface design. All of the requirements stated in the System Requirement Specification (SRS) of develop a plant and community for environment safe website document will be the inputs of this SDD.

Purpose

The purpose of this SDD:

- To describe the system architectural design of develop a plant and community for environment safe website
- To describe the database design of develop a plant and community for environment safe website
- To document and illustrate the user interface design of develop a plant and community for environment safe website.

Scope

Develop a plant and community for environment safe website it is a website for the people who want to donate to plant trees and help the environment through this website and knowing the latest news about nature and climate changes.

The target user of this website is the people from the Iraqi Kurdistan region. They are two categories of users who are Admin, and people. Admin will manage and publish the news about the nature and latest news of climate change and manage the

donations. the people will donate to planting a tree and seeing the news. This system will be developed as a website for the users.

The website's main goal is to increase the planting of a tree in the Iraqi Kurdistan region. And publishing the news of nature climate change

Definitions, Acronyms and Abbreviation

Term	**Definition**
KRG	Kurdistan Region Government
FR	Functional Requirement
NFR	Non-Functional Requirement
SDD	Software Design Document
SRS	Software Requirement Specification

Figure 18 Definitions, Acronyms and Abbreviations used in the system

References

Sommerville. "Software Engineering", 10th Edition, Addison Wesley.

Overview

This document is divided into five sections, each section contains several subsections and the main sections are shown below:

Introduction

This section describes an overview of the SDD.

System Architectural Design

This section explains the chosen system architecture for design of develop a plant and community for environment safe website.

Database Design

This section explains the design of the database for design of develop a plant and community for environment safe website. It contains data dictionary which explains all the data attributes that will be used in the system.

Interface Design

This section explains the chosen system architecture for design of develop a plant and community for environment safe website.

System Architectural Design

The chosen system architectural architecture that will be used in the Develop a plant and community for environment safe website is explained in this section. The system architectural design pattern used is the Model-View-View Model (MVVM)

architecture pattern, and the class diagram for this in this part, an architecture design pattern will be demonstrated.

Model-View-View Model (MVVM)

Model-View-ViewModel architecture, sometimes known as MVVM, is a type of system design pattern that separates system interaction into three groups or layers:

ViewModel, View, and View. Data management falls under the purview of the model layer. data retrieved by ViewModel from the mysql database services database. Contrarily, the element in charge of viewing content is the View layer. providing the user with information. Additionally, it manages the relationship between the information displayed, the user controls how the data is displayed on the interface for the system.

The information from the Model layer will be transformed by the ViewModel layer and transferred to the View Layer so that it is visible to the user.Usually, ViewModel are classes that can be handed around.shows the MVVM architecture design pattern in a high-level manner. Whenever a user enters data, the View layer sends it to the ViewModel layer, which then calls the Model layer and modifies the data before sending it back to the ViewModel layer and delivering it to the View layer to output to the user.

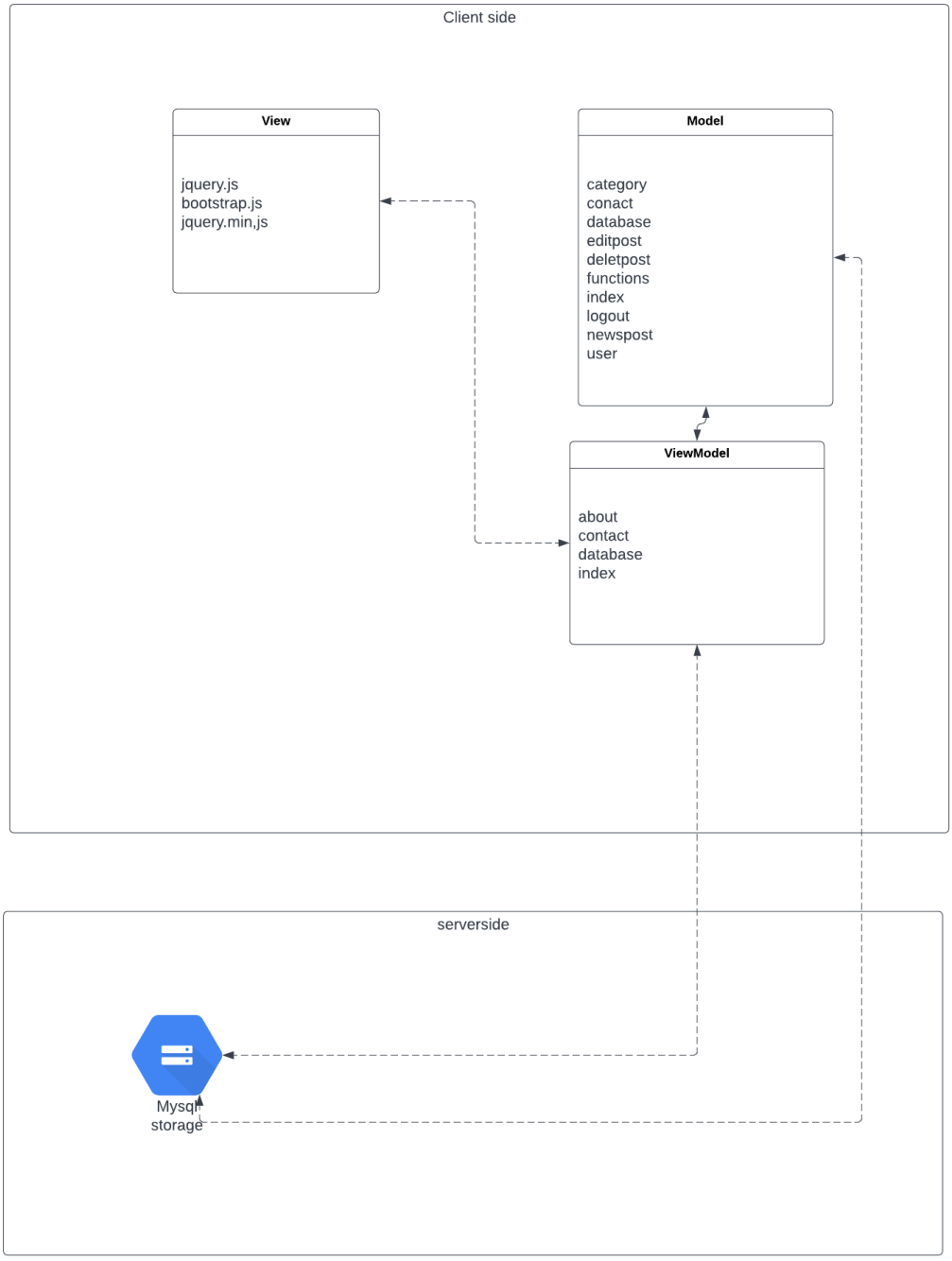


Figure 19 mvvm

Model

In order to manage actions on data information, business logic, and rules, the model layer interacts with the database. It is composed of classes that reflect the

system's domain. Figure displays the model component class diagram in develop a plant and community for environment safe website.

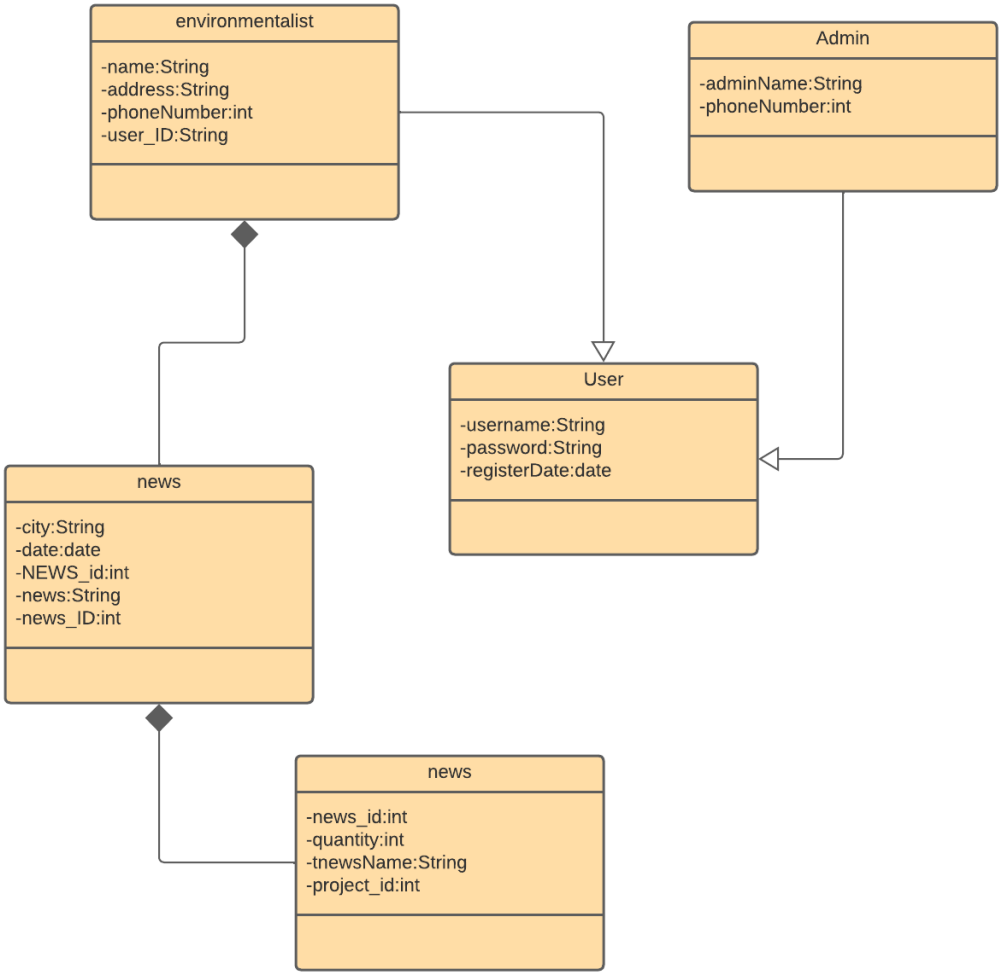


Figure 20 Model

View

The system's View Layer is a component that displays the output data to the user. It represents the user interface that the user will utilize to access the system's functions. The class diagram for View components is displayed in develop a plant and community for environment safe website Figure.

Figure 21 View

View Model

A component that collects user input and transmits it to model components is the view model layer. By mapping input requests from the application response, View Model moves data from View to Model. Figure displays the class diagram for the Controller components in the develop a plant and community for environment safe website

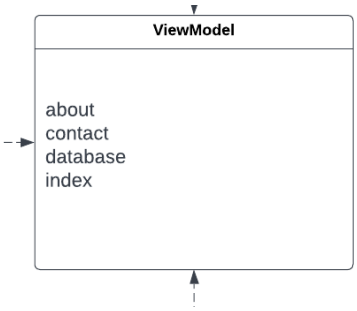


Figure 22 ViewModel

Database Design

Database design organizes all of the system database's data, which aids in the system's overall design, development, implementation, and maintenance. Figure depicts the database design that has been used.

Data Dictionary

The data attributes that are involved and kept in the develop a plant and community for environment safe website

the system's database is all explained in this section.

Admin_users

Table 5 Data Dictionary

Attribute	**Data Type**
id	String
Admin date	String
name	String
username	String
password	String

Category

Table 6 Data Dictionary

Attribute	**Data Type**
id	String
date	String
name	String
owner	String

contact

Table 7 Data Dictionary

Attribute	**Data Type**
id	String
date	String

name	String
email	String
phone	String
message	String

Post

Table 8 Data Dictionary

Attribute	**Data Type**
id	String
postDate	String
title	String
Category_name	String
author	String
image	String
content	String

User Interface Design

The Develop a plant and community for environment safe website user interface design will be described in this part. The system has two types of interfaces: the Initial User Interface and the Administrative

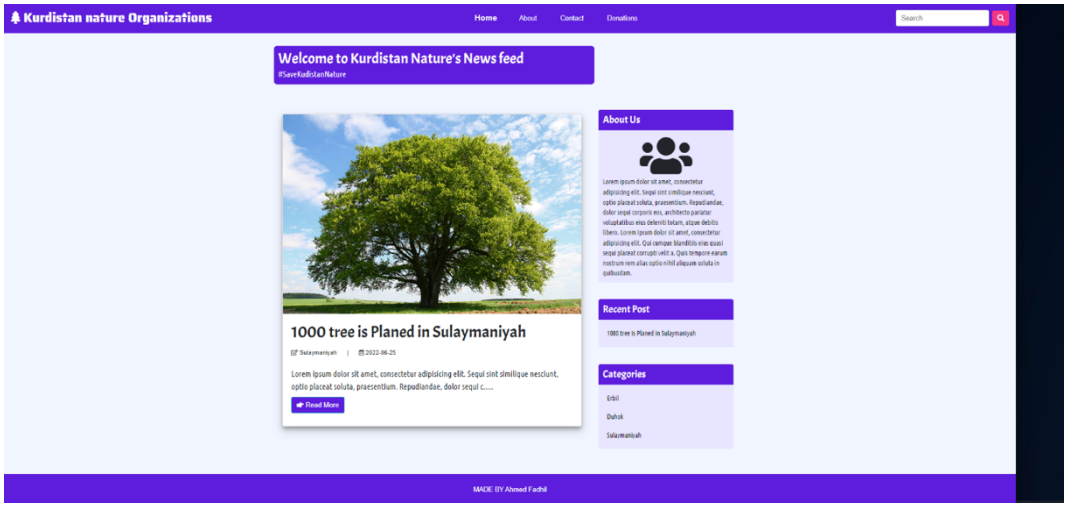


Figure 23 Home page - Interface

Figure 24 about page - Interface 2

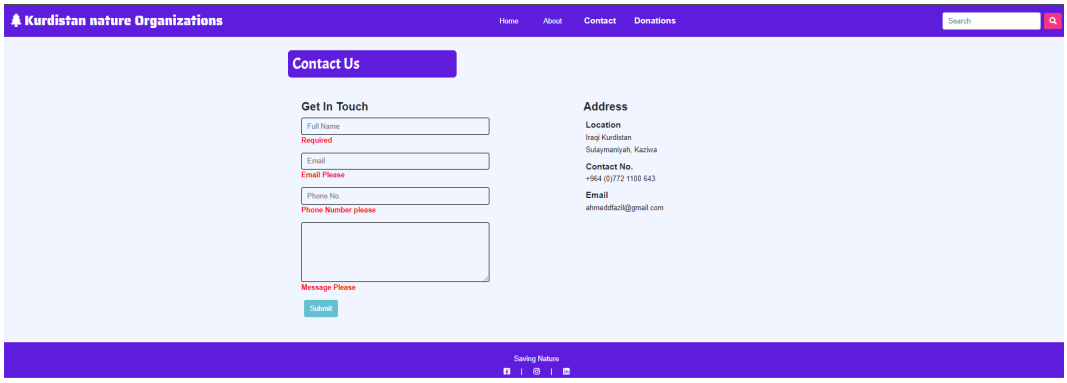


Figure 25 contact page - Interface 3

Figure 26 administrations panel page - Interface 4

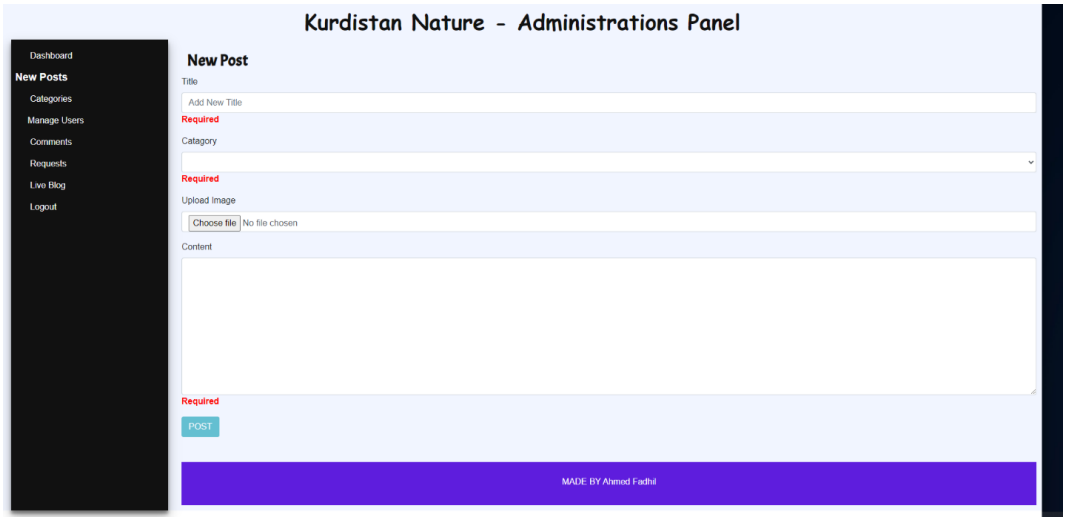


Figure 27 administrations panel news posts page - Interface 5

Figure 28 administrations panel contact page - Interface 6

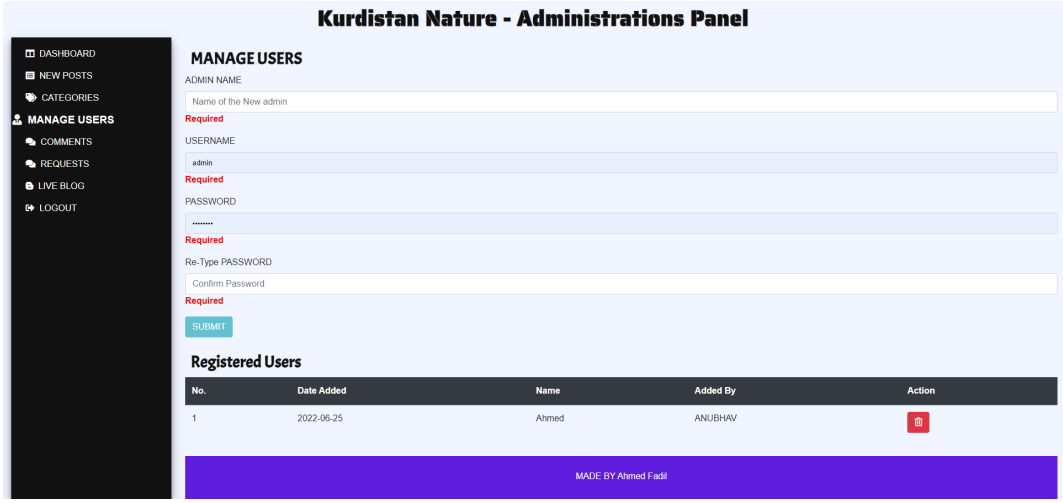


Figure 29 administrations panel manage admin page - interface 7

Appendix C

SOFTWARE TESTING DOCUMENT (STD)

Introduction

This Software Testing Document describes all of the testing activities that have been carried out for the Develop a plant and community for environment safe website. This document provides software testers with a comprehensive documentation structure for recording their testing process. This allows for proper testing process management and provides a clear reference in the future. Black Box Testing and User Acceptance Testing are two testing techniques that have been used on this project

Black Box Testing

Software testing methods known as "Black Testing" are used to test a system's functioning without consulting the system's code structure. Without having any internal knowledge of the system, it operates by concentrating on the output that the system produces based on the input entered. Black Box Testing, as a result, is only concerned with the system's usability from the user's perspective.

Shared Interface Section

This section describes the black box boxing testing of the Develop a plant and community for environment safe website for the shared interface between the User and Admin sections, including Register and Login.

Signup

Table 9 Test Case for sign up

Test Case ID	TC 01 – 01	TC02 – 02	TC03 – 03	TC04 – 04	TC05 – 05	TC06 – 06	TC07 – 07
Inputs and Actions							
Email		ahmed	ahmedfazil@gmail.com	ahmedfazil@gmail.com	ahmedfazil@gmail.com	ahmedfazil@gmail.com	ahmedfazil@gmail.com
Password					5678	12345678	12345678
Full Name		ahmedfazil	ahmedfazil	ahmedfazil	ahmedfazil	ahmedfazil	ahmedfazil
Expected Result	Actual Result						
Error message on invalid email address	✓	✓					
Error message on empty password	✓	✓	✓	✓			
Error message on passwo					✓		

rd d must be above 6 character s							
Redirect User to homepage							✓
Test Results							
	Pass	Pass	Pass	Pass	Pass	Pass	Pass

Login

Table 10 Test Case for Login

Test Case ID	TC01 – 01	TC02 – 02	TC03 – 03	TC04 – 04	TC05 – 05	TC06 – 06	TC07 – 07
Inputs and Actions							
Email		ahmed	ahmedfazil@gmail.com	ahmedfazil@gmail.com	ahmedfazil@gmail.com	ahmedfazil@gmail.com	ahmedfazil@gmail.com
Password					5678	12345678	12345678
Expected Result	Actual Result						
Error message on invalid email address	✓	✓					

Error message on empty password	✓		✓				
Error message on wrong Email or password					✓		
Redirect User to homepage							✓
Test Results							
	Pass	Pass	Pass	Pass	Pass	Pass	Pass

Admin Section

This section describes the black box testing of Develop a plant and community for environment safe website for Admin section which includes Publishing News, logout and manage the donations.

Publishing news

Table 11 Test Case for Publishing news

Test Case ID	TC03-01	TC03-2
Inputs and actions		
Click news	✓	✓
Fill news form	✓	✓
Publish news	✓	✓
Expected Result	Actual Result	

News Published	✓	
Test Result		
	Pass	Pass

Logout

Table 12 Test Case for Logout

Test Case ID	TC04-01	TC04-02
Input and Actions		
Click "Logout"	✓	✓
Expected Result	Actual Result	
Redirect user to Login Page		✓
Test Results		
	Pass	Pass

User Section

This section describes the black box testing of Develop a plant and community for environment safe website for User section which includes Newsfeed, logout and the Donations

Newsfeed

Table 13 Test Case for News Feed

Test Case ID	TC04-01	TC04-02
Input and Actions		
Click "News Feed"	✓	✓
Expected Result	Actual Result	
Redirect user to News page Page		✓

Test Results		
	Pass	Pass

Donations

Table 14 Test Case for Donations

Test Case ID	TC04-01	TC04-02
Input and Actions		
Click “Donations”	✓	✓
Expected Result	Actual Result	
Redirect user to Donations Page		✓
Test Results		
	Pass	Pass

Logout

Table 15 test Case for Logout

Test Case ID	TC04-01	TC04-02
Input and Actions		
Click “Logout”	✓	✓
Expected Result	Actual Result	
Redirect user to Login Page		✓
Test Results		
	Pass	Pass