

GREEN CREDIT ENVIRONMENT TRACKING SYSTEM

J. Romilda Antony^{#1}, S. Preethi^{#2}, P. Sireesha^{#3}, Ms. M. Benita Roy^{#4}

Email : romildajayaraj9703@gmail.com, sireeshasiri598@gmail.com, Preethi200502@gmail.com ,
benitaroym@gmail.com.

^{#123} UG Student, Department of Computer Science and Engineering, School of Engineering and Technology, Dhanalakshmi Srinivasan University, Trichy-621112-Tamilnadu.

^{#4} Assistant Professor, Department of Computer Science and Engineering, Dhanalakshmi Srinivasan University, Trichy-621112- Tamil Nadu.

Abstract - This journal version expands upon the original IEEE-style paper by providing a more comprehensive explanation of the complaint management framework, including data collection, preprocessing, prioritization techniques, and system implementation. The study focuses on analyzing complaint text data submitted by citizens in order to identify the urgency and nature of the issues reported. Advanced Natural Language Processing (NLP) techniques are applied to process and interpret unstructured complaint data effectively. In particular, Named Entity Recognition (NER) is used to extract key entities such as locations, organizations, and issue-related terms from the complaint text. These extracted entities help the system understand the context of each complaint and support accurate prioritization. By combining text analysis with prioritization strategies, the proposed system enables faster identification of critical complaints and assists organizations in responding more efficiently, ultimately improving the overall effectiveness of citizen complaint management systems.

Keywords

Complaint Management, Text Mining, Named Entity Recognition, NLP, Data Analytics

I. INTRODUCTION

Environmental sustainability has emerged as a global priority in recent years, in response to rising levels of pollution, deforestation, and climate change. Citizens, governments, and nonprofits are seeking new and creative ways to stimulate environmentally-friendly behavior and track their commitments to sustain the environment. The Green Credit Tracking Environment System (GCTES) is a digital initiative that encourages environmental citizenship among citizens on a global scale by recognizing and rewarding their efforts to help the planet become greener. GCTES offers a new approach to environmental management as a community-based management system that is accessible through a transparent, interactive, and technological platform. The project consists of two primary modules — Admin and User. The User module provides an opportunity for individuals to register for the system and log in to upload photos and videos of their greening activities, including tree planting, waste management, clean-up activities, and water conservation, etc. Each upload includes the location for which the Admin can determine whether or not the activity took place in the indicated area, and whether it was, in fact, a "greening" effort. Once the uploads are verified, the Admin assesses the upload's criteria and assigns a measurable Green Credit Score according to how impactful the activity was relative to its scale. There is a leaderboard that tracks users with respect to credit points and

encourages people to engage competitively and sustainably.

The gamified experience encourages both awareness and participation in sustainability-focused activities, promoting social responsibility as a community. Since they have Admin access to the platform, the Admin has additional functionality to view user activity, search user details, and manage any uploaded items. To promote collaboration and awareness, the platform will include a chat function that enables users to connect with one another to share ideas and encourage one another to take on additional environmental projects. An important part of the system is the complaint module, which allows users to submit a complaint to the administration about pollution issues in their area. Users submit complaint forms to the admin through email. The admin can read and act in regard to the complaints and then update the status of the complaint so the user is notified via email. Overall, this project minimizes the distance between technology, such as digital platforms, and environmental conservation by using a digital platform to track, encourage, and reward positive environmental action. The system also develops transparency, as it will create a digital record of everyone's good deeds, as well as provide real-time feedback in the form of credit scores. Additionally, this system will encourage public participation, accountability, and community engagement in response to local environmental issues. All things considered, the Green Credit Tracking Environment System creates a scalable framework for identifying green initiatives while also encouraging people to contribute to environmental sustainability.

II. OBJECTIVES OF THE PROJECT

The Green Credit Tracking Environment System's core goal is to increase environmental awareness and engagement in environmentally friendly behavior through a digital, transparent, and reward-based system. It will allow users to track, verify and evaluate users green behavior

by uploading pictures or videos with regard to location. The overall goal is to inherently encourage behavior by using a scoring system that awards Green Credit Scores to users and a leaderboard to support some healthy competition. The hope is that users will feel engaged due to communication and collaboration with other users through chat, complaint management through an email reporting module or simply by engaging with other members. Overall, the goal of the Green Credit Tracking System is for the design and implementation of a smart interactive and accountable behaviors to help change individuals to contribute to a cleaner greener, transparent and responsible commitment towards a more sustainable future.

III. LITERATURE SURVEY

a. Title: Complaint Management System Analysis: Online Community Aspiration and Complaint Services

Authors: Heriyanto, Melty Oktavianda, and Lia Suprihartini

In this study, we look at how to implement an online complaint management system to improve the efficiency with which community aspirations and public grievances are managed. We demonstrate how digital tools facilitate communication between the government and its citizens. This research highlights the value of transparency, accountability, and responsiveness when providing public services. Furthermore, the research determines how electronic systems facilitate the efficient registration, tracking, and resolution of complaints. The study also identifies several challenges to the implementation of an online complaint management system. These include low levels of public awareness, technical obstacles, and delayed responses from government officials. By conducting a qualitative and quantitative analysis, the authors assess the effectiveness of the electronic complaint management system in increasing citizen satisfaction. Furthermore, the authors assert that achieving optimal

performance from an online complaint management system demands appropriate administrative coordination and digital literacy. In addition, the authors establish that online complaint management systems support citizen participation in governance. Furthermore, by facilitating digital data collection, the authors identify ways to use public complaints to increase the effectiveness of future policymaking. Finally, the findings of this research demonstrate that by integrating automation and monitoring features within the online complaint management system, governments are better able to achieve positive service outcomes. Therefore, the conclusion of this study is that implementing formalized complaint management systems will improve the experience of citizens interacting with government and the level of citizen participation in government decision-making.

b. TITLE: Save the Environment, Get Financing! How China is Protecting the Environment with Green Credit Policies
Authors: Chi-Wei Su, Muhammad Umar, and Ruosu Gao

This research aims to investigate how China's "Green Credit" policy has contributed to environmental conservation and sustainable economic growth. The objective of this research is to explore the relationship between financial services and environmentally responsible business operations. The authors of this paper explore how green finance provides the incentive for the business community to adopt eco-friendly technologies, which will ultimately lead to the reduction of pollution. The authors utilized empirical data to evaluate the effect of green credit regulations on industrial sustainability and carbon emissions. The authors emphasize how government policies promote responsible investment strategies through their use of financial incentives and how these incentives can alter the way Corporations interact with and behave toward the natural environment. Furthermore, they argue that environmental risk assessments must be part of the financial decision-making process. The result of this research shows that green credit

policies have significantly decreased environmental degradation. This paper contributes to the larger body of literature concerning climate governance and sustainable finance. The research suggests that other developing economies can learn from China's policy structure and that financial systems possess the ability to be an effective tool for achieving environmental sustainability.

IV. PROBLEM IDENTIFICATION

Today, issues of rising pollution, deforestation, and a lack of public awareness regarding the environment are significant barriers to sustainable living. Although many people engage in green activities such as tree planting, waste separation, and pollution management, we do not have a standard way of verifying, tracking, or rewarding their contributions. Current methods depend on the use of manual submissions, or social media accounts, which cannot provide the assurance of authenticity, transparency, or basis for comparisons. There is not even a centralized, digital communication- space for environmentally-minded citizens to connect, collaborate on initiatives or be recognized for their environmental contributions. Additionally, delays often effect the resolution of pollution complaints, due to various communication and reporting breakdowns between the public and government authorities. Thus, there is a clear need for an automated and transparent Green Credit Tracking Environment System, which can digitally verify users' green actions, provide credit scores for utilizing the system, maintain leaderboards and track complaints; and motivate individuals and communities to work together toward environmental stewardship and sustainability.

V. SYSTEM ANALYSIS

VII. SYSTEM ARCHITECTURE

REQUIREMENT ANALYSIS

HARDWARE SPECIFICATION

- Processor :Dual core processor 2.6.0 GHZ
- RAM : 4GB
- Hard disk : 320 GB
- Compact Disk : 650 Mb
- Keyboard :Standard keyboard

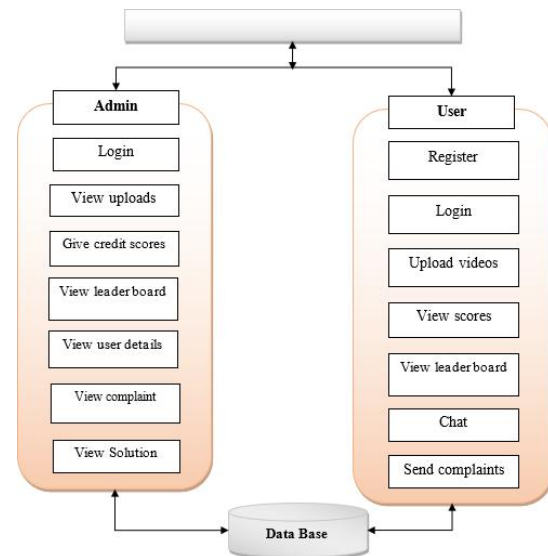
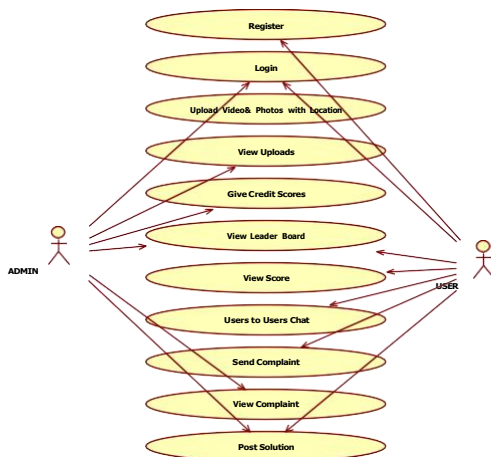
SOFTWARE SPECIFICATION

- Operating system :Windows OS
- Front End : REACT JS
- Back end : NODE JS
- Database :MONGO DB

A system architecture or systems architecture is the conceptual model that defines the structure, behavior, and more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviors of the system. System architecture can comprise system components, the externally visible properties of those components, the relationships (e.g. the behavior) between them. It can provide a plan from which products can be procured, and systems developed, that will work together to implement the overall system. There have been efforts to formalize languages to describe system architecture, collectively these are called architecture description languages (ADLs).

VI. USE CASE DESCRIPTION

A use case diagram at its simplest is a representation of a user's interaction with the system that shows the relationship between the user and the different use cases in which the user is involved. In this context, a "system" is something being developed or operated, such as a web site. The "actors" are people or entities operating under defined roles within the system.



VIII. USER INTERFACE DESIGN

MODULES

ADMIN

- Login
- View Uploads
- Give Credit Scores
- View Leader Board
- View User Details

- View Complaint
- Post Solution

USER

- Register
- Login
- Upload Video& Photos with Location
- View Score
- View Leader Board
- Users to Users Chat
- Send Complaint

MODULE DESCRIPTION

ADMIN

- Login
This module allows the administrator to securely access the system using valid credentials username and password. Once logged in, the admin can manage user activities, review uploads, and assign credit scores.
- View Uploads
This module enables the admin to access and review all photos and videos submitted by users. It displays each upload along with location details and submission time.
- Give Credit Scores
In this module allows the admin to assign green credit points to users based on their verified environmental activities. Scores are awarded according to the quality, impact, and authenticity of the uploaded work.
- View Leader Board

This module allows the admin to monitor and analyze user rankings based on their green credit scores. It provides a complete view of top- performing users and their contributions.

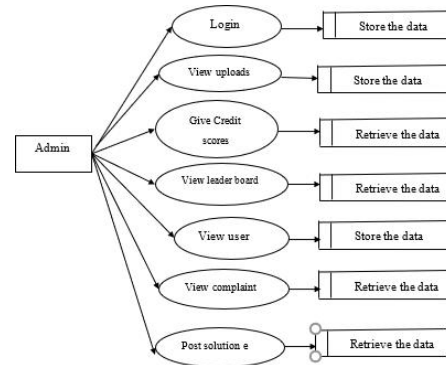
- View User Details
This module allows the admin to search and view detailed information about a specific user by entering their name. It displays user profile details, uploaded activities, and earned credit scores.
- View Complaint
The View Complaint Module allows the admin to access and review all pollution-related complaints submitted by users. It displays details such as complaint description, sender information, and submission time.
- Post Solution
This module allows the admin to respond to user complaints by providing suitable solutions or updates. The admin can post the action taken or resolution details for each complaint.

USER

- This module allows new users to create an account by entering details like name, email, and password. The system stores the information securely and ensures valid and unique registration.
- This module allows registered users to log in using their username and password. The system verifies the credentials and grants access to the platform.
- Users can upload photos and videos of their environmental activities along with location details. The data is stored in the system for admin verification.

- Users can view their green credit points given by the admin. It also shows their ranking based on their contributions.
- This module displays the ranking of all users according to their total green credit scores. Rankings update automatically when new scores are assigned.
- This module allows users to send messages and communicate with each other. It helps them share ideas and collaborate on environmental activities.
- Users can report pollution or environmental issues to the admin through email. Complaints are stored and tracked for further action.
- Users can check the solutions or responses given by the admin for their complaints and track the complaint status.

job, and shows the flow of data between the various parts of the system.



IX. DATA FLOW DIAGRAM

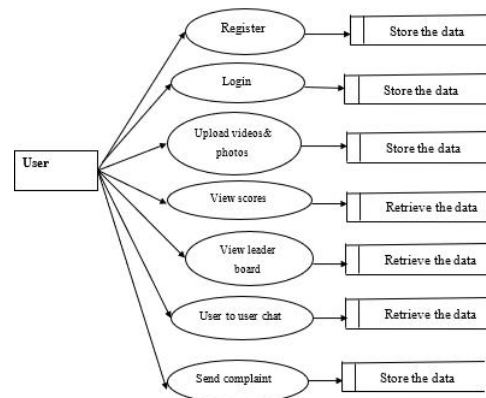
A two-dimensional diagram explains how data is processed and transferred in a system. The graphical depiction identifies each source of data and how it interacts with other data sources to reach a common output. Individuals seeking to draft a data flow diagram must identify external inputs and outputs, determine how the inputs and outputs relate to each other, and explain with graphics how these connections relate and what they result in. This type of diagram helps business development and design teams visualize how data is processed and identify or improve certain aspects.

LEVEL 0

The Level 0 DFD shows how the system is divided into 'sub-systems' (processes), each of which deals with one or more of the data flows to or from an external agent, and which together provide all of the functionality of the system as a whole. It also identifies internal data stores that must be present in order for the system to do its

LEVEL 1

The next stage is to create the Level 1 Data Flow Diagram. This highlights the main functions carried out by the system. As a rule, to describe the system was using between two and seven functions - two being a simple system and seven being a complicated system. This enables us to keep the model manageable on screen or paper.



X. DATABASE DESIGN

A table is a data structure that organizes information into rows and columns. It can be

used to both store and display data in a structured format. For example, databases store data in tables so that information can be quickly accessed from specific rows. Websites often use tables to display multiple rows of data on page. Spreadsheets combine both purposes of a table by storing and displaying data in a structured format.

complaints	ObjectId[] (ref Complaint)	Submitted complaints
createdAt	Date	Record creation time
updatedAt	Date	Record update time

Databases often contain multiple tables, with each one designed for a specific purpose. For example, a company database may contain separate tables for employees, clients, and suppliers. Each table may include its own set of fields, based on what data the table needs to store. In database tables, each field is considered a column, while each entry (or record), is considered a row. A specific value can be accessed from the table by requesting data from an individual column and row

Table Name: Chatroom Collection (Chatrooms)

Table Name: user collection

Field Name	Data Type	Description
_id	ObjectId	Primary Key
name	String	User full name
email	String (Unique)	User email address
password	String (Hashed)	Encrypted password
phone	String	Contact number
address	String	User address
creditScore	Number	User credit points
isAdmin	Boolean	Admin access flag
profileImage	String	Profile image URL
bio	String (Max 500)	User bio
uploads	ObjectId[] (ref Upload)	Uploaded posts
settings.maxFileSize	Number	Maximum file size

Field Name	Data Type	Description
_id	ObjectId	Primary Key
name	String	Chat room name
description	String	Chat room description
type	String (public/private/group)	Chat type
participants	Array	List of room members
participants.user	ObjectId (ref User)	User ID
participants.role	String	Role in chat
participants.joinedAt	Date	Joined date
participants.lastSeen	Date	Last seen time
messages	Array (Embedded)	Chat messages
settings.allowFiles	Boolean	File upload allowed

settings.allowedFileTypes	String[]	Allowed file types
isActive	Boolean	Room active status
createdAt	Date	Created time
updatedAt	Date	Updated time

Table Name: Message (Embedded In Chatroom)

Field Name	Data Type	Description
_id	ObjectId	Message ID
sender	ObjectId (ref User)	Sender ID
content.text	String	Message text
content.files	Array	Attached files
messageType	String	Message type
reactions	Array	Emoji reactions
replyTo	ObjectId (ref Message)	Reply reference
edited	Boolean	Edited status
editedAt	Date	Edit timestamp
deleted	Boolean	Soft delete flag
deletedAt	Date	Delete timestamp
createdAt	Date	Created time
updatedAt	Date	Updated time

Table Name: Complaint Collection (complaints)

Field Name	Data Type	Description
_id	ObjectId	Primary Key
user	ObjectId (ref User)	Complaint creator
title	String	Complaint title
description	String	Complaint details
imageUrls	String[]	Complaint images
location.latitude	Number	Latitude
location.longitude	Number	Longitude
location.address	String	Address
status	String	Complaint status
emailSent	Boolean	Email notification status
adminResponse	String	Admin reply
createdAt	Date	Created time
updatedAt	Date	Updated time

Table Name: Upload Collection (uploads)

Field Name	Data Type	Description
_id	ObjectId	Primary Key
user	ObjectId (ref User)	Uploaded by
title	String	Upload title
description	String	Upload description
mediaUrl	String	Image/Video URL
mediaType	String (image/video)	Media type
location.latitude	Number	Latitude

location.longitude	Number	Longitude
location.address	String	Address
likes	ObjectId[] (ref User)	Users who liked
dislikes	ObjectId[] (ref User)	Users who disliked
comments	Array	Post comments
creditPoints	Number	Points for upload
isApproved	Boolean	Admin approval
createdAt	Date	Created time
updatedAt	Date	Updated time

XI. RESULT AND DISCUSSION FUTURE POTENTIAL

The Green Credit Tracking Environment System was completed as a functional web-based platform encouraging environmental awareness as well as individual involvement with it. Users are able to register and create a profile, upload their eco-friendly activities, earn free green credits, and track their scores via a dynamic leaderboard through the system. The admin module manages user activity, verifies submitted activities, assigns credit scores to submissions, and manages pollution-related complaints. All modules integrated successfully, and functionality and performance tests were performed on the entire system with successful results. Overall, there has been a substantial increase in user's participation in environmental programs as a result of the credit-based reward system; the leaderboard feature has positively impacted competitive spirit and continual user involvement; and the complaint management system has created improved communication between users and administrators, facilitating the reporting and monitoring of real-world environmental issues via a digital means. Finally, the chat feature has encouraged collaboration and sharing of ideas between users enhancing the sense of community. Based on the

above discussion, it is clear that digital platforms like this have a great potential to enhance environmental participation through the provision of recognition and transparency. During the development and testing process, challenges associated with file management, verification accuracy, and overall system performance were encountered; however, various modifications and optimizations were made in order to resolve the challenges.

XII. REFERENCES

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