



GREEN CREDITS TRACKER – ECO SYSTEM

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Abstract- Environmental awareness and sustainable living are becoming increasingly important in modern society. However, individuals often lack a structured platform to record and monitor their eco-friendly activities. This project proposes a web-based application called “Green Credits Tracker – Eco System,” developed using the MERN stack(MongoDB, Express.js, React.js, Node.js).The system allows users to upload proof of green activities such as tree planting, waste recycling, and pollution reporting along with location details. Instead of AI-based verification, the platform uses a manual admin verification model to validate user submissions. Verified activities are rewarded with green credit points, which are displayed in a leaderboard to encourage community participation.The system also includes a community interaction module where users can post, like, and comment to promote environmental awareness. The proposed solution aims to create a structured digital ecosystem that encourages sustainable practices through gamification and transparent verification mechanisms.

I. INTRODUCTION

Environmental degradation, pollution, and climate change have become major global concerns affecting ecosystems, public health, and sustainable development. Despite increased awareness campaigns, individual participation in environmental protection activities remains inconsistent and unstructured. Traditional awareness programs often fail to provide measurable tracking mechanisms or motivational systems to encourage continuous eco-friendly behavior.Many existing environmental platforms focus mainly on spreading information rather than tracking real-time user contributions. There is a lack of structured systems that reward individuals for performing sustainable activities such as tree planting, waste recycling, pollution reporting, and energy conservation. Without proper monitoring and incentive mechanisms, it becomes difficult to measure the real impact of individual efforts toward environmental sustainability.The “Green



Credits Tracker – Eco System” is designed as a web-based application that promotes sustainable living through a reward-based digital platform. The system enables users to upload evidence of eco-friendly activities along with location details, which are verified by an administrator before awarding green credit points. By integrating a leaderboard and community interaction module, the platform encourages healthy competition and collective environmental responsibility. The primary objective of this project is to create a structured digital ecosystem that motivates individuals to adopt environmentally responsible habits while ensuring transparency through a manual verification model. By combining user participation, administrative validation, and gamification techniques, the system aims to foster accountability and build a strong eco-conscious community.

II. PROPOSED SYSTEM

2.1 Green Credits Tracking Model

The proposed Green Credits Tracker – Eco System is designed as a structured web-based platform that records, verifies, and rewards eco-friendly activities performed by users. The system does not depend on artificial intelligence algorithms; instead, it follows a rule-based and manual verification approach to maintain transparency and reliability.

User Activity Submission

Users can register and securely log into the platform to upload eco-friendly activities such as tree planting, recycling, pollution reporting, and energy conservation. Each submission includes a photo, location details, activity description, and timestamp. The uploaded data is stored in the database with a pending verification status until reviewed by the administrator.

Green Credit Allocation Mechanism

Each eco-friendly activity is assigned predefined green credit points based on its environmental impact. Once the administrator verifies and approves the submission, the system automatically updates the user's



total credit score. The points system acts as a motivational factor, encouraging continuous participation in sustainable practices.

Manual Verification System

The system incorporates an admin verification module where all user submissions are reviewed digitally. The administrator validates the contextual relevance of the image, checks the provided location details, and verifies the timestamp before approving or rejecting the activity. This human moderation model ensures accountability and prevents misuse of the platform without relying on AI-based detection systems.

Leaderboard and Community Engagement

The system dynamically updates a leaderboard that ranks users based on accumulated green credits. This feature promotes healthy competition among participants. Additionally, a community section enables users to share posts, like, and comment, thereby fostering environmental awareness and collaborative participation.

2.2 Working of Proposed System

The Green Credits Tracker – Eco System operates through a structured workflow that integrates user participation, database management, and administrative validation. When a user uploads an eco-friendly activity, the system stores the data in the MongoDB database with a pending status. The administrator accesses the admin dashboard to review submitted activities. After verification, if the activity is genuine, it is approved and the assigned credit points are added to the user's total score. If the submission is invalid, it is rejected and no credits are awarded. The leaderboard is automatically updated based on the accumulated credits of all users. For pollution reporting activities, the administrator reviews the submission and may manually forward the information to the concerned authority if necessary. Through this structured and

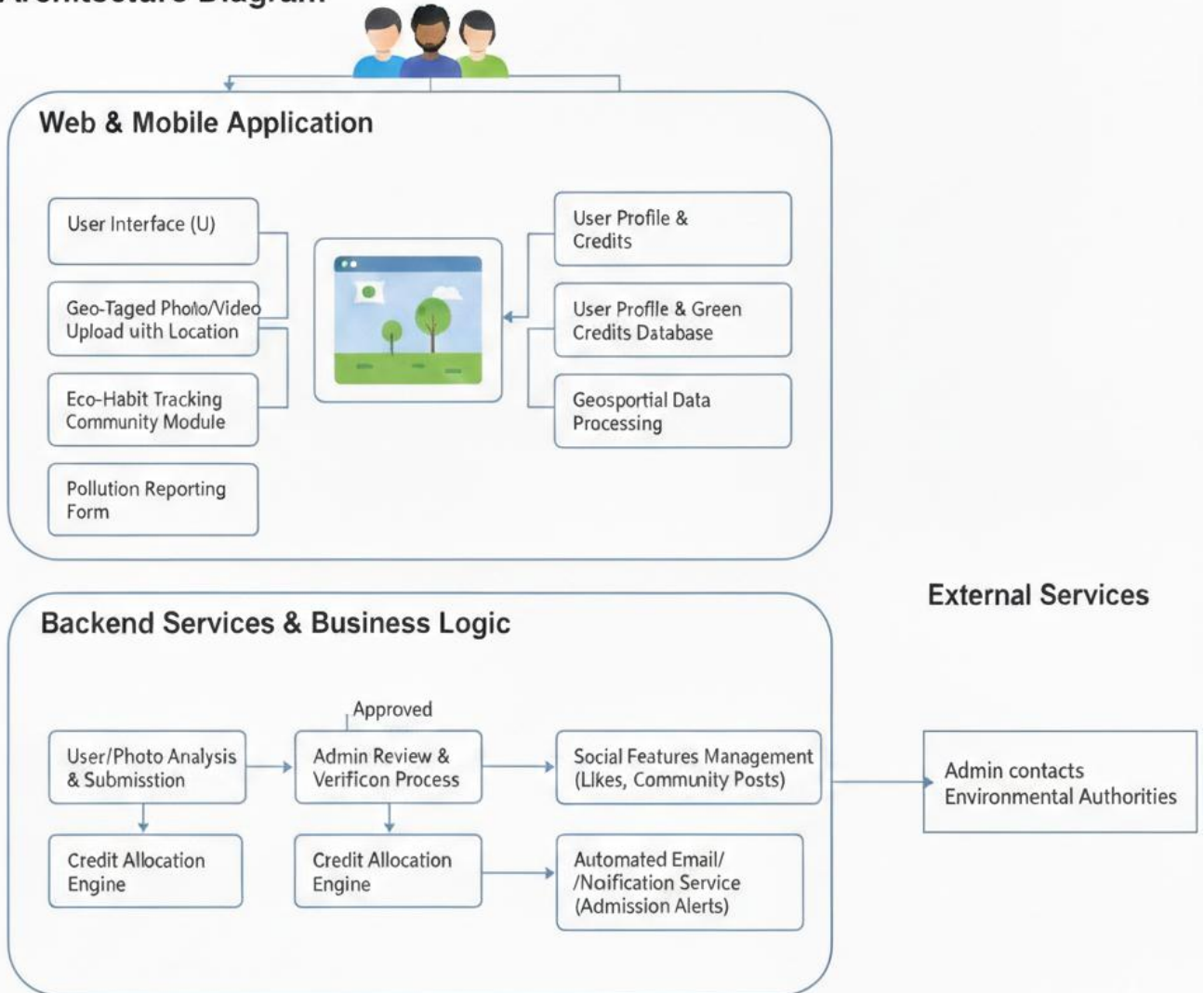


layered approach, the proposed system ensures reliability, transparency, and engagement while promoting sustainable environmental practices.

III. SYSTEM ARCHITECTURE



Green Credits Tracker Ecosystem - Architecture Diagram



3.1 Components Used in the Proposed System

1. User Interface Layer

- Web application developed using React.js for user interaction.
- Provides secure login and registration system for users and admin.



- Includes dashboard displaying total green credits, activity history, and leaderboard ranking.
 - Allows users to upload eco-activity photos with description and location details.
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2. Application Layer

- **Activity Management Module:** Handles submission, storage, approval, and rejection of eco activities.
 - **Green Credit Calculation Module:** Assigns predefined credit points based on activity type.
 - **Leaderboard Module:** Dynamically ranks users according to accumulated green credits.
 - **Admin Management Module:** Enables admin to review and verify user submissions.
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3. Security & Verification Layer

- **Authentication System:** Secure login using email and password validation.
 - **Manual Verification Module:** Admin reviews uploaded photos, timestamps, and activity details before approval.
 - **Activity Status Monitoring:** Tracks pending, approved, and rejected submissions.
 - **Role Based Access Control:** Separate privileges for users and administrators.
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4. Data Management Layer

- **Database System:** Stores user profiles, activity records, and credit scores securely.
 - **File Storage System:** Stores uploaded eco activity images securely in the cloud storage.
 - **Data Validation Mechanism:** Ensures accurate input format and prevents duplicate submissions.
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5. Integration Layer

- **REST API Services:** Connects frontend (React) with backend (Node.js & Express).
 - **External Map Integration :** Used for location tagging of activities.
 - **Notification Integration:** Sends confirmation messages for activity approval or rejection.
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6. Infrastructure Layer



- Cloud Based Hosting Environment for scalability and availability.
 - Backup and Recovery System to prevent data loss.
 - Server Monitoring Tools to track system performance and uptime.
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IV. EXISTING SYSTEM

Current environmental awareness platforms and social responsibility applications mainly function as basic activity logging or information sharing systems. Most existing systems allow users to post environmental activities such as tree planting or recycling, but they do not include a structured verification mechanism. Activities are often displayed publicly without proper validation, which creates the possibility of fake or misleading submissions. Many platforms depend only on user trust without implementing an approval workflow. There is no centralized administrative monitoring system to verify whether the uploaded eco-activity is genuine. As a result, users can upload images from the internet or reuse old photos to claim recognition without actually performing the activity. Additionally, existing systems lack a standardized green credit calculation model. They do not provide a consistent reward mechanism that motivates long-term participation. Leaderboard features, if available, are not dynamically linked with verified environmental contributions. Another major limitation is the absence of a structured role-based access system. Most applications do not clearly separate user and administrator privileges, which reduces system control and accountability. Furthermore, many environmental reporting platforms do not maintain proper data storage management, secure authentication mechanisms, or systematic record keeping. These limitations reduce transparency, reliability, and user trust in the platform. Therefore, there is a need for a structured, secure, and



verification-based eco activity tracking system that ensures authenticity, transparency, and sustainable engagement.

V. METHODOLOGY

First, the system requirements are analyzed and the overall architecture of the Green Credits Tracker is designed. The database schema is structured to store user details, eco-activity submissions, green credit scores, and verification status. Next, the frontend interface is developed using React.js to allow users to register, log in, upload eco-activity details, and view their credit scores and leaderboard ranking. The backend is developed using Node.js with Express to handle API requests, manage user authentication, and process activity submissions. After implementation, the activity submission workflow is integrated with the manual verification module. When a user uploads an activity, the data is stored in the database with a pending status. The administrator reviews the submission through the admin dashboard and either approves or rejects it based on validation of the image, description, and location details. Upon approval, predefined green credit points are automatically added to the user's total score. The leaderboard module dynamically updates rankings based on accumulated credits. Finally, the system is tested for functionality, data validation, authentication security, and proper role-based access control to ensure reliability and smooth operation of the platform.

VI. CONCLUSION

The **Green Credits Tracker – Eco System** successfully helps users monitor and improve their eco-friendly activities by tracking actions and awarding credit points. Users can upload photos of their green activities along with location information, which are verified by the admin to ensure authenticity. Approved activities reward users with points, contributing to a dynamic leaderboard that encourages healthy competition and



sustainability awareness. The system also notifies the pollution department about relevant eco-actions, ensuring that environmental initiatives are recognized and tracked. While AI-based verification could enhance automation in future versions, the current workflow effectively balances user engagement with administrative validation. The community section enables interaction among users, allowing likes, comments, and messages, fostering a collaborative and motivated eco-conscious community. In conclusion, **this web-based system demonstrates how technology can support sustainable practices**, motivate users, and provide a structured approach to tracking and rewarding green activities. With future integration of AI for verification and analytics, the platform could further automate monitoring and provide more robust eco-feedback mechanisms

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