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DAANSETHU

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Abstract: The DaanSethu Donation App is a comprehensive digital platform designed to reduce resource wastage and address unmet community needs through sustainable redistribution. It allows for donations of food, clothing, toys, bedding, blood, and monetary contributions, promoting responsible consumption. Built using React Native for cross-platform compatibility and Firebase for secure backend operations, the app features a real-time geolocation-based matching system that minimizes logistical emissions and ensures efficient distribution. By reducing waste and supporting circular economy practices, DaanSethu not only strengthens community engagement but also contributes to environmental preservation. The platform's volunteer coordination tools, secure transactions, and data analytics further enhance its scalability and potential to transform community support systems sustainably.

Keywords: Resource Redistribution, Circular Economy, Sustainability, Firebase, React Native, Geolocation Matching, Community Engagement, Waste Reduction, Secure Transactions, Volunteer Coordination.

I. INTRODUCTION

Resource wastage, particularly of food and clothing, remains a global challenge, contributing to environmental degradation through greenhouse gas emissions and inefficient resource use. Concurrently, many communities lack access to basic necessities. Traditional donation systems suffer from inefficiencies, often resulting in missed opportunities for effective redistribution.

The DaanSethu Donation App bridges this gap by providing a scalable and user-friendly solution that connects donors, recipients, and volunteers in real time. Leveraging React Native and Firebase ensures cross-platform compatibility, secure operations, and minimal environmental impact. Key features like geolocation-based matching reduce transportation emissions by facilitating local donations, while real-time notifications and analytics encourage active community participation.

The platform aligns with Sustainable Development Goals (SDGs), particularly SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action), by promoting resource redistribution, reducing waste, and minimizing carbon footprints.

II. SOCIAL IMPACT

- Reduces Poverty and Hunger: Since the app facilitates the efficient distribution of surplus food and other necessities, it directly helps poor and hungry individuals and communities improve the quality of their lives and their well-being.
- Vulnerable Groups: The app reaches out to delivery, with the focus areas being orphanages, old age homes, shelters, and most importantly, the low-income families to fulfill needs concerning essential food, clothing, and other stuff. Promotion of a Culture of Giving: The platform fosters a sense of social responsibility by encouraging individuals, businesses, and organizations to donate their surplus resources, promoting collective action for societal welfare.
- Reduction of Resource Waste: By redirecting surplus resources to those in need, the app significantly reduces waste, aligning with sustainability goals and contributing to environmental preservation.
- Community Engagement and Volunteerism: Through volunteer coordination features, the app empowers individuals to actively participate in social causes, strengthening community bonds and promoting civic engagement.
- Health and Well-being: With options for blood donation and timely food redistribution, the app addresses urgent health and nutritional needs, improving public health outcomes.
- Empowerment of NGOs and Charitable Organizations: By streamlining the donation process, the app enhances the operational efficiency of non-profits, enabling them to focus more effectively on their core missions.

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III. ECONOMIC IMPACT

- Reduction in Resource Wastage: By redistributing surplus food, clothing, and essential items, the app minimizes waste, translating into cost savings for donors such as restaurants, households, and businesses that would otherwise bear disposal costs.
- Support for Low-Income Communities: The app provides essential resources like food and clothing to underprivileged individuals and families, reducing their financial burden and improving their economic stability.
- Empowerment of Local Businesses: The app encourages partnerships with small businesses and local vendors for logistics, such as food collection and transportation, generating economic activity at the grassroots level. Efficient Use of Donations: The platform's real-time matching and analytics features ensure donations are effectively utilized, reducing inefficiencies and maximizing the impact of every contribution.
- Encouragement of Charitable Giving: By making donations easier and more transparent, the app motivates individuals and organizations to contribute more frequently, boosting the overall flow of resources into social welfare.
- Job Creation: The need for logistics support, app management, and volunteer coordination generates employment opportunities, especially in areas like transportation, technology, and non-profit operations.
- Long-Term Savings: By addressing food insecurity and health needs through timely donations, the app indirectly reduces societal costs related to malnutrition, healthcare, and poverty alleviation programs.

IV. LITERATURE REVIEW

- Bhojansamvedi (Patil et al., 2024) introduced a mobile platform for food donations, highlighting the role of digital tools in reducing food waste. However, it focused primarily on food, lacking broader resource redistribution and sustainability frameworks.
- Food Wastage Reduction through Donation (Jethwa et al., 2018) discussed an internet-based system but did not address real-time geolocation matching or energy-efficient design.
- MySusCof App (Haas et al., 2022) emphasized sustainability in food waste reduction but did not integrate volunteer coordination or comprehensive resource donation features.
- DaanSethu builds upon these works by integrating a wider range of donation categories, emphasizing local distribution to reduce emissions, and employing a cloud-based architecture for energy efficiency.

V. PROBLEM STATEMENT

Millions suffer from hunger and lack essential resources, while surplus food, clothing, and other items go unused. The absence of a centralized, efficient platform to connect donors and recipients leads to increased waste, resource mismanagement, and environmental degradation.

DaanSethu addresses these challenges through a mobile platform that connects donors, recipients, and volunteers via real-time notifications, secure transactions, and geolocation-based matching. By ensuring surplus resources reach those in need, the app reduces waste, minimizes transportation emissions, and fosters sustainable consumption practices.

VI. OBJECTIVES

1. **Efficient Resource Redistribution:** Facilitate timely distribution of surplus resources.
2. **Minimize Resource Wastage:** Redirect usable resources to underserved communities.
3. **Promote Sustainable Practices:** Reduce landfill waste and related emissions.
4. **Encourage Community Engagement**: Foster a culture of giving and responsible consumption.
5. **Support Vulnerable Populations:** Serve low-income families, orphanages, and old age homes.
6. **Leverage Technology for Social Good:** Use geolocation and real-time notifications for efficient resource delivery.
7. **Scalability:** Develop a flexible, scalable platform for broader implementation.

VII. SYSTEM DESIGN

Design is a creative process. A good design is the key to effective system. The system design is defined as "The process of applying various techniques and principles for the purpose of defining a process or a system in sufficient detail to permit its physical realization". Various design features are followed to develop the system. The Design Specification describes the features of the System, the components or elements of the system and their appearance to end users. The text edit has been completed, and the paper is ready for the template. Duplicate the template file by using the Save As command, and use the naming convention prescribed by your conference for the name of your paper.

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VIII. PROPOSED PLAN

The Proposed System Consists of 3 main modules as follows:

A. The system follows a client-server model.
B. The front-end is developed using React Native, providing a user-friendly interface for donors, beneficiaries, and volunteers.
C. The back-end uses Firebase for real-time database management, authentication, and cloud storage.

A. The system follows a client-server model

The Daan Sethu app is based on a client-server model, which divides the system into two major components: the client (front-end) and the server (back-end). The client-side acts as a mobile application on user devices, making requests such as login, donation creation, or item tracking to the server. The server processes these requests, performs the necessary actions, and sends responses back to the client. This architecture ensures a clear separation of responsibilities, improving system performance, scalability, and security. Users benefit from quick responses and a smooth interface, while sensitive data remains protected on the server. The server processes these requests, performs necessary actions, and sends responses back to the client. Improving system performance, scalability, and security. Users benefit from quick responses and a smooth interface.

B. Front-End (React Native)

The front-end of the DaanSethu app is developed using React Native, a powerful framework that enables the development of cross-platform mobile applications. React Native ensures a consistent experience across Android and iOS devices with a single codebase. It offers a user-friendly interface for donors, beneficiaries, and volunteers, featuring intuitive navigation and real-time updates. This is because the modular design of React Native allows for the reuse of components, thereby making the app customizable and easier to maintain. Features such as push notifications and localization further enhance accessibility and engagement for a diverse user base.

C. Back-End (Firebase)

Firebase powers the back-end of the app with robust tools for real-time database management, user authentication, and cloud storage. The real-time database enables instant synchronization of data, ensuring that users receive updates on donations, feedback, and requests without delay. Firebase Authentication secures user accounts through various methods like email/password and third-party logins. Cloud storage supports the uploading and sharing of files, such as images of donations, while Firebase Cloud Messaging sends real-time notifications. In addition, Firebase Analytics provides insights into user behavior, helping to improve on functionality and more satisfied users.

IX. COMPONENT DIAGRAM

The component diagram describes the modules of the system and how they interact. It includes the front-end for user input, the back-end for data processing and storage, and Firebase as the central database for managing user and donation details. The admin interface handles approval and rejection of donations, ensuring efficient data flow and system functionality. The system ensures seamless interaction between the users and the backend through efficient data flow. Once a user has filled in his or her information, the Daan Sethu app captures this data through the front-end interface, which then communicates with Firebase for storage. Admins are responsible for overseeing the approval process, with pending data waiting for verification. This process helps in maintaining quality control and ensures that donations are legitimate before they are processed. For any rejected items, the trash system acts as a repository where the data can be reviewed or restored. This structure guarantees that the platform remains organized, secure, and responsive to user needs while providing admins with the necessary tools to manage the system effectively. Once a user inputs their information, the Daan Sethu app captures the data via the front-end interface.

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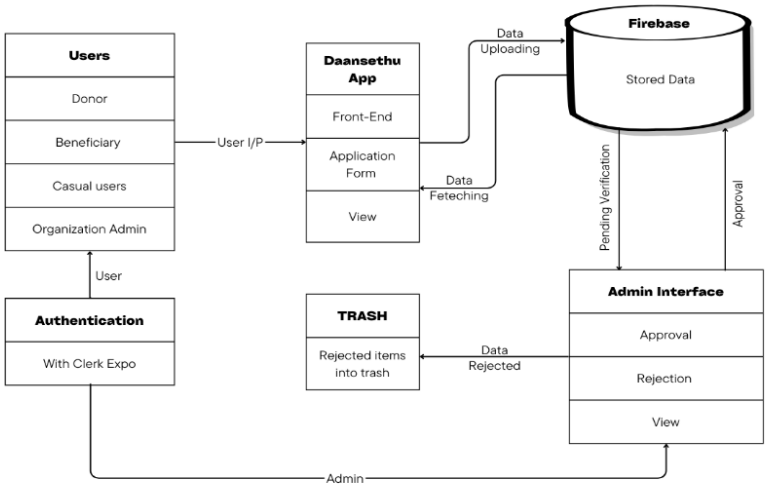

Figure 1 Component Diagram

X. BLOCK DIAGRAM

A block diagram is a simplified visual representation of a system using blocks to represent components and arrows to show their interactions. It provides an overview of a system's architecture, helping to illustrate the flow of data and functions. Block diagrams are often used in system design to simplify complex processes and to understand the overall structure.

The block diagram you have provided represents the structure and flow of the Daansethu application. It begins with a landing page and login screen where users must authenticate themselves to continue. After authentication, there are multiple components that include the home screen with sections like header, slider, and categories to explore the food donation options. A bottom tab navigation is allowing users to go to the respective sections of the app like food share, food donate, volunteer, and feedback. The areas are segregated into donating and getting food, for giving feedback and to access other resources such as old age home and organization, and to show how a user can move further to look up food, admin details, and user information on the diagram. Users can also log out or adjust their profile settings from the application interface. There are also some admin functionalities offered, which can be accessed to view details and manage donations for admins. Such interlinked blocks suggest that the user interface of Daansethu is well designed to navigate easily, give easy access to donation features, and organize all things clearly to let users use the app effectively.

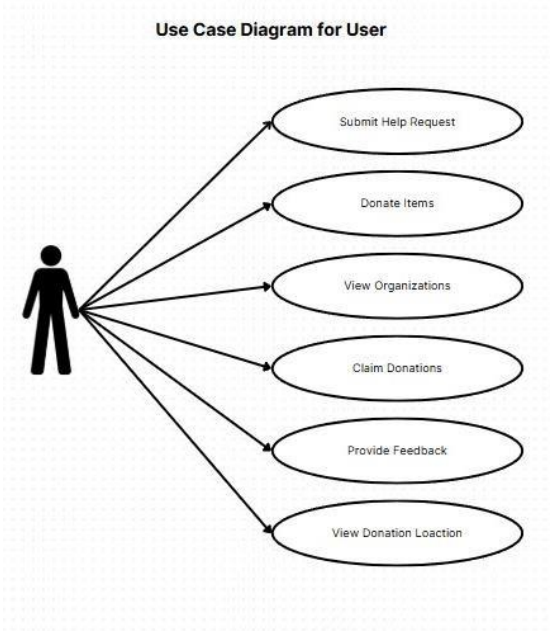

Figure 2 Use-case diagram of Admin module

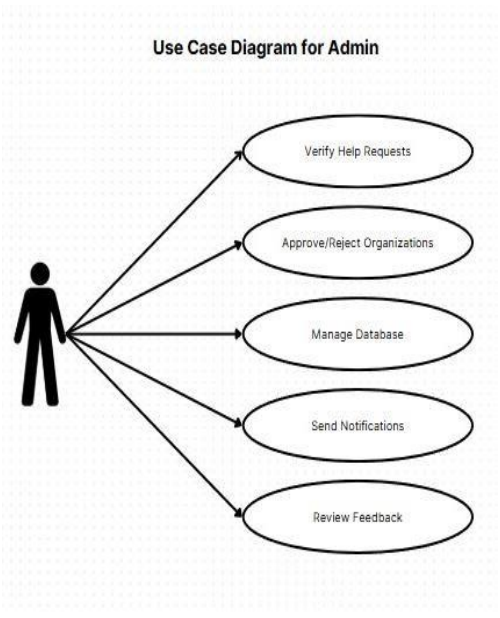

Figure 3 Use case diagram of user

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The admin use case diagram explains the roles and capabilities of the administrators in running the platform. Admins verify and approve help requests to ensure that they are legitimate. They oversee the approval or rejection of organizations seeking to partner with the application, ensuring credibility. Admins manage the database of the platform to ensure smooth running and accuracy of data. They also have the role of sending notifications, which include status updates, alerts, or announcements for events, thus keeping the user updated. In addition, admins read feedback from users to determine problems that need improvement to enable the system to function better.

The control flow diagram of the Daan Sethu project is used to depict all the different workflows that handle the core functionalities of the system. It starts with users submitting their requests for assistance, which the admin verifies.

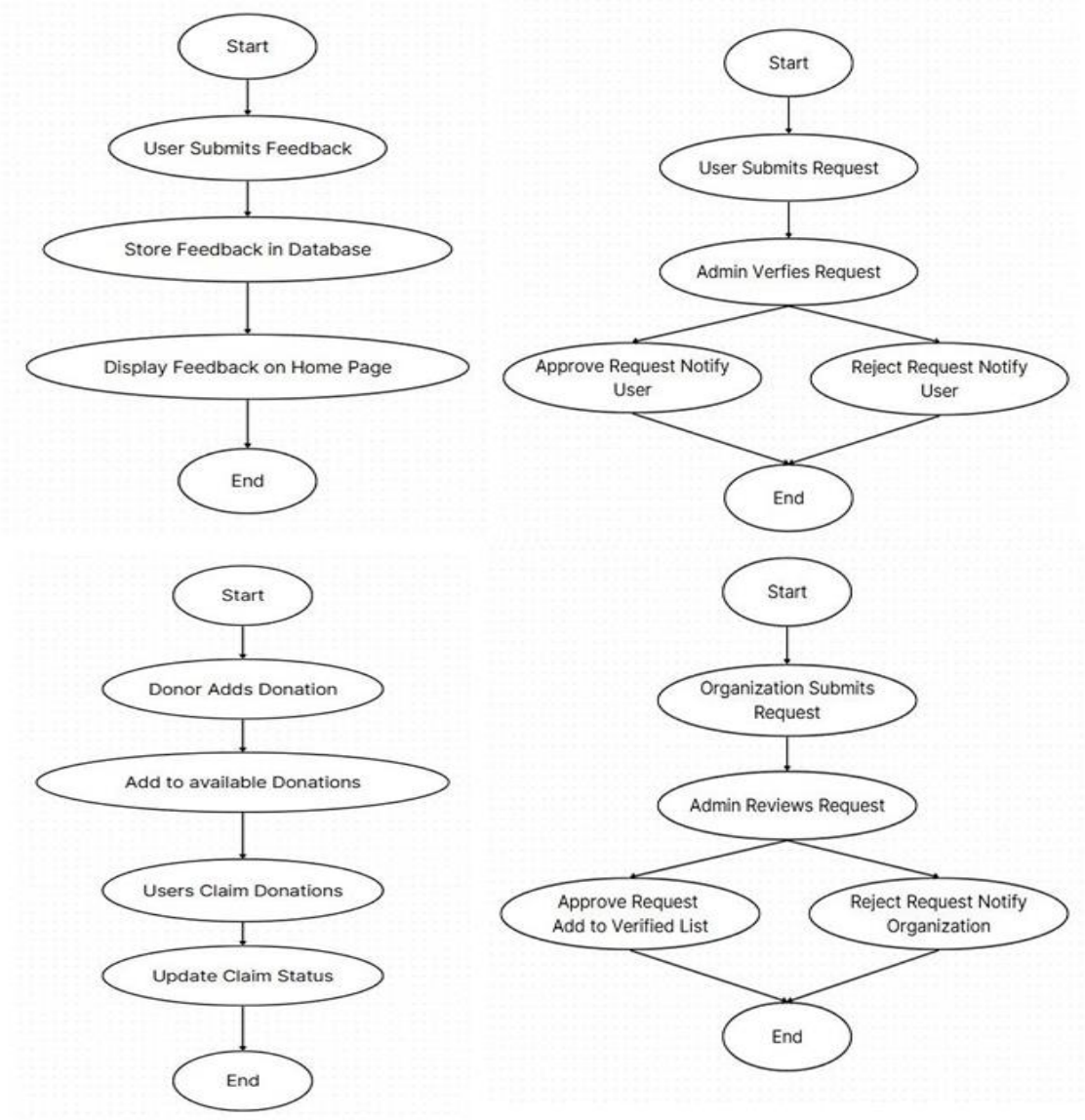

Figure 4 Control Flow diagram

Depending on the verification, requests are either approved or rejected and a notification is sent to the user. In the case of donation management, donors add donations to the system, which enables users to claim them. Once a donation is claimed, the status of the claim is updated, and the process ends. Organizations can also make requests that are reviewed by the admin. Approved requests are added to a verified list, and notifications are sent to organizations if rejected. Users can also give feedback, which is stored in the database and displayed on the homepage.

The monetary donation process involves users making payments via an integrated payment gateway. After successful transactions, donation details are updated, a thank-you message is displayed, and the admin is notified. This structured flow ensures smooth coordination between users, donors, organizations, and administrators, fostering an efficient and transparent system.

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XI. CONCLUSION

Experiments DaanSethu project intends to bridge the gap between the donor and beneficiary by creating a highly efficient, user-friendly, and impactful donation management platform. By utilizing the latest technologies in Firebase, React Native, and cloud integration, the project facilitates smooth communication and real-time updates while ensuring the security of transactions. Features of the platform include donation management, interaction with the beneficiary, and coordination of volunteers to address major needs in the donation ecosystem. The presence of an admin panel guarantees effective monitoring and decision-making that can ensure transparency and trust with the users.

It's designed with a positive social impact in view as it enables people to contribute or receive easy resources, encourage participation in their communities, and enhance the practice of giving back. DaanSethu will be ready for scaling when continuous improvements can lead to enhancements in the basis of feedback for societal well-being and humanitarian cause-related contributions.

In conclusion, DaanSethu is not just a project but a step toward building a connected and compassionate society, ensuring that resources reach those in need efficiently and effectively.

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