

Child Labour Reporting Application

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Abstract: *Crime is a huge menace in almost every State of the world, especially in underdeveloped countries with galloping crime rates. Data in these places are often stored in records manually, thus hampering the connectivity of different records. This forces the investigation officer to search for clues and leads by himself, in order to arrive at the possible suspects involved in recent crimes. Serial offenders most of the time make use of a distinguishable pattern when committing crimes, known as the modus operandi. In this work, we propose a machine learning-based predictive policing system that utilizes both the modus operandi of recent crimes and existing criminal records. Working with the model is aimed at predicting and generating a list of suspects who might be linked to recent crimes so as to enable the police investigation process. Implementation of our model consists of a few key stepping stones. First, we need to collate reliable and competent data from various police departments. This will ensure that we have an entire dataset covering a wide range of criminal activities. After that, we need to focus on extracting features from the data, which establish patterns and distinguishing characteristics in the modus operandi of each individual criminal. These features are instrumental in training our machine learning model to recognize and predict possible suspects from new crime evidence. Our model predicts a suspect or a group of suspects by analysing the crime data and learning from past incidents. Once a recent crime is committed, it correlates the modus operandi of the present incident with that of the past ones contained in the database of the model; thus, generating today's list of potential suspects in order of their likelihood of involvement. The validation using real data of our model achieved promising results, increasing greatly the accuracy and speed of suspect identification, particularly with regard to those who have been involved in crimes in the past. This computerization permits the investigation officer to direct his work toward the most likely suspects, thus increasing efficiency and practical effectiveness. In other cases, it can be reconfigured. Different areas and instances of the crime can customize it, thus making it a multipurpose tool for law enforcement agencies. With its success in identifying potential suspects, the model demonstrates the capability of machine learning to change the traditional ritual of policing. It is giving a strategic advantage in the fight against crime, thus aiming at decreased crime rates and increased global public safety. It shows the potential of predictive policing algorithms to change the world and prepares the ground for further development in this area. Our mission is to help law enforcement agencies utilize technology to combat crime more effectively and make communities safer.*

Keywords: Crime

I. INTRODUCTION

Child labour still remains one of the most severe and entrenched social problems in a large number of developing nations, especially India. Owing to numerous constitutional safeguards, legal instruments, and international agreements to eradicate child labour, still, the issue has remained persistent as a result of poverty, ignorance, ineffective enforcement of law, and weak provisions for reporting. Millions of children continue to be exposed to exploitative and dangerous labour, denying them education, protection, and a decent childhood. While government agencies and NGOs have made several attempts to intervene, the lack of real-time data collection and community-level reporting constrains the impact of interventions. To address these challenges, this project offers an innovative and tech-based solution an



Android-based app specifically for the reporting of incidents of child labour. The app empowers ordinary citizens to become proactive protectors of children by allowing them to report such incidents straight from their phones. The concept is based on the conviction that actual change may start from the grassroots level, particularly if coupled with current digital tools.

Development of the application is done following a disciplined software engineering process. Requirement analysis was performed at the starting point to determine key features that will make the application functional and easy to use. Key among the core requirements were secure user authentication, the capability to report incidents real-time, the option of adding images or videos as evidence, and automatic GPS location tracking. These functionalities guarantee that reports submitted via the application are authentic, informative, and easy to verify by concerned authorities. After the requirements were well established, the system was designed with caution to provide a smooth interaction between the user, the server, and the NGO network. The frontend of the application was developed using XML, enabling the clean and organized user interface, while Java was used for the backend logic, which is compatible with Android devices and strong enough to support real-time processing. MySQL was utilized as the backend database system to handle storage and retrieval of data. This arrangement ensures that all the user inputs, reports, and status updates are stored and retrieved efficiently, forming a reliable foundation for long-term data management and analysis. The application has an API layer which integrates with a centralized NGO system. Upon receipt of a complaint from a user, it is forwarded to the server where it is categorized and presented to the NGO network for action. The NGO system subsequently analyzes the complaint and updates the status based on the intervention stage—Pending, In Progress, or Solved. This open flow of information enables users to monitor the status of their lodged complaints, making the system accountable and fostering public trust. The actual development process was not merely coding and interface design, but also the implementation of a number of significant backend services. These consist of user login, which only allows authentic users to enter complaints; complaint upload modules that can take text and multimedia inputs; database integration for secure and organized storage; and an NGO dashboard to handle, filter, and respond to entered complaints. To further promote community involvement, the app also features such elements as a donation option and push notifications for updates, making it more than just a reporting tool but a complete platform for action and advocacy.

At the core of the application is a scalable and responsive architecture that accommodates real-time synchronization of information. The system makes sure that all complaints, after submission, are channeled from the user to the server, and subsequently to the NGO system without delay. The server takes care of choosing the correct complaint, assigning it to the correct authority, and making sure that actions taken are documented and fed back to the user. This ongoing feedback mechanism is critical to creating a clean and reliable platform for eradicating child labour. Through the integration of the accessibility of Android phones with organized backend computation and NGO coordination, the app introduces a new solution to an old problem. It provides a platform for everyone, technical or not, to speak up against child exploitation. In addition, through the participation of NGOs in the response, it ensures not only that the reports are received but also dealt with immediately.

Identifying such loopholes, this project offers a new, community-oriented, and technology-facilitated solution—a powerful Android application tailor-made for the reporting of child labour cases. The objective is to enable ordinary citizens, activists, and local leaders to be the first line of defense against child exploitation by enabling them to report suspected cases with a simple few taps on their smartphones. With increasing smartphone penetration and low-cost internet access in rural and urban India, using mobile technology presents a scalable and inclusive solution that is in line with the Digital India initiative. The underlying philosophy of the application is based on the premise that technology can serve as a bridge between concerned citizens and intervention agencies such as NGOs and government agencies. Through the democratization of the reporting process, the app converts passive witness into active contributor, empowering individuals to use their abilities to bring positive change to the lives of vulnerable children.

The application lifecycle development adhered to a systematic software engineering process, beginning with a thorough requirement collection phase. Stakeholder interviews, surveys, and case studies were carried out during this phase in order to determine the pain points of current reporting mechanisms. From these findings, the key features necessary for making the application useful, user-friendly, and effective were determined by the development team. These characteristics comprised secure login mechanisms to avoid spam and abuse, real-time reporting features, GPS location



tracking, and the capability to append multimedia evidence such as photos or videos to verify the authenticity of every report. For seamless and user-friendly interaction, the application's frontend was implemented using XML layouts, following Android UI/UX guidelines for responsiveness and accessibility. In the backend, Java was utilized for its support for Android Studio and handling multiple processes in an efficient manner. Server-side logic assures safe processing of real-time data with performance and security measures. For storing persistent data, a MySQL database was implemented as it supports structured queries, scalability, and simplicity in integration with Android-based applications. The application design comprises a strong API integration layer that serves as a gateway between the mobile app and a centralized NGO coordination system. The system dynamically classifies received reports according to urgency, geography, and content, and relays them to the respective NGOs or government ministries. Every complaint is monitored across its entire life cycle, with statuses like "Pending," "In Progress," or "Solved" displayed to the user. This transparency not only fosters trust between users but also holds responding agencies accountable. On top of its essential features, the app adds user authentication, complaint handling, data encryption, and admin dashboards for NGOs to make their workflow simpler. In addition to encouraging user activity and advocacy, the app also features push notification for status update, a donation gateway for supporting NGO activities, and an educational section that provides users with information regarding child rights, supporting laws, and signs of exploitation.

II. PROBLEM STATEMENT

Child labour is still a main issue in the socio-economic scenario of developing countries like India where thousands of children are badly deprived of their rights of education, safety, and dignified childhood. The laws already exist, like the Child Labour (Prohibition and Regulation) Act, with their fair share of national programs and policies for the elimination of child labour, yet this continues to exist. There are reasons like poverty, illiteracy, unemployment, ignorance, and poor legal enforcement mechanisms causing child labour to exist. Among these, the biggest and most under-recognized issue is the absence of an efficient, accessible and real-time reporting system that allows citizens to participate in the process of identification and reporting in cases of a child being exploited. Traditional mechanisms of reporting, like government helplines, physical visits to child protection offices, or NGO outreach programs, have their own limitations. They are very time consuming and do not provide immediate intervention most of the time. Most people in rural and semi-urban areas don't know how to report cases of child labour or how to do it without exposing themselves to fear of being involved, social norms, or bureaucratic delays. Sadly, in urban settings, the situation is not any better, as such an accessible and responsive complaint system discourages people from taking action on events of child labour. Besides, once a complaint is lodged, the majority of the time, there is no trackable progress or outcome mechanism. All these factors lead to a reduction in trust within the system and, hence, discourage future reporting. Really big, serious problems arise when the public complaints may not be effectively channeled to the responding agencies such as NGOs and child welfare committees. In many instances, the NGOs work on the field but do not have access to incident data because complaints may not have been fed via connected or up-to-date channels. The net result of this is rather long delay between reporting, verification, and action which all in all cut into the impact of interventions. Such a gap between public concern and the organizational response is a hurdle in fighting child labour. Then again, there are new growing needs for modern technology and infrastructure, particularly mobile, to bridge these gaps. In the last decade, India has soared with a capital upsurge in smartphones and internet penetration. But this advancement in technology has not effectively been tapped in the area of child protection. Mobile applications, if defined and built appropriately, could become enormous facilitators for real-time data upload, location tracking, evidence submitting, and automated updates. However, such mobile-based systems currently do exist to report cases of child labour and then go into the too complicated, small-scale systems, or have features lacking like GPS tagging for complaint tracking or are not directly connected to an NGO. Such features should be combined with an adequate Android one-stop application to report child labour instances with the help of laymen from their mobile phones in a clear, safe, and effective manner. All possible features inclusivity is proposed here, such as easy multilingual communication, attaching image or video evidence, and automatic location tracking of incidents where intervention is needed to ensure that authorities act without delay. It should also have a secure login mechanism with the highest form of security to prevent spam or false complaints with promises of protecting the reporter's identity. In addition, the



backend system must accommodate received complaints by storing them and organizing them in a structured format. It should also connect directly to a centralized server and an NGO management interface to enable child welfare organizations to view verified complaints, take appropriate actions, and amend the status of each such case. This two-way communication channel will ensure a fast response and at the same time foster transparency and accountability by keeping the original reporter apprised of the progress of his complaint.

In conclusion, the main problem dealt with in this research is the absence of a real-time, citizen-driven, mobile version for reporting and managing child labour cases, which results in underreporting, slow responses, and poor coordination between the general public and child-well-being authorities. In attempting to provide a solution to this dire gap, this project is concerned with the design and implementation of an Android-based Child Labour Reporting Application integrated with a centralized server and NGO interface. The purpose of the proposed solution is to create a transparent, responsive, and community-driven ecosystem that empowers the community to act against child exploitation and supports NGOs to better respond to that and thus contribute to the greater goal of eradicating child labour from society.

III. METHODOLOGY

The methodology of the project describes the systematic and organized procedure followed in designing the Android-based child labour reporting application. It includes the technological base, software tools, database structure, and overall system design that collectively constitute the backbone of the application. The methodology is concerned with how each element was chosen, set up, and deployed to achieve the project's specific goals—mainly to facilitate real-time reporting, provide data reliability, and accommodate responsive user interaction.

Frontend Technology:

XML: XML was used as the markup language to create and organize the user interface elements of the Android app. The reason for using XML is that it can describe UI elements in a straightforward, hierarchical manner, which makes it well-suited for creating Android layouts. For our application, XML helped the development team to create a user-friendly and responsive interface that can support a vast variety of screen sizes and resolutions. This was especially critical with the varied devices being used across rural and urban India.

Android Studio: It was used as the primary Integrated Development Environment (IDE) to develop the Android application. It was chosen since it is the official IDE that Google recommends for Android development, offering a rich set of tools that are specifically designed to simplify mobile app development. The reason behind implementing Android Studio in our project was to provide a structured, effective environment supporting all phases of app development from design to coding, testing, and debugging. Android Studio includes a visual layout editor that made it possible for the development team to drag and drop UI objects while editing the XML code in parallel, thereby accelerating the UI creation process. Additionally, it offers robust features like real-time layout previews that demonstrate how the app will look on various devices and screen sizes, which was imperative in making our application accessible across all devices.

Backend Technology:

Java: The choice of Java as the primary backend programming language stems from its excellent compatibility to Android development and its trustworthy performance in coping with heavy tasks. Java was used in this project to implement all backend logic on the client-side Android application, such as user authentication, complaint functionality, and communication with external services. Java is the official language for Android development and has excellent object-oriented programming support which has allowed us to create modular scalable code structures.

RESTful API Integration: Another core part of back-end is the API Integration which employs RESTful. The purpose of this project in using the RESTful API is to create a secured and standardized manner of communication between this mobile application and the core server or the NGO Coordination System. APIs then become the bridge which enables the data to be sent over and receive from the client-side app and server. Using JSON format, we created these APIs because this is lightweight, easy to parse, and can easily be used with Java as well as PHP.



Database

MySQL: Reliability, Scalability, and Integration with Android applications made MySQL the obvious choice of the relational database management system for this project. In this system, MySQL plays an important role in storing all the data required for the effective running of the Child Labour Reporting App, which includes user credentials, complaints, NGO actions, multimedia metadata, and status logs. The structure of the schema and SQL query language of MySQL obviously makes it very suitable for managing relational data.

PHP: PHP was employed as middleware to enable communication between the Android application and MySQL. The primary role of PHP in this architecture is to facilitate an API request to the mobile application securely via an intermediary, hence, processing the request and interacting with the database accordingly. PHP, in this case, facilitates the processing of HTTP requests and responses, session management, and safe interaction with databases through SQL. In our application case, PHP is the one fetching and posting data to and from the MySQL database.

IV. IMPLEMENTATION

The implementation phase is the most important phase in a project. This is when theoretical designs are converted into a working and interactive mobile application. This application, tailored specifically for the NGO, is created for building a robust platform for public reporting on child labour incidents and swift action by NGOs. This further includes features for donation of items to registered NGOs.

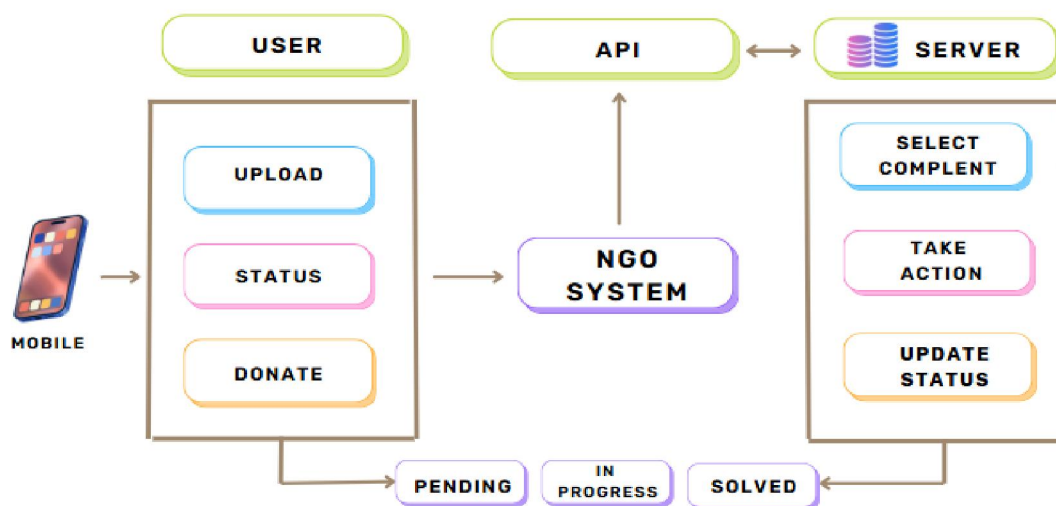


Fig 1. System Architecture

The architecture of the application is designed to provide seamless interaction between users and NGOs with a mobile-first approach, underpinned by API integration with a centralized server. With the mobile application, users access the system to upload complaints, check the status of existing complaints, and donate funds. These requests run through an API layer, which serves as the communication pathway between the user interface and the back-end server.

At the heart of the entire system stands the NGO module, which receives the complaints submitted, assigns action to the proper personnel, and updates status accordingly. The server component is critically important because it stores all major pieces of information necessary for the operation, such as the details of the user, complaints, donations, and complaint statuses. NGO personnel access the system through an administration panel that enables them to view complaints and take necessary actions to update the progress of each case. The entire lifecycle of a complaint is tracked using status flow, which passes through three states: Pending, In Progress, and Solved.



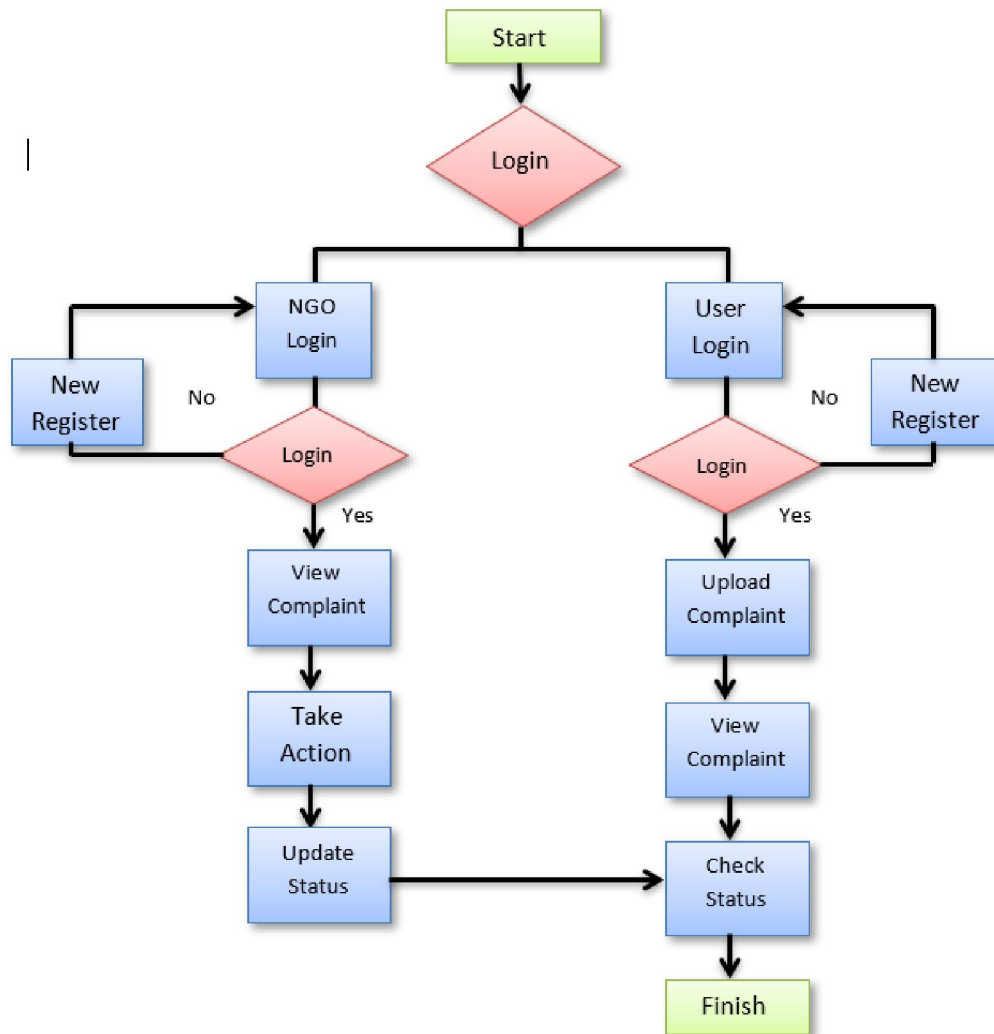


Fig 2. Workflow Diagram

The following application has two major modules:

1. User Module
2. NGO Module

Every module comes with its own particular functional and workflow that is stipulated below.

1. User Module

The module is meant for the general public willing to report incidents and donate to NGOs.

User Registration and Login

A user registration screen is provided by application for collecting name, email, password and mobile number for registering the user.

After registering, users can login with their credentials.

A session is created securely for accessing activity of user through application after login.

Upload Complaint



User takes a picture or chooses one related to child labour and then uploads it.

After that, application redirects user to a details page where:

Latitude and longitude values are fetched automatically using the device's GPS.

A description is provided about incident by user.

After submission of form, all data is to be stored in the database including:

Image path

GPS coordinates

Description

Date and time of complaint

Status (default: "Pending")

Donate to NGO:

The user gets a list of registered NGOs that he or she can choose from.

After that, after selecting an NGO, the user fills the following fields:

Donation Category (Money, Books, Food, Clothes, Others)

Pickup Address

Contact Number

Donation Description

Clicking on the submit button sends an SMS to selected NGO via an integrated SMS API with full details of donation.

View My Complaints:

This allows the user to view the list of complaints that have been uploaded by him or her.

Each complaint entry includes:

Complaint ID

Submission date

Current status: Pending / In Process / Solved

This feature helps users keep track of the demands and consequences of their reports.

Logout:

- It closes the session currently in progress and directs the user to a page of login to keep it secure.

2. NGO Module

Issues arise when proper action is not take with a good monitoring system.

NGO Login

NGOs acquire credentials to log in.

Once NGOs login, they get access to a control panel with several functionalities.

All Complaints

Provides a comprehensive overview of the complain concerning child labour against individual users.

NGO staffing can does for each of those complains:

Look at the Details: Image, contact number, complaint time, description, etc.

Call the User: Will open the device dialer with the user's number.

Update Status: It will allow an NGO user to add action notes and select status from a dropdown (Pending, In Process, Solved).

Get on Map: It will open Google Maps and gets the location of the complaint according to the captured GPS coordinates.

View Actions

This shall reflect all actions taken by the NGO regarding the complaints.

Clicking on any complaint opens a scroll-down list of actions taken which including:

NGO name

Time of action

Updated status

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Notes entered by the NGO

My Complaints

Shows every complaints the NGO has responded to.

NGO may open, edit statuses and add follow-ups as appropriate.

Solved Complaints

This documentation may be useful for reporting and transparency as it allows for the listing of all complaints with "Closed" status.

Logout

Ends the NGO current session and be directed back to the login page.

3. Backend Implementation

The backend for the NGO connect application is implemented in PHP where MySQL is used as the database which would act as the server-siding languages. Also, the communication between the server and the Android client will occur through RESTful APIs developed in PHP. The application uses Volley which is a known HTTP Library for Android for performing network operations with these APIs. Actually, the NGO connect application is based out on PHP for its backend-server-side language and uses the database MySQL. But communication of this android client and the server will happen through RESTful APIs developed in PHP. The application uses an HTTP library like Volley for Android: for network operations with these APIs. The following backend functionalities have been implemented:

User Registration and Login APIs

Registration API: Takes user input (name, email, password, phone number) and saves it securely to the users table after validating against duplicate entries.

Login API: Validate the user by checking email and password from the database and sends success or failure response with user details if valid.

Complaint Upload API

It takes the following parameters :

Complaint image (uploaded as base64 or multipart file)

Latitude and Longitude values

Complaint description

User ID

The data is inserted into the complaints table.

The image is saved in the server directory, and the path is stored in the database.

View My Complaints API

Returns the logged-in user with all the complaints made using his/her User ID.

All entry shall consists of :

Complaint ID

Date and time

Status

Image URL

Description

NGO Module APIs

NGO Login API: Authenticates the NGO credentials and returns the corresponding NGO details upto successful authentication.

All Complaints API: Retrieves all complaints from the database for the NGO dashboard.

Update Status API: Allows information about the status and action notes to be updated by NGOs for each complaint.

My Complaints API: Returns complaints on which the logged-in NGO has taken action.

Solved Complaints API: Fetches all complaints marked as "Solved."

View Actions API: Displays a log of all actions taken by various NGOs for transparency and tracking.

Testing

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527

The application was put through unit testing, module testing, and integration testing to ensure functionality of all features.

Testing backend APIs creations with Postman.

Testing was performed for the application on different devices to ensure GPS, image upload, and SMS services functionality.

V. CONCLUSION

The NGO Connect Application has been built primarily to create a digital gap between the public and NGOs for one of the most critical social evils-child labour. With this initiative, we wanted to merge a simple yet effective mobile application for people to report and combat child labour actions. The application provides an opportunity for users to register, login, and submit real-time complaints-including images, detailed descriptions, and captured location coordinates (latitude and longitude) automatically. It captures complaints submitted from all registered users to the appropriate registered NGOs well-equipped to take action on the complaints received. There is also a complaint status tracker, thus enhancing transparency and trust among the users. However, users can also donate money, food, clothes, and books through this donation module. SMS alerts integrated into this app make donations notified instantly to the NGOs, thus improving their responsiveness to donations. For NGOs, the app offers features to see complaints, contact users, update status, and view complaint locations in maps. The perception of complaints' management and redressal is high on efficiency and effectiveness.

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