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DISASTER RELIEF TRACKER: AN INTERACTIVE WEB DASHBOARD FOR TRANSPARENT SDRF DISTRIBUTION

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Abstract:
State Disaster Relief Fund (SDRF) is a fund created by the government of a country or a state within a country to provide financial assistance and support for immediate relief and rehabilitation measures in the event of natural disasters or other calamities. One of the primary problems is the delayed response in allocating and disbursing funds. Ineffective planning and coordination among various government agencies involved in disaster response can lead to inefficiencies. Poor coordination may result in overlapping efforts, resource wastage, and a failure to address the most urgent needs. To address these problems, governments need to implement efficient and transparent systems, prioritize disaster preparedness and mitigation efforts, and ensure that relief funds are allocated based on the actual needs of affected communities rather than other considerations. In response to these challenges, the project has been developed to streamline the allocation process by offering real-time insights into fund distribution, allowing stakeholders to track and visualize the utilization of funds during different stages of disaster relief efforts. The dashboard promotes transparency by providing clear guidelines for fund allocation and criteria, fostering public trust in the relief distribution process. Through an intuitive interface, the web dashboard facilitates coordination among government agencies and ensures a targeted and efficient response to disaster-affected citizens. It serves as a vital tool in improving disaster management strategies, ensuring equitable relief, and enhancing overall preparedness for future calamities.

Keywords:
Disaster management strategies, Disaster-affected citizens, Fund distribution, State Disaster Relief Fund (SDRF).

(1) INTRODUCTION

The State Disaster Response Fund or SDRF is the primary fund available with the state governments of India to respond to disasters in the respective states. SRDF covers notified disasters which are cyclone, drought, earthquake, fire, flood, tsunami, hailstorm, landslide, avalanche, cloudburst, pest attack, frost and cold waves. The State Disaster Response Fund (SDRF), constituted under Section 48 (1) (a) of the Disaster Management Act, 2005, is the primary fund available with State Governments for responses to notified disasters. The Central Government contributes 75% of SDRF allocation for general category States/UTs and 90% for special category States/UTs (NE States, Sikkim, Uttarakhand, Himachal Pradesh, Jammu and Kashmir). The annual Central contribution is released in two equal instalments as per the recommendation of the Finance Commission. SDRF shall be used only for meeting the expenditure for providing immediate relief to the victims.

States may provide immediate relief to victims of natural disasters that local authorities consider “disasters” in their state by using up to 10% of the available funds under the SDRF and which are not on the Ministry of

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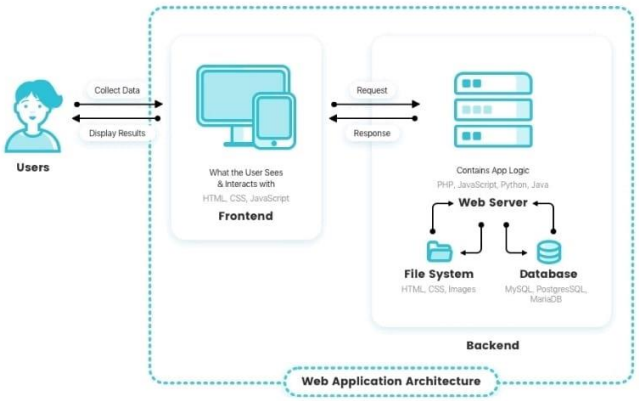
Home Affairs' notified list of disasters, provided that the State Government has notified clear and transparent norms and guidelines with the approval of the state authority, i.e. the State Executive Authority (SEC).State Government may use up to 10% of the funds available under SDRF for providing immediate relief to the victims of the natural disaster that day considered to be "Disaster" within the local contacts in the State and which is not included in the notified list of disaster of the Ministry of Home Affairs (MHA) subject to the condition that the State Government has listed the State specific natural disaster and notified clear and transparent norms and guidelines for such disaster with the approval of the State authority i.e. State Executive Committee (SEC).

Web Application Architecture:

A Web application is a complex piece of software. It consists of many components like the user interface, a login-screen, an in-app store, the database, etc. To manage these components, software engineers devised web application architecture to logically define the relationships and manner of interactions between all of these components for a Web app.



Every Web application consists of both a front-end and a back-end.

Front - End

The front-end, also known as the client-side, is everything that the user sees and interacts within inside their browser. The main purpose of the client-side is to collect data from users. It is written in variants of HTML, CSS, and JavaScript.

Back - End

The back-end, also known as the server-side of the app. It is the part, which is not accessible by users; it stores and manipulates data. The backend processes HTTP requests which essentially "fetch" the data (text, images, files, etc.) called for by the user. Unlike the frontend, many languages like PHP, Java, Python, JavaScript, and others can be used to write the backend of a Web Application.

(2)SYSTEM SPECIFICATION

2.1. HARDWARE REQUIREMENTS

Processor : Intel® Core™ i5 processor
RAM : 4GB
Hard disk : 500 GB

2.2. SOFTWARE REQUIREMENTS

Programming : Python 3.8.
Database : MYSQL
Operating System: Windows OS
Web Server : WAMP Server
System type : 32 or 64 Bit OS
IDE : Flask 1.2.
Packages : Pandas,

(3)SYSTEM ANALYSIS

3.1. EXISTING SYSTEM*

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The existing system for disaster relief fund distribution often involves manual and paper-based processes.
Manual Application Submission: Citizens typically submit relief fund applications manually, often involving physical forms and documentation.
In-Person Verification : Government officials conduct in-person verification by visiting affected areas to assess the extent of damage and gather necessary information.
Paper-Based Approval Process : The approval process involves reviewing physical documents, and decisions are made through manual assessment by committees or authorities.
Face-to-Face Communication : Communication between stakeholders, including citizens and government officials, is primarily done in person or through traditional means such as phone calls or postal services.
Manual Fund Allocation : Approved funds are allocated manually based on priority lists, and the disbursement process may involve physical checks or cash transactions.
Documentation Challenges : Record-keeping relies on physical documents, which can be prone to loss or damage, and the retrieval process may be time-consuming.

(4)DISAVANTAGES

1)Slow processes due to manual application submissions and approvals.
2)In-person verifications are time-consuming and may be hindered by geography.
3)Lack of digital tools leads to reduced real-time application status tracking.
4)Traditional communication methods result in slower information flow.
5)Manual allocation processes cause delays in distributing funds to citizens.

(5)Benefits of the Proposed System

1)Automated approval workflows reduce processing time, enabling faster assistance.
2)Real-time transparency and accountability through digital tools.
3)Instant communication channels for efficient stakeholder updates.
4)Transparent and fair fund allocation based on priorities.
Robust data security and integrity in a centralized digital system.

(6)SYSTEM STUDY

Technical Feasibility: The technical feasibility of the Disaster Relief Tracker Web App is evident, given the utilization of well-established technologies such as Python, Flask, MySQL, and Bootstrap.
Operational Feasibility:The operational feasibility revolves around the ease of use and integration of the system into existing processes.
Economic Feasibility : The economic feasibility is influenced by factors such as development costs, potential benefits, and long-term sustainability.
Legal Feasibility:Legal feasibility involves ensuring that the project complies with relevant laws and regulations.
Scheduling Feasibility: Scheduling feasibility assesses whether the project can be completed within a reasonable timeframe.
Social Feasibility: Social feasibility evaluates the acceptance and support of the project by stakeholders and the community.

(7)SYSTEM DESIGN

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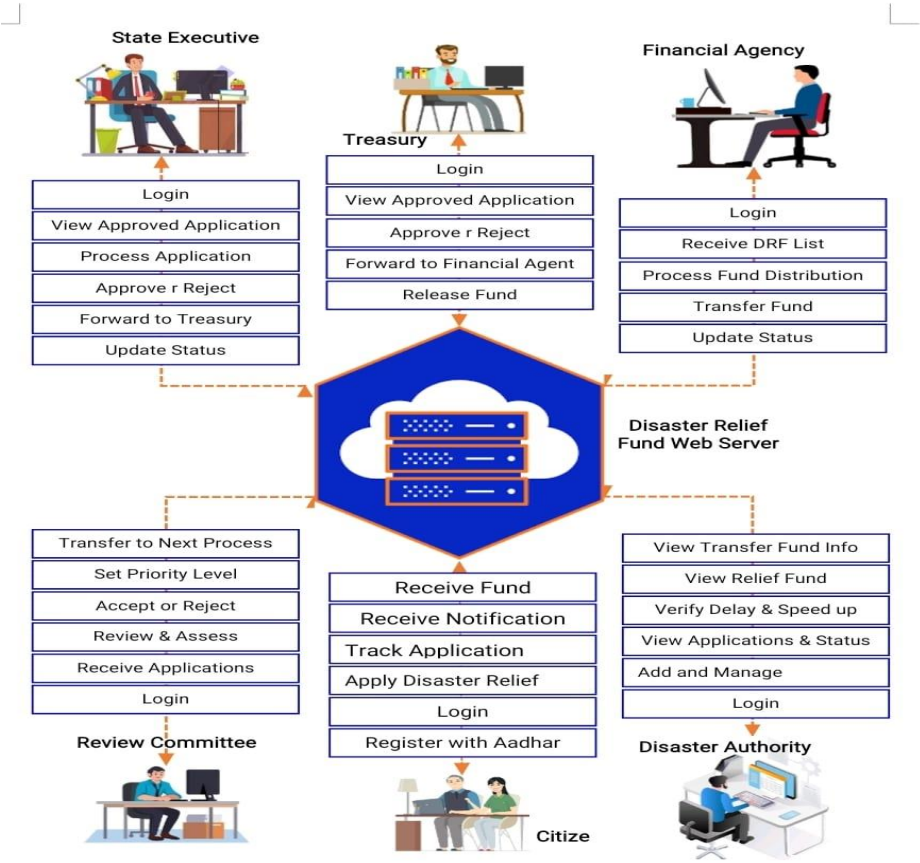

(8)SYSTEM TESTING

TESTING DEFINITION :

Software testing in the software development life cycle (SDLC) that involves the evaluation of a software application or system to ensure that it meets specified requirements and functions correctly. The primary goal of testing is to identify defects or bugs that may affect the software's performance, reliability, and functionality. Testing helps in delivering a high-quality and error-free software product.

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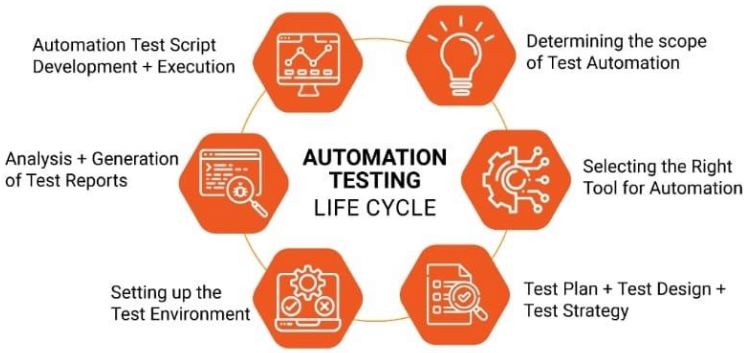

(11)Types of Software Testing

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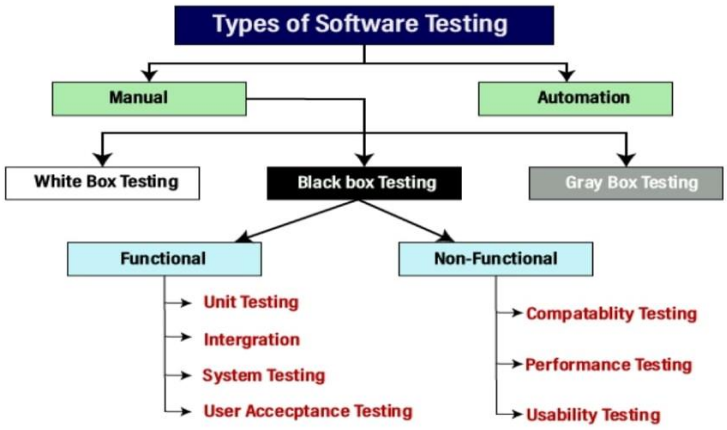

(12)SYSTEM FLOW

Sure! Here are short points summarizing the detailed process:

1. **User Registration and Verification**
   - Register with Aadhar for secure profiles.
   - Verify via OTP.
2. **User Login**
   - Secure login for personalized access.
3. **Application Form Submission**
   - Fill out form with personal and damage details.
4. **Document Upload**
   - Upload proof of residence and damage photos.
5. **Real-time Tracking**
   - Track application status in real-time.
6. **Automated Notifications**
   - Receive updates on application status.
7. **Review Committee Actions**
   - Examine applications, verify details, and score based on criteria.
8. **Priority List Generation**
   - Create a priority list for fund allocation based on severity.
9. **Approval/Rejection Decision**
   - Committee decides to approve or reject applications.
10. **Forward to State Executive Committee**
    - Approved decisions and priority list sent for further review.
11. **State Executive Committee Actions**
    - Review applications and make final decisions.
12. **Forward to Treasury/Revenue Department**
    - Approved applications with fund details are sent for processing.
13. **Treasury/Revenue Department Actions**
    - Verify details and release funds to banks.
14. **Financial Agencies/Banks Actions**
    - Distribute funds through direct transfer, account transfer, or cheque.
15. **Disaster Management Authority Actions**
    - Manage committees, oversee processes, and address delays.
16. **Notification Module**
    - Automated notifications via SMS, email, and in-app.
17. **Reports Module**
    - Generate and export reports on application status and fund allocation.

13)MODULE DESCRIPTION

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1. Disaster Relief Tracker Web App
The Disaster Relief Tracker Web App is designed and developed using Python, Flask, MySQL, and Bootstrap, ensuring a robust and efficient relief fund distribution system.
2)User Dashboard
2.1. Citizen Dashboard:
Registration with Aadhar: Citizens register using Aadhar, ensuring secure and verified user profiles.
2.2)Review Committee Dashboard:
Login: Members of the Review Committee log in using provided credentials.
Receive Applications: Applications submitted by citizens are directed to the Review Committee.
2.3)State Executive Committee Dashboard:
Login: State Executive Committee members log in to the dashboard.
View Approved Applications: Access approved applications, their assessment scores, and priority lists.
2.4)Treasury or Revenue Department Dashboard:
Login: Authorized personnel log in using provided credentials.
View Approved Applications: Access approved applications and verify provided details.
2.5) Authorized Bank Dashboard:
Login with Received Credentials: Authorized banks login with credentials received via mail and registered post.
Receive Relief Fund Distribution List: Access the list of approved applications, fund details, and citizen information.
2.6) Disaster Management Authority or Disaster Regulator Dashboard:
Login: Authorities log in using default credentials.
Add and Manage Committees and Departments: Add, manage, and provide login credentials to Review Committees, State Executive Committees, Treasury, and Financial Agencies
3)Apply Relief Fund
The "Apply Relief Fund" module streamlines the process for citizens seeking financial assistance during disasters. Citizens begin by registering on the platform, providing essential details. Verification, conducted through Aadhar and OTP mechanisms, ensures a secure and verified user base.
4)Verification and Assessment
The "Verification and Assessment" module plays a main role in evaluating applications submitted by citizens seeking financial assistance during disasters. Initially, applications are assigned to the dedicated Review Committee for thorough examination.
5) Disaster Relief Fund Approval
The "Disaster Relief Fund Approval" is overseeing the evaluation and approval process for applications submitted by citizens in need of financial assistance during disasters
6)Disaster Relief Fund Allocation
The "Disaster Relief Fund Allocation" module is designed to oversee the distribution and allocation of approved funds to citizens in need during disasters. Authorized personnel from the Treasury or Revenue Department gain access to this module by logging in with secure credentials, ensuring controlled access.
7)Disaster Relief Fund Disbursement
The "Disaster Relief Funds Disbursement" module is the final stage of the relief fund distribution process – the actual transfer and distribution of approved funds to citizens in need
8) Notification
The "Notification" module within the Disaster Relief Tracker Web App is a dynamic system ensuring efficient communication with stakeholders through SMS, E-Mail, and In-App notifications. Applicants receive timely updates on their relief fund applications, including approval status and disbursement details.
9)Reports
The "Reports" module serves as a robust tool for stakeholders to gain comprehensive insights into the relief fund distribution process. This module is instrumental in facilitating data analysis, informed decision-making, and ensuring transparency by generating detailed reports.

(14)SCREEN SHOT

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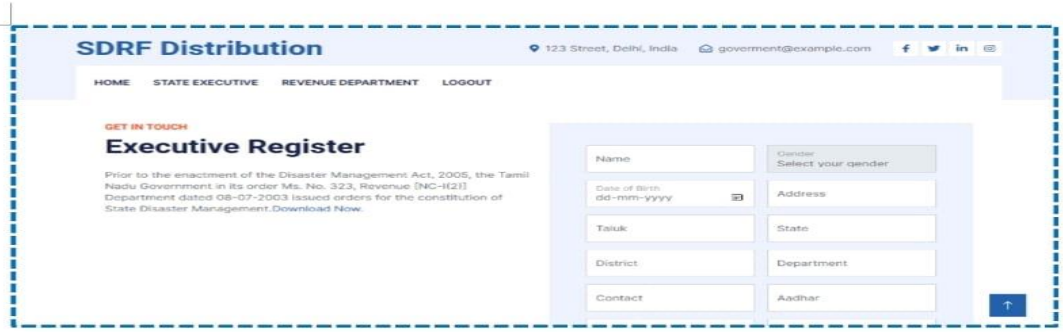

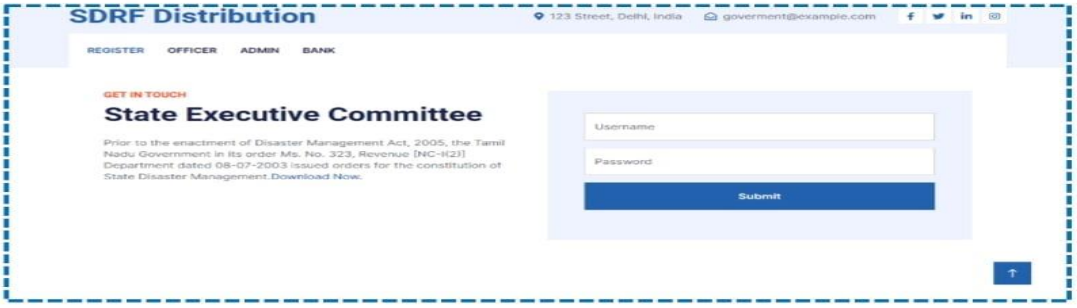

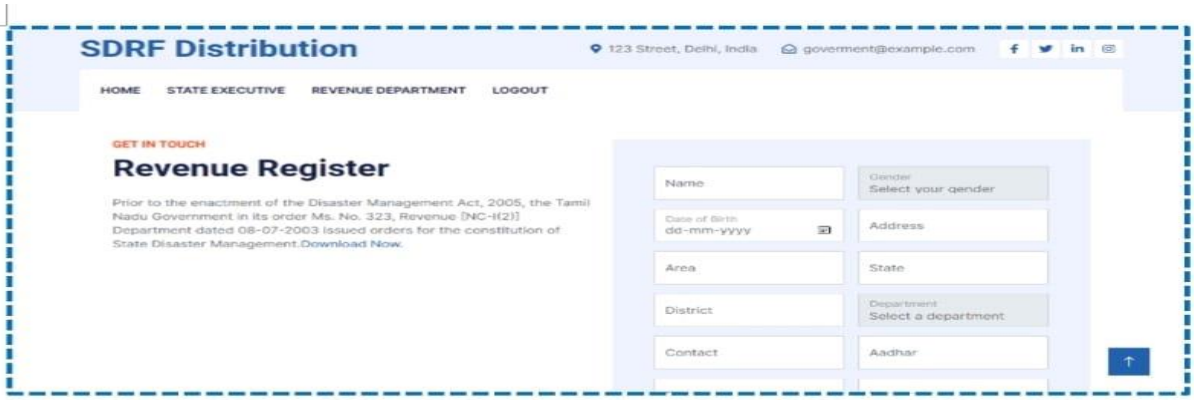

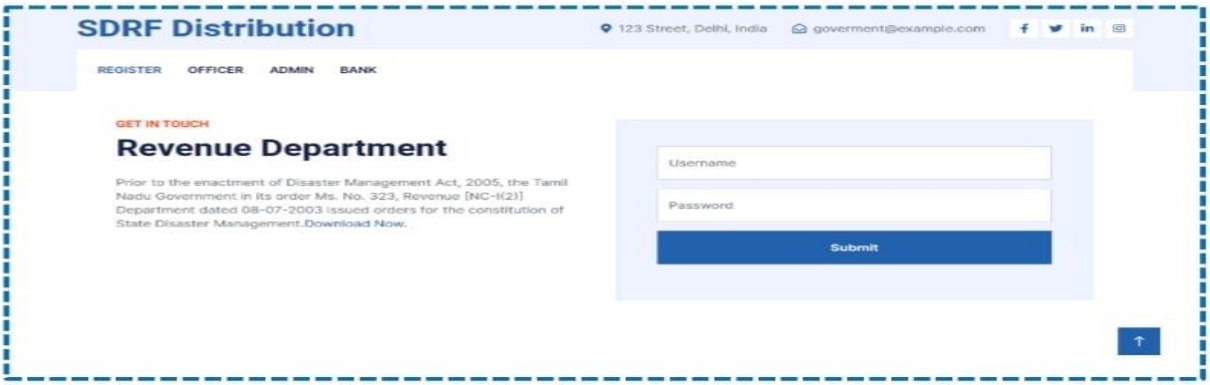

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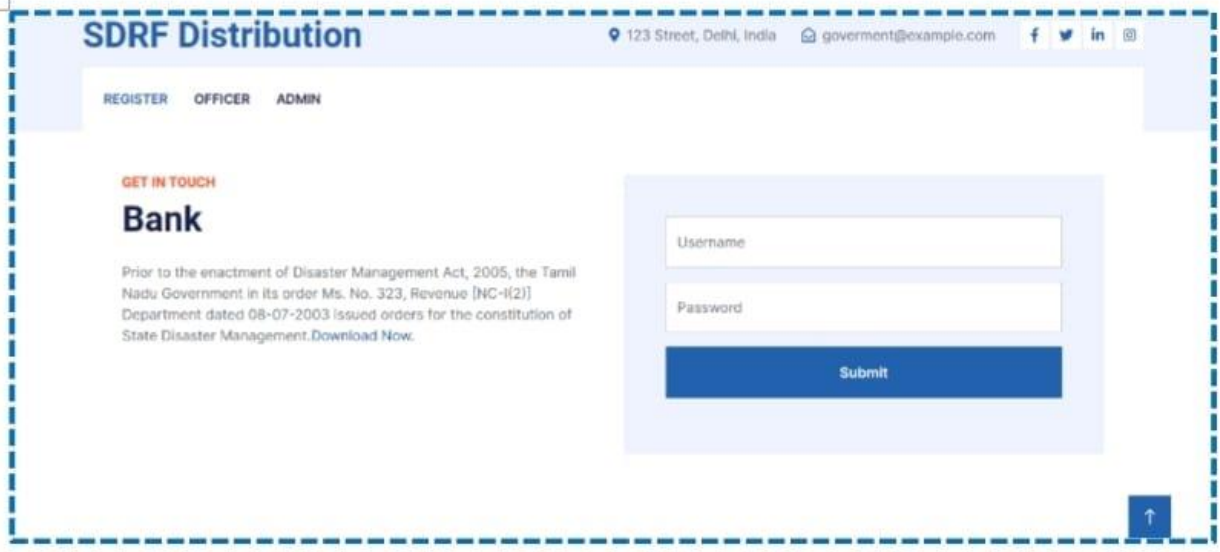

(15)CONCLUSION

In conclusion, the proposed system presents a solution to address the challenges associated with the allocation and distribution of State Disaster Relief Funds during natural disasters. By leveraging established technologies such as Python, Flask, MySQL, and Bootstrap, the system aims to streamline operations, enhance transparency, and improve overall efficiency in the management of disaster relief efforts. The system's user-centric design caters to various stakeholders, including citizens, review committees, state executive committees, treasury departments, financial agencies, and disaster management authorities. The clear and intuitive interfaces enable citizens to easily apply for relief funds, track their applications, and receive timely notifications, while government officials can efficiently review, assess, and approve applications through a systematic process. Real-time updates, multi-channel notifications, and customizable reports contribute to effective communication and data-driven decision-making. The feasibility study underscores the technical, operational, economic, legal, scheduling, and social viability of the project. The combination of these factors positions the Disaster Relief Tracker as a practical and beneficial tool for optimizing the disaster relief fund distribution process. Ultimately, this project aligns with the goal of improving disaster preparedness and response, fostering public trust through transparency, and ensuring that relief funds are allocated based on actual needs. By addressing the complexities associated with disaster management, the Disaster Relief Tracker stands as a valuable asset in promoting efficient, equitable, and timely assistance to communities affected by natural disasters.

(16)FUTURE ENHANCEMENT*

- **Integration with Emerging Technologies:** Use AI and ML for predictive analytics and improved decision-making.
- **Enhanced GIS Functionality:** Upgrade GIS mapping for detailed, real-time disaster data.
- **Mobile Application:** Develop an app for easier access and interaction on mobile devices.
- **Blockchain for Transparency:** Implement blockchain to ensure transparency and security in fund allocation.

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