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Real -Time Dashboard For State Disaster Relief Fund Managemen

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Abstract: ***The State Disaster Relief Fund (SDRF) is a critical resource created by the government to provide immediate financial assistance during natural disasters or other calamities. However, one of the key challenges in utilizing this fund effectively is the delayed response in allocation and disbursement, compounded by inefficient planning and poor coordination among various government agencies. This lack of coordination often leads to overlapping efforts, resource wastage, and an inability to address the most urgent needs of affected communities. To address these challenges, the project introduces a solution that streamlines the SDRF allocation process by providing real-time insights into the distribution and usage of funds. The interactive web dashboard enables stakeholders to track and visualize fund allocation at each stage of the disaster relief process, ensuring transparency and efficiency. By providing clear guidelines and criteria for fund distribution, the dashboard fosters public trust and confidence in the relief efforts. With its user-friendly interface, the dashboard promotes better coordination among government agencies, facilitating a targeted response to affected areas. This tool plays a vital role in improving disaster management strategies, ensuring equitable relief for all affected communities, and enhancing overall preparedness for future emergencies.***

I. 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 installments as per the recommendation of the Finance Commission. SDRF shall be used only for meeting the expenditure for providing immediate relief to the victims.

SOFTWARE ANALYSIS

- **Programming : Python 3.8.**
- **Database : MYSQL**
- **Operating System : Windows OS**
- **Server : WAMP Server**
- **System type : 32 or 64 Bit OS**
- **IDE : Flask 1.2.**
- **Packages : Tensor flow, Keras, Pandas, Yolov8**

Python 3.7.4

Python is a general-purpose interpreted, interactive, object-oriented, and high-level programming language. It was created by Guido van Rossum during 1985- 1990. Like Perl, Python source code is also available under the GNU General Public License (GPL). This tutorial gives enough understanding on Python programming language.

Python is a high-level, interpreted, interactive and object-oriented scripting language. Python is designed to be highly readable. It uses English keywords frequently where as other languages use punctuation, and it has fewer syntactical constructions than other languages. Python is a MUST for students and working professionals to become a great Software Engineer specially when they are working in Web Development Domain.

Pandas

pandas is a fast, powerful, flexible and easy to use open source data analysis and manipulation tool, built on top of the Python programming language. pandas is a Python package that provides fast, flexible, and expressive data structures designed to make working with "relational" or "labeled" data both easy and intuitive. It aims to be the fundamental high-level building block for doing practical, real world data analysis in Python.
Pandas is mainly used for data analysis and associated manipulation of tabular data in Data frames. Pandas allows importing data from various file formats such as comma-separated values, JSON, Parquet, SQL database tables or queries, and Microsoft Excel. Pandas allows various data manipulation operations such as merging, reshaping, selecting, as well as data cleaning, and data wrangling features. The development of pandas introduced into Python many comparable features of working with Data frames that were established in the R programming language. The panda's library is built upon another library NumPy, which is oriented to efficiently working with arrays instead of the features of working on Data frames.

NumPy
NumPy, which stands for Numerical Python, is a library consisting of multidimensional array objects and a collection of routines for processing those arrays. Using NumPy, mathematical and logical operations on arrays can be performed.
NumPy is a general-purpose array-processing package. It provides a high-performance multidimensional array object, and tools for working with these arrays.
Matplotlib
Matplotlib is a comprehensive library for creating static, animated, and interactive visualizations in Python. Matplotlib makes easy things easy and hard things possible.
Matplotlib is a plotting library for the Python programming language and its numerical mathematics extension NumPy. It provides an object-oriented API for embedding plots into applications using general-purpose GUI toolkits like Tkinter, wxPython, Qt, or GTK.

III. EXISTING SYSTEM

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.

PROPOSED SYSTEM

The proposed system for the disaster relief fund distribution project involves leveraging modern technologies and digital tools to enhance efficiency and transparency.

- **User-Friendly Dashboard**

Design an intuitive and user-friendly web dashboard for citizens to easily apply, track applications, and receive timely updates.

- **Online Application Submission**

Citizens can submit relief fund applications online through a user-friendly web interface.

- **Digital Verification Processes**

Implement digital verification methods, such as electronic document submission and online assessments, to expedite the verification process.

- **Automated Approval Workflow**

Utilize automated approval processes based on predefined criteria to streamline decision-making and reduce processing time.

- **Real-time Communication**

Implement digital communication channels, including SMS, E-Mail, and In-App notifications, for instant updates and information dissemination.

- **Transparent Fund Allocation**

Use digital tools for transparent fund allocation based on priority lists, ensuring a more efficient and equitable distribution.

- **Centralized Database**

Maintain a centralized digital database for secure storage of application information, enabling quick retrieval and minimizing the risk of data loss.

- **Digital Fund Disbursement**

Facilitate digital fund disbursement methods, such as direct transfers and online transactions, for faster and more secure financial transactions.

- **Comprehensive Reporting Module**

Develop a robust reporting module for comprehensive data analysis, aiding decision-making and continuous improvement strategies.

IV. MODULES

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. The User Authentication and Access Control module guarantees secure logins with Flask's user management. The Dashboard Interface is crafted with Bootstrap for a responsive and visually appealing real-time display of relief efforts. The Application Submission and Verification modules utilize Python and Flask to seamlessly handle citizen submissions, with MySQL managing the database for storing and retrieving application details. Citizens easily submit applications, while government officials use tools for verification and assessment, including on-site inspections. The State Executive Committee reviews and approves projects based on predetermined criteria, with an automated priority list ensuring systematic fund allocation. The app integrates with Treasury and Disaster Management Authority for fund allocation, earmarking, and disbursement. Real-time analytics offer insights, and a communication system keeps stakeholders informed. Feedback mechanisms and documentation ensure transparency, while GIS integration aids in mapping affected areas. An audit trail maintains accountability, and training resources enhance user proficiency in this accessible and comprehensive web app.

2. User Dashboard

2.1. Citizen Dashboard:

- **Registration with Aadhar: Citizens register using Aadhar, ensuring secure and verified user profiles.**
- **OTP Verification: Verified with OTP for enhanced security during the registration process.**
- **Login: Authenticated users can log in securely to access the dashboard.**
- **Apply for Disaster Relief Fund: Citizens can submit relief fund applications with necessary details.**
- **Track Application Status: Real-time tracking of application status, allowing citizens to stay informed.**
- **Receive Notification: Automated notifications keep citizens updated on the status of their applications.**

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.**
- **Review and Assess: Committee members review applications, assess damage, and assign scores.**
- **Approve/Reject Application: Applications are either approved or rejected based on the assessment score.**
- **Priority List: Approved applications contribute to a priority list for immediate relief.**

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.**
- **Process Applications: Review and either approve or disapprove relief fund applications.**
- **Forward to Treasury/Revenue Department: If approved, forward applications with fund details to Treasury or Revenue Department.**

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.**
- **Process Applications: Confirm details with the State Executive Committee and release funds.**
- **View Citizen Registration and Applications:** Monitor citizen registration, track relief fund applications, and manage the overall process.
- **Verification and Notification:** Verify delays in application processing and notify relevant departments for resolution.
- **Receive Lists and Fund Details:** Access approved and rejected lists with fund details, and view disbursed fund information.

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. Authenticated users can then securely log into their accounts, creating a personalized and secure environment. The heart of the module is the application form, where citizens furnish personal information and details about the extent of damage, specifying the type of assistance required.

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. Government officials within this committee then verify the information provided in the applications to ensure accuracy and authenticity. This may involve on-site inspections or interviews to assess the extent of the damage and validate the submitted information.

5. Disaster Relief Fund Approval

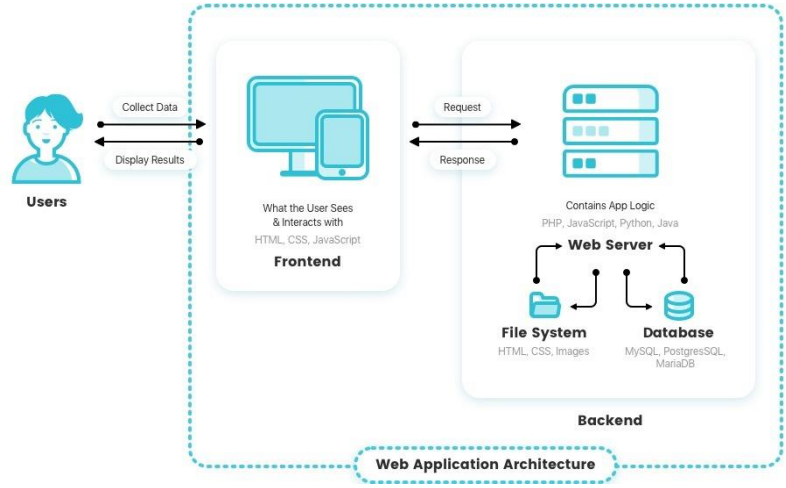
The "Disaster Relief Fund Approval" is overseeing the evaluation and approval process for applications submitted by citizens in need of financial assistance during disasters. The State Executive Committee, responsible for this crucial phase, follows a systematic approach facilitated by the following key functionalities: Upon logging into the system using secure credentials, State Executive Committee members gain access to a list of approved applications and the associated priority list as

determined by the Review Committee. Each application's details, including the assessment score assigned by the Review Committee, are scrutinized. The committee engages in a thorough decision-making process, carefully reviewing each application to determine whether to approve or disapprove the relief fund based on the provided details and assessment scores.

6. Disaster Relief Fund Allocation

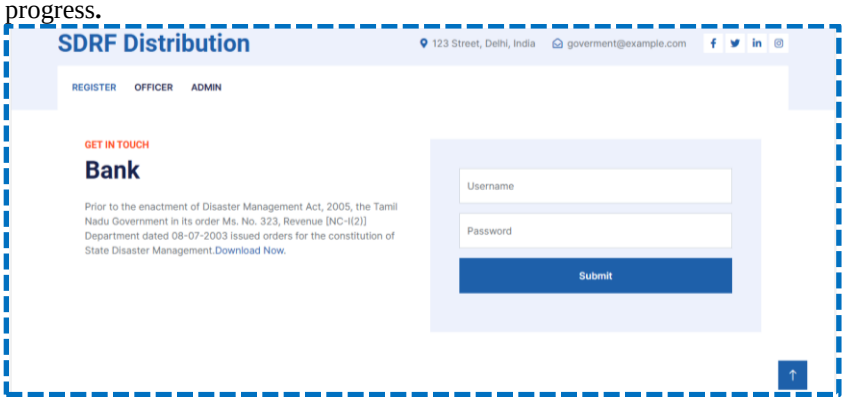
The "Disaster Relief Fund Allocation" module is designed to oversee the distribution and allocation of approved funds to citizens in need during disasters. Authorized personnel from the Treasury or Revenue Department gain access to this module by logging in with secure credentials, ensuring controlled access. Upon entry, the department views a list of approved applications along with detailed fund allocation information provided by the State Executive Committee. The application details are carefully verified for accuracy, aligning with the decisions made by the State Executive Committee

ARCHITECTURE DIAGRAM



RESULT

A real-time dashboard for state disaster relief fund management is a powerful tool that enables efficient monitoring and allocation of resources during disaster recovery efforts. It provides an up-to-date view of available funds, including government allocations, donations, and grants, while tracking expenditures across different categories such as emergency response, rehabilitation, and infrastructure repair. The dashboard integrates with disaster impact data, offering real-time updates on affected areas, displaced populations, and damage assessments, which helps prioritize funding allocation. Additionally, it features geospatial mapping to visualize the distribution of funds across regions and monitor recovery progress.



VI. 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.

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