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Farmer Assistance Website for Damage Recovery

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ABSTRACT: The Farmer Assistance Website for Damage Recovery is designed to bridge the gap between government relief schemes and affected farmers by leveraging technology to streamline the grievance redressal process. The Website ensures real-time access to government schemes, providing farmers with a user-friendly interface to submit grievances related to disasters. It utilizes socio-economic data to match beneficiaries with relevant relief programs efficiently. Additionally, the system incorporates secure cloud storage with encryption to protect sensitive information and maintain data privacy. A key feature of the website is its grievance tracking system, which enables Farmers to monitor the status of their complaints while allowing government officials to review, process, and resolve them efficiently. Designed with a Farmer-centric approach, the system improves transparency, accessibility, and responsiveness in Damage Recovery efforts, ensuring timely assistance to those in need.

KEYWORDS: Farmer Assistance Website, Damage Recovery, Government Schemes Mapping, Real-Time Access, Cloud Storage, Encrypted Files, Agricultural Grievances, User-Friendly Interface, Secure File Management, Data Security, Digital Governance, Disaster Management System.

I.INTRODUCTION

Natural disasters and socio-economic crises often leave farmers in urgent need of government assistance. However, the process of accessing relief schemes is often complex, time-consuming, and lacks transparency. Many eligible beneficiaries struggle to find relevant schemes or face difficulties in submitting grievances efficiently. The Farmer Assistance Website for Damage Recovery aims to bridge this gap by providing a digital solution that maps government schemes to beneficiaries based on their socio-economic background. This Website enables Farmers to submit grievances, track their status in real-time, and securely store relevant documents using encrypted cloud storage. Government officials can efficiently review and resolve grievances, ensuring a faster and more transparent relief process.

By using technology and automation, this system enhances Farmer-government interaction, ensuring that disaster-affected individuals receive the support they need without delays.

1.1 PROBLEM STATEMENT

During disasters, affected farmers often struggle to access government relief schemes due to lack of awareness, delays, and inefficient grievance redressal mechanisms. Many eligible beneficiaries find it difficult to identify and apply for the right schemes based on their socio-economic background. Additionally, the grievance submission process is often manual, slow, and lacks transparency, making it difficult for farmers to track the status of their requests. Furthermore, storing and managing grievance-related documents securely is a major challenge. Unauthorized access, data breaches, and mismanagement of records can lead to inefficiencies in relief distribution. There is a need for a secure, real-time, and farmer-friendly website that enables efficient grievance redressal, automated scheme mapping, and encrypted cloud storage to ensure faster and more transparent Damage Recovery assistance.

1.2 OBJECTIVE OF THE STUDY

The primary objective of this study is to design and develop a Farmer Assistance Website for Damage Recovery that facilitates efficient grievance redressal and ensures timely access to government schemes. The specific objectives are:

1. To develop a user-friendly digital Website that enables farmers to submit grievances and track their status in real-time.

2. To map government schemes to beneficiaries based on their socio-economic background, ensuring that eligible individuals receive the right assistance.
3. To implement a secure cloud-based storage system for grievance-related documents using encryption to protect sensitive data.
4. To streamline the role of government officials in processing and resolving grievances efficiently, reducing delays in Damage Recovery.
5. To improve farmer-government interaction by providing a centralized system for communication and grievance resolution.
6. To ensure data security and privacy by integrating encryption techniques and access control mechanisms.

II. LITERATURE REVIEW

The Farmer Assistance Website for Damage Recovery is designed to address the challenges in disaster management, grievance redressal, and beneficiary mapping. This section reviews existing research, technologies, and methodologies related to grievance redressal systems, cloud-based data management, and government-Farmer interaction in Damage Recovery efforts.

In paper [1], Daisy Sharmah, a researcher from the University of Science and Technology, Meghalaya, proposed an innovative method for secure data sharing in cloud environments by leveraging Elliptic Curve Cryptography (ECC).

In paper [2], Na Wang et al. proposed a novel approach for secure and efficient similarity retrieval in cloud environments, introducing the SESR (Secure and Efficient Similarity Retrieval) scheme.

In paper [3], Balachandra Muniyal, a researcher at the Manipal Institute of Technology, Manipal University, India, has proposed an innovative solution that combines advanced cryptographic techniques with efficient data retrieval mechanisms to address the growing security concerns in information and communication technology (ICT) systems. His solution integrates a sophisticated Binary Search Tree (BST) structure with Elliptic Curve Cryptography (ECC), creating a system that not only ensures fast and efficient data retrieval but also incorporates a high level of security. The BST structure is designed to optimize search operations, enabling quick access to large datasets, while ECC provides a robust encryption mechanism, securing sensitive data from unauthorized access or tampering.

In paper [4], SK. Pujitha et al. present a groundbreaking approach in their paper, proposing an efficient large universe regular language searchable encryption scheme designed specifically for cloud environments. This innovative scheme aims to address significant privacy and security concerns in cloud storage, offering a robust solution for searchable encryption while maintaining the confidentiality of sensitive data. One of the most notable features of this scheme is its ability to withstand off-line keyword guessing attacks (KGA), which are a common vulnerability in traditional search systems.

III. SYSTEM ARCHITECTURE

The Farmer Assistance Website for Damage Recovery is designed to provide a structured and efficient approach to grievance redressal, beneficiary mapping, and secure data storage. The system architecture outlines the key components, data flow, and interactions among different modules to ensure seamless functioning.

3.1 SYSTEM OVERVIEW

The system follows a three-tier architecture consisting of:

1. Presentation Layer (Frontend) – User interface for Farmers, government officials.
2. Application Layer (Backend) – Processes the requests, manages grievance data, and maps beneficiaries to schemes.
3. Data Layer (Database & Cloud Storage) – Stores encrypted grievance records, beneficiary details, and scheme-related information

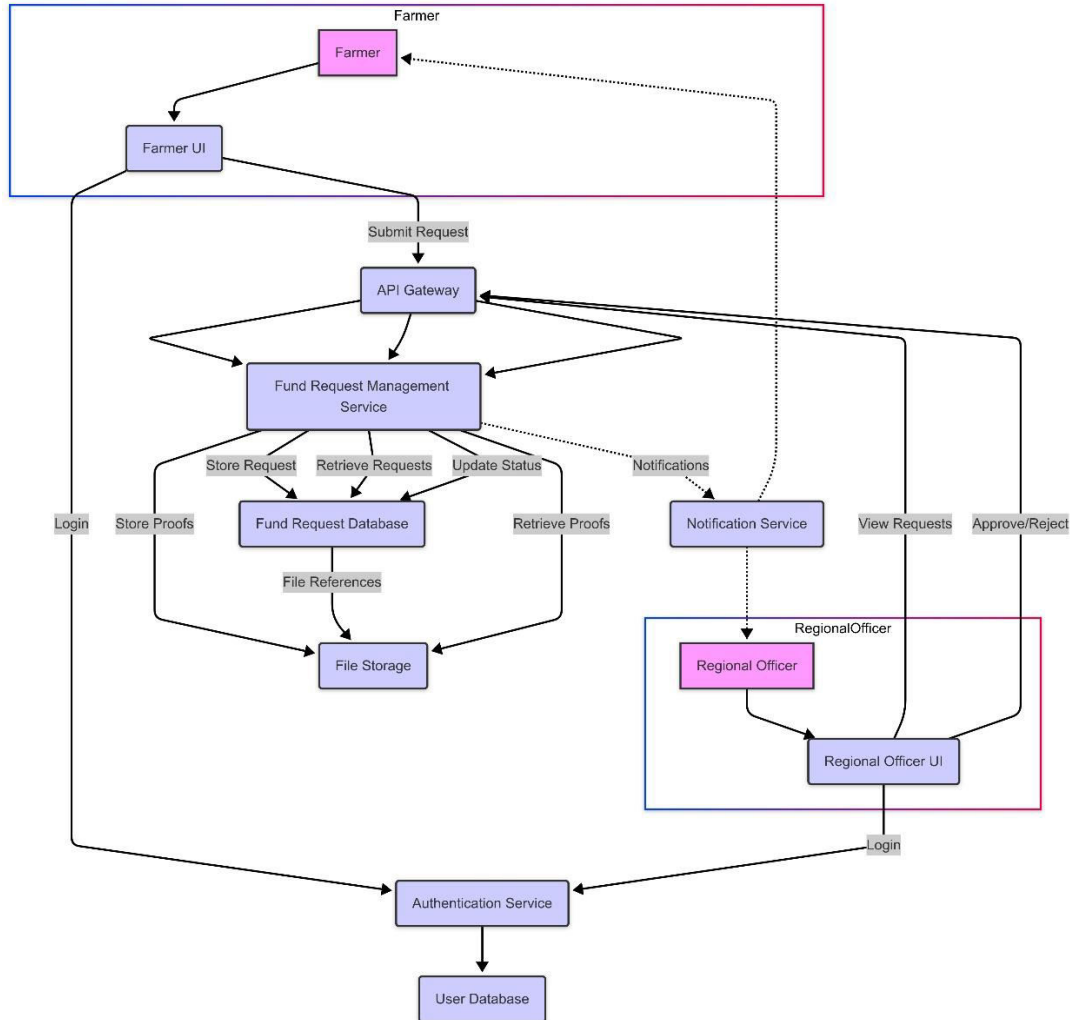


Fig.1 Architecture of the System

3.2 DATA FLOW DIAGRAM (DFD)

The Data Flow Diagram (DFD) for the Farmer Assistance Website for Damage Recovery illustrates the movement of data within the system, highlighting how Farmers, government officials, and administrators interact with the Website. At Level 0, the DFD provides a high-level overview of the system. It shows three external entities: Farmers, who submit grievances; Government Officials, who review and approve grievances. The core process, the Grievance Management System, facilitates grievance submission, review, and storage. The data is stored in three main data stores: the Grievance Database, User Database, and Cloud Storage. At Level 1, the DFD delves into more detail, breaking down the major processes. Farmers can register or log in to the system, after which they can submit grievances. The grievances are stored securely in the Grievance Database. Government Officials review the grievances and approve or reject them, mapping them to relevant government schemes based on socio-economic data. All records and documents are stored securely in Cloud Storage using encryption. This DFD illustrates the secure and organized flow of data from submission to approval, ensuring effective Damage Recovery management.

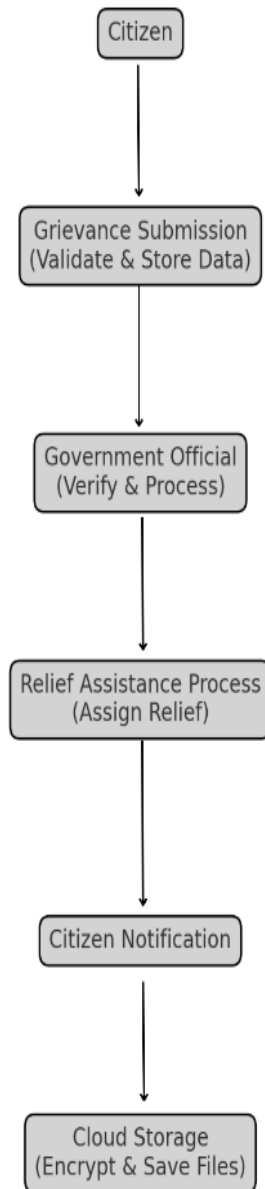


Fig.2 Data Flow Diagram

IV. CRYPTOGRAPHIC ALGORITHM

4.1 AES ALGORITHM

AES (Advanced Encryption Standard) is a widely used symmetric encryption algorithm designed to secure data. It encrypts and decrypts data in fixed-size blocks (128 bits) using a secret key. AES supports three key sizes: 128, 192, and 256 bits, providing a strong level of security. When used for file encryption, AES works by converting plain text (or an unencrypted file) into ciphertext, making it unreadable without the correct key. The encryption process involves several rounds of substitution, permutation, and mixing of the input data. The number of rounds depends on the key size: 10 rounds for 128-bit keys, 12 rounds for 192-bit keys, and 14 rounds for 256-bit keys. To encrypt a file, the file is

first divided into blocks of 128 bits (or 16 bytes). If the file size isn't a multiple of 128 bits, it is padded. Each block is processed through the AES algorithm, with the same key applied across all blocks. Once encrypted, the file can only be decrypted back to its original form using the correct key. AES encryption is highly secure due to its efficient design and resistance to known cryptographic attacks, making it a popular choice for securing sensitive data, including files in cloud storage or during data transmission.

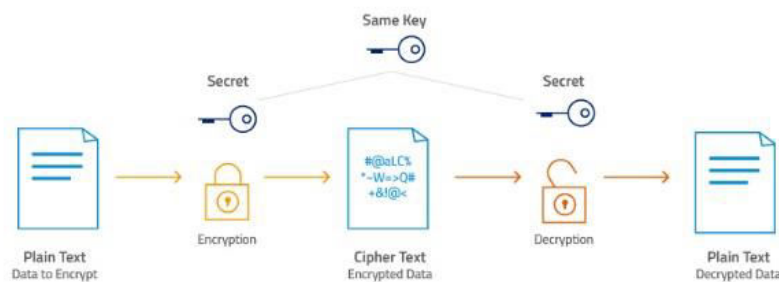


Fig.3 AES Algorithm working concept

AES (Advanced Encryption Standard) is a symmetric encryption algorithm that operates on 128-bit blocks of data with key sizes of 128, 192, or 256 bits. It consists of an initial round where the plaintext is XORed with the first -round key, followed by several main rounds (10 for AES-128) involving four steps: Sub Bytes (substitution), Shift Rows (shifting rows), Mix Columns (mixing columns), and Add Round Key (XOR with round keys). The final round omits the Mix Columns step. The process transforms plaintext into ciphertext, ensuring data security. Decryption is the reverse of encryption using the same key and round keys.

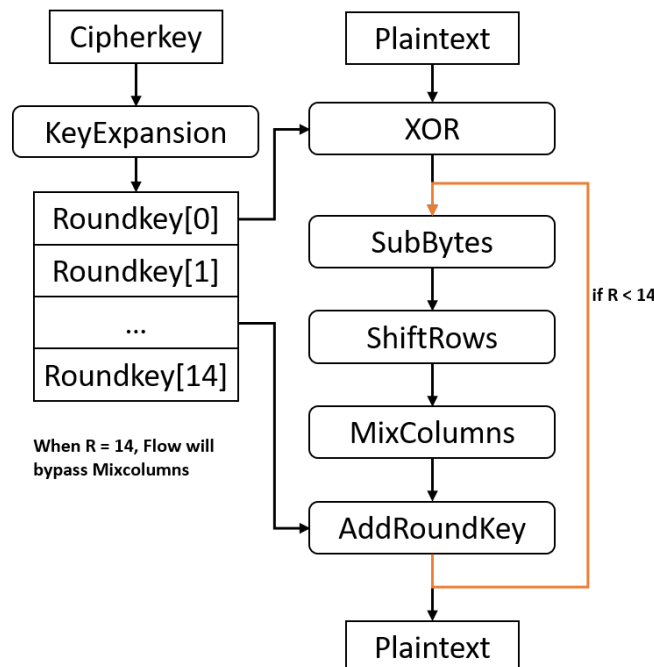


Fig.4 AES algorithm flowchart

V. RESULTS AND DISCUSSION

5.1 COMPARISON WITH EXISTING SYSTEM

The proposed grievance redressal system offers significant improvements over traditional methods by enhancing security, accessibility, and efficiency. Conventional systems often rely on local storage or unsecured databases, making them vulnerable to data loss, breaches, and unauthorized access. In contrast, this system securely stores user-submitted files in the cloud, ensuring seamless access, automatic backups, and protection against hardware failures. A key advancement is the integration of AES encryption, which safeguards sensitive grievance-related documents by encrypting file content before storage. This ensures that even if unauthorized access occurs, the data remains unreadable without the correct decryption key. Traditional systems typically lack such robust encryption mechanisms, making them susceptible to data leaks and privacy violations. Additionally, real-time grievance tracking and automated notifications improve transparency, keeping users informed about the status of their complaints. It provides a scalable and modern approach to grievance handling, surpassing conventional systems in terms of both security and operational efficiency.

5.2 SCREENSHOTS

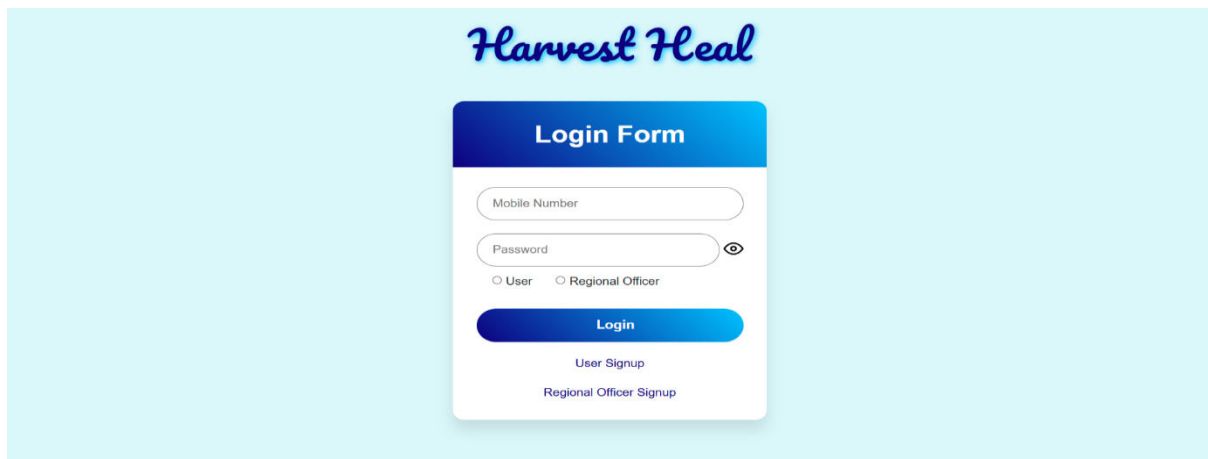


Fig.5 Login Page

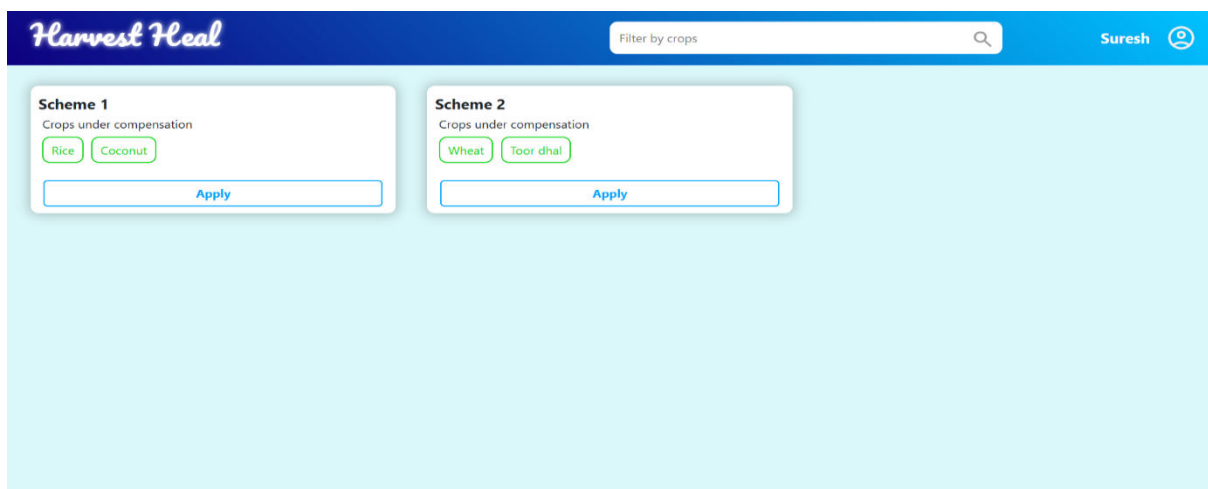


Fig.6 Home page – Farmers can choose the scheme and apply for damage recovery

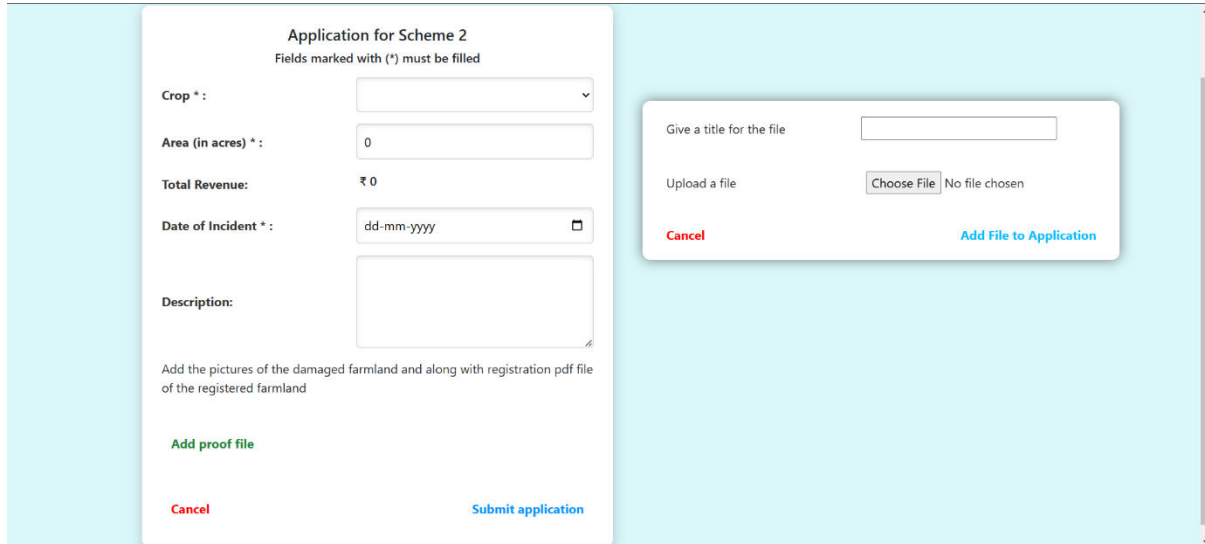


Fig. 7 Application for damage recovery of a particular crop

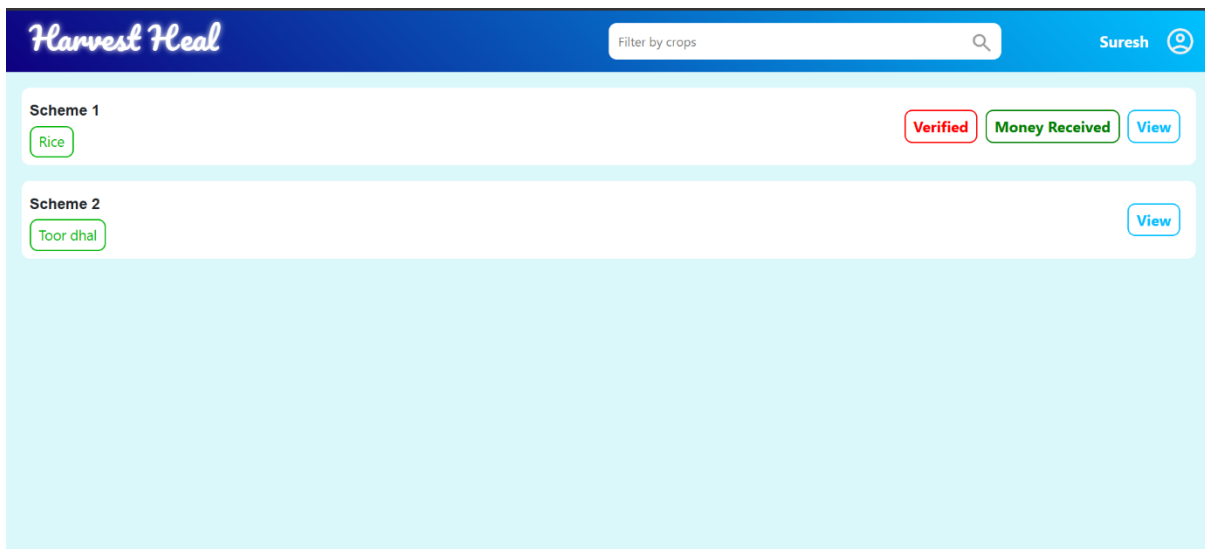


Fig.8 Tracking of application from a farmer's login

VI. CONCLUSION

In conclusion, the proposed grievance redressal system enhances security, transparency, and efficiency by integrating cloud storage and AES encryption. It ensures that user-submitted documents remain protected from unauthorized access while providing seamless accessibility and automatic backups. The real-time grievance tracking and automated notifications further improve user engagement and trust, addressing key shortcomings of traditional systems. By implementing these features, the system offers a reliable and scalable solution for secure grievance management. For future enhancements, the system can incorporate AI-driven sentiment analysis to prioritize grievances based on urgency and severity. Blockchain technology could be introduced to ensure tamper-proof records, enhancing transparency. Additionally, multi-factor authentication (MFA) can be integrated for stronger security, and chatbot support can be added for quick user assistance. These enhancements will make the system even more robust, user-friendly, and effective in handling grievances efficiently.

VII. FUTURE SCOPE

In the future, expanding support for multiple languages would greatly enhance accessibility, allowing users from diverse linguistic backgrounds to engage with the Website seamlessly. Additionally, integrating voice-based grievance submission would further improve usability, especially for individuals who face challenges with typing or have limited literacy skills. This feature would enable users to record and submit their concerns effortlessly, ensuring a more inclusive and user-friendly experience. By incorporating advanced speech recognition and language processing technologies, the system can accurately interpret and process grievances, ultimately improving responsiveness, user satisfaction, and engagement. These enhancements would significantly broaden the Website's reach and impact.

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