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SMART MEDICAL ASSISTANCE AND LIFE SAVING ALERT SYSTEM

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Abstract: In recent times, many individuals seek financial aid for medical treatment by posting fund requests on social media platforms such as WhatsApp and Facebook. However, scammers exploit this situation by fabricating fake medical bills to deceive donors. Identifying fraudulent medical fund requests is a challenging task. The proposed application utilizes Artificial Intelligence (AI) to detect and block fake medical fund requests by verifying uploaded medical treatment documents against a verified hospital dataset. This system ensures that only legitimate patients receive financial assistance. The project consists of two roles: patient and donor. Patients can upload their medical bills, which are then validated using AI-based pattern matching. Donors can confidently contribute, knowing that the system filters out fraudulent requests.

Keywords: Artificial Intelligence, Medical Fund Requests, Fraud Detection, Pattern Matching, Online Donation, Healthcare Support.

I. INTRODUCTION

This project aimed to measure the impact of perceived healthcare service quality on patient and user satisfaction. The main objective is to develop a system for hospitals and fund donors. The website is primarily designed to identify fake advertisements related to fundraising, particularly those posted on WhatsApp and other social media platforms. The existing system relies on manual operations, where fund details for hospitals are provided. Finding appropriate funds and obtaining further information about them is challenging in the current system. Fund providers may be willing to donate but are often unaware of whether the requests are genuine. There are many possibilities for fraud in fund-related messages. Additionally, the existing system is tedious, time-consuming, and requires skilled manpower, with periodic and unavoidable maintenance costs. In the proposed system, the admin will enter the necessary information regarding patients' needs. Any fund details or blood donor registrations will be handled exclusively by the admin. This process ensures that donors can identify and support genuine recipients, thereby reducing fraudulent activities and enhancing trust in the donation process.

II. LITERATURE REVIEW

Several approaches have been developed to verify online fund requests, aiming to prevent fraudulent activities and ensure that financial aid reaches genuine recipients. Some traditional methods rely on manual verification, where individuals or organizations review fund requests and supporting documents. However, this process is time-consuming, labor-intensive, and prone to human errors, making it inefficient for large-scale verification. In recent years, machine learning and AI techniques have been widely explored in fraud detection, particularly in banking and e-commerce sectors, where they help identify suspicious transactions and prevent financial fraud. These technologies utilize advanced algorithms to analyze patterns, detect anomalies, and flag potentially fraudulent activities. Despite these advancements, limited research has been conducted on leveraging AI for medical fund verification. The healthcare sector lacks an automated and reliable system to validate fundraising requests, leaving room for fraudulent claims. To address this gap, our study employs pattern matching techniques and verified hospital datasets to automate the verification process. By analyzing medical treatment documents and comparing them against legitimate hospital records, the system can efficiently identify and filter out fake requests, ensuring that financial assistance is directed only to those in genuine need.

III. METHODOLOGY

Role of Python in the System

The implementation of the "Smart Medical Assistance and Life-Saving Alert System" relies on a robust and secure

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technological stack to ensure efficiency, accuracy, and data protection.

The front-end of the system is developed using Python frameworks such as Flask or Django, which provide a flexible and scalable web interface for both patients and donors. The back-end is powered by MySQL Server, which manages user data, medical fund requests, transaction records, and AI verification results. AI-based verification processes utilize TensorFlow and OpenCV for machine learning and image processing, allowing the system to detect fraudulent medical documents effectively. Security is a key focus, with advanced encryption techniques implemented to safeguard sensitive user information and transaction details. Furthermore, blockchain technology is integrated into the system to enhance transparency and prevent fund mismanagement by maintaining an immutable ledger of transactions. The combination of these technologies ensures a seamless and trustworthy medical fundraising platform.

Integration with Healthcare Systems: Python's compatibility with electronic health records (EHRs) and hospital management software enables seamless data exchange and AI-powered decision-making support.

Objectives

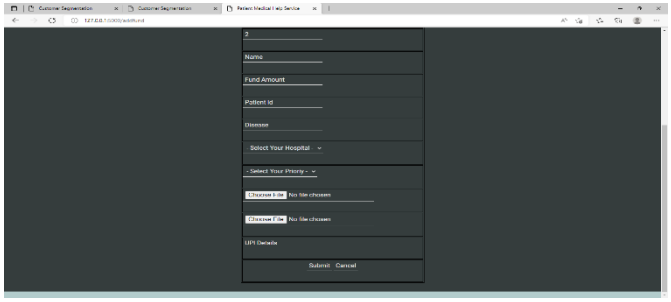
- To develop a secure and transparent online platform for medical fund assistance.
- To integrate AI for verifying medical treatment documents with high accuracy.
- To ensure transparency and reliability for donors, reducing the chances of scams.
- To prevent fraudulent medical fund requests using machine learning and image processing techniques.
- To implement blockchain-based transaction tracking for added security and transparency.

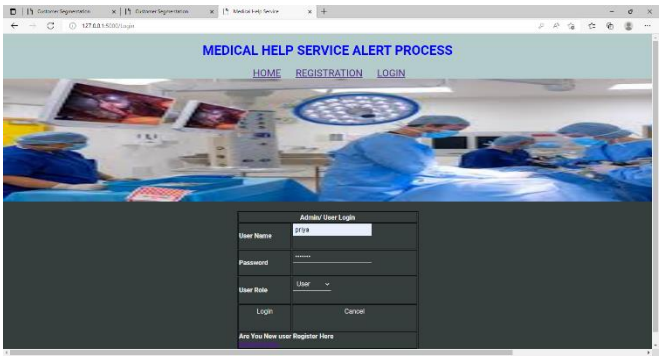
System Architecture

The system consists of two primary user roles: patients and donors.

Patient Module

- Registers on the platform with necessary details.
- Logs in and submits a medical fund request along with proof of treatment in the form of medical bills and reports.
- AI verifies the authenticity of the uploaded documents using a hospital dataset and pattern-matching techniques.
- If verified, the request is made visible to donors; otherwise, it is blocked.
- Patients can track the status of their fund requests and update documents if necessary.





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Donor Module:

- Registers on the platform with authentication measures to ensure legitimacy.
- Logs in to view only verified medical fund requests.
- Selects a patient and makes a donation through a secure payment gateway.
- Uploads payment proof after a successful transaction for transparency.
- Can track donation history and receive real-time updates on fund utilization.

Admin Module:

- Oversees the entire system and manages user registrations.
- Approves or rejects patient and donor registrations based on identity verification.
- Monitors AI verification results to manually review flagged fund requests.
- Manages the hospital dataset used for AI-based verification.
- Ensures that transactions and donations are securely processed and tracked.
- Generates reports on system performance, fraudulent request detection, and financial transactions.

SQL Database

SQL databases play a crucial role in the Smart Medical Assistance and Life-Saving Alert System by ensuring structured and efficient data management across all system components. Unlike real-time NoSQL databases, SQL provides a relational structure that organizes user information, medical fund requests, verification statuses, and transaction details into well-defined tables. When a patient submits a medical fund request, SQL ensures that the data is securely stored and updated in a structured manner, allowing donors and administrators to retrieve the latest information through optimized queries. Additionally, SQL databases offer high reliability, scalability, and ACID compliance, ensuring data consistency even during high traffic loads.

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Features like stored procedures, indexing, and joins enhance data retrieval efficiency, while authentication mechanisms and role-based access control provide robust security for sensitive medical and financial data. By leveraging SQL, the system ensures efficient data handling, improved performance, and strong data integrity, making it a reliable choice for managing medical fund transactions and user interactions.

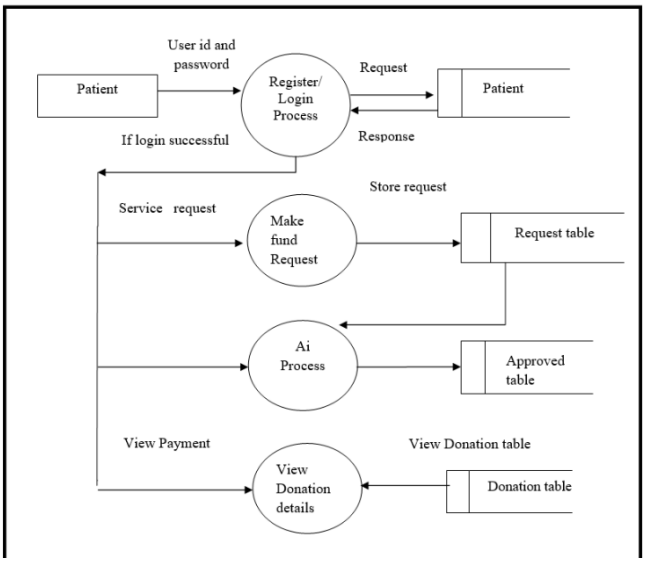
Web Development

The Smart Medical Assistance and Life-Saving Alert System is designed as a web-based platform to provide easy access for patients, donors, and administrators. The front-end is developed using HTML, CSS, and JavaScript to ensure a responsive and user-friendly interface. Frameworks such as React.js or Vue.js can be integrated to enhance interactivity and performance. For back-end development, Python frameworks like Flask or Django handle user authentication, data processing, and AI verification. The system is hosted on cloud platforms for scalability and accessibility. Firebase Realtime Database ensures real-time updates, while MySQL Server securely manages structured data. The integration of a secure payment gateway allows donors to make transactions confidently. Additionally, RESTful APIs facilitate communication between the front-end and back-end, ensuring smooth data flow across the platform.

IV. ARCHITECTURE

The Application Layer serves as the processing unit, handling core functionalities such as user authentication, fund request processing, AI-based verification, and transaction management. The back-end is implemented using Python and Django/Flask, with integrated AI models leveraging TensorFlow and OpenCV for fraud detection. The AI module performs pattern matching and image processing techniques to analyze uploaded medical documents and compare them with authenticated hospital records. This ensures that only genuine fund requests are approved and displayed to donors, reducing the likelihood of fraudulent activities. Additionally, this layer facilitates secure payment transactions and provides real-time updates on fund utilization.

The Database Layer manages both structured and real-time data storage, ensuring efficient handling of user information, medical fund requests, and verification results. The system uses MySQL Server to store structured data such as user credentials, transaction records, and verification logs. Additionally, Firebase Realtime Database is integrated for real-time data synchronization, enabling dynamic updates of fund request statuses, AI verification results, and donor contributions. The Firebase database ensures seamless communication between different system modules, improving responsiveness and efficiency. Moreover, the system architecture incorporates blockchain technology to maintain secure, immutable transaction records, ensuring transparency in fund distribution. The decentralized ledger minimizes risks associated with fund mismanagement and unauthorized modifications.



Flowchart 1: System Architecture

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IV. IMPLEMENTATION

The implementation of the "Smart Medical Assistance and Life-Saving Alert System" involves a structured approach utilizing modern technologies. The system is built using Python (Flask/Django) for backend development, ensuring seamless integration with AI-based fraud detection mechanisms. The front-end is designed using HTML, CSS, and JavaScript, providing a user-friendly experience. The AI module is implemented using TensorFlow and OpenCV, allowing efficient analysis of medical documents for fraud detection. MySQL Server is used for structured data management, while Firebase Realtime Database ensures instant synchronization of user requests and AI verification results. The integration of blockchain technology guarantees the security and transparency of transactions, maintaining an immutable record of donations. The system is deployed on cloud-based servers for scalability and high availability. Furthermore, RESTful APIs facilitate seamless communication between different system modules, ensuring a smooth and efficient operation of the platform.

V. RESULT

The proposed system effectively identifies and blocks fraudulent medical fund requests, ensuring that only genuine requests are presented to donors. Initial testing has demonstrated a high accuracy rate in detecting fraudulent documents using AI-powered verification techniques. The platform enhances trust among donors and streamlines the medical fundraising process. The implementation of blockchain ensures that funds are securely transferred and tracked, adding an extra layer of reliability. Additionally, Firebase Realtime Database enables efficient real-time data management, improving responsiveness and user experience. Furthermore, donors receive real-time updates on fund utilization, improving transparency and accountability.

Figure: 1

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Figure: 2

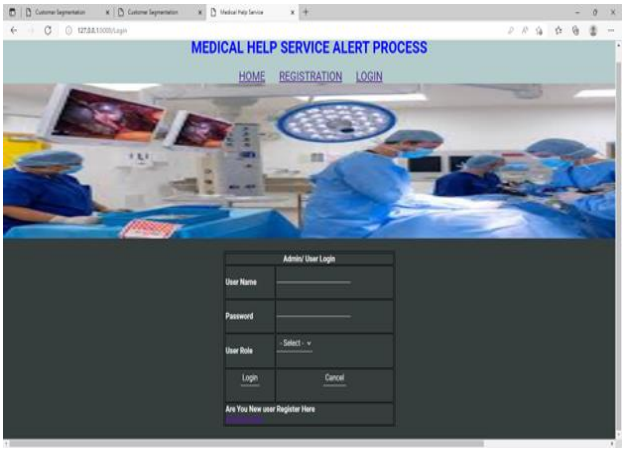

Figure: 3

In the center of the page, a login form is presented, allowing users to enter their credentials. The form includes fields for Username, Password, and User Role, with a dropdown selection for role-based access control (e.g., Admin, Donor, or Patient). The "Login" and "Cancel" buttons enable users to proceed or exit the form. Additionally, there is a registration link labeled "Are You New User? Register Here", which directs new users to the sign-up page.

The interface is designed with a dark-themed login box placed over a contrasting background to ensure readability. The structured layout ensures that users can easily navigate and access key functionalities. The system aims to provide a secure authentication process, ensuring that only registered users can access the platform, thereby preventing unauthorized access and enhancing security.

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Figure: 4

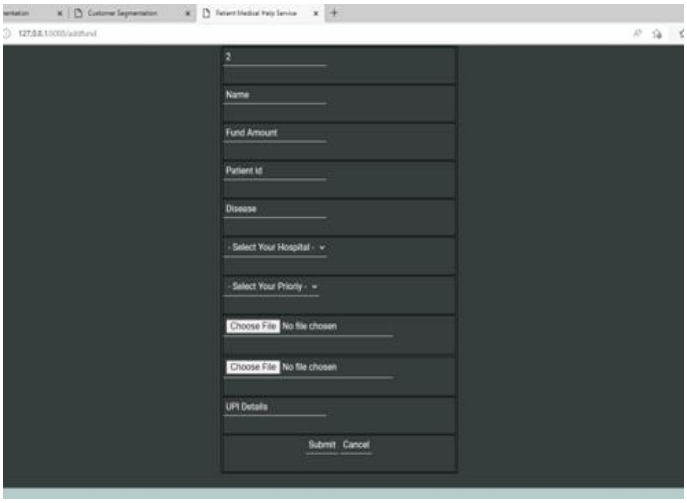

Figure: 5

The interface has a dark-themed background with structured input fields. At the top, a pre-filled number likely represents a Request ID for tracking. Users can enter their name, required fund amount, patient ID, and disease information to justify their funding request. Dropdown menus allow the selection of a hospital and priority level, ensuring organized processing based on urgency. Two file upload buttons enable users to submit supporting documents, such as medical reports or hospital bills. A designated field for UPI details ensures direct transfer of funds to the patient or hospital. At the bottom, the Submit button finalizes the request, while the Cancel button allows users to exit without submitting. The form serves as a structured way for patients or their representatives to seek financial aid by providing essential details for approval and donation processing.

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VI. CONCLUSION

Implementation is the stage of the project when the theoretical design is turned into a working system. Thus, it can be considered the most critical stage in achieving a successful new system and in giving the user confidence that the new system will work and be effective. In the proposed system, it is concluded that the application works well and satisfies the needs. The application is tested thoroughly, and errors are properly debugged. The proposed system successfully provides a user-friendly application for society, allowing users to easily access only genuine fund-related help requests. The proposed application effectively detects and blocks fake medical treatment fund requests using Artificial Intelligence (AI). This application enables patients to raise medical help service requests through the website, and after successfully uploading the required information, AI checks the hospital dataset to verify whether the uploaded treatment-related information is correct using a pattern-matching approach. After successful verification, if the fund request is genuine, it will be displayed to donors; otherwise, the fund request will be blocked.

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