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Sanavi - Your Health Partner

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Abstract: ***The rapid advancement of Artificial Intelligence (AI) in healthcare has enabled the development of intelligent systems that improve diagnosis accuracy, patient management, and emergency response. Sanavi – Your Health Partner is an integrated AI-based healthcare platform designed to address key challenges such as delayed diagnosis, inefficient OPD management, improper identification during emergencies, and lack of real-time emergency coordination. The system incorporates fingerprint-based blood group identification, online OPD appointment booking, AI-assisted medical report analysis, and smart ambulance integration with real-time tracking. By combining biometric identification, digital healthcare services, and intelligent decision support, Sanavi enhances hospital workflow efficiency, reduces waiting time, and supports timely medical intervention. This paper presents the architecture, methodology, features, and applications of Sanavi, demonstrating a practical approach toward modern, accessible, and secure digital healthcare solutions.***

Keywords: Smart Healthcare, Artificial Intelligence, Blood Group Detection, OPD Management, Smart Ambulance, Medical Report Analysis, Digital Health

I. INTRODUCTION

The integration of Artificial Intelligence (AI) into healthcare systems has significantly improved the efficiency, accuracy, and accessibility of medical services. However, many healthcare environments continue to face challenges such as delayed diagnosis, overcrowded outpatient departments, improper patient identification during emergencies, and inefficient emergency response mechanisms.

These issues are more prominent in high-population regions where healthcare resources are limited. *Sanavi – Your Health Partner* addresses these challenges by providing an AI-driven, unified healthcare platform that integrates biometric-based blood group identification, online OPD appointment scheduling, medical report analysis, and smart ambulance tracking. Unlike conventional healthcare systems, Sanavi focuses on automation, accuracy, and user-centric design, making it suitable for hospitals, clinics, and emergency medical services.

II. LITERATURE REVIEW

Existing healthcare management systems primarily focus on individual functionalities such as online appointment booking, disease prediction, or ambulance tracking. Fingerprint-based blood group detection systems using Convolutional Neural Networks (CNNs) have demonstrated promising accuracy but are often implemented as standalone solutions without integration into hospital workflows.

Similarly, online OPD appointment systems reduce waiting time but lack intelligent prioritization and diagnostic support. Smart ambulance systems focus on GPS tracking and route optimization but often fail to integrate seamlessly with hospital management platforms. Recent studies highlight the need for an integrated healthcare solution that combines biometric identification, AI-assisted diagnostics, digital appointment management, and emergency response coordination. This gap motivates the development of Sanavi as a unified and intelligent healthcare platform.

III. PROBLEM STATEMENT

Despite technological advancements, current healthcare systems suffer from fragmented services, delayed diagnosis, inefficient OPD management, and inadequate emergency coordination. Errors in blood group identification during emergencies, long waiting times in outpatient departments, and lack of real-time ambulance monitoring pose serious risks to patient safety. Existing solutions operate independently and fail to provide a centralized, intelligent, and secure healthcare framework. Therefore, there is a need for an integrated AI-based healthcare system that improves diagnostic accuracy, streamlines hospital workflows, ensures rapid emergency response, and maintains data security. Sanavi aims to address these challenges through a unified healthcare management platform.

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IV. METHODOLOGY

A. System Architecture

Sanavi is designed as a modular healthcare platform consisting of patient, doctor, and administrative interfaces. The system integrates biometric authentication, AI-based diagnostic models, digital appointment management, and real-time ambulance tracking into a single framework. Each module operates independently while sharing secure data through centralized services to ensure smooth coordination and scalability.

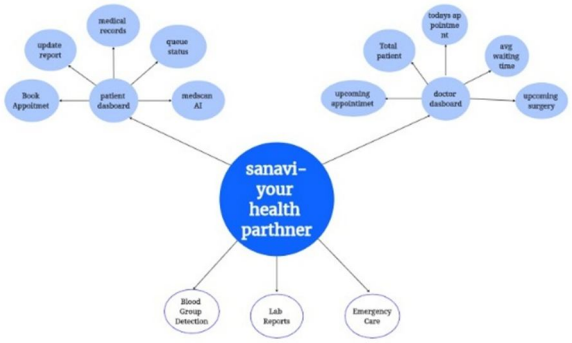


Figure 1: System Flow Diagram

B. Blood Group Identification

The blood group detection module uses fingerprint biometrics for rapid and non-invasive identification. Fingerprint images are processed using image preprocessing techniques and classified using machine learning and CNN-based models. This approach eliminates the need for blood sampling and supports faster clinical decision-making during emergencies.

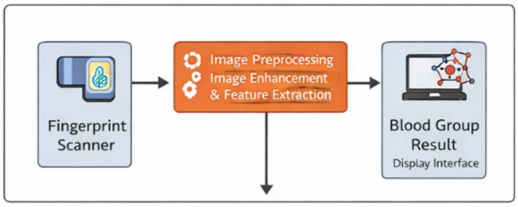


Figure 2: Architecture of Fingerprint-Based Blood Group Detection System

C. OPD Appointment Management

The OPD module provides an online appointment booking system that allows patients to schedule consultations based on doctor availability and specialization. A queue management mechanism reduces waiting time and prevents overcrowding. Emergency cases are prioritized to ensure timely medical attention.

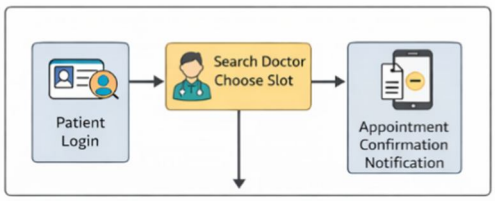


Figure 3: Architecture of Online OPD Appointment Management System

D. AI-Assisted Medical Report Analysis

The MedScan module analyzes uploaded medical reports using AI techniques such as Natural Language Processing and deep learning. It extracts key medical indicators and provides preliminary health insights, assisting doctors and patients in understanding diagnostic results.

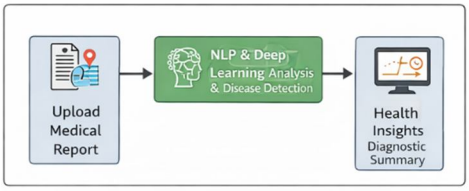


Figure 4: Architecture of MedScan AI-Based Medical Report Analysis System

E. Smart Ambulance Integration

The emergency care module enables real-time ambulance tracking using GPS-based location monitoring. Route optimization algorithms assist in reducing response time, while driver activity tracking ensures accountability during emergency operations.

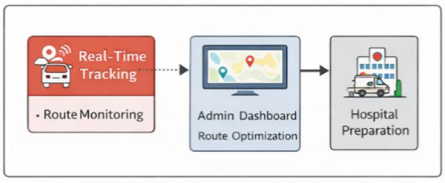


Figure 5: Architecture of Smart Ambulance Tracking and Emergency Response System

V. RESULTS AND DISCUSSION

The Sanavi system demonstrates improved efficiency in hospital operations and emergency response. The blood group identification module provides fast and reliable results, while the OPD appointment system significantly reduces patient waiting time. AI-assisted report analysis enhances diagnostic support, and real-time ambulance tracking improves emergency preparedness. The integrated design enables seamless interaction between patients, doctors, and administrators, improving overall healthcare delivery.

VI. ADVANTAGES OF SANAVI

Sanavi offers an integrated healthcare solution combining diagnostics, appointment management, and emergency response in a single platform. The system improves diagnostic accuracy, reduces OPD congestion, enables rapid emergency identification, and enhances hospital workflow efficiency. Its user-friendly design and modular architecture allow easy scalability and deployment across healthcare environments.

VII. LIMITATIONS AND FUTURE WORK

The current implementation functions as a prototype and relies on limited datasets for AI models. Real-time integration with hospital databases and large-scale deployment is yet to be implemented. Future enhancements include advanced disease prediction models, backend database integration, live ambulance–hospital communication, and mobile application support for wider accessibility.

VIII. CONCLUSION

Sanavi – Your Health Partner presents a comprehensive AI-driven healthcare management system that addresses critical challenges in modern healthcare delivery. By integrating biometric identification, digital OPD management, AI-assisted diagnostics, and smart ambulance tracking, the system improves efficiency, accuracy, and emergency response. The proposed platform provides a scalable foundation for future intelligent healthcare solutions and demonstrates the effective use of AI in enhancing patient care and hospital operations.

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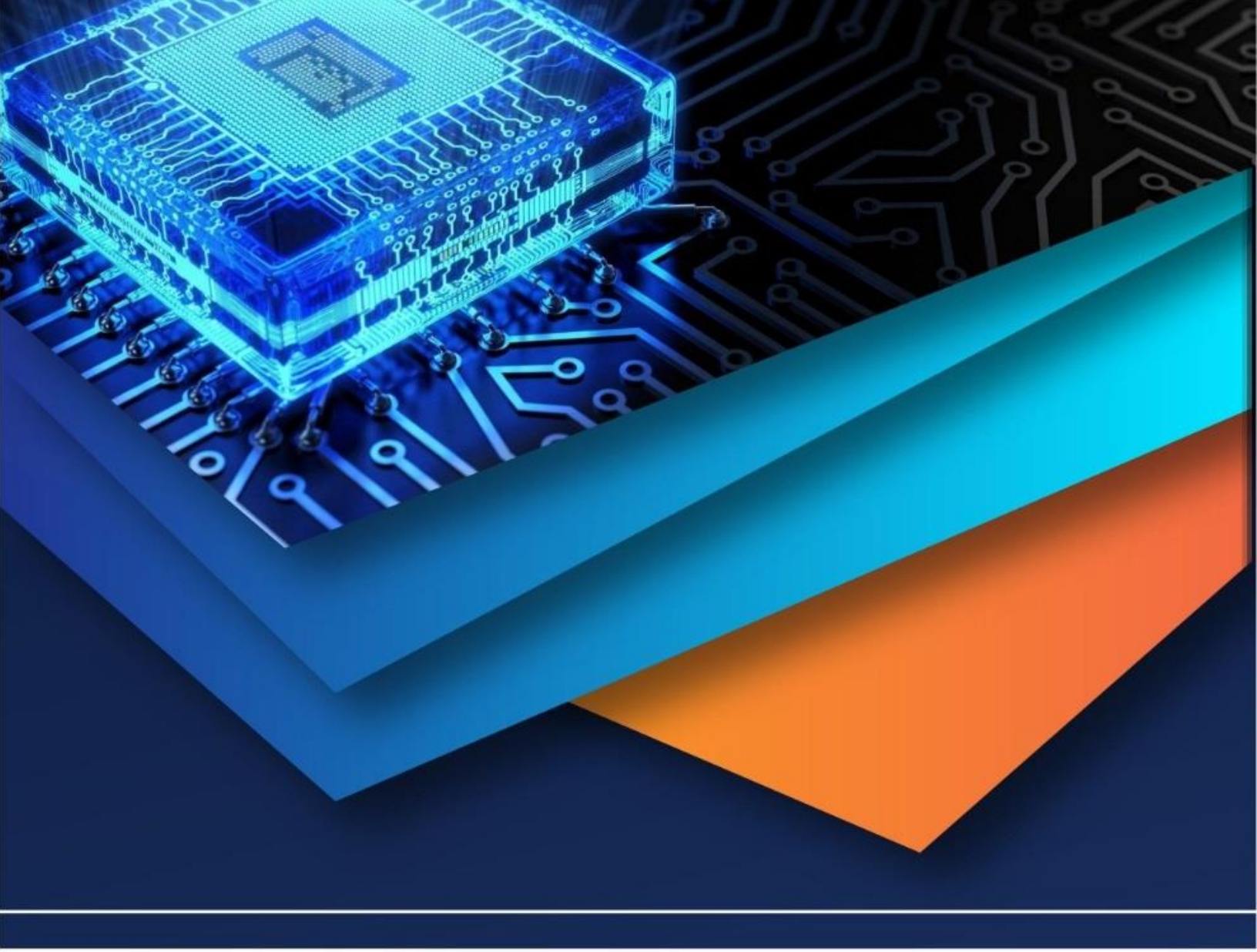
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