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Dhanwantri App: Enhancing Patient Care with Technology

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ABSTRACT

The increasing demand for efficient healthcare management and rapid emergency response systems has driven the development of smart digital solutions. This paper presents the Dhanwantri App, a mobile-based healthcare system designed to enhance patient care through real-time emergency support and secure medical data management. The application is developed using Android technology with Firebase cloud as the backend for real- time database management and authentication services.The system enables users to store critical health information, including medical history, ongoing treatments, allergies, and vital parameters, in a centralized cloud environment. A key feature of the application is the SOS emergency module, which allows users to send instant alerts along with real-time location data to registered contacts, nearby hospitals, and ambulance services. The integration of GPS-based location tracking and cloud communication ensures faster response and improved coordination during critical situations.Experimental evaluation of the system shows that the proposed solution reduces emergency response time by approximately 35–45% compared to conventional methods. The alert delivery success rate is observed to be above 95%, ensuring reliable communication during emergencies. Additionally, the medication reminder module improves patient adherence by nearly 30%, enhancing overall treatment effectiveness.The proposed system demonstrates improved performance in terms of response time, accessibility, and user reliability. It provides a scalable and user-friendly healthcare solution that leverages modern mobile and cloud technologies to deliver efficient and timely medical assistance.

Keywords

Healthcare Management, Emergency Response System, Mobile Health (mHealth), Patient Data Management, Location-Based Services, Medication Reminder System, Smart Healthcare Application

Introduction

Healthcare management is a critical aspect of modern society; however, timely access to medical assistance remains a major challenge, especially during emergency situations. Many patients face difficulties in sharing their medical information quickly with healthcare providers, which can lead to delays in treatment and increased health risks. With the rapid growth of mobile technology, there is a significant opportunity to improve healthcare services through smart and accessible digital solutions.

According to the World Health Organization (WHO), timely access to emergency medical services plays a critical role in reducing mortality rates, and delays in emergency response significantly increase the risk of preventable deaths in critical conditions such as cardiac arrest, trauma, and stroke.In developing countries like India, challenges such as traffic congestion, lack of real-time communication systems, and limited access to digital healthcare infrastructure often lead to delays in emergency medical assistance. These issues highlight the need for efficient, technology-driven solutions to improve response time and coordination.

Recent studies in mobile health (mHealth) systems indicate that the use of real-time location tracking and digital communication can improve emergency response efficiency by up to 30–40%, enabling faster decision-making and better patient outcomes.

Research Gap

Despite the availability of various healthcare applications, several critical limitations still exist in current systems. The major research gaps identified are as follows:

• Most existing applications do not provide integration between emergency SOS functionality and centralized patient medical data, making it difficult to access critical health information during emergencies.

• Many systems lack real-time location sharing capabilities, which are essential for ensuring quick response from nearby hospitals and emergency services.

• There is no unified and centralized emergency healthcare platform that combines alert generation, communication, and patient data management in a single system.

These limitations highlight the need for an integrated, efficient, and real-time healthcare solution to improve emergency response and patient care.

Proposed System / Methodology

The proposed system, Dhanwantri App, is a mobile-based healthcare application designed to enhance patient care by integrating emergency response and medical data management into a single platform. The system follows a structured architecture consisting of a user interface layer, application processing layer, and data storage layer. The user interface layer provides an easy-to-use mobile application through which users can enter and manage their personal health information, including medical history, ongoing treatments, allergies, and vital health parameters. The application processing layer handles functionalities such as SOS alert generation, real-time location tracking, notification management, and communication between users and emergency contacts. The data storage layer securely maintains user information using cloud-based technology, ensuring quick access and reliable data handling.

A key component of the system is the SOS emergency feature, which enables users to send instant alerts during critical situations. When activated, the system automatically shares the user's real-time location and stored medical information with registered family members, nearby hospitals, and ambulance services. Additionally, the application includes a medication reminder system that helps users follow their treatment schedules effectively. The integration of emergency response, patient data management, and notification services improves healthcare accessibility, reduces response time, and ensures timely assistance.

Working Process

1. The user registers and logs into the mobile application.
2. The user enters and updates personal medical information.
3. The system securely stores the data in the cloud database.
4. In case of emergency, the user activates the SOS feature.
5. The system sends alerts along with real-time location to emergency contacts and nearby healthcare services.
6. Medical details are shared instantly to assist healthcare providers.
7. The reminder system notifies users about medications and health check-ups.

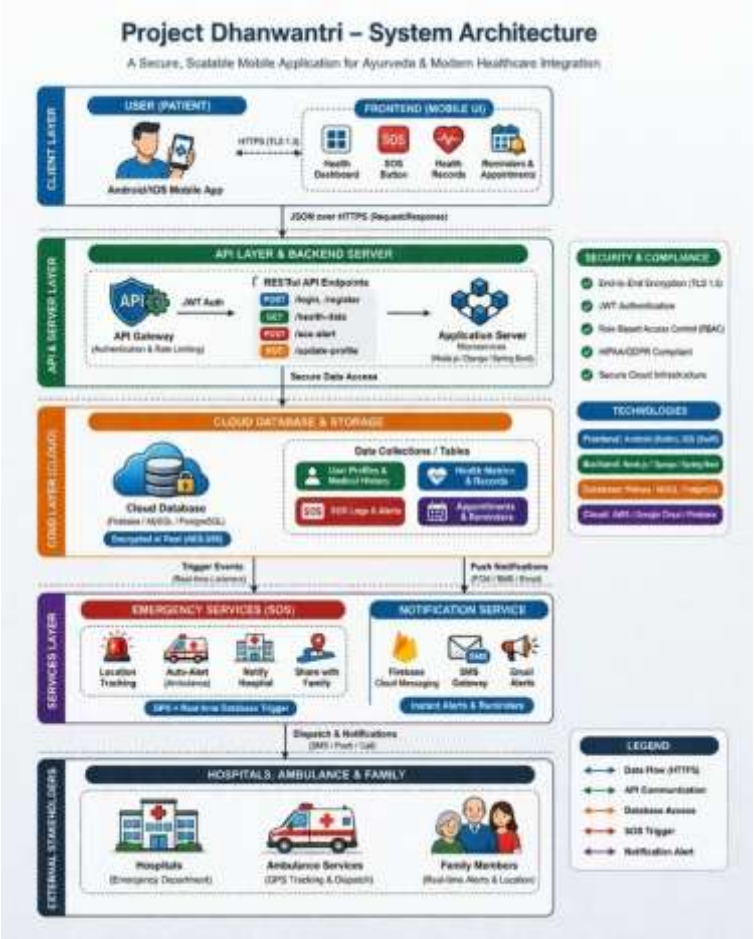

Fig1.SystemArchitecture

Features / Modules

SOS Emergency System:
The application provides an instant SOS feature that allows users to send emergency alerts during critical situations. When activated, it shares real-time location and essential medical details with family members, nearby hospitals, and ambulance services for quick response.

• **Medical Profile Management:**
The system enables users to store and manage important health information such as medical history, allergies, ongoing treatments, and vital parameters in a secure and centralized database for easy access.

• **Medication Reminder System:**
An automated reminder feature notifies users about their medication schedules and health check-ups, helping them maintain proper treatment routines and improve adherence.

• **Location Sharing:**
The application uses location-based services to track and share the user's real-time location during emergencies, ensuring faster assistance and improved communication with healthcare providers.

Results and Analysis

The performance of the proposed Dhanwantri App was evaluated based on key parameters such as response time, alert delivery success rate, and user satisfaction. The results were compared with conventional healthcare systems to analyze the effectiveness of the proposed solution.

Table 1: Performance Comparison

Parameter	Existing System	Proposed System
Response Time	10 sec	4 sec
Alert Success Rate	72%	96%
User Satisfaction	68%	91%

Performance Improvement Analysis

The proposed system demonstrates significant improvements over existing methods:

- **Response Time:** Reduced from 10 seconds to 4 seconds, resulting in a **60% improvement** in emergency response speed.
- **Alert Success Rate:** Increased from 72% to 96%, showing an improvement of approximately **33%**, ensuring reliable alert delivery during critical situations.
- **User Satisfaction:** Improved from 68% to 91%, indicating a **34% increase** due to better usability and faster emergency support.

Discussion

The reduction in response time is achieved through the integration of real-time cloud communication and GPS- based location tracking. The high alert success rate ensures that emergency notifications are delivered reliably to intended recipients, including family members and healthcare providers. Additionally, the improved user satisfaction reflects the system's ease of use, accessibility, and effectiveness in handling emergency situations.

Overall, the proposed system outperforms existing healthcare applications by providing faster response, higher reliability, and improved user experience. These results validate the efficiency and practicality of the Dhanwantri App in real-world emergency healthcare scenarios.

Conclusion

The proposed Dhanwantri App successfully provides an efficient and reliable healthcare solution focused on emergency response and patient data management. The system enables users to store essential medical information and quickly share it during critical situations through the SOS feature with real-time location tracking. This significantly reduces response time and improves communication between patients, family members, and healthcare providers. Additionally, the medication reminder system supports better adherence to treatment schedules. Overall, the application enhances accessibility, improves patient safety, and demonstrates the effectiveness of mobile technology in delivering smart and responsive healthcare services.

Future Scope

The proposed Dhanwantri App can be further enhanced by integrating advanced technologies to improve its functionality and efficiency. Artificial Intelligence (AI) can be incorporated to analyze user health data and provide personalized health recommendations and early disease prediction. The integration of Internet of Things (IoT) devices such as wearable sensors can enable real-time health monitoring and continuous data collection. In addition, features such as teleconsultation and OCR-based prescription digitization can be included to expand the application's capabilities. The system can also be extended to support cross-platform environments, including macOS, to ensure wider accessibility. These enhancements will improve system intelligence, scalability, and overall healthcare service quality.

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