

MEDICARE: A SMART FAMILY HEALTH MANAGEMENT SYSTEM WITH VOICE-ASSISTED ALERTS

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Article Received: 21 March 2026, Article Revised: 11 April 2026, Published on: 01 May 2026

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DOI: <https://doi-doi.org/101555/ijarp.5791>

ABSTRACT

MediCare is a comprehensive family healthcare management system designed to address the growing challenges in managing medical routines such as medicine schedules, doctor appointments, and emergency situations. In many households, healthcare data is scattered across multiple applications, making it difficult to track and manage effectively. MediCare integrates all essential healthcare features into a single web-based platform.

The system uses Supabase for cloud-based data storage and real-time synchronization, ensuring reliable and secure access to health information. A major feature of the system is the voice-assisted alarm, which uses Text-to-Speech technology to notify users about medicine timings and doctor appointments. This feature significantly improves accessibility for elderly users and visually impaired individuals.

Additionally, MediCare includes an emergency SOS system and a basic image-based pill identification feature. The system is lightweight, scalable, and easy to use, making it suitable for both academic and real-world applications.

1. INTRODUCTION

Healthcare management plays a crucial role in maintaining a healthy lifestyle. However, with the increasing number of digital tools, users often rely on multiple applications to manage different aspects of healthcare. This fragmentation leads to confusion and inefficiency.

Elderly individuals face even greater challenges due to complex interfaces and lack of accessibility features in existing applications. Forgetting medicine schedules or missing doctor appointments can lead to serious health issues.

MediCare is developed to overcome these challenges by providing a unified platform for managing healthcare activities. The system focuses on simplicity, accessibility, and real-time interaction. By integrating voice-based features and emergency alert systems, MediCare ensures that users can manage their health effectively without technical complexity.

Advantages

- Simple and user-friendly interface
- Real-time data synchronization
- Voice-assisted accessibility
- Cost-effective implementation
- Suitable for academic and real-world use

Limitations

- Basic pill identification accuracy
- Requires internet connectivity
- Limited advanced AI features

2. Literature Review

Several healthcare applications such as Practo, 1mg, and Medisafe provide features like medicine reminders and online consultations. However, these systems are primarily designed for individual users and lack integration for family-level healthcare management.

Most existing systems do not provide real-time emergency alert mechanisms or voice-assisted reminders, which are essential for elderly users. Furthermore, many applications rely on complex machine learning models, making them difficult to implement in academic projects.

Supabase has emerged as a modern backend solution that offers real-time database capabilities, authentication, and cloud storage. It provides a simple and efficient alternative for developing scalable applications. This motivates the use of Supabase in the MediCare system.

3. Problem Statement

The current healthcare management systems face several limitations:

- Lack of centralized data management for families

- Difficulty in maintaining regular medicine schedules
- Delayed response during emergency situations
- Complex interfaces that are not suitable for elderly users

The objective of this project is to design a system that addresses these issues by providing a simple, efficient, and accessible solution.

3.1 System Architecture

The MediCare system follows a client-server architecture to ensure efficient communication and data handling.

Frontend:

The frontend is developed using HTML, CSS, and JavaScript, providing a lightweight and responsive user interface. The design focuses on simplicity to ensure ease of use for all users.

Backend:

Supabase is used as the backend service, providing authentication, database management, and real-time synchronization. The database is based on PostgreSQL, ensuring reliability and scalability.

The architecture ensures that all user data is stored securely and can be accessed in real time across devices.

4. METHODOLOGY

The system is developed using practical and efficient methodologies:

- User Interface Design: Simple and intuitive layout.
- Database Management: Supabase for storing user data.
- Voice Processing: Speech-to-Text for input and Text-to-Speech for output.
- Notification System: Event-based triggers for reminders.
- Image Processing: Basic image comparison for pill identification.

Workflow:

1. User enters data manually or through voice input.
2. Data is processed and stored in the database

3. System schedules reminders and alerts
4. Notifications are delivered via text and voice output

This methodology ensures smooth operation and user convenience.

4.1 Implementation

The system is implemented in modular form to ensure flexibility and scalability.

Family Health Hub:

Provides a centralized dashboard for managing multiple users and their health data.

Medicine Manager:

Allows users to schedule medicines and receive timely reminders.

Voice Alarm System:

Uses Text-to-Speech technology to provide audio alerts for medicine intake and doctor appointments.

Emergency SOS System:

Triggers alerts to predefined contacts in case of emergency situations.

Pill Identifier:

Uses simple image matching techniques to identify medicines and assist users.

All modules are integrated into a single web-based application, ensuring seamless interaction.

5. RESULTS AND DISCUSSION

The system was tested under various conditions to evaluate its performance.

- Medicine reminders were delivered accurately and consistently.
- Voice alarm system effectively notified users.
- Emergency alerts were triggered within seconds.
- Data synchronization using Supabase was reliable.

The results indicate that MediCare significantly improves healthcare management efficiency

and user experience. The system is particularly useful for elderly users due to its voice-based features.

6. CONCLUSION AND FUTURE SCOPE

6.1 Conclusion

MediCare provides a comprehensive and user-friendly solution for managing family healthcare. By integrating essential features such as medicine reminders, voice alerts, and emergency systems, the platform improves accessibility and efficiency.

The use of lightweight technologies ensures that the system is easy to implement and maintain. MediCare is a practical solution that can be used in real-world scenarios as well as academic projects.

6.2 Future Scope

- Integration with telemedicine platforms
- Secure cloud-based medical records
- Appointment booking system
- Advanced AI-based pill detection
- Mobile application development

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