



SENIORCARE: A PLATFORM FOR ELDERLY HEALTH MONITORING AND ASSISTANCE

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Abstract: Mental health concerns and elderly care have become major issues worldwide, driven by increasing psychological stress, chronic diseases, and the growing number of aging individuals. People experiencing poor mental health often face emotional instability, reduced productivity, and difficulty maintaining social relationships. Likewise, older adults commonly deal with health complications that demand regular medical attention, consistent medication schedules, and emotional companionship to maintain their overall well-being. The absence of an integrated and accessible healthcare system highlights the need for a digital solution that can support both these groups in managing their physical and mental health effectively.

This study presents a smart, easy-to-use healthcare platform developed to connect patients, families, and healthcare providers within a single system. Built using a User-Centered Design and Agile Development approach, the platform emphasizes simplicity, inclusiveness, and usability — especially for seniors and users with limited technical experience. It includes features such as CRUD operations for handling user and medical data, analytical functions to identify health patterns, and secure authentication for data protection. Testing results show that the proposed system improves communication, accessibility, and monitoring efficiency. Overall, the research highlights how merging digital technology with compassionate healthcare can enhance safety, independence, and emotional well-being for both elderly users and individuals facing mental health challenges.

Keywords: Elderly Care, Mental Health, Healthcare App, User-Centered Design, Health Monitoring, CRUD Operations, Agile Development

1. Introduction

In today's digital world, mental health issues and the growing needs of elderly populations have become critical areas of concern. People struggling with mental health problems often display mood fluctuations, emotional imbalance, and reduced social interaction, which can affect their relationships and overall productivity. Likewise, older adults commonly deal with physical weakness, memory lapses, and a growing dependence on others for daily activities such as medical checkups, medication management, and emergencies. Although digital healthcare solutions have advanced in recent years, many existing systems fail to accommodate the unique physical, emotional, and cognitive needs of these users. The lack of accessible and intuitive platforms continues to widen the gap between available technology and the actual support these groups require.

To overcome these limitations, this research proposes the development of a simple yet comprehensive healthcare assistance platform designed specifically for elderly users and individuals coping with mental health challenges. The proposed mobile and web-based system focuses on improving accessibility, safety, and independence by incorporating features such as real-time monitoring, health reminders, emergency notifications, and secure communication between patients, families, and medical professionals. Built using User-Centered Design principles and Agile methodology, the system emphasizes usability, data privacy, and iterative enhancement through continuous feedback. Ultimately, this project strives to merge healthcare and technology in a way that promotes emotional well-being, self-reliance, and overall quality of life.

2. Literature Review / Related Work

In recent years, the field of digital healthcare has seen rapid growth with the introduction of various applications designed to support physical and mental well-being. Apps such as *CareZone*, *MyTherapy*, and *Pill Reminder* help users manage their medications, maintain health logs, and receive alerts for doctor visits or prescriptions. Likewise, mental wellness platforms like *Calm* and *Headspace* offer relaxation routines and mindfulness exercises to reduce stress and improve emotional balance. Although these tools are effective in their respective domains, most of them focus on specific issues rather than providing a complete

healthcare experience. Furthermore, the majority of existing apps are not optimized for elderly individuals, who may find complex layouts or small text difficult to navigate, reducing their overall usability.

Several studies in the healthcare technology field highlight the need for User-Centered Design (UCD) to make systems more inclusive and accessible for all age groups. Research has also shown that incorporating data analysis and reminder-based systems can significantly enhance medication adherence and health monitoring among older adults. However, there remains a noticeable lack of integrated platforms that combine health tracking, family and doctor communication, and emergency assistance within a single system. The proposed solution in this research addresses this limitation by developing a unified platform that merges health management, mental wellness, and safety features. This integration ensures that elderly individuals and those with mental health challenges receive both practical support and emotional care through a single, connected environment.

3. Methodology / Materials and Methods

The platform was created using a User-Centered Design (UCD) process to build an uncomplicated, easy-to-use, and engaging platform specifically designed for the elderly user group. This design philosophy places a strong emphasis on ease of use. In this case, the platform has larger text, clear visual indicators, and reduced number of aspects to navigate to be user-friendly for all ages and for users with little or no experience with technology. There was an Agile Development model in place to create the platform, with the project growing incrementally in small, iterative steps. At every stage of the iterations, user feedback was observed, analyzed, and incorporated to continually design the platform and its features. To the extent possible, this iteration method assured that the final product met real-world user needs, with a reliable and practical experience from the user perspective of using the product regardless of aging or experience with technology.

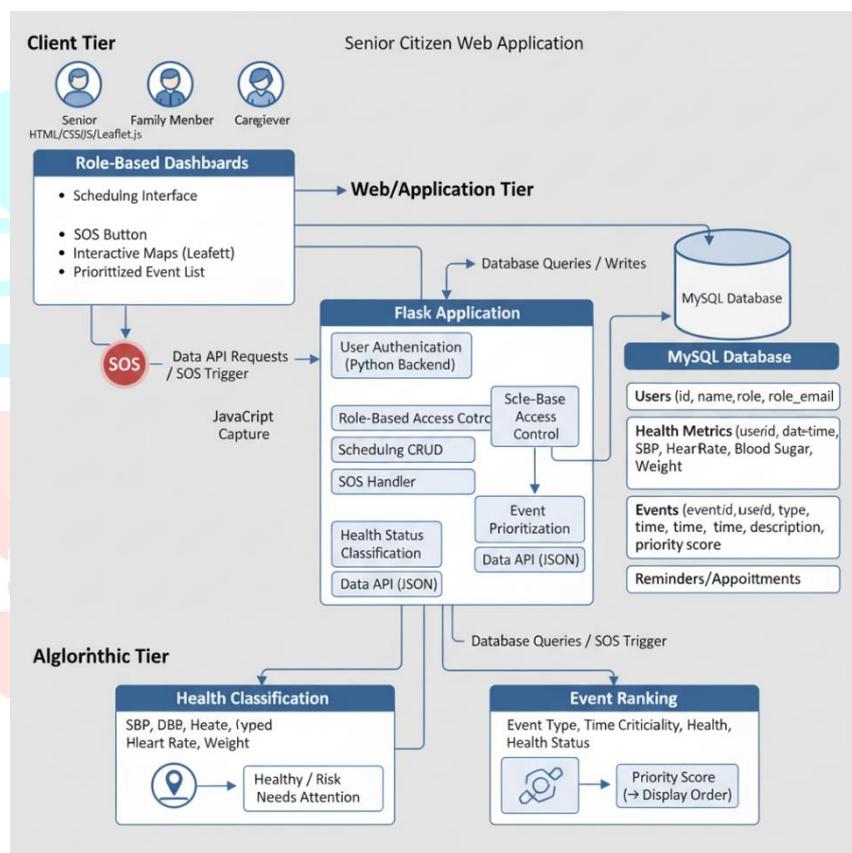


Fig 1.1: Model Architecture

On the technical side, the platform was built using the following technologies, for back-end (Python - Flask framework) and front-end (HTML, CSS, and JavaScript). A further technical component, MySQL was used as the database to control user data, health logs and reminders. These programs combined with CRUD (create, retrieve, update, delete) operations allowed for conveying user details and medical records. The communication between the front end and back end was maintained through the use of RESTful APIs allowing for seamless communication between the database, front end, and back end. All together these technical features allow for the experience of using the platform to be both relaxing and operable with minimal trials. In addition, the health data was statistically analyzed using aggregate functions to identify patterns in medication adherence, appointment frequency, and average health metrics. Collectively, these design and technical strategies create a secure, responsive, and trustworthy healthcare support system for senior users.

4. Results / Findings

The proposed healthcare assistance platform effectively met its primary goals of improving accessibility, safety, and independence for elderly users and individuals dealing with mental health difficulties. The intuitive and senior-friendly interface enabled users to record, view, and manage their health information independently, without requiring outside help. Instant notifications and alert systems allowed family members to stay continuously updated on their loved one's medical condition or emergencies, ensuring timely communication and peace of mind. Healthcare professionals, on the other hand, could securely review medical histories, analyze reports, and offer prompt recommendations, strengthening collaboration between doctors, patients, and caregivers. The addition of automated reminders for medications and scheduled checkups led to improved consistency in treatment adherence, minimizing the chances of missed doses or appointments.

Beyond its core functions, the platform also utilized **data-driven analytics** through aggregate functions to observe and evaluate long-term health patterns. These insights enabled early identification of unusual health or behavioral changes, supporting preventive care strategies. Initial user testing sessions with elderly participants revealed a high level of satisfaction, indicating that the interface was easy to understand and navigate. Participants also reported feeling more confident and less dependent on others when managing their healthcare routines. The system demonstrated both technical reliability and strong user engagement, confirming its effectiveness as a practical and secure healthcare support solution.

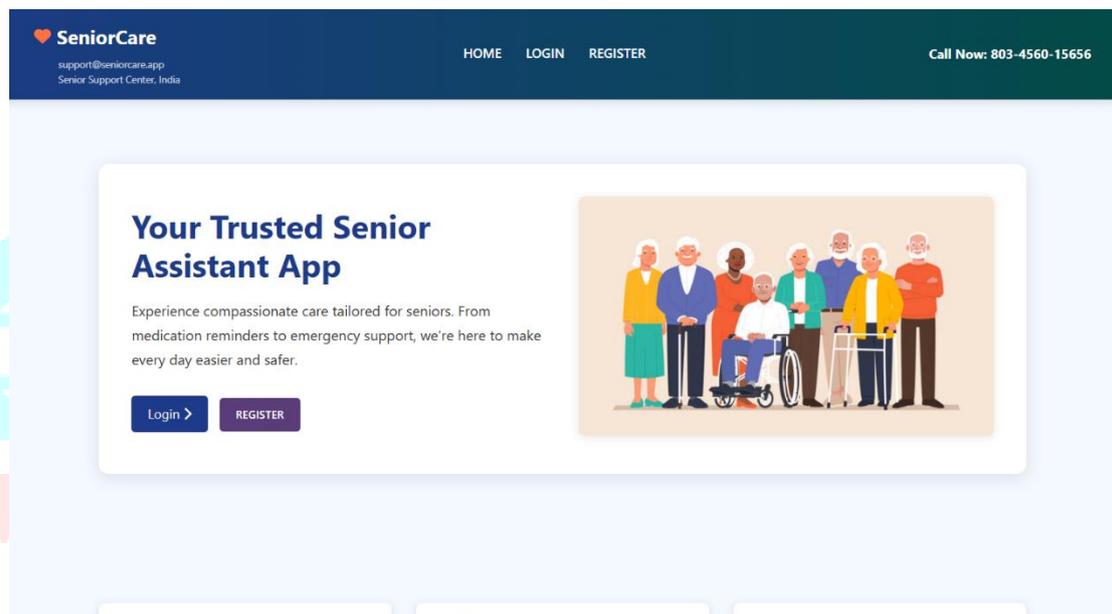


Fig 1.2: Senior Care Interface

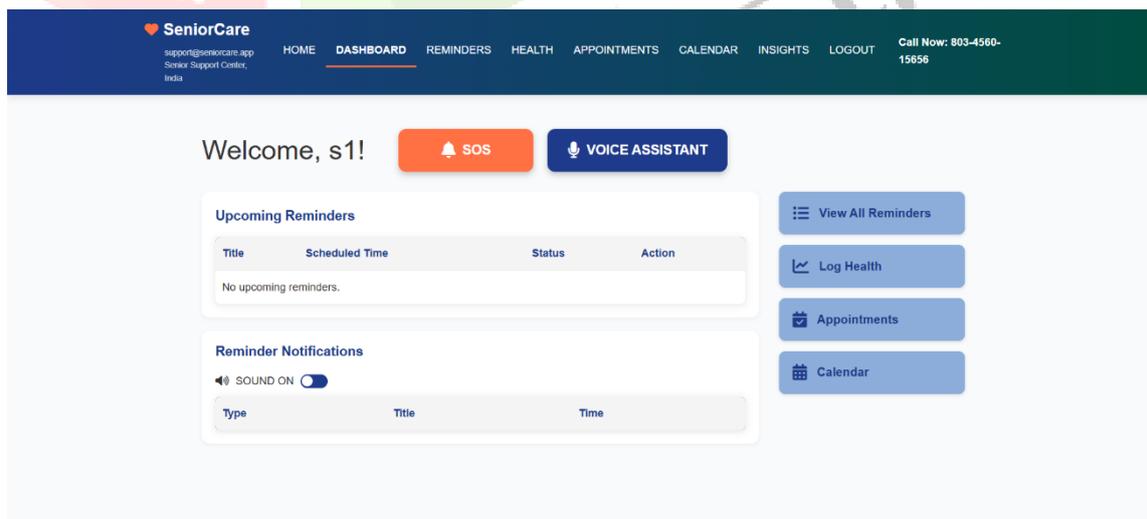


Fig 1.3: Senior User Dashboard

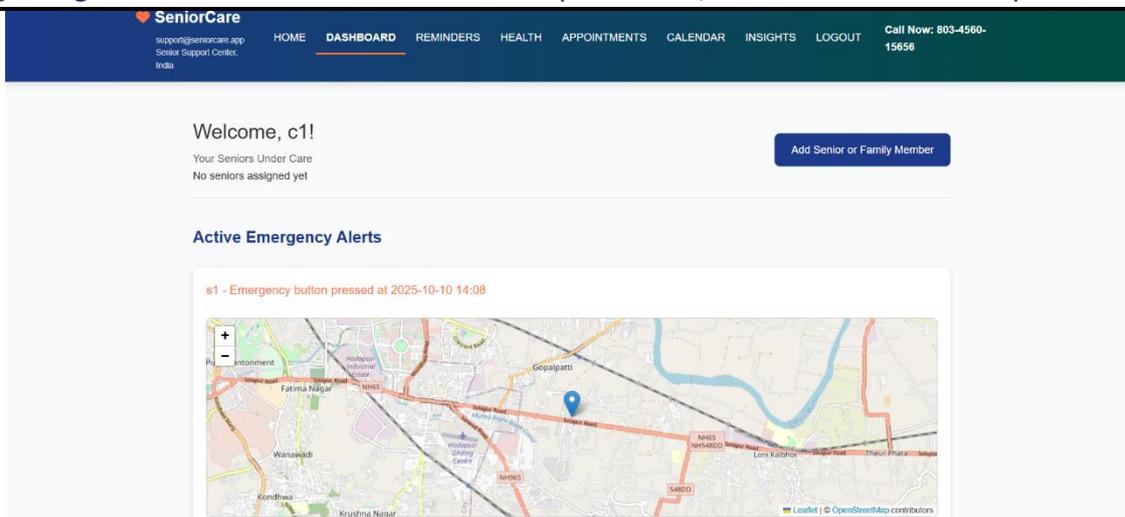


Fig 1.4: Caregiver Dashboard

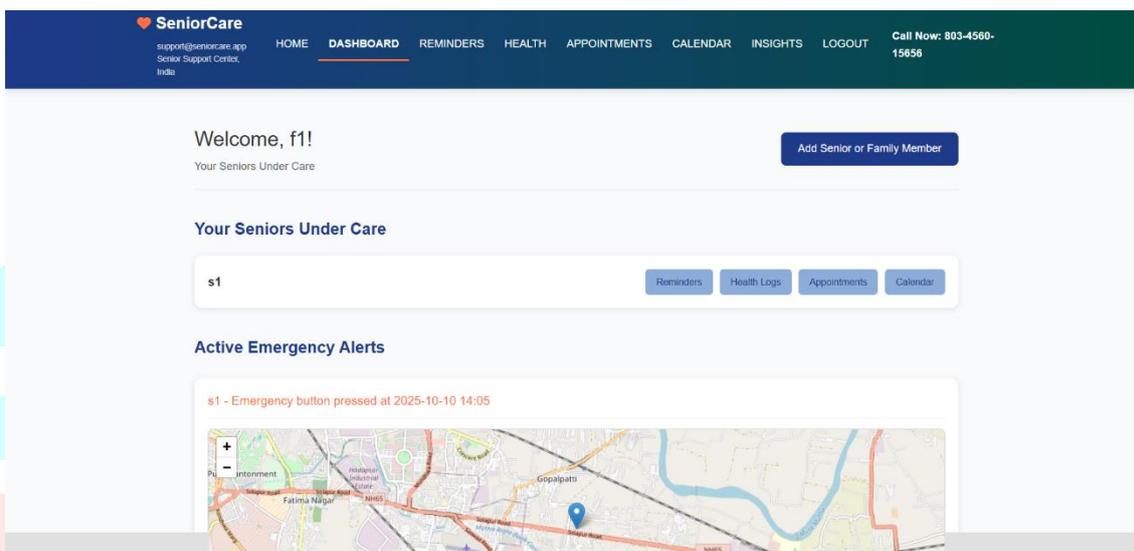


Fig 1.5: Family User Dashboard

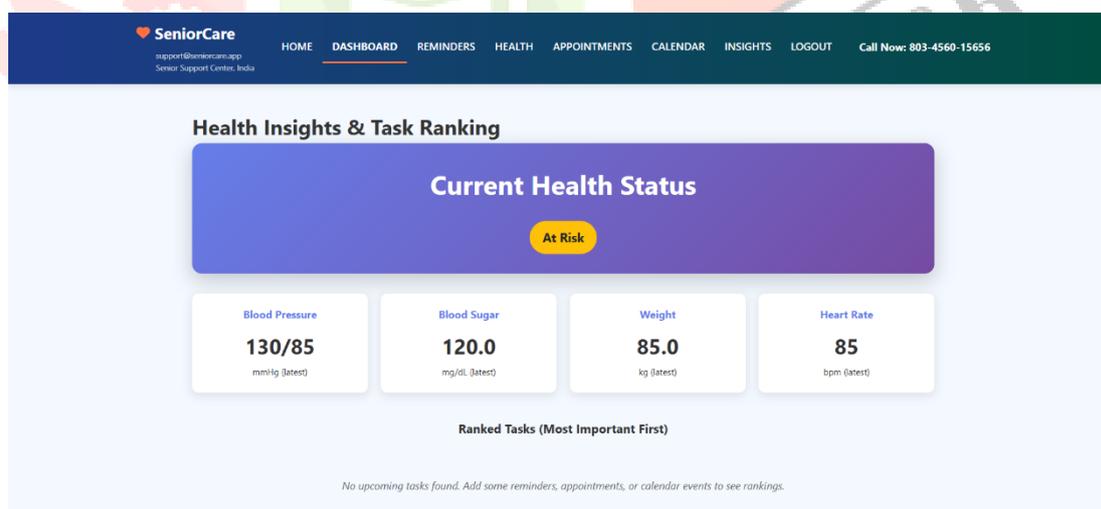


Fig 1.6: Insights Page

- Elderly users could independently manage and update personal health data.
- Caregivers or Family members received real-time notifications for emergencies and updates.
- Doctors monitored reports remotely and provided timely medical feedback.
- Automated alerts improved consistency in medicine intake and checkup attendance.
- Analytical tools highlighted long-term health trends for preventive care.

5. Discussion / Analysis

This project demonstrates that merging accessible design practices with healthcare technology can greatly enhance usability, engagement, and user confidence, particularly among elderly individuals and people managing mental health issues. By creating a shared platform that connects patients, families, and healthcare providers, the system builds stronger trust and smoother communication—addressing the disconnect that often exists in traditional healthcare solutions. Its straightforward interface and simplified navigation make it suitable for users who are less comfortable with digital tools, while the inclusion of multiple user roles encourages real-time collaboration among doctors, caregivers, and patients. This connected approach leads to more timely medical responses and improved overall health outcomes.

When compared with current healthcare applications, this solution stands out because of its **all-in-one structure** that merges health tracking, communication, and reminder systems under a single framework. This integration eliminates the need for users to juggle multiple apps for different tasks, improving consistency and reliability. Looking ahead, the system has strong potential for further enhancement through features like AI-driven mood recognition or IoT-based wearable device integration. These improvements would allow for more adaptive, personalized, and proactive care, enabling early detection of issues and strengthening preventive healthcare for vulnerable users.

6. Conclusion and Future Work

6.1 Conclusion

This study concludes that developing a simple, accessible, and integrated healthcare support system can significantly enhance the well-being of elderly individuals and those experiencing mental health difficulties. The platform promotes safety, independence, and stronger communication by seamlessly linking patients, family members, and healthcare professionals. With its ability to monitor health records, send timely reminders, and provide instant alerts during emergencies, the system helps users manage their physical and emotional health more confidently and effectively. Overall, the project demonstrates how technology—when designed with empathy and usability in mind—can bridge the gap between patients and caregivers, improving quality of life for vulnerable groups.

6.2 Future Work

1. Integrate **AI-based emotional analysis** to identify early signs of stress, anxiety, or mood variations.
2. Implement **IoT-enabled devices** for real-time monitoring of vital health parameters and preventive care.
3. Add **voice-assisted functionality** to make the system more accessible for seniors with visual impairments or limited technical experience.
4. Continue refining the platform to make it **smarter, more inclusive, and easier to use** across diverse user needs.

7. References

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