



# NATIONAL HEALTHCARE HACKATHON

**JECRC UNIVERSITY**



# MEET THE TEAM

**Team Name : HACK TO HEAL**

**Team Number : 23**




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# PROBLEM STATEMENT

Number : 23



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**Title :** Innovation of Medicine Dispenser with Voice Reminder for Elderly Patients

## **Key Objective :**

- Create an **IoT-powered solution** to address **medication non-adherence** in elderly patients.
- Use **simple automation** and **human-centered design** principles for effective medication reminders.
- Improve **patient independence** and **reduce caregiver dependency**.
- Enhance **healthcare outcomes** by ensuring timely medication intake.

# PROBLEM UNDERSTANDING



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- **Medication non-adherence** is a significant challenge in healthcare, particularly among elderly patients.
- Over **50% of elderly individuals** fail to follow prescribed medication schedules, leading to **worsened health conditions** and **increased hospitalizations**.
- **Caregiver dependency** for reminders adds pressure, especially in **resource-limited settings**.
- This problem not only affects **patients' health** but also drives up **healthcare costs** and reduces overall **quality of life**.

# SmartMed

Smart Medicine Dispenser with Voice Reminder



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## Key Features and Functionalities :

- **Scheduled Reminders** : LED & voice alerts for timely medication.
- **Acknowledgment Button** : Confirm medication and log data.
- **Customizable Schedule** : Tailored to individual needs.
- **Voice System** : Adjustable volume & language for accessibility.
- **Remote Monitoring** : Syncs with app for caregiver tracking.
- **Simple Interface** : Easy-to-use buttons for elderly users.

# Tech-driven Approach



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## Core Technologies

- **ESP32 Microcontroller** : Powers scheduling, LED control, and voice alerts.
- **RTC Module (DS3231)** : Ensures precise, time-based medication reminders.
- **LED & Speaker System** : Multi-sensory cues for enhanced visibility and accessibility.
- **Mobile/Web App** : Enables remote tracking of medication adherence.
- **Arduino IDE** : Seamless programming and device control.

## Methodology

- **Multi-Sensory Alerts**: Combining LED and voice for clear reminders.
- **Real-Time Data Logging**: Tracks intake for caregivers' reference.
- **Adherence Monitoring**: Automated notifications for missed doses.
- **User-Centric Design Testing**: Ensures accessibility for elderly users.

# INNOVATION & UNIQUENESS



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- ★ **Multi-Sensory Reminders:** Voice modulation + LED alerts for seamless adherence.
- ★ **Customizable Alerts:** Adjustable tone, volume, and language options.
- ★ **Data-Driven Monitoring:** Logs reminders and actions for tracking and intervention.
- ★ **Elderly-Friendly Design:** Large buttons, simple setup, and intuitive operation.
- ★ **Cost-Effective & Scalable:** Ideal for homes, hospitals, and rural healthcare setups.

# Implementation Approach



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## Step-by-Step Development Plan :

- **Component Integration:** Assemble ESP32, RTC module, LEDs, speaker, and acknowledgment button.
- **Core Programming:** Schedule reminders, sync LED and voice alerts, and program acknowledgment functionality.
- **Testing:** Test with real-world scenarios to refine accuracy and reliability.
- **Feedback Loop:** Usability testing with elderly users to improve design accessibility.
- **Final Prototype:** Develop a compact, robust system for deployment.



# Implementation Approach



## Real-World Feasibility:

- **Hospital Application:** Ideal for ward-level or patient-specific medication management.
- **Home Settings:** Accessible and affordable for independent elderly patients.
- **Scalability:** Modular design for multiple patients or healthcare facilities.

## Anticipated Challenges & Solutions:

- **Technical Issues:** Use high-quality components and extensive testing to ensure reliability.
- **Accessibility:** Optimize interface for non-tech-savvy users with simpler design.
- **Cost Management:** Focus on affordable hardware while maintaining functionality.
- **Adoption Resistance:** Demonstrate ease of use and benefits through demos and training.

# Expected Outcomes And Impact



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**For Patients:** Ensures timely medication, improving health outcomes and independence.

**For Caregivers/Attendants:** Reduces burden through automated reminders and adherence tracking.

**For Doctors:** Provides reliable data on medication adherence for better treatment decisions.

**For Hospitals:** Lowers readmissions and enhances patient care efficiency.

**For Nursing Staff:** Minimizes manual intervention, enabling focus on critical care tasks.

Overall, ***promotes better healthcare accessibility and cost-effectiveness.***