JECRC UNIVERSITY
BUILD YOUR WORLD

CELEBRATING 25 YEARS OF BUILDING TALENT

JMCH
JECRC Medical College and Hospital

NATIONAL HEALTHCARE HACKATHON

JECRC UNIVERSITY

MEET THE TEAM

Team Name : HACK TO HEAL

Team Number : 23

Yash Joshi
B.Tech. CSE
Contact:
📧 yjjoshi2003@gmail.com
📱 +91 9748600721

Arunil Keshri
B.Tech. CSE
Contact:
📧 arunilkeshri03@gmail.com
📱 +91 8690197069

Ayan Raj
MBBS
Contact:
📧 ayan452006@gmail.com
📱 +91 9427349521

PROBLEM STATEMENT

Number : 23

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

JECRC UNIVERSITY
BUILD YOUR WORLD

- **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

JECRC UNIVERSITY
BUILD YOUR WORLD

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

JECRC UNIVERSITY
BUILD YOUR WORLD

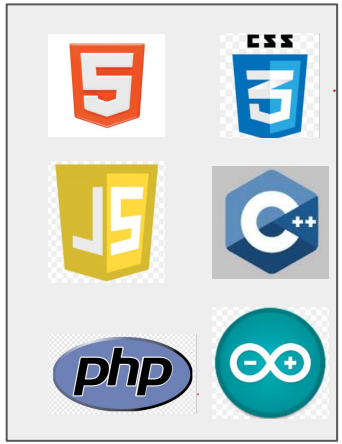
Core Technologies

- **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.

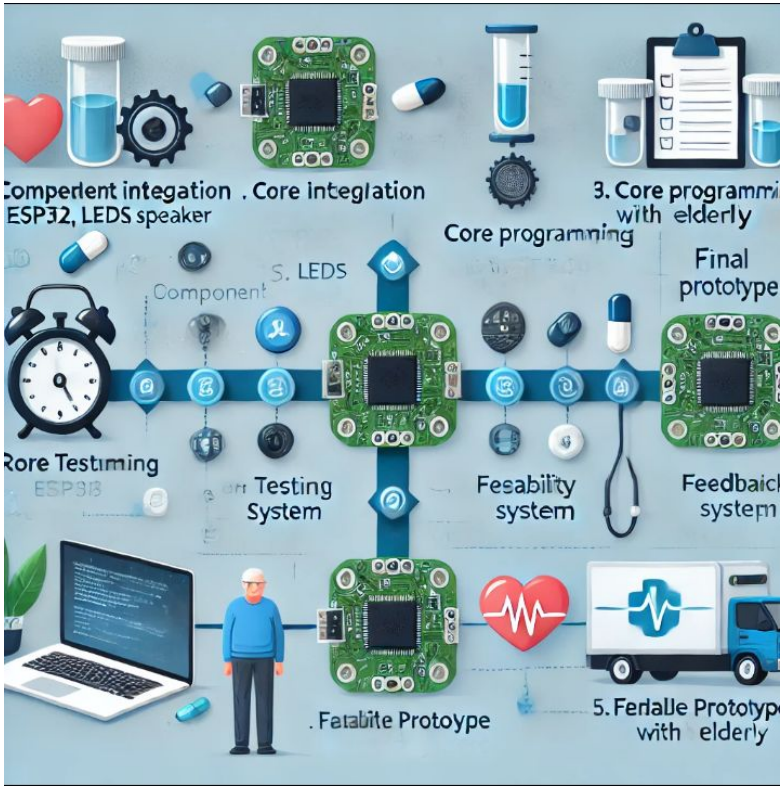
Tech Stack



INNOVATION & UNIQUENESS

JECRC UNIVERSITY
BUILD YOUR WORLD

- ★ **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.

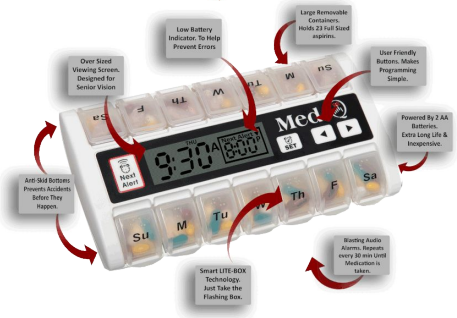


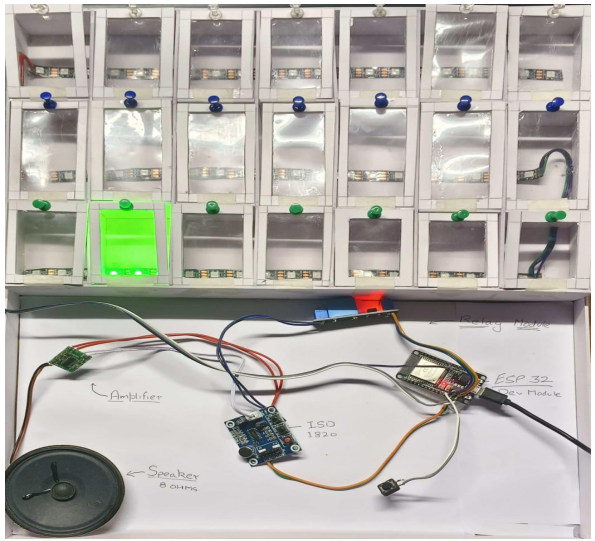
Implementation Approach

JECRC UNIVERSITY
BUILD YOUR WORLD

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

JECRC UNIVERSITY
BUILD YOUR WORLD

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

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***.