

SMART MEDICINE REMINDER

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ABSTRACT

This project presents a smart medication reminder system combining a pillbox weight scale and a wristband alert module. The system continuously monitors the pillbox using a load cell and alerts the user via a vibrating wristband when it's time to take medication. If no weight change is detected within 15 minutes, the system notifies the caretaker. The solution leverages IoT with Blynk integration to ensure timely medication intake, supporting elderly and chronic disease patients

INTRODUCTION

Medication adherence plays a crucial role in managing chronic diseases effectively. However, many elderly patients often forget or miss their prescribed doses, which can lead to serious health complications. To address this challenge, the proposed project introduces an IoT-based system that monitors pillbox usage and provides real-time alerts to the user. By integrating a weight sensor (load cell) connected to an ESP32 microcontroller and a wristband equipped with an ESP-01 module, the system ensures that users are reminded to take their medication on time through discreet wristband alerts, helping improve adherence and overall health outcomes.

OBJECTIVES

- Automate medication reminders and monitoring.
- Provide non-intrusive alerts using a wristband vibration motor.
- Detect non-compliance (pill not taken) and notify the caretaker.
- Reduce manual tracking and improve health outcomes.

LITERATURE SURVEY

Smart Pillbox Systems: A Review of Medication Adherence Technologies	John Doe Jane Smith	Discusses various smart pillbox designs aimed at improving patient medication adherence. Covers weight-based, time-based, and RFID-based systems. Highlights effectiveness in reminding patients and reducing missed doses.	Most systems rely on local alerts only (sound/light) and lack remote caregiver notification features.
Wearable Devices for Healthcare Monitoring: A Review	Alice Brown Michael Johnson	Explores the use of wearable devices (like wristbands) for health monitoring and patient reminders. Focuses on the integration of sensors, actuators, and wireless communication. Highlights the role of vibration motors for discreet, user-friendly alerts.	Many wearables are designed for fitness or general monitoring, not specifically for medication adherence.
IoT-based Healthcare Monitoring Systems: A Survey	Priya Kumar Rahul Patel	Reviews Internet of Things (IoT) applications in healthcare, including medication management. Emphasizes real-time data collection, remote monitoring, and caregiver notifications. Highlights the importance of integrating sensors with cloud-based alert systems.	Challenges include power management, system reliability, and user acceptance in elderly populations.

EXISTING SYSTEM

Manual Tracking:

Patients rely on **alarms**, **written schedules**, or **caregivers** for reminders, but these methods are easy to ignore and lack reliability, especially for those with memory issues.

Limited Escalation Methods:

Most systems only provide **notifications** without follow-ups, leaving patients at risk of missing doses without intervention.

Lack of Verification:

Traditional **pill organizers** and **reminder apps** do not confirm if medicine is taken, making **adherence difficult to track**, especially for elderly or cognitively impaired users.

No Adaptive Reminders:

Many existing systems **use fixed reminder** times and cannot adjust based on the user's daily routine, missed doses, or changing health needs, reducing their effectiveness in supporting real-world adherence.

PROPOSED SOLUTION

Ensuring proper medication adherence requires an integrated approach that combines reminders, monitoring, and verification

SMART PILLBOX FOR TIMELY REMINDERS

The smart pillbox uses a load cell to monitor the pillbox weight. At scheduled times, it checks if the pill has been taken by **detecting weight change**. If no change is detected **within 15 minutes**, it escalates the **alert**. This system avoids false alerts by focusing on actual pill removal rather than just opening the box.

VIBRATING WRISTBAND

The wristband provides a **silent vibration alert** to remind the user to take medication. It connects wirelessly to the smart pillbox and vibrates when it's time for the dose. This ensures the user receives a private, wearable reminder without disturbing others.

EMERGENCY ESCALATION

If the pillbox detects no change in weight after 15 minutes, the system automatically **escalates the alert** by initiating a phone call or sending a message to the caregiver. This ensures that missed doses are promptly addressed and intervention can happen when needed.

COMPONENTS

- **1. Microcontrollers & Processors**
 - **ESP32**
 - **Esp01**
- **2. Sensors & Modules**
 - **For the Pillbox**
 - **Load Cell + HX711 Module**
 - **For the Wristband**
 - **Vibration Motor**
- **3. Power Supply**
 - **Li-ion Battery (3.7V 1000mAh+)**
 - **TP4056 Charging Module**
 - **12V Adapter / Power Bank**

MODULES

1. Pillbox Weight Monitoring Module

This module uses an ESP32 microcontroller connected to an HX711 load cell amplifier and a load cell to measure the pillbox's weight. It continuously tracks whether pills have been taken at scheduled times. Powered by a LiPo battery, it ensures portability and operates efficiently within the pillbox.

2. Wristband Alert Module

Includes an ESP-01S, vibration motor, and transistor to send discreet vibration alerts at pill times. Lightweight and battery-powered.

MODULES

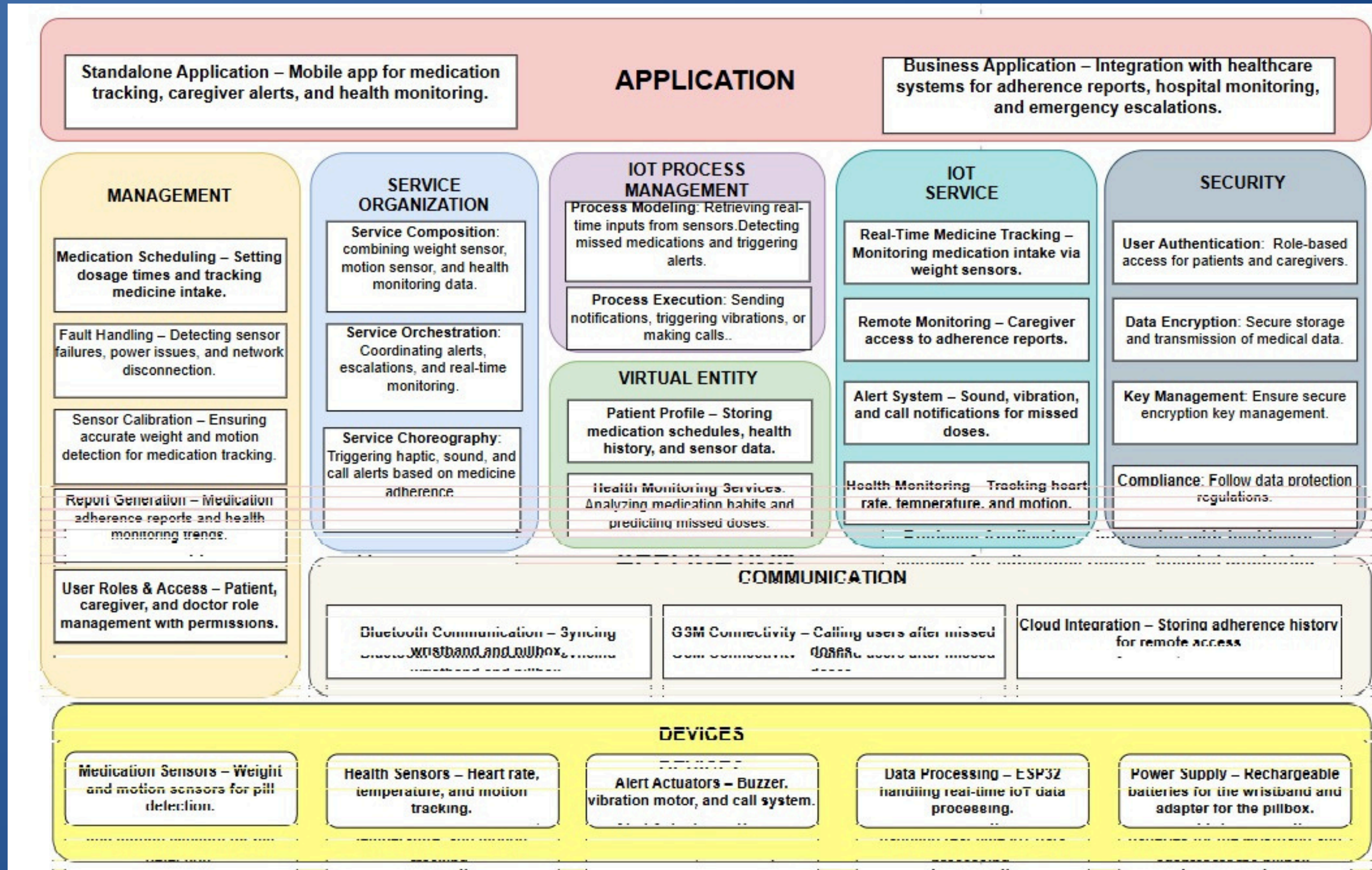
3. Wireless Communication

Handles data transfer between pillbox and wristband using Wi-Fi. Syncs reminders and updates through platforms like Blynk.

4. Caretaker Notification

Sends alerts to the caregiver if pills are not taken within 15 minutes, ensuring timely intervention.

ARCHITECTURE



FUTURE ENHANCEMENTS

The system can be further improved by adding features like a **speaker** or **LED** on the wristband to offer visual or audio alerts alongside vibrations.

Incorporating **Bluetooth fallback** will help maintain reliable communication if Wi-Fi drops.

Expanding the system to handle multiple medications or support multiple users would make it more versatile and useful in larger households or care settings.

Additionally, introducing a **mobile app dashboard** would give users and caregivers an easy way to view medication schedules, track history, and improve overall engagement and monitoring.

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THANK
YOU

FEATURES

PILLBOX

- **Scheduled Alerts:** Emits a beep at the designated medicine time
- **Proximity Detection:** Stops beeping when it detects a hand near the pillbox
- **Medicine Intake Tracking:** Tracks medicine intake using motion sensors
- **Escalation Alert:** Calls if no response after 15 minutes

WRISTBAND

- **Vibration:** vibrates to remind the user when it's time to take medicine.
- **Health Monitoring:** Monitors heart rate & body temperature
- **Motion Detection:** Detects user movement
- **Seamless Connectivity:** Wireless connectivity with the pillbox

WORKING MECHANISM

