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Smart Medicine Reminder System Using IoT

Prerna Mhatre, Soniya Mhatre, Juhi Nayak, Poonam Shekar
A.C. Patil College Engineering, Kharghar, India

Abstract: *Internet of Things (IoT) has revolutionized the healthcare industry with its ability to provide advanced monitoring and automation systems. There are various challenges that the healthcare sector faces, one of which includes medication non-adherence. It refers to the scenario where a patient forgets or delays the consumption of prescribed medicines. Such a situation might cause serious health risks to the patients, particularly those who belong to the elderly age group and have chronic illnesses.*
The suggested IoT-based medicine reminder device is an advanced solution that reminds patients to consume their medicines based on predefined timings. This system will employ the microcontroller (Arduino Uno/NodeMCU), real-time clock (RTC) module, buzzer, liquid crystal display (LCD), and internet of things (IoT) communication mechanism to develop medicine alerts in terms of alarms and mobile notifications. The proposed system has the capability of storing medicine schedules and alerting users during the correct time slots while also notifying caretakers in case of missed doses..

Keywords: Internet of Things (IoT), Medicine Reminder, Smart Healthcare, Arduino, NodeMCU, Embedded Systems

I. INTRODUCTION

1.1 Introduction

Monitoring in healthcare has grown more prominent with the aging population and chronic diseases. An everyday struggle for many patients is not taking their medicines regularly. Traditional ways like manual alarm reminders, writing schedules, or relying on family members do not work all the time.
The proposed solution to this problem is the IoT-Based Medicine Reminder Device. This device acts as a reminder and alerts the user about their medications at specified times.

1.2 Motivation

This work is driven by various issues, including:
•Growing numbers of older people needing regular medication
•Medication mistakes due to skipped dosages
•Requirement for intelligent healthcare support systems
•Remote healthcare monitoring for caregivers

1.3 Problem Statement

There are no automated reminders for medication that are remotely monitored and intelligent. People may forget to take their medicine because of poor memory, a hectic schedule, or even neglect. A solution is needed that is intelligent and inexpensive.

1.4 Project Objectives

The key objectives of this project are as follows:
•To create a medicine reminder system
•To trigger alarms and alerts as reminders
•To track medicine consumption status
•To notify caregivers when there is any dose failure
•To offer a scalable IoT-based healthcare solution

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II. METHODOLOGY

2.1 System Development Strategy

Development strategy involves the use of embedded systems approach together with IoT technology. Hardware and software components are both developed incrementally.

2.2 System Architecture

Presentation Layer
•LCD screen to display name and quantity of medicine
•Buzzer produces alert sound
•Mobile app to show notifications
Application Layer
•Control system using NodeMCU
•Handles timing schedules
•Controls reminder generation and sending notifications
Data Layer
•Records timing of medicines
•Remote cloud database (Firebase)
•saves user information
Keeps record of drug intakes and reminder records
Security Layer
•IoT security protocols
•User authentication

2.3 Functional modules

A. User Registration Module
Helps users to register their medicine schedules and dosages.
B. Reminder Module
Produces alarm signals for reminders whenever it is time to take medicine.
C. Monitoring Module
Monitors the intake of medicines.
D. Notification Module
Notifies the caregiver if the patient misses taking medicine.

2.4 Algorithm Design

Medicine Reminder Algorithm
1.Activate system
2.Enter medicine schedule
3.Store schedule in memory/database
4.Match current time with schedule
5.If match found, turn on alarm
6.Wait for confirmation from user
7.In case of missed medicine, send reminder to caregiver
8. Loop cycle

III. DISCUSSION

3.1 Features

Medicine reminder automatically
IoT-enabled remote tracking
Real-time notifications

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Alert for missing doses
Cost-effective solution
User-friendly design

3.2 Problems and Drawbacks

Technical Issues
Synchronization between sensors
Consistent internet connection
Battery-related problems
User Issues
Trouble for new users
Requiring correct schedule input

IV. FUNCTIONALITY OF THE SYSTEM

The system functions in the following manner:
1.Patient inputs schedule of medicines
2.Schedule stored in microcontroller
3.RTC continuously checks for time
4.Alarm rings when time to take medicines
5.Medicine taken by patient and confirmed
6.Status is logged into the system
7.Caregiver alerted on missed medicines

V. LITERATURE REVIEW

Conventional drug reminder systems operate on simple alarm mechanisms without monitoring capabilities. Modern studies indicate that IoT-based drug reminder systems enhance medication compliance via automation, remote control, and intelligent alerts. However, conventional drug reminder systems are faced with issues relating to cost and ease of operation.

VI. FUTURE SCOPE

Some future improvements include:
•Integrating with smart medicine boxes
•Using voice assistants for reminders
•Using artificial intelligence to give proper dosages
•Integrating cloud health records
•Supporting wearable devices

VII. CONCLUSION

The IoT-Based Medicine Reminder Device proves to be an efficient and viable solution for taking medicines. It prevents missing dosages, helps with the care of the elderly, and offers advanced healthcare monitoring via IoT systems.

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