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# MEDICINE REMINDER THROUGH VOICE GUIDE USING IOT

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**Abstract:** This project is entitled as "MEDICINE REMAINDER THROUGH VOICE GUIDE" is a IOT based application. The project introduces an innovative solution to enhance medication adherence and patient care. This system incorporates key components such as a voice recorder, microcontroller, and IoT connectivity to facilitate effective medication management. The core concept involves the voice recorder delivering timely medication reminders, categorized into morning, afternoon, and evening sessions, ensuring patients stay on track with their prescribed regimen. The system employs two buttons for patient interaction: Button 1 serves as confirmation that the medication was taken, preventing the need for an IoT alert, while Button 2 enables patients to schedule their medication times as per their physician's instructions. Crucially, if a patient fails to press Button 1 within a specified timeframe after the voice reminder, the system automatically generates an IoT alert. This alert is transmitted to a designated user, alerting them to the patient's non-compliance. This proactive approach aims to reduce the risk of missed doses and improve patient well-being, making it a valuable tool in modern healthcare management.

**Keywords**: Node MCU, Button, Voice Recorder, Speaker.

## I. INTRODUCTION

The "Medicine Reminder Through Voice Guide" project aims to address the challenge of medication non-adherence in healthcare by providing an innovative, voice-guided solution. The project is driven by the prevalence of medication non-adherence, which leads to suboptimal health outcomes, increased healthcare costs, and a burden on healthcare systems. Traditional reminder systems often lack the human touch needed to engage users effectively, leading to a more intuitive and natural approach. Advancements in voice recognition technology offer a powerful tool for creating seamless user experiences, allowing for a user-friendly interface that increases engagement. Personalization for improved outcomes is also a motivation, as tailoring reminders to each user's specific needs enhances the sense of ownership and responsibility, leading to better health outcomes. The project empowers users to take control of their health journeys by demystifying medication management, making it more accessible and user-friendly. This empowerment creates a positive ripple effect, influencing users to actively participate in their healthcare. In conclusion, the "Medicine Reminder Through Voice Guide" project aims to be a beacon of innovation, providing an effective and empathetic solution to improve medication adherence in healthcare. By integrating voice guidance, the project aims to transform the way individuals perceive and manage their health, contributing to a healthier and more connected society.

## II. RELATED WORK

The topic of "Medicine Reminder Through Voice Guide" has seen various research and development efforts, including the integration of voice-activated smart assistants like Amazon Alexa, Google Assistant, or Apple's Siri for personalized reminders. Mobile applications with voice features have also been explored, allowing users to set up schedules and receive voice-guided reminders. IoT-enabled medication dispensers have also been developed, providing voice instructions and reminders to users. Accessibility features are being developed to cater to users with visual impairments or cognitive challenges. Machine learning algorithms are being used to personalize reminders by analyzing user behavior patterns and adherence history. Integration with wearable devices, such as smartwatches or fitness trackers, is also being explored. User feedback mechanisms and behavioral analysis are being incorporated to improve overall adherence. Security and privacy considerations are being addressed, including encryption measures and compliance with healthcare data protection regulations. Telehealth integration is also being explored, ensuring a holistic approach to patient care and medication management. Real-time connectivity is being prioritized, allowing users to receive voice-guided reminders and updates regardless of their location. Cloud-based synchronization ensures seamless medication information management across multiple devices.

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For the most up-to-date information on research and development efforts related to "Medicine Reminder Through Voice Guide," it is essential to conduct a literature review using academic databases and journals. This dynamic field is likely to see further advancements and innovations.

The author lacks specific information on a survey conducted in India on the topic of "Medicine Reminder Through Voice Guide." Surveys on healthcare-related technologies, particularly in India, are constantly evolving. To find the latest information, researchers can explore academic databases, healthcare journals, official health organizations, research repositories, government health reports, and local health institutions. These sources often provide insights into ongoing or recent surveys related to healthcare technology adoption, including topics like medication management and reminders. New surveys may be documented in academic publications, health reports, or news articles. Online platforms of healthcare organizations, government health departments, or academic institutions can also be valuable resources. As of January 2022, there is no specific information on a foreign survey conducted on the topic of "Medicine Reminder Through Voice Guide."

However, it is likely that various surveys and studies have been conducted globally to assess the impact and adoption of technology in medication management. To find the latest information on foreign surveys, one can explore academic databases like PubMed, healthcare journals, government health agencies, health tech organizations, survey platforms like Statista, university research centres, conference proceedings, and news articles. It is essential to use up-to-date sources as the field of healthcare technology is dynamic and new surveys and studies are continually emerging. If there have been significant developments or surveys conducted since the last update, they are likely to be documented in recent publications and reports.

Voice-guided medication reminder systems present several challenges, including user adoption and acceptance, privacy and security concerns, accurate voice recognition, integration with existing healthcare systems, accessibility for different user groups, cultural sensitivity and language diversity, and potential opportunities. User adoption and acceptance can be improved by designing user-friendly interfaces and conducting user training sessions. Privacy and security concerns can be addressed by implementing robust security measures, encryption, and complying with healthcare data protection regulations. Accurate voice recognition can be achieved by investing in advanced technology and conducting thorough testing. Integration with existing healthcare systems can be complex and may face interoperability issues.

Collaboration with healthcare institutions can create seamless integrations while adhering to industry standards. Accessibility for users with disabilities requires careful consideration, and alternative modes of communication, such as visual cues or vibrations, can be implemented. Cultural sensitivity and language diversity present challenges in developing voice-guided systems that are applicable globally. Incorporating multilingual support and culturally relevant content in voice interactions can cater to a diverse user base. Potential opportunities include improved medication adherence, enhanced user experience, behavioural analysis and personalization, integration with wearable devices, telehealth integration, remote monitoring and caregiver support, and education and health literacy. Addressing these challenges and leveraging opportunities can lead to the development of more effective and user-friendly voice-guided solutions.

## III. METHODOLOGY

**Hardware Requirements**

Board : Node MCU
Module : Voice recorder
Wire : Jumping wires
Appliance : Speaker

**Software Requirements**

Operating system : Windows 11 Language : Embedded C
Software : Arduino IDE
Documentation : Microsoft word

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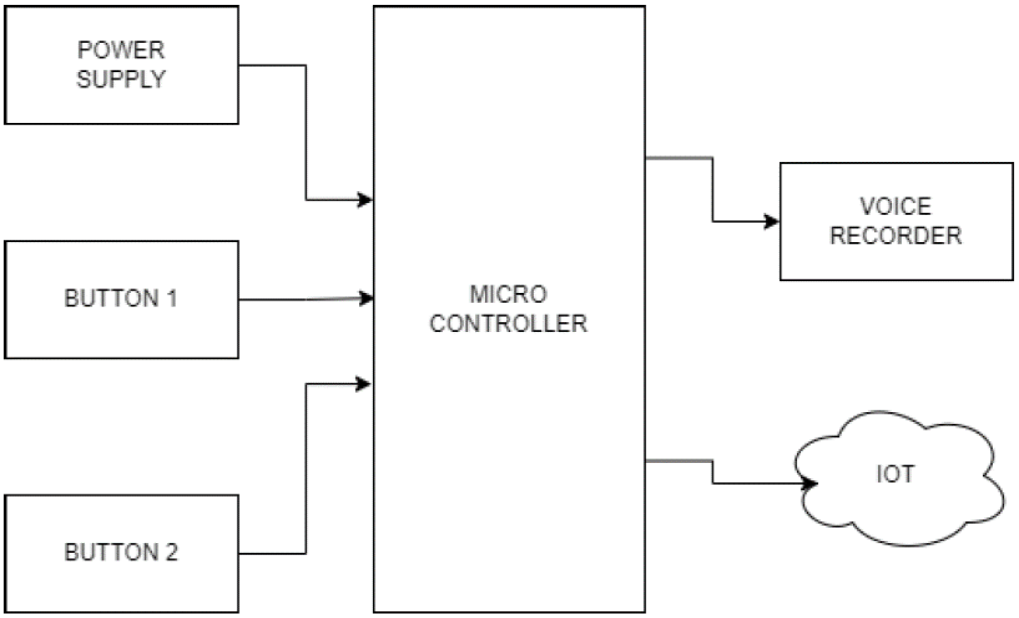


Figure 1 BLOCK DIAGRAM

NodeMCU is a popular open-source platform for developing Internet of Things (IoT) applications. It combines two things Firmware and Development boards. Firmware is software that runs on a specific microcontroller chip, the ESP8266, made by Espressif Systems. The NodeMCU firmware is based on the Lua scripting language, which is known for being easy to learn and use. Development boards are physical circuit boards that contain the ESP8266 chip, along with other components that make it easier to use, like voltage regulators and USB ports. There are many manufacturers of NodeMCU development boards, but they all share a similar design.

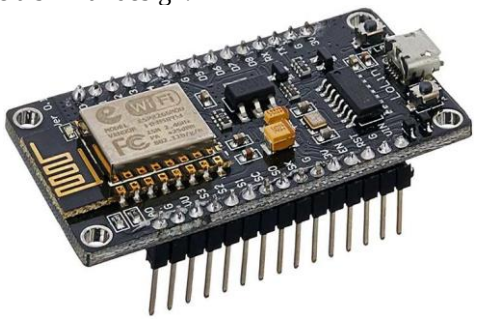

Figure 2 NODE MCU

The NodeMCU uses the RTC module to keep track of the time. When a medication reminder time arrives in the programmed schedule, the NodeMCU triggers the speaker to play the pre-recorded voice message reminding you to take your medication. If you have a medicine dispenser connected, the NodeMCU can also signal it to dispense the correct dosage at the reminder time.

**Advantages of NodeMCU**

- Budget-friendly
- Wi-Fi on board
- Easy to learn
- Open Source and adaptable
- Compact and versatile
- Low power consumption

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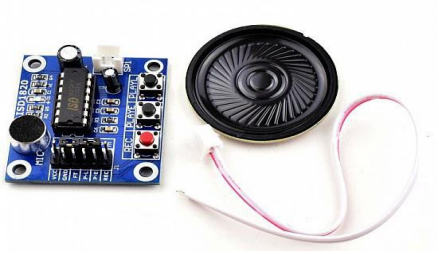

**Figure 3 VOICE RECORDER AND SPEAKER**

ISD1820 is a small Voice Recorder and Playback module that can do the multi-segment recording. The user can achieve a high quality of recording (for 8 to 20secs) for each application with the adjustment of the on-board resistor.

This Voice Recorder/Playback module is designed with embedded-Flash memory, which can hold data for up to 100 years and erase/record the life cycle up to 100,000.

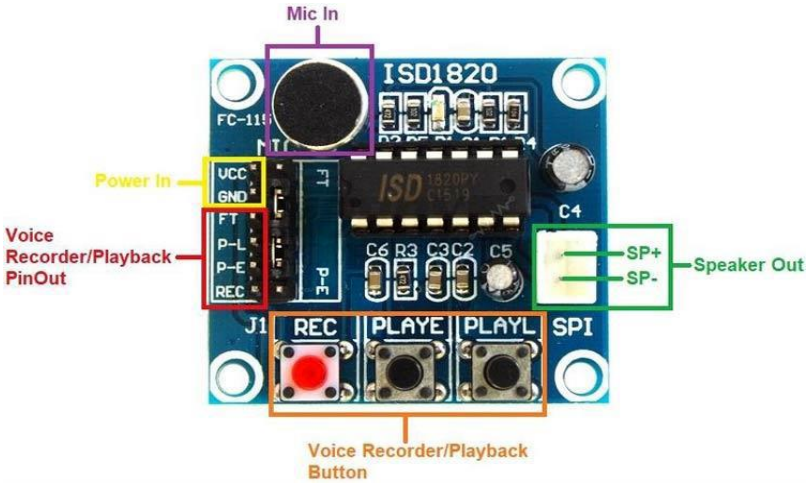


Figure 4 VOICE RECORDER

**Features**

- Operating Voltage: Wide power supply ranges from 2.4V to 5.5V DC
- With the internal audio amplifier, this board can drive 8 Ohm 0.5W speakers directly.
- An on-board microphone.
- Dual operating modes:
  1. Standalone mode
  2. Microcontroller Driven mode
- The device control playback with buttons, quick tap (edge) or holding the button (level) to play recordings.
- The device can record voice messages up to 20 seconds long.
- Automatic power-down mode (standby mode)
- Dimensions (LxWxH) in cm 8 x 6 x 3

**BUTTON:**

Figure 5 BUTTON

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Push Buttons are normally-open tactile switches. Push buttons allow us to power the circuit or make any particular connection only when we press the button. Simply, it makes the circuit connected when pressed and breaks when released. A push button is also used for triggering of the SCR by gate terminal. These are the most common buttons which we see in our daily life electronic equipment's.

**Push Button Features**

• Prevent flux rise by the insert-molded terminal
• Snap-in mount terminal
• Contact Bounce: MAX 5mS
• Crisp clicking by tactile feedback
• Dielectric Withstanding Voltage 250V AC for 1 minute

**Technical Specifications**

• Mode of Operation: Tactile feedback
• Power Rating: MAX 50mA 24V DC
• Insulation Resistance: 100Mohm at 100v
• Operating Force: 2.55±0.69 N
• Contact Resistance: MAX 100mOhm
• Operating Temperature Range: -20 to +70 ℃
• Storage Temperature Range: -20 to +70 ℃ 29

**Applications**

• Calculators
• Push-button telephones
• Kitchen appliances
• Magnetic locks
• Various other mechanical and electronic devices, home and commercials.

**SCREENSHOT:**

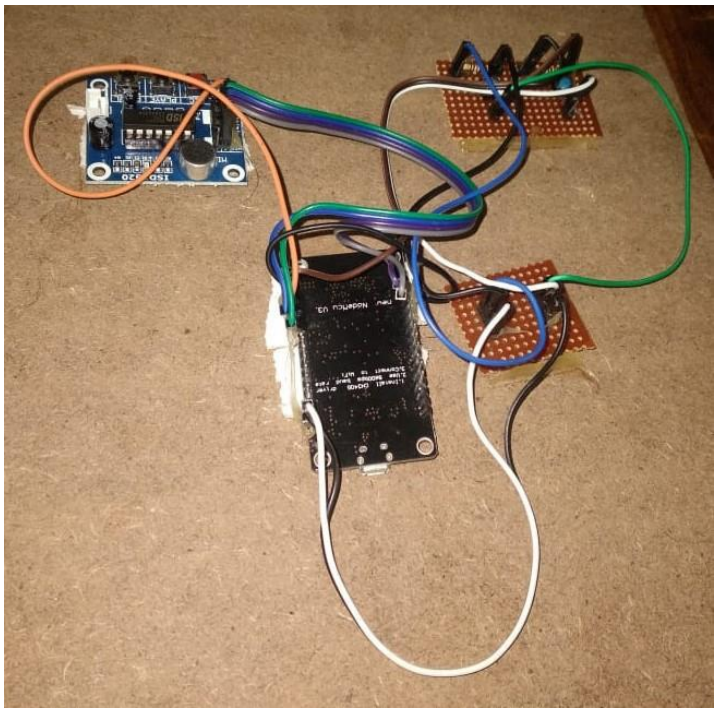

Figure 6 CONNECTION WITH NODE MCU

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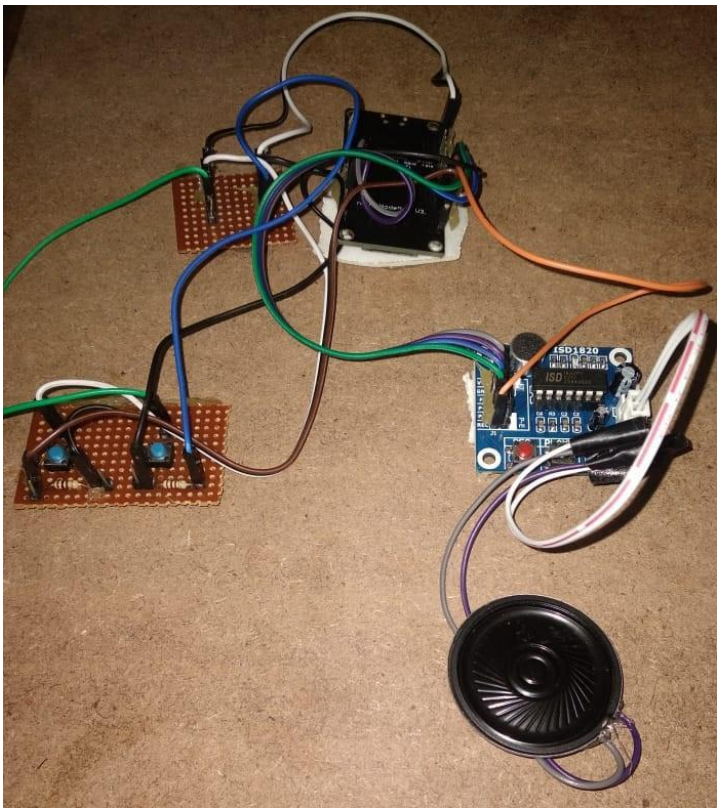


Figure 7 CONNECTION WITH VOICE MODULE

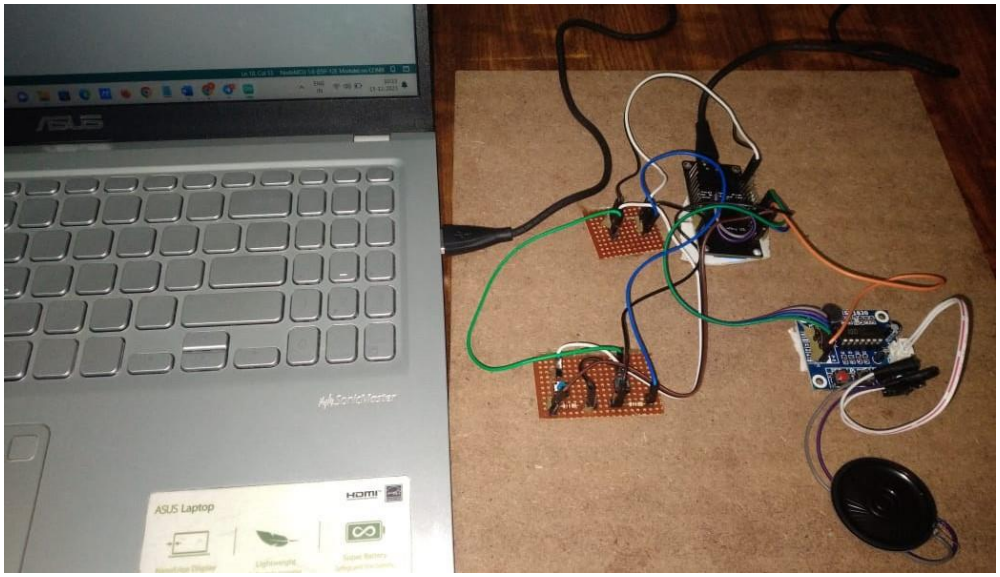


Figure 8 CONNECT WITH ARDUINO CODE

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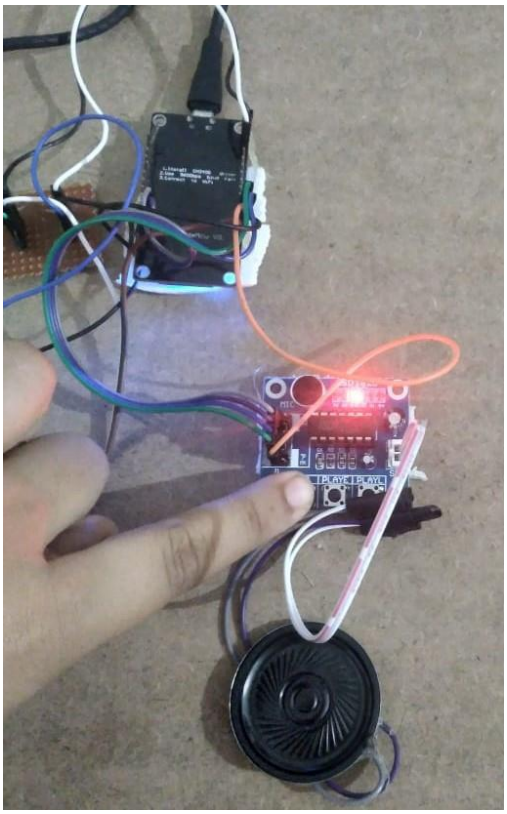

Figure 9 GIVING ALERT THROUGH VOICE

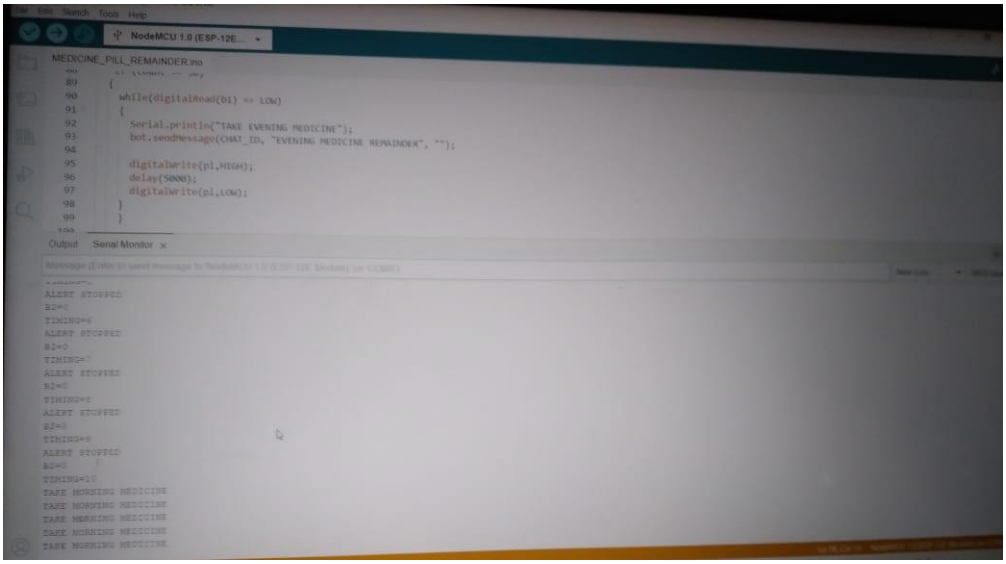


Figure 10 COMPLETE WORKING SENSORS IN SERIAL MONITOR

## IV. CONCLUSION

In conclusion, the project represents a significant advancement in medication management and patient care. By integrating a voice recorder, microcontroller, and IoT technology, it offers a comprehensive and user-friendly solution for medication reminders. The project enhances medication adherence by providing personalized voice alerts and a confirmation mechanism through Button 1. It also empowers patients to schedule their medication times with Button 2, fostering a sense of control over their healthcare. The system's ability to automatically generate IoT alerts in the absence of Button 1

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confirmation ensures that patients' adherence is closely monitored, and caregivers or healthcare providers are promptly informed of any non-compliance. This project bridges the gap in existing manual systems, addressing issues of human error and accountability while promoting better patient engagement. Overall, it holds great promise for improving patient well-being, reducing medication errors, and advancing the quality of healthcare delivery.

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