Fourth National Conference on Emerging Trends and Challenges in Biomedical Engineering
In Association with International Journal of Scientific Research in Science and Technology
Volume 9 | Issue 10 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X (www.ijsrst.com)

Design and Implementation of Automatic Medicine Vending Machine Based on Android App

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ABSTRACT

This project shows a machine with an Android app that can deliver healthcare in places where a medical shop isn't practicable or possible. It lets the user to choose a drug, pay the needed money, and then have the medicine dispensed when it validates the amount received. It gives a comprehensive answer for someone seeking rapid symptomatic alleviation for minor health issues. It can entirely eradicate both presentism and absenteeism in the workplace by alleviating minor symptoms at work. It also has the potential to reduce the existing expenses of open medication cabinets. Workplaces without clinics or pharmacies can profit from greater work productivity and minimise underperformance by sick personnel by installing an over-the-counter vending machine. Furthermore, it guards against It also saves time spent waiting in lines at clinics for minor ailments such as colds and headaches. When a place is hit by a localised epidemic or pandemic, the situation becomes even more dire. This project shows a machine with an Android app that can deliver healthcare in places where a medical shop isn't practicable or possible. It lets the user to choose a drug, pay the needed money, and then have the medicine dispensed when it validates the amount received. It gives a comprehensive answer for someone seeking rapid symptomatic alleviation for minor health issues. It can entirely eradicate both presentism and absenteeism in the workplace by alleviating minor symptoms at work. It also has the potential to reduce the existing expenses of open medication cabinets. Workplaces without clinics or pharmacies can profit from greater work productivity and minimise underperformance by sick personnel by installing an over-the-counter vending machine. Furthermore, it guards against It also saves time spent waiting in lines at clinics for minor ailments such as colds and headaches. When a place is hit by a localised epidemic or pandemic, the situation becomes eve

I. INTRODUCTION

For folks who live in remote areas, diagnosis is always a problem. In addition, discounting the aspect of full cure, drug availability has a significant influence. The goal of this prototype is to provide brief comfort so that patients have a greater chance of preventing their health from deteriorating until they can see a doctor.

People would be able to get pharmaceuticals through patient kiosks in public locations such as drug shops, malls, buses, and train stations, as well as on highways and in areas where medical stores are few. As technology advances, every aspect or institution, whether corporate or health-related, must improve. There have been many innovations, but the health department has not been one of them. Various pharmaceutical vending machines have been created to improve the efficiency and reliability of health care services. Vending machine advancements for various goods such as drinks have been witnessed over the years. It is usual in most hospitals, especially public hospitals, to find that the process of providing medications takes a lengthy time, and this machine is one technique to combat this problem. Patients must utilise a unique identifier in order for the machine to function properly. This will prevent confusion between patients and the medications to be taken from the device. The medication dispenser's architecture has been meticulously built, and it has sensors that can detect the number of medicines dispensed, when they should be dispensed, and how much should be dispensed.

II. LITERATURE SURVEY

[1]. Yasothaa Kalai Chelvam, has developed An electronic pill box that can keep track of when medicine is taken from it. This might exacerbate the problem of prescription abuse, particularly among the elderly. It is critical that they take the medication exactly as prescribed in terms of dose and duration. They may require the assistance of family members to remind them of their prescription regimen, but this strategy is not appropriate for the elderly who live alone at home. [2] M. Volk, J. Sterle and U. Sedlar, has invented. The user interface, where the nurse must first sign up using her name and password to create her user id and password for her first time login, then the next window pops up for face recognition, where the nurse must authenticate her face and password. Only if the face and password match will the nurse or the caretaking staff be able to access the device and send medication to the patient. Thing talk is used to connect the gadget from the nurse station to the Automatic Medicine Dispenser has developed a pill dispenser that ensures that medications are taken safely and on time, particularly by the elderly. The alarm function is introduced to the system as a popup notice utilising the Insta push programme on the smart phone, which is the key advantage of this system.

[3] A Medium Corporation [US] has studied Nurses and caretakers are authenticated using a face recognition technology. For face recognition, histograms of oriented gradients (HOGs) and neural networks are utilised. OpenCV provides a number of face detection and recognition packages that are loaded into the Python code..

[4] Aakash Bharadwaj et al., has developed Patients keep pill boxes in which they can store medicines for their daily, weekly requirements. There are also other systems to remind patients about their medical schedule, such as a computer-based alarm technique that reminds patients about their medication with closed loop communication between the doctor, nurse, and patient using the internet of things concept the medicines.

III. PROPOSED SYSTEM

Keeping the benefits of the existing technique in mind, the suggested solution would provide access to the machine via an Android application, which will be available to all users who have the app. It will also lower the production costs. Above all, this gadget will be a lifesaver in emergency circumstances when having the proper drugs at the right time, even before a diagnosis, may save a person's life. In this project, an Atmega16 microcontroller is employed, and an ultrasonic sensor is used to count the medicine in the vending machine. The tables are dispensed using a gear motor. The android app is paired via a Bluetooth device.

IV. BLOCK DIAGRAM

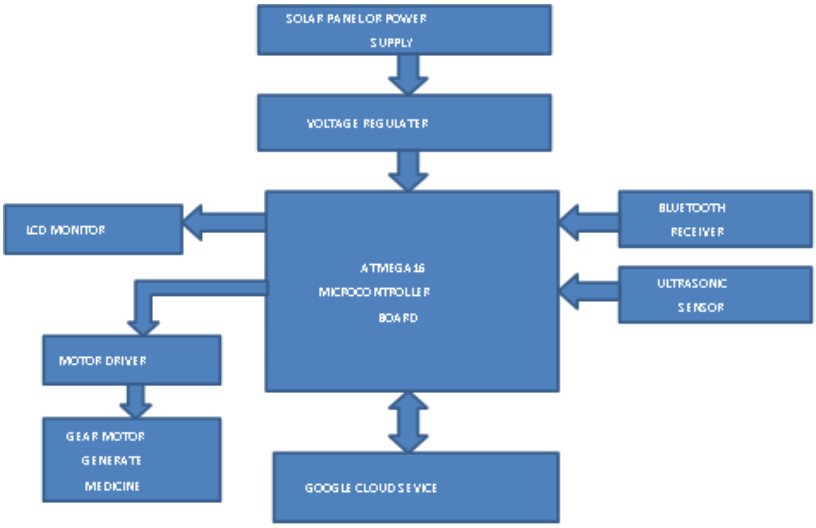
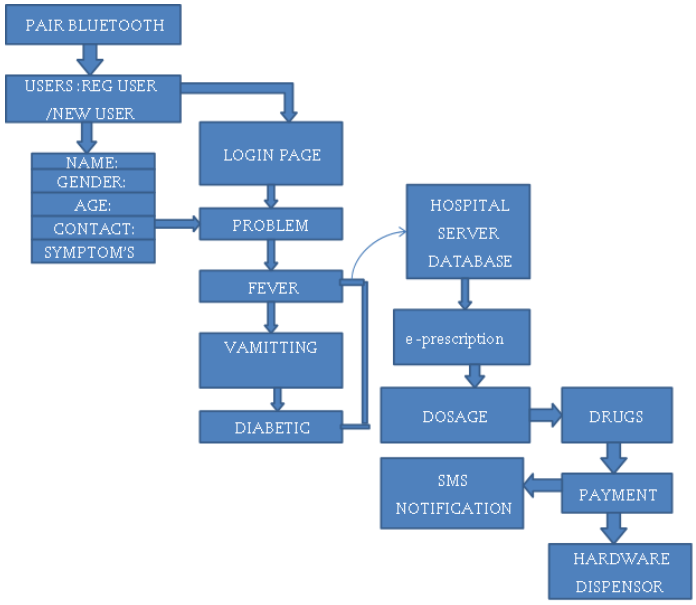


Fig 1. Block diagram for hardware side



ATMEGA16 MICROPROCESSOR : It is a 28-pin low-power 8-bit microcontroller based on the AVR architecture and created using CMOS technology. This Atmel Mega microcontroller is the most widely used AVR microprocessor. The Atmega16 is a low-power 28-pin microcontroller.

TIMER: Timers are utilised in the controller to calculate the internal signal. Two 8-bit timers and one 16-bit timer are included in the Atmega16..

WATCHDOG TIMER*:* The watchdog timer, which is used to produce the interrupt and reset the timer, is a notable feature to this controller.

SERIALCOMMUNICATION: The USART and SPI units on the Atmega16 are used to develop serial communication with external devices. Other microcontrollers, such as the Atmel 8051, are preferred over the Atmega16.

LCD DISPLAY: A liquid crystal display (LCD) is a flat panel display, electronic visual display, or video display that makes use of liquid crystals' light modulating properties. Liquid crystals do not directly emit light.

ULTRASONIC SENSOR: The LV-Max Sonar delivers extremely short to long-range detection and ranging in an impressively tiny size with 2.5V - 5.5V power.

V. CIRCUIT DIAGRAM AND DESCRIPTION

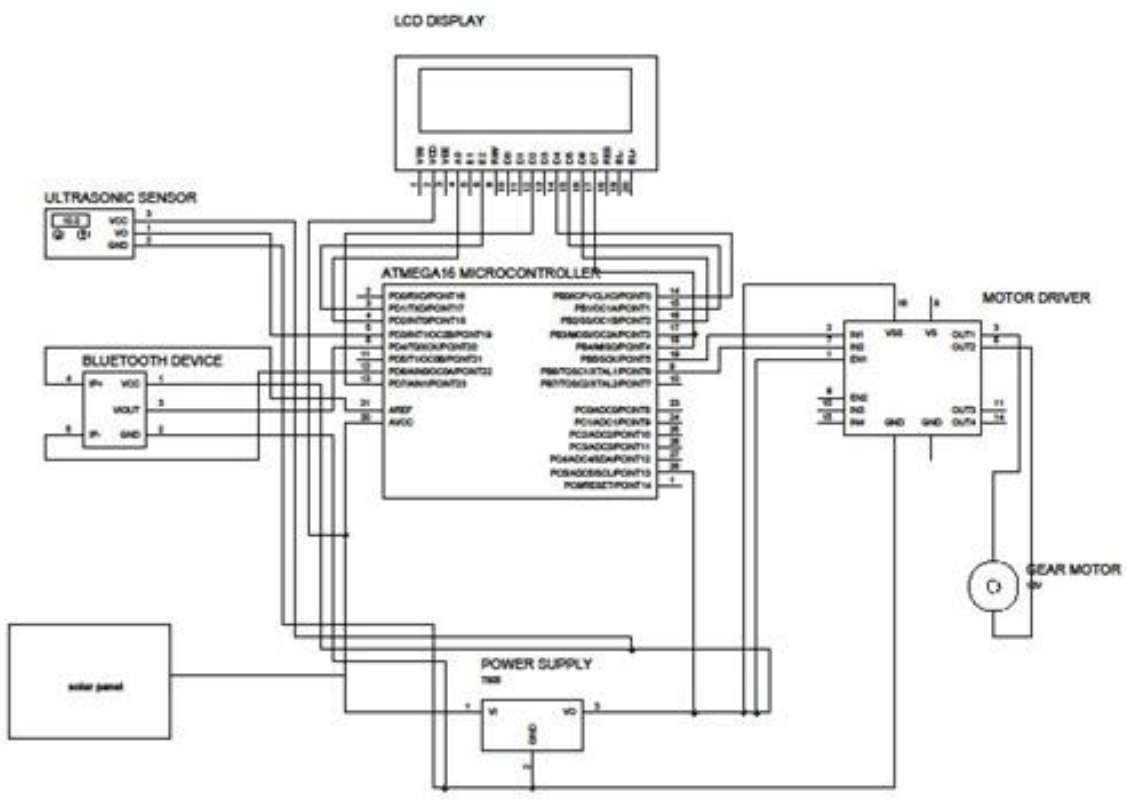


Fig3: circuit diagram

This includes both the hardware and software aspects. The user has access to the hardware in order to obtain medication from the machine. The ATMEGA16 microcontroller board, which serves as the primary unit of the hardware and is powered by the solar panel, makes up the hardware side of the machine. Because the power supplied by the solar panel is ac current, the voltage regulators must convert it to a power of 0-5 mv and dc current. The user's data is retrieved through Bluetooth, and the ultrasonic sensor is utilised to determine the level of medication inside the chamber. The LCD monitor receives data from the microcontroller and displays the device's status. The force to dispense the medicament from the machine is generated by the gear motor. The google cloud service should save the data retrieved from the user for subsequent usage. The dispenser's software consists of a login page that gets data from the Bluetooth. The data is then sent to the user page. The user page requests information such as name, gender, age, contact information, and other information depending on diseases such as symptoms, while the logic page requests that we enter the primary symptoms that have already been programmed into the device. The information is then sent to the hospital. database on the server The physicians then issue an E-prescription, which is followed up with an SMS notice. The data is supplied to the device and the hardware dispenser when the payment is done via online transaction, and the medicine is dispensed.

VI. SOFTWARE

Adding additional activities to an existing app module is one of the most typical applications of templates. Add an activity with the Login Activity template, for example, to create a login screen for your app's users. The most widely used activity templates for phone and tablet apps are covered in this section. Wear OS, Android TV, and Cloud App Engine are just a few of the app module kinds that Android Studio has templates for. When developing an app module, you may see templates for these distinct module kinds. More API-specific modules and activities, such as Google Ad Mobs Ads and Google Maps, have their own templates. The code components for certain usage circumstances, such as login into an account, are provided in the following phone and tablet templates. Displaying a detailed list of objects or scrolling over a big block of text Each may be used as a standalone app or as part of a larger app.

Fig4 : simulated prototype

VII. CONCLUSION AND FUTURE SCOPE

The pharmaceutical dispensing machine is a cost-effective, versatile, and reliable option for extending basic healthcare to all locations. The machine may be adjusted to fit any terrain and environment with minor hardware and software adjustments. This machine will be upgraded to include an intelligent medication unit that, when the quantity of medicine strips falls below a specific threshold, sends a refill notification message to the nearest pharmacy. People can use an automated medication vending machine because it is technically viable. It is based on a microcontroller and provides GCM functionality. It ensures that drugs are always available, even in remote locations. It's incredibly useful, and it's also quite easy to use.

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