

Real-Time Remote General Healthcare Clinic

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Abstract— Distributing medicines to people located in remote areas is a daunting not so easy for the Government and the Real-time remote general Healthcare Clinic help meet the above requirements. The model has basic and emergency medicines which is monitored and can be refilled. We can consider it to be a computerized drug stock-room system that people can access easily in an emergency without having to go near the pharmacy. The machine could be easily setup in remote regions, such as highways, deserts, tribal areas. It is a microcontroller and motors based system that dispenses the drug when the user accesses the event via input drug storage data can be obtained remotely based on this information refilling the machine will be hassle-free.

I. INTRODUCTION

Some groups in India are biting the dust because they are not in leadership positions and medicine is not available in time. Most need regular access to the most basic medicines. This is due to the level of network needs and as a result there is a growing shortage of funds to hold these posts. If the need for medicine is so great that pharmacies are not open or medicines are not available in this mood in the evening, problems arise. In remote and remote areas and areas with low public turnover, the availability of medicines within reach of patients is a fundamental issue. Government accountability, prudent choice, adequate public sector support, productive circular structures, control of costs and commitments, and drug delivery by current and future prescribers to improve the enduring quality of healthcare in India.

Education in the culture of normal use. In the current situation where we want all devices to be programmed, this model will be of great help for the state of well-being. This framework is fully constrained by a 16-bit microcontroller. To improve efficacy and patient well-being, these frameworks provide potential components for PC-controlled capacity, management, observation, and tracking.

The World Wellbeing Association mentions 'Countries with less social finance classes has less of well-being. Happiness Inequality is tightly linked to levels of social status. Happiness has all the characteristics of being one of the anchor points that connect education and access to data. Competent electronic health checks with clever billing frameworks for remote areas are another idea, but very useful in an agricultural country like India, where healthcare is virtually rudimentary. Dispensing machines allow prescriptions to be stored securely in permissive payment units and the use of opiates and other controlled substances to be tracked electronically. The framework is customizable as new skills can be added or current skills can be modified according to requirements.

II. RELATED WORKS

International Situation – According to work done by Shih Shih in 2016, he developed an intelligent medicinal dispenser in which the dispenser is fully programmed with the exception of setting up activities and retrieving

individual parts from the medicinal compartment. Suggested construction and operation. Improvement progresses through current connections and correspondences 2121 between parts that rely on broader collaboration [1].

According to a study proposed by Sarika Oundhakar in 2017 on information on equipment and innovations that deal with most of the ubiquitous confectionery machinery. It makes sense to use these candy machines to reduce reliance on labor and magnify their effectiveness [2].

In 2012 he proposed a framework that works for all sizes of pills and containers, done by Mukund. The concentrate also had a schedule he could change for 31 days for 21 drugs. The station broadcasts four warnings a day. In addition, a program gradually changes the number of doses and the number of doses as needed [3].

Based on a work by S. Gayathri on 2015, it aimed to monitor patients in remote regions by wearable sensors. Here, the framework includes temp, strain, heart rate, and rate increase sensors. Information is monitored and put to use by a μ controller. Additionally, the framework uses the GSM modem method to send data to the expert wearable device via SMS [4].

Referring to a work of Varun Vaid in 2014, he proposed a procedural plan to promote candy vending machines. These candy machines have a variety of applications that can be deployed anywhere and used by anyone [5].

E-Health Checking with a superior management framework for remote areas is powered by an Arduino implementation. The planning and execution of this framework combine both management and observation parts to achieve better adaptation.

National Status - A 2018 study by Rajendra Prasad P showed that efficient e-health monitoring using a smart remote area dispensing system can be used to plan and execute a variety of well-selected medications using pre-defined A framework that contains the pill container used by Arduino to allocate a. Medicine with the help of the appropriate switch. Clean pillows and maternity units are added for the wellbeing of women. Monitoring sensors such as temp, heart rate and circulatory stress is present to really see the patient's condition. If conditions exceed normal, an emergency button can be pressed to provide assistance. [6]

A 2017 Vishal Tank study provides an adaptable, easy, and crude solution for extending basic healthcare to all positions at a very secure price. Machines can be adapted to any area or environment with minor changes in equipment and programming. This machine is hooked up to add a sharp drag unit that sends a top-off notification message to the nearest scientist when the number of drag strips falls below a certain level. [7]

In 2017 According to Mahaveer Penna's research, an automated drug dispensing machine proposal was planned and implemented to further develop medical care in remote areas by caring for patients with essential conditions such as fever, migraine. This frame utilizes state-of-the-art specialized perspectives such as implantable frames and Arduino to administer the medicine expected by the patient according to the patient's wishes through a keyboard interface, which has achieved great results in improving medical care. We've also consolidated medical development information into one place. Simple trial and error justification. [8]

III. COMPONENTS

The prototype done is made using an ESP32. The other components used in the model are DC motors, switches, and IR sensors. Components are selected from those available in local stores to represent the most appropriate quality-price ratio. A DC motor is used to drive the trays and deliver the desired drug. A gear set converts that high speed into high torque. This is important for the design as the main job is to open the tray with the product on it.

A medical vending machine should be designed as a service to deliver medicines with special requests. This model's working requires a vending machine to dispense commonly used non-prescription medications on demand. The working principle of this method is illustrated in block diagram.

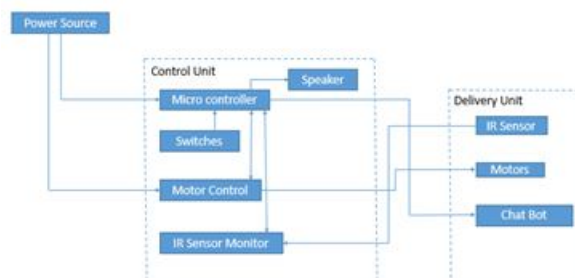


Figure 1: Block diagram

The block diagram above fully describes how the project works. As you can see, the whole project is divided into her two units, the control unit and the delivery unit. The control unit consists of parts necessary for data processing such as controllers and input switches, and the delivery unit consists of motors, infrared sensors, chat-bots, etc., all attached to the delivery tray.

The main component of the model is the microcontroller ESP32. Connect all peripherals and programmatically con-trol all processes in the system. Panels are used as inputs for controllers. Separately, an infrared sensor is connected to the controller to monitor and update the availability of medicines in the medicine tray. push buttons in the system allow product selection. Each medicine becomes available at the push of a button.

DC motors are responsible for drug delivery by opening and closing the shell. Pressing a specific button turns on the motor for the respective drawer, opening it with the help of a gear set and closing it after a specified time as a pre-caution. Patients/consumers have access to medicines during business hours.

The prototype has a chat-bot feature that recommends medications that are appropriate for a patient's symptoms. This chat-bot uses embedded C and is trained with a certified list of symptoms and medication records.

Other than that the availability of medicines in the trays are monitored and continuously updated to the cloud via internet using the ESP32 controller. And the data in the cloud are in encrypted format for basic security purpose and for viewing the details an OTP generation method for the registered email id is used

The data is available with the time stamps.

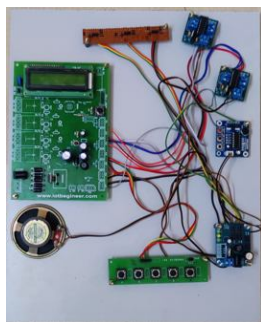


Figure 2a: Control unit



Figure 2b: Delivery unit



Figure 3: Chat-bot

IV. LIMITATIONS OF THE PRODUCT

One main limitation of the vending machine is the required supply voltage setting for the . This is determined by the input voltage for the element and its diversity. The Main Board runs up to 15V along with the DC motors also which also draws considerable amount of current and requiring input voltage of 10-30V, so we can't connect the machine straight to the main 220V power supply. In the prototype the Control board and the motor are powered by individual power supplies, can be considered impractical.

V. PROBLEMS AND POSSIBLE SOLUTIONS

A problem observed is when the IR sensor generated high output value. When inspected the reason for this malfunction was the bright lights in the environment where it was used. So the IR sensor works the best in dark conditions

Another problem is that since multiple components are used the availability of pins for connecting them lacked which resulted in making multiple compromises and it also reduces the availability of pins for additional components in the future

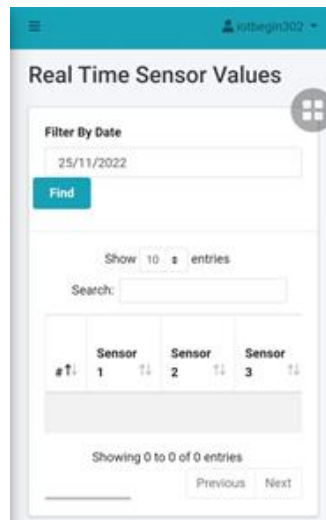


Figure 4: Live stock monitoring

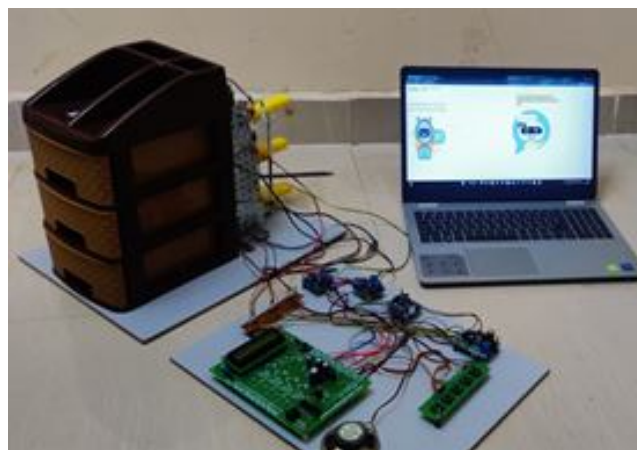


Figure 5: The final model

VI. FURTHER IMPROVEMENTS

In the current prototype, there is a vast amount of improvements that can be made. Firstly the lack of user authentication. Since we are dealing with medicines to prevent cases of overdose or any other undesirable things from occurring authentication is a must and can be added. Which QR code method may be a good option with each person having their own QR code and when it is scanned the patient will be identified

The power supply, as mentioned above, consumes very little power considering its size, and the main advantage of the proposed vending machine is its remote location. So the system can be completely off-grid. this is a better option. , would be a better option A better option would be to use solar panels and batteries to store the extra power generated for running without the sun.

For pharmaceuticals, the issue of dosing must be addressed. To do this, we can use Young's rule, a formula that calculates dosage for different age groups using age and adult dosage as parameters. Depending on the patient's age, the system will provide the right drug with the right dosage.

Patient monitoring is not done by the model, sensors such as temperature and blood pressure sensors could be used in the future to monitor patients and recommend better drugs to them.

VII. CONCLUSION

In this real-time remote general medicine clinic project, a basic model of a medication machine with inventory monitoring and consultation software (chat bot) was created. Its potential hasn't been fully realized yet, but there are a lot of additions that can be made to the model, so this project shows how to make a remote medication dispenser and what additional basics you can do with your project. Ideas include tethering chat-bots to hardware, the ability to physically monitor patients to prescribe better dosages, and software improvements for better counselling.

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