Smart Pill Box

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***Abstract* —** *Most of the old age people have multiple medicines to take to overcome their illnesses. Many deaths occurs due to wrong medication on wrong timing, or not taking medicine at all. Thus, in this paper a solution is proposed to overcome this problem. We are designing an intelligent pill box that can remind the elders to take medicine on time and can inform the families remotely weather the elders took the medicine or not. The pill box is equipped with a mobile application which gives privilege to the caretaker of elders to check and program the pillbox. If the elders don't take medicine, the caretakers will be informed on their mobile application to remind the elders manually.*

Keywords — *Intelligent Pillbox, Wemos, Internet of Things, Android Application, alarm system.*

I. INTRODUCTION

In our day to day life, due to busy schedule and workload, people often forget to take their medicines on time. Especially, old aged people having illnesses and who are illiterate have problem while taking the medicine, and sometimes it's not possible for the family members to give them medicine at prescribed time.

There might be chances of them taking wrong medicines because of poor eyesight. It is also possible that they might take extra dosage of same medicine, so this may lead to another medical condition which is not desirable. In order to stabilize their health condition they need to take right medicines at the right time.

In the recent years IOT plays an important role in making devices which are very helpful in our day to day life. So to solve the above issue by using IOT, we propose an intelligent pillbox which has alarm system and LEDs for indicating the right compartment of pill box from which the person is supposed to take the pill at respective time. Hence the objective of this paper is to design and develop the pill box having the alarm system, sub compartment for different dosage, automatic lock system for compartment and feedback to the mobile application use.

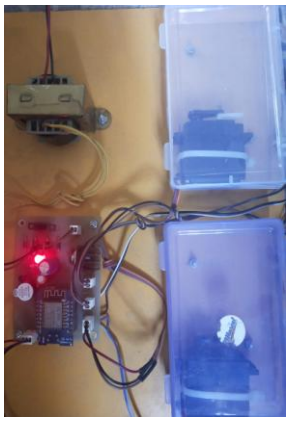
II. LITERATURE SURVEY

As the era is changing most of work is done using automated systems. Automated pillbox are created especially for elder people, so as they can take the medicines on time. Pillbox have alarm system which reminds people to take medicines on time. Many such automated pillbox are there in the market, different companies create them with different functionalities. For example, GMS MED-E-LERT automatic pill dispenser, electronic dispenser, E-Pill's tamper proof automatic medication dispenser, etc. The pillbox available in market includes alarm system but lack in much other functionality. Recently, pillbox was modified by many researches and new features are added. For instance, a pill box called as "The Intelligent Pillbox" proposed in uses Assistive Technology to open and close the pillbox automatically. Then, a smart pill box proposed in uses infrared sensor and Arduino microcontroller, in this alarm notification is also sent on user's smartphone. Lastly, an intelligent pill box proposed in it is a single user platform and it connects the patient, doctors and pharmacies with each other. In the previous paper Pill Dispenser with Alarm via smart phone notification IOT technology was used which generates reminder as proposed time but there was no confirmation feedback. In next Paper "Enhancing Healthcare using m-care Box" uses Alarm notification service but in this paper there was no feedback notification and it was oriented for single user. "A smart Pill Box with remind and Consumption confirmation function" camera were use in the compartment but it was costly as well as complex to put camera in every compartment. So far, there is no pillbox which gives proper feedback of weather the medicine is taken or not, to the user. Hence, we are designing a pillbox which will give proper feedback of confirmation to the smartphone user using mobile application. The data will be stored on cloud and further using communication manager it is passed on to the user as a notification.

III. PROPOSED SYSTEM

In this work, we have implemented a model of smart pill box with alarm and android phone notification by combining the hardware part and software part. It consist of three layer mobile application, server and pill box. The pill box consists of electrical and mechanical components such as servo motors, wire etc. Below shown block diagram is a smart pill box prototype Mobile application is user interface which is used to take information about pill time, date, schedule and then sends data to server which contains module or programing for functioning of smart pill box. We give power supply to the microcontroller, the microcontroller then controls all the sensors and motors. Real Time Clock (RTC) module to provide

the time and date information .We use touch sensor to get feedback from elder when he close the lid of box manually. Next, the output part consists of a LED to indicate from which compartment medicine has to be taken, servo motor is used to open and close the lid of the respective medicine compartment.



Modules:

(A) Micro Controller : Auduino Wemos: It is a microcontroller which is connected to firebase and contains the code of hardware i.e. opening and closing the smart pill box, sending notification, matching the schedule to open the box.

(B) Touch Sensor : In the implemented module touch sensor is mounted on pill box to take the records of weather the medicine is been taken and send notification accordingly.

(C) Firebase : It is cloud based service used to store and retrieve data.

(D) Android Application : It's an android application where medicine schedule is set and updated.

IV. SYSTEM ARCHITECTURE

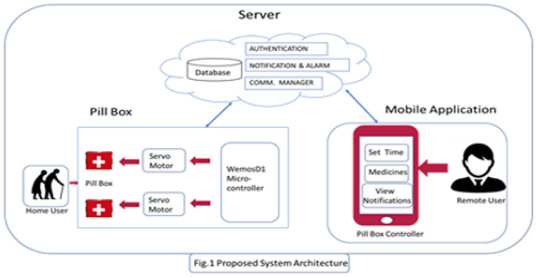
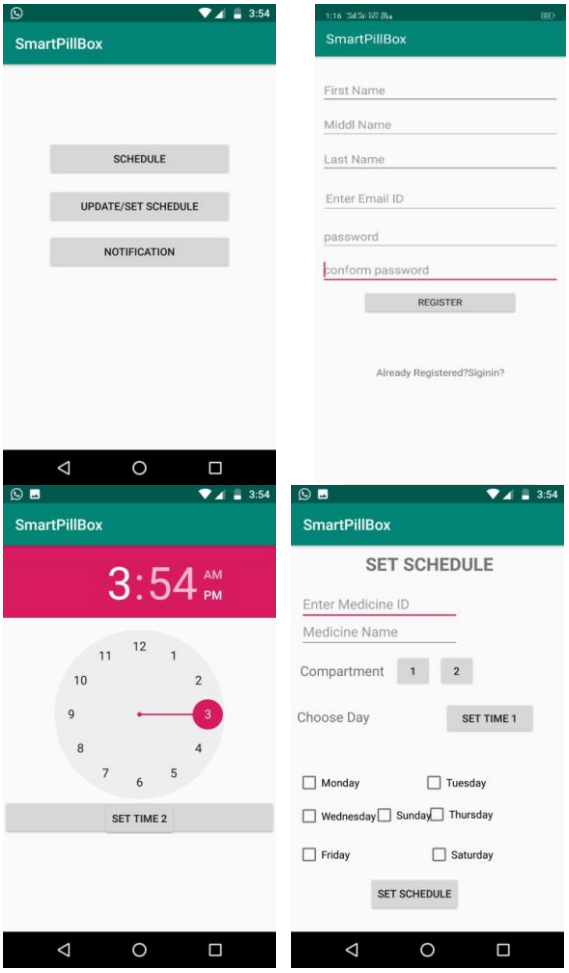


Fig.1 Proposed System Architecture

V. USER INTERFACE

The User Interface is designed with simplicity so as a person having even the basic knowledge could use it hassle free. The mobile application keeps the user updated about the schedule of the medicines also it gives the acknowledgement of weather the medicine is been taken or not. All the data is stored and retrieved from the cloud database. The cloud database used is FIREBASE.

For the user logging in for the first time, he'll be asked to register himself with his e-mail ID. Once the user is registered the details are stored in the database. The credentials will be verified every time a user tries to login, only if the credentials are matched the access will be given. Hence the security is maintained and only authorized user can access the app. Once logged in user can set schedule by entering medicine id, medicine name, the compartment number, time and day on which the medicine is to be taken. If there are any changes in the prescription or the timings of the medicine user can always update the schedule from the app very quickly and easily and can even add the new schedule.



VI. CONCLUSION AND FUTURE WORK

The proposed system for Smart Pill Box has the alarm system, touch sensors and automatic lock system which ensures that the medicine is taken safely and on time. The main advantage of this system is feedback to the mobile application user by using the touch sensors. Data of the patient whether medicine is taken or not is also saved in the database. In future, it could be possible to connect the application with Medical stores and send list of the medicine to medical store which are about to get over.

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