

Smart Pill Tracking System

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Abstract - Now a days, a large portion of the patients may neglect to accept their drugs according to the solution because of mental pressure and busy schedule. Henceforth, it might cause drag out period to recoup from the illnesses. Now and then, the matured patients are swallowing tablets and their dose level inaccurately causing an extreme issue which gives rise to need for legitimate medication at exact amount and time. To defeat these issues, a novel **Smart Pill Tracking System (SPTS)** framework is proposed. Our medication distributor is focused on clients who consistently ingest medications or nutrient supplements or attendants who deal with the more established or patients. Our medication box is programmable that enables attendants or clients to determine the pill amount and day to take pills, and the serve times for every day. Contrasted and the conventional pill box that requires clients or medical caretakers to stack the crate each day or consistently. Our brilliant prescription box would altogether discharge medical attendants or clients' weight on oftentimes preloading pills for patients or clients. This venture manages the time at specific, the Patient needs to take pills.

Key Words: Legitimate Medication, Smart Pill Tracking System, Programmable, Medical Caretakers, Mental Pressure, Conventional.

1. INTRODUCTION

Our smart pill tracking system following framework venture is to assemble a microcontroller based savvy drug box. The arranging is set to the structure from the outset reminding and it will in general be changed by the patient as demonstrated by his essential. The system will start alert at that particular time. This movement the pills will be discharged. In the wake of having pills, the customer must need to put the no. of pills he ousted from the carton. As, the no. of pills remains relatively few, the solicitation for the particular pill is sent by the system therefore to restorative shop through WIFI structure. Along these lines, it is helpful to customer to get the pill at explicit time and keep up a good way from confusion among pills.

Our venture is to make a IoT based pill tracker which uses an ultra-sonic sensor. It is necessary for the patient to take pills from the crate at the perfect time generally our frameworks keeps making enormous sound until the medication is taken out from the case. This notice highlight adds life years to the patient and along these lines this thing is extremely important for our venture. The issue of

neglecting to take pills at perfect time, taking incorrect prescriptions and incidentally taking of lapsed drug causes medical problems for patient and these prompts experience the ill effects of undesirable life. All these issues can be settled utilizing a shrewd pill following framework. The project uses a NodeMCU microcontroller to ensure the dispensing of pills takes place within a given time span and can be managed through mobile application developed using android studio.

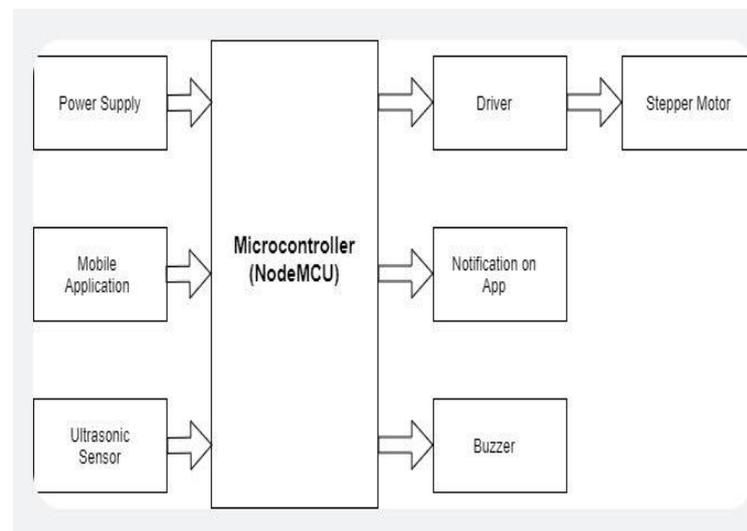


Fig-1: System Architecture

2. LITERATURE SURVEY

Taking Medicine at perfect time in appropriate sum will lead towards the quicker recuperation. As a general rule what happens is that, they get their recommended prescription yet neglect to adhere to their human services' proficient guidelines. Numerous individuals while taking endorsed drug don't adhere to their doctor's' directions. Some basic explanations behind this are People may begin feeling better and choose to not complete the entirety of the medication. In a few cases individuals think this drug isn't working and they may not see an improvement in their side effects immediately and may quit taking the prescription. In some different cases individuals attempt to set aside cash and they believe that these meds are costly, and individuals may skip dosages or take less.

As indicated by World Health Organization, over 80 percent of the individuals over the age of 60 years are recommended meds that are to be regulated 2 - 4 times

each day. With the expansion in Cardiovascular illnesses and Diabetes among the companion bunch standard medication organization has become a need. Be that as it may, among this another 40-60 percent is having the issues identified with overlooking the taking of drugs at correct time.

The proposed framework is reasonable for a wide range of patients. It productively controls the hour of patients to take medication. It additionally lessens the proportion that patient misses and postpones taking medication. What's more, the crate likewise has a chilly stockpiling for hardly any exact drug. On the off chance that the tablets are vacant in the crate it sends an alarm message to top off it. Discover field helps in finding the case.[1] This paper investigates the utilization of IoT based applications in medicinal field and proposes an IoT Tiered Architecture (IoT TA) towards a methodology for changing sensor information into ongoing clinical criticism. This methodology considers a scope of viewpoints including detecting, sending, preparing, putting away, and mining and learning. Utilizing this methodology will create helpful and compelling answers for seeking after frameworks advancement in IoT medicinal services applications. The aftereffect of the survey found that the development of IoT applications for social insurance is in regions of self-care, information mining, and machine learning.[2] In this paper an electronic pillbox called MedTracker was proposed; in the MedTracker, the time at which each spread was opened or shut is recorded, and transmitted to PC by methods for a Bluetooth connect.[3] In a pill box reliant on a MCS51 littler scale controller was proposed; that pill box can pass on remedy using a stepper motor at a booked time, anyway there was no game plan to record when the patient truly took the medication[4]

3. OBJECTIVES

The proposed system has a major edge over prevailing mobile applications in the sense of data input given to the system. Raw data is directly sent to the processing and controlling data from the sensors mounted on or embedded in each of the equipment. This minimizes much of the error that occurs in the data calculation and hence predictions, due to human intervention. Client can set time table of medication without anyone else's input. Great in quality and execution; ready to be trusted for patients and mature age individuals. Agreeable for mature age individuals and give solid life to patients who are consistently take meds. The item can be utilized for long time. Caution will ring at appropriate time which is set by client already. It will need less Maintenance. It is a one-time venture a while later it tends to be utilized constantly.

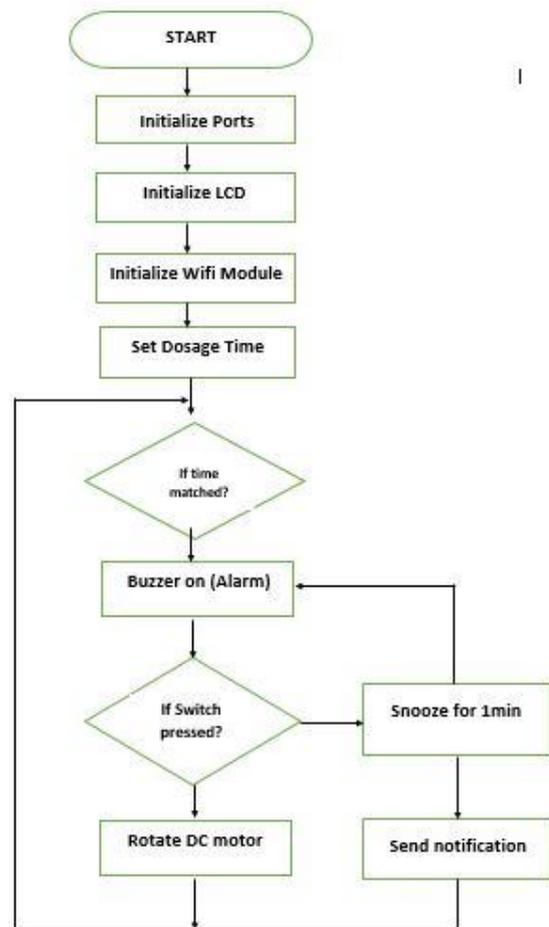


CHART-1: Flow Chart

4. SYSTEM DESCRIPTION

4.1 Hardware

The system consists of both hardware and software. Microcontroller used is NodeMCU and ESP8266 WiFi (IEEE 802.11 b/g/n) enabled chip is interfaced with it to facilitate sending the data to the database maintained on Firebase by Google Inc. This microcontroller can be programmed using the Arduino IDE. It is fully acquired with TCP/IP stack and is a lower cost and low power consuming chip. With the help of appropriate libraries and the acquired data can be pushed to the cloud. Database services being used by the system are Google's Firebase. Firebase helps to maintain a real time database. It allows the admins to push and get data for the required fields. To dispense the pills from the box a stepper motor is used. This project uses a stepper motor (NEMA17) and its driver (A4988). NEMA 17 is a hybrid stepping motor with a 1.8 step angle (200 steps/revolution). Each phase draws 1.2 A at 4 V, allowing for a holding torque of 3.2 kg-cm. NEMA 17 Stepper motor is generally used in Printers, CNC machines and Laser Cutters. The project also uses a beep buzzer to notify user about dispensed pills and is rung

after every 2 minutes if not taken by the user. To notify the user regarding the unattended pills an ultrasonic sensor is used to determine whether the pills are taken from box or not. Here we are using an ultrasonic sensor which has range of about 3cm. The module automatically sends eight

40khz square wave and automatically detects whether receive the returning pulse signal. If there is a return signal, the output level will be high and the high time of the signal is the time from transmitting to receiving.

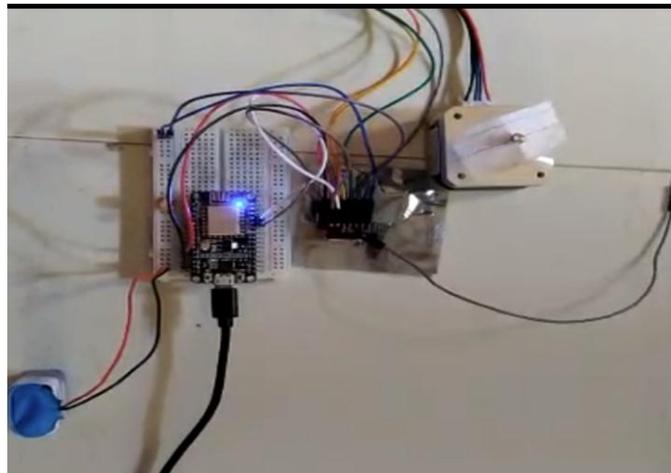


Fig-2: Circuitry

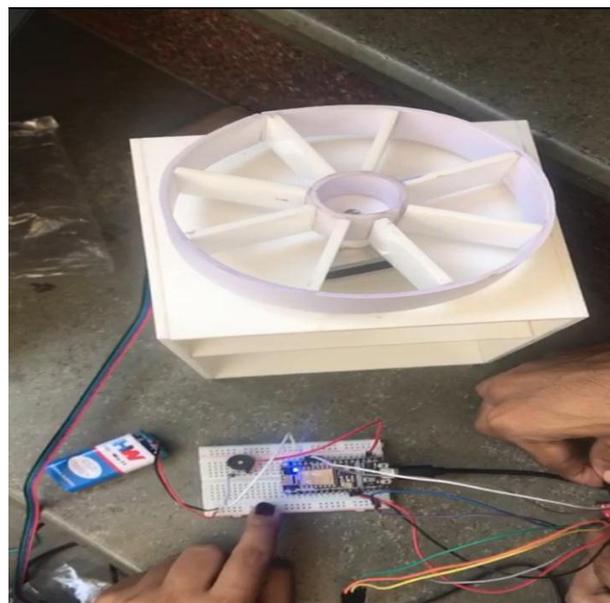


Fig-3: Hardware System

4.2 Software

Raw data from sensors is generated, achieved and synchronized by the microcontroller using Arduino IDE supporting a wide range of libraries that help in calibrating the data in a useful format. The processed data is then stored on Google Firebase, a reliable and secure cloud service by Google Inc. Firebase provides various other services such as mobile applications support,

Machine Learning Toolkit for data analysis, etc. Data stored on the cloud is displayed on a user-friendly mobile application developed on Android platform using Android Studio. Authentication support along with a user session, beginning notification, support for system hardware such as Driver of stepper motor, and timely notifications are the features designed in the system mobile application. Using mobile application a specific time can be set to make sure that the medicines are being taken on time.

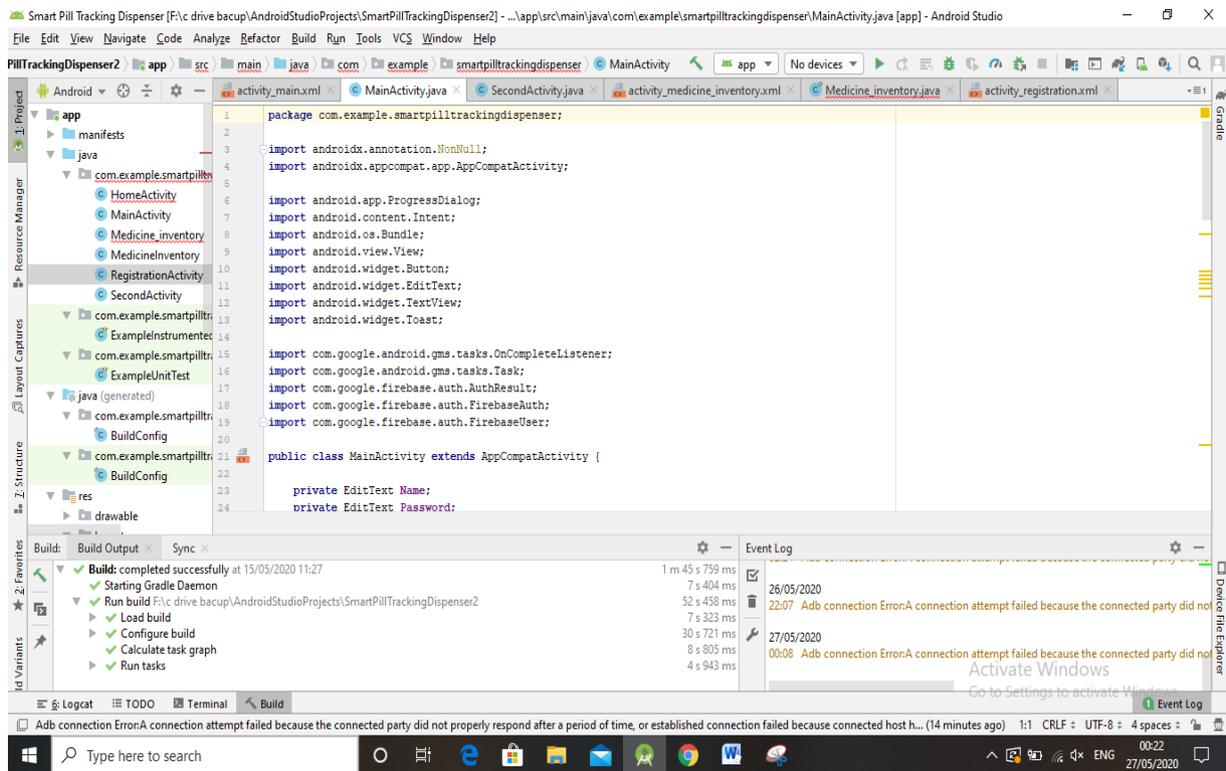


Fig-4: Android Studio Interface

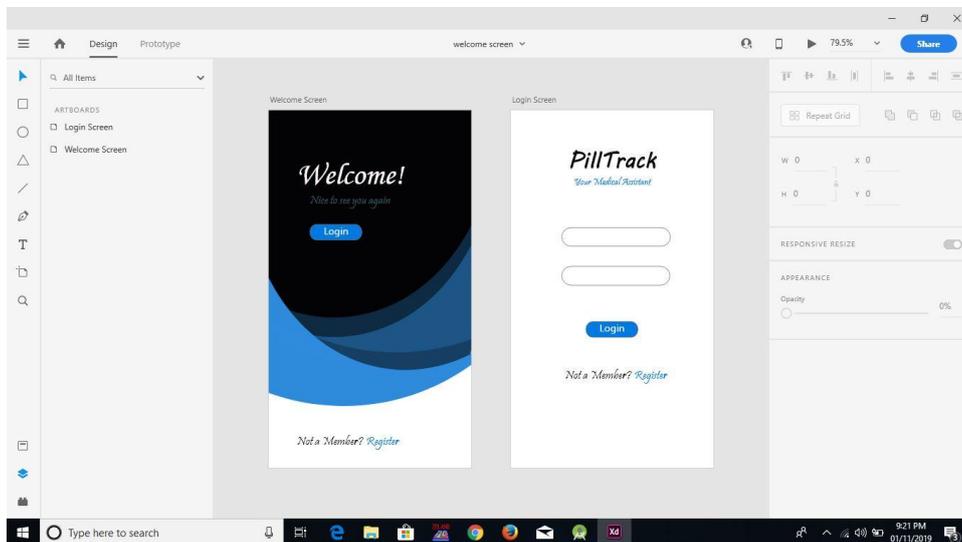


Fig-5: Application Frontend

6. IMPLEMENTATION

Process starts with authentication; every user needs to create its own user id and password in the mobile application. This will allow the user to input the time at which pills are to be taken. SPTS is automatic monitored locked medication dispenser device dispense up to 6 times per day. The SPTS has been developed to give the patients caregiver peace of mind knowing that right medication are taken by patient on right time . When the alarm goes off,

this SPTS reminds patients to take their dose by long duration alarm. Alarm will ring for 15 minutes, if a patient does not take medicine or misses dosage, system will be automatically notifying the caretaker. It has feature of remotely notifying caretaker by sending message, email or phone call when patient misses dosage. Current system can alerts caregiver about drug refilling by sending message, or email. SPTS is lockable pill dispenser keeps medication safe. It has rotating disk that contains several

compartments in which pills are separated in order to create appropriate dosage.

The system's rationale structure contains three significant stages: Client instatement organize. Correlation arrange. Update organize. In the client introduction arrange, the client enters the current time, date and pill data (counting sum and spend time in jail for each kind of pill). After the client wrapping up all the data, the gadget will enter the examination organize except if the introduction catch is squeezed. During the examination arrange, the framework analyzes the pill data for medicine information inputted using mobile application with the time tallied by RTC. When the data entered by the client coordinates the RTC time, the framework will hop out of examination arrange and enter the update organize. In the update arrange, the system will 3 persistently play buzzer, and send a notification on application regarding the status and also rotate the pill dispensers to pop out pills.

This project works by applying direct current (DC) to the stepper motor. The stepper motor moves at an angle of 45 Degree so the medicine that is kept in the rotating disk fall once they come on the section that is cut. The medicine is then stored in a box where the UltraSonic Sensor checks if the medicine is taken or not. Once the medicine is taken the timer resets and the stepper motor after (X time) will again move at an angle of 45 Degree and the same process will happen.

7. CONCLUSION

The goal of our project is to provide healthy and tension free life to those users who are taking regularly pills and to provide this product at affordable cost also. Our project is also reusable by exchanging those other medicine box that has only alerting system and are non-usable or unaffordable compare to our product. This device can help and give advantage to the caretakers. The main objective for this project is to monitor the consumption of medicine intake for patients. This device is controlled by using GSM system, so the nurse does not need go to the personal ward to give the medicine. This system is a very good to apply in the hospital because it can make the caretakers job easier besides making the patients more relaxed to stay at the hospital.

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