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E-Max: Your Personal M-care Companion

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Abstract*:* Many of the people forget to take their medications on time. This proposed device is an alarm based device to remind people to take their medicines at respective time as prescribed by the doctors. The M-care box is a single board computer assistive device basically used in hospitals or for people in old age or people suffering from short term memory loss. This research includes the use of a mobile application. The application intimates or reminds the user to take their pills. It even allows the patient to enter some of its symptoms to get a reply from their respective doctors or even call them in case of emergency.
The proposed application can be used by the patients as well as the doctors. The doctors are able to see the status of the medications or even respond to the patients concerns.
The use of the intelligent M-care box in hospitals and in daily use will ease the difficulties of the patients as well as the doctors.
Keywords: Automated Medical Box, Intelligent Medical Box, Cloud Storage.

I. INTRODUCTION TO E-MAX

The development of technology systems is increasing day-by-day at identical time several new diseases area unit being found to be spreading. In most of the cases, recovery from a selected sickness takes longer than usual to recover. Even once consulting a doctor, several people neglect final consultations once the treatment due to long queue of patients looking ahead to appointments. A clock based medical box to cue the patient regarding the course of medication was developed. A program was developed for the patient additionally because the doctor to observe the dose of the drugs taken by the patient. An extra program for doctor and pharmaceutical store was created to order medication provides on behalf of the patient to urge the medicines delivered at the patient's sill. The amount of medication is consistently updated within the information on each dose. This analysis includes the utilization of an associate mobile application. The appliance intimates or reminds the user to require their pills. It even permits the patient to enter a number of its symptoms to induce a reply from their several doctors or perhaps decision them just in case of emergency.

The planned application are often utilized by the patients additionally because the doctors. The doctors are ready to see the status of the medications or perhaps answer to the patients issues. The use of the intelligent M-care hold in hospitals and in daily use can ease the difficulties of the patients additionally because the doctors.

II. EXISTING SYSTEMS

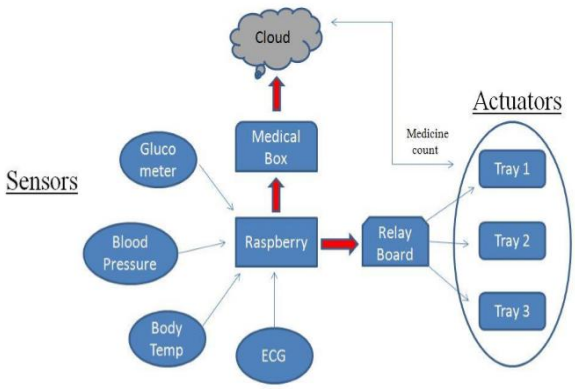

Figure 1: Medical Box using Raspberry Pi 3

A. A system is being developed using Raspberry Pi 3 which lies on single board computer. The sensors for diagnosing area unit connected to the raspberry Pi that sends the information to cloud storage. A relay board is coded in such some way that tray one opens for medicines to be taken within the morning, whereas tray two is for medicines for afternoon, whereas the third tray is for the night medicines per doctor's prescription. The whole data is keep within the cloud, the patient information may be accessed solely by the doctor. The raspberry pi are going to be coded in such some way that associate degree alarm notification are going to be sent to the patient. The quantity of tablets are going to be updated within the cloud information. The patient's compliance to the prescription may be monitored by the doctor daily or sporadically. Each try is attached with a DC motor having rack gear attached to it.

B. In the next system, Radio Frequency Identification (RFID) tags are used. As a part of IoT – intelligent parts, radio-frequency identification (RFID) tags, embedded sensors and actuators, etc. – areapace developed and considerably swollen in scope. As a consequence, the quantity of IoT-based applications has boomed. It uses weight sensors to sense the number of tablets remaining in the medical box. It also informs the respected chemists in case the medication count becomes zero.

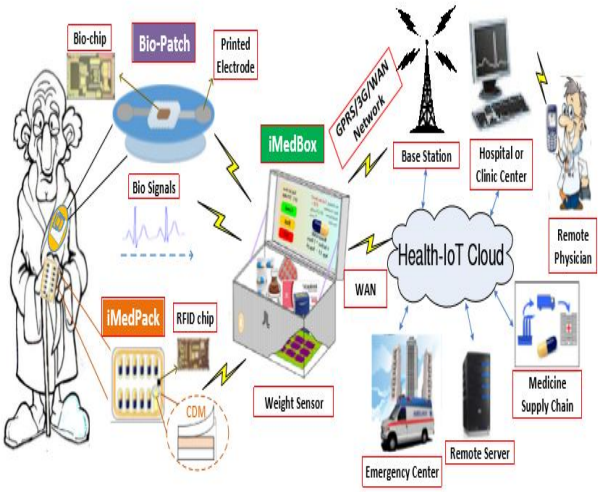

Figure 2: Medical Box using RFID Tags

III. PROPOSED SYSTEM

This proposed system is a mobile application. M-care companion (box) is used by old age people or by people suffering from short term memory loss. It is accompanied by a hardware kit with all necessary medications. Due to the application, patients are reminded to take their medicines on time. This application can also be used by doctors.

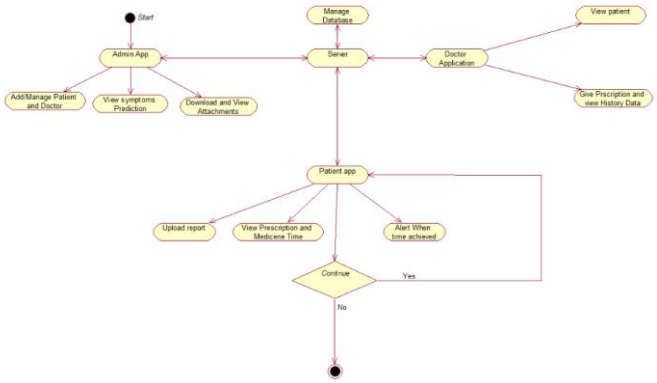

Figure 3: Proposed System

In case of any other symptoms of illness, patients can consult their respective doctors. Using this application, the next appointment can be scheduled as well as the patient will also be reminded of their appointment with the doctor. In case of emergency, the doctors as well as the patients relatives will be informed

immediately. LED's are used to glow light in the compartment from which medications have to be taken. This proposed system will require a constant power supply, Bluetooth connectivity.

IV. HARDWARE'S USED

A. **Controller:**

AVR Controller:-

An AVR microcontroller is a type of device manufactured by Atmel in 1996, which has particular benefits over other common chips. AVR was one amongst the primary microcontroller families to use on-chip non-volatile storage for program storage, as critical one-time programmable storage, EPROM, or EEPROM utilized by alternative microcontrollers at the time. AVR microntrollers are available in completely different packages,some designed for through-hole mounting and a few surface mount. AVRs are offered with 8-pins to 100-pins, though something 64-pin or over is surface mount solely. the general public begin with a DIL (Dual In Line) 28-pin chip just like the ATmega328 or the 40-pin ATmega16 or ATmega32. Atmel's AVRs have a two-stage, single-level pipeline style. this suggests subsequent machine instruction is fetched because the current one is capital punishment. Most directions take only 1 or 2 clock cycles, creating AVRs comparatively quick among eight-bit microcontrollers. The AVR line will commonly support clock speeds from zero to twenty megacycle per second, with some devices reaching thirty two megacycle per second.

B. **Device Driver:**

ULN 2803:-

The ULN2803A device could be a 50 V, 500 mA Darlington semiconductor device array. The device consists of eight NPN Darlington pairs that feature high-voltage outputs with common-cathode clamp diodes for shift inductive masses. The collector-current rating of every Darlington combine is 500 mA. The Darlington pairs could be connected in parallel for higher current capability. Applications embrace relay drivers, hammer drivers, lamp drivers, show drivers (LED and gas discharge), line drivers, and logic buffers.
Features :-

- 500-mA-Rated Collector Current (Single Output)
- High-Voltage Outputs: 50 V
- Output Clamp Diodes
- Inputs Compatible With Various Types of Logic

C. **LED's:**

The normal LED bulbs are used to glow light whenever an alert is generated.

D. **Bluetooth Connector:**

The Bluetooth connector is responsible for connection with the mobile application.

V. ARCHITECTURE OF E-MAX

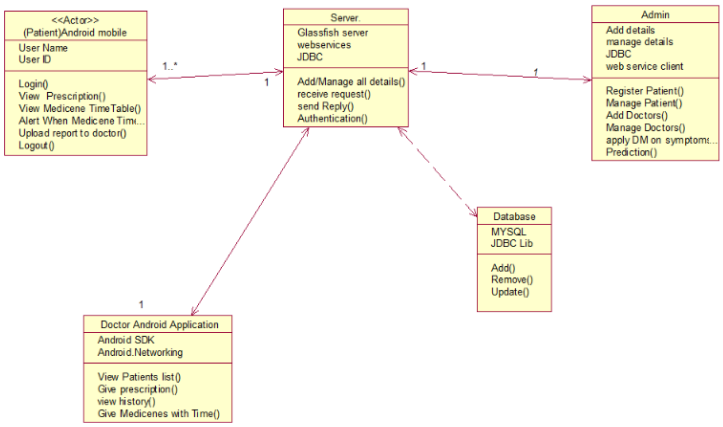

Figure 4: Flow of the proposed systems

WORKING THEORY:

The Medicine Box works in the following way:

1. The prescribed medicine is stored in the Medical Box.

2. The schedule for the medicine consumption is stored on to the application.

3. Every time the patient opens the bottle, a counter counts the openings and stores it back.

4. Every time a pill is taken, the medicine Box can note and decrease the counter used to store quantity of the pills and use this information to mark the time the pill was taken and from count the number of times the bottle is opened, the remaining pills calculate what number pills were taken.

5. The Medicine Box will prompt the patient to take his medication. Additionally, the medical Box will send alerts using indications like light and sound.

The Medical Box keeps track of the quantity and time of pills the patients have taken. This invention is thus capable of rising the patient's health drastically. The functions of the Medical Box are supported by LEDs and a microchip which is keeping track of your time and quantity of pills left within the Medical Box.

Patient's schedule for taking his medication is additionally stored on. The Medical Box uses this information to infer whether or not the patient is obliging together with his treatment. The device will hold over one tablet/pill as a result of the old and sick typically are prescribed with over one medication to form them work. The conventional range of medicines by every patient over the age of sixty years was larger than five per day. Whenever the patient has to take his pills, the patient receives an alert. The LED's glow inside the medical box to indicate which medicine are to be taken.

VI. ADVANTAGES AND DISADVANTAGES

Advantages:

1. It stores medication timings and details for the patient.
2. It schedules appointments for the patients.
3. It reminds doctors and patients about their appointments.
4. It provides emergency alerts.

Disadvantages:

1. Server requires to be 24*7 ON.
2. It requires constant power supply.
3. It requires constant Bluetooth Connectivity.

Applications:

This proposed application can be used in hospitals as well as at residence. The hardware kit is used by patients. In future, alternate medications including same contents (drugs) can be suggested. Confirmation messages can also be provided to the relatives regarding consumption of medicines.

VII. CONCLUSION

This work provides scope for development of helpful device for the people and facilitate them follow the medication course properly and provides them an honest healing expertise.

This could additionally create the recovery method quicker because the medicines are going to be taken on time. The health data storage and access take place inside the cloud. By immediately informing the health professional in adverse case, probability of cure is increased and better quality of life is provided.

This work additionally provides simple property between the doctor, patient and also the pharmacies therefore creating recovery method way more simple.

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