

AUTOMATED SYSTEM FOR MEDICATION MANAGEMENT

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Abstract: *Nowadays the trend in healthcare is to move routine medical checks and other health care services from hospital to the home environment. In this project we are proposing the following systems, digitalizing the manual prescription, Controlling the medication of aged people by continuously monitoring their intake and dosage of the medicines, The proposed model has an intelligent medicine box that gives alerts to patients for their medication at the right time. It is connected to the internet to make timely updates about medicine to patient's Smartphones through notices in android applications. The android application will be linked with the hospital website and the associated doctors and the nurses can monitor the patients by giving alerts to the patients for their medication at the right time. The application automatically gives an alarm to the patient to take the medicine at the right time.*

I. INTRODUCTION

The category of patients involves all human beings-teachers, students, businessmen, housewives, children and also all of us have a busy hectic schedule. Today's life is full of responsibilities and stress. So people are prone to diseases of different types and it is our duty to make ourselves stay fit and healthy. If the patient stays at home then he or she might get someone to look after him/her but when one is not at home, is out of the city or state away from home then it is hard for the family members to call them and remind them their dosage timings every time. Individuals disregard about their well being. Individuals think that it's troublesome in recollecting the drugs to be taken. Indeed, even today guardians still use the manual strategy to give the medicine to the patients. Point of the framework which has been proposed is to move restorative check-ups from clinics to home. The framework proposed causes the patients to take pills at the specific time. The carelessness of the patient with respect to legitimate prescription, that is taking medications at standard interims taking overdose than recommended and sporadic check- ups may prompt a few symptoms and beat restorative carelessness of the patients by cautioning them every now and again in regards to the admission of meds at appropriate time and interims. It likewise helps in telling the patients with respect to the check-up plans and the archives to be conveyed for the following check-ups. The proposed model has a smart medicine box that offers alarms to patients for their medicine at opportune time. It is associated with the web to make auspicious updates about medication to patient's cell phones through notice in android applications. With this we get an opportunity to use technology in a better way so that it can be made useful to us. And it plays an important part in our daily life and helps us stay fit in many ways.

II. LITERATURE SURVEY

The system works on recall and consumption functionality regarding the intake of medicines. The pill that has to be consumed pops out of the container at the particular set time thus reducing the confusion as to which medicines has to be consumed, which also reduces the burden of caretakers regarding the proper medicines that has to be given from time to time to the elderly people. It also sends a purchase order to the medical shop when the medicines are over. The alert sound that will be given helps the patient to consume the medicines at right at the right time without fail and also without anyone's help [8]. Monitoring the health of large number of patients suffering from various chronic diseases especially in the case of elderly people has become a tedious task with rapid population growth. The elderly people find it difficult to manage with medicines and the paper comes up with a smart system that monitors the dosage as well as their health. The Arduino board will receive continuous readings of the patient from a smart sensor. Each pill container has its prescribed timing and it is interfaced with real clock time. When the time comes the alarm rings and reminds the patient for consumption. The system helps doctors in keeping track of a large number of patients and their medical dosages as well as routines [1]. The aged people are often the victims of chronic diseases and should be taking medicines without fail are also suffering from dementia and forget their daily routines of medication. Reminding about the medication schedule and monitoring the patients and updating of medicines from remote places by the doctor through the web. The paper has been focused on to be beneficial for improved efficiency of prescribed drugs. The system can be implemented with sensing and wireless modules and these should be secured so that the data containing information about health of the patient should not turn up corrupt. IoT plays a major role in communication between two devices. With the usage of messaging standard and communication protocol, the important messages regarding health can be transferred safely [10]. The project is designed for the people who are under continuous medication and also for elderly people who should never neglect medication. The negligence can have a serious effect on people with diseases like blood pressure, heart problems, diabetes, cancer, breathing problems etc. The medicine box is set up with a time table of prescribed medicines with a push button. RTC module saves present time and notification time is stored in EPROM. At the time of intake the system generates a notification sound and LED display light on certain pill boxes. The system provides an effective and easy way for people who take medicines regularly at costs which are easily affordable [2]. The proposed system is used for improvising to reduce risks regarding health and also costs in healthcare services by

collecting, recording, analysing and sharing large data streams efficiently. The system reduces the patient's efforts of visiting the doctor every time to get blood pressure, heart rate etc. checked. The vision of the project is to provide proper and efficient medical services to patients by connecting and collecting data by health status monitors that would comprise various information regarding patient's health. A better and efficient service to the patients can be provided by implementation of a networked information cloud. From this information the doctor can make use of the information and monitor the patient from remote places at any given time. A mobile application can also be deployed for the same so that the information can be accessed as and when required in case of emergency [11]. The system is to provide help for the people suffering from chronic diseases in their medication routines to stabilize their health conditions. Consumption of the medicine at the right time and dosage becomes crucial. The smart pill box is implemented with a camera that is based on a medicine bag concept. A matrix code is printed on a medicine bag that interacts with the pill box to perform reminder and confirm functions. A family member or a caretaker's responsibility may also be reduced. Remind and confirm function can also work without internet, hence reducing the cost of the implementation [3]. The system is designed keeping in mind the aged people who live alone on their own. Some of them who are suffering from disability find it difficult to take care of themselves. Any negligence or delay in medication will raise certain health issues. The medicine box can be used by the patients as well as caretakers to monitor their health. It is implemented with visual and audio notifications to alert the patient regarding the medicine intake and refilling of the box when the medicine gets over. A mobile application is also designed to send SMS and E-mail alerts to the patient's caretaker. The box helps the patient or the guardian regarding the required pill quantity to be consumed and the exact time when it has to be taken [7]. Many systems have been proposed to shift medication process from hospital to home environment. An intelligent medicine box implemented with sensors for monitoring and diagnosis of health is proposed here. The medicine box is wireless and integrated with a mobile application helps the doctor and patient to interact in a closer manner. The system alerts the patients for medicine intake at the prescribed time. An alert will also be given to the guardian of the patient if any signs of negligence is shown. The doctor can have direct monitoring over the patient in the system. In the proposed system magnetic reed switches are used in operation. The operation is carried by means of stepper motors which have controlled signals given from Arduino [4].

III. PROPOSED WORK

We are designing our system in a more effective way to overcome the problem in the existing system. In our proposed system the alert from the hospital is sent to the cell phone of the patient and the Smart Medicine Box gets automatically updated without any manual intervention. Medicines are the basic remedy for the prevention and curing of almost all the diseases. A proper

medication can cure many of the risky diseases. Improper intake of medicines can have side and adverse effects. The system helps in overcoming the negligence regarding the intake by providing intimation that is alerts about the right medication to be taken at the prescribed time. A buzzer and LED are implemented to provide audio and visual alerts respectively. The patient can take the medicine with the specified dosage at regular interval of time without any other's guidance. The medical reports and the prescription of the patient will be updated automatically to the patient database. Acknowledgement will be received from the patient for the confirmation of the intake of tablets.

Applications of Proposed System

- It helps the hospital to have continuous monitoring over the patient's health and management of patient information.
- Smart medicine boxes can also be used at places like old age home, rural health centres.

IV. EXISTING METHOD

The existing System is an application for the Android platform mobiles and the IoT medicine box which are designed to give alert to the patient about the medicine intake. The android application will remind their user about the medicine in-take schedule. This reminder will be set in the mobile with the help of the reminder application. The reminders will be automatically set as per the prescription. The IoT medicine box is designed with an Arduino board, the alerts for medication are set manually by the patient. And there is no connection between hospital people and the IoT medicine box patient taken that box privately for their own use.

The patient is not alerted automatically by the hospital regarding intake of medicines and their dosages. Periodic visit for check up by the patient is also monitored manually.

Limitations of Existing System

- Reminders are not automatically set. So every existing system requires manual work of setting the reminder.
- Existing systems are time consuming because of manually setting the reminders.
- There is no facility of storing the original prescription in any of the existing systems.
- There is no facility of reminding the doctor's next appointment in the existing system.
- There is a possibility of hanging down the existing systems due to the normal work.

V. CONCLUSION AND FUTURE WORK

In this project, we have proposed a system that is an IoT integrated web and mobile application that helps in the efficient monitoring of the patients. This system helps the patients to overcome their negligence regarding the medication process by notifying them frequently. An alerting system has been given for the patient with the integration of a smart medicine box that alerts the patient to take prescribed medicines at the proper time. The patients will also be

guided by the box to take this specific medicine at the proper time with the help of LED and buzzer. The cloud which stores the details of the hospital database sends timely alerts to the mobile application of the patients regarding the medicine in take. The system provides an effective way of improving a patient's health in the easiest way possible. The system is feasible and is a cost effective way for monitoring the medication process of a patient.

FUTURE ENHANCEMENT

We have made the maximum utilization of our potential and zest in developing this project. But gaining knowledge is a continuous process and so is this new technology. Therefore in this section we present some of the ideas which can be used to enhance the functionalities of our project to widen its applications.

QR code Implementation

During the patient's registration at the hospital for the first time along with the unique patient ID, a QR code for that particular patient can be generated. With the help of this QR code it is possible to fetch any prescription, medical reports and records at any particular place and time.

Weight Sensors

Sensors can be implemented with the box to measure the weight of the tablets. With the help of these measurements it might be possible to acknowledge if the patient has consumed medicine or not. Along with this a system can be implemented where in a notification to the nearby medical store regarding the need of new medicines.

Automatic Closing and Opening of the Box

The box can be implemented with the help of proximity sensors that will help in monitoring the medicine in take by opening at a particular specified time of a particular box. This helps in avoiding the intake of wrong medicines and taking over dosage

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