

# Automatic Medicine Reminder with RTC Interface through Mobile & WHATSAPP

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**Abstract:-**In this Paper a new kind of device is proposed to make an Automatic Medicine Reminder for the health context. Normally elderly people forgot to take their daily medication. Lot of people, especially elderly people, takes a lot medication on a regular basis to stay as healthy as possible. Some of that medication needs to be taking on exact time; else they don't function properly. So this machine that automatically reminds the right pills at the right moment. Currently reminding of medicine is done through orally by reminding patient about the medicines. But now we are implementing such system who reminds medicine through automatic process. The proposed system includes the Raspberry Pi Module, GSM Module, SD Card, RTC, Power supply, Ethernet/wifi interface for Internet access, and Smart/Android Phone. So basically this system is useful for both business class as well as middle class people.

**Keywords:** Raspberry Pi Module, GSM, RTC, WiFi.

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## 1. INTRODUCTION

Technological innovation is changing the way patients are receiving care services. Nowadays, Smartphone's are not only the key computing and communication mobile devices, but an ensemble of embedded sensors that collectively enable new applications in many areas such as homecare, healthcare, social networks, safety, environmental monitoring, e-commerce and transportation. Today in healthcare systems, the utilization of mobile devices is becoming more and more frequent. Indeed, mobile technology is playing important role in chronic disease management, empowering the elderly and expectant mothers, reminding people to take medication at the exact time, extending service to underserved areas, and improving health outcomes and medical system efficiency.

Mobile phones are not only powerful and rich in features but also less costly due to advances made in various technology domains. Besides primary use of personal communication and entertainment, it can also interestingly used in various health and Wellness monitoring applications. The proliferation of multi-touch interface, multimedia, enhanced computing also strong embedded system offers easy to use smart phones like iPhone, HTC Touch, etc. And hence smart phone and mobile internet usage can be used as rapid growth all around the world starting from past few years. Empowering user friendly design as well as intuitive usage, those devices can be used by everyone even by disabled and elderly patients.

Traditionally, patients' health information records were created with paper and kept in storing boxes. Now we can use mobile phones to remind the medicine by sending text message for reminding the dosage of medicine through GSM module. Also those who have smart/Android phone can receive the WhatsApp message through Raspberry Pi module. So it can be useful for those who have smart phone and also those who don't have smart phone. In addition to this it has LCD Display through which user can able to see the required dosages of medicines.

Most of the healthcare solutions developed leveraging on prevalent use of the smart phones to collect reliable and real-time health diary information. As a mean of personal as well

as intelligent reminders, smart phones can be used for reminding the medicine and performing daily activities regularly and correctly. Usually, such reminder systems are used for end users to remind some activities to do exactly. Data collection applications, smart phones can also be either used by someone such as nurses or patients or permanently placed at strategic locations.

## 2. RELATED WORK

Mei-Ying Wang et.al, introduced *Wedjat*, which can be used to remind its users to take the correct medicines on time and maintain the record of medicines and other things to review for healthcare professionals[1].

Guanling Chen,et.al[2]. proposed Mobile-phone based Patient Compliance System (MPCS) that can minimize the time-consuming and error-prone processes of existing self-regulation practice for helping facilitate self-reporting, non-compliance detection, and compliance reminders.

Mark Donnelly et al [3]. developed such a system in which the ability to deliver reminders at different times of the day as a series of static audio messages like "take lunch" and "visit the doctor." This system is designed to offer support through control for the environment as well as delivery of reminders via touch-screen device embedded in the home.

Chihwen Cheng et.al[4], designed prototype of a Sickle cell disease Reporting as well as Monitoring Telemedicine system (Sickle REMOTE), focusing to resolve limitations of conventional monitoring diaries.

Mobile health (mHealth), as a one of the important development for eHealth, is an innovative application of spatial information technology used in health field. [5] developed the important technology of location based mobile health system.

People with disabilities or chronic long-term conditions (LTCs) are increasingly being cared for at home. So [6] developed technology that can support or augment. Such a type of care at home is normally referred to as assisted or independent living technology (ALT) and which is majorly used for continuing to supporting our ageing population and a general shift towards more self managed care.

Royana Afwani et.al[7], describe the user-centered co-design and evaluation of a multimodal reminder system for the home deployed on mobile devices.

Marilyn McGee-Lennon et.al[8], discusses the prevention solution Tuberculosis (TB)in Indonesia with the help of a system which is designed to accept mobile cloud computing technologies, so TB organization can have access and take more benefited information technology resources which can be used for major investment, Including for patients to get immediate treatment from users mobile devices very easily.

Ljilja Ruzic Kascak et.al [9], developed Mobile technology which is used to increase the life style of older persons in another level through via health monitoring, memory aids which consist of medicine reminders as well as personal data management not only social but also communication assistance.

Alexander Batrakov et.al [10], developed the MRAAGILE, which is a device designed for monitor and medication consumption as well as improve the healthy daily regimen for those who live independently. The device gives interactive reminder messages to influence users to follow directions.

Ilias Maglogiannis et.al [11], proposed a multimodal reminder system, as part of an assisted living application. The main functionality of the system involves the creation of reminders using a PC or their Android device, which are stored in a Cloud infrastructure.

Souad Sadki et.al [12], presented such a system which can access patients for their sensitive medical data while using their mobile devices based on an smart phone application which predicts their privacy preferences easily. Their solution aims to help patients to make preferences concerning the disclosure of their sensitive data.

### 3. PROBLEM STATEMENT

Existing system provides the patients details such as oxygen level in blood, Heart rate. Some systems also provide text message service for reminding the medicine. But no system provides such a module that supports text message service as well as WhatsApp message facility in addition with LCD display information. That means no existing system is present who are easy to use for middle class people as well as business class people. So we have tried here to eliminate these drawbacks through our new system.

### 4. PROPOSED SYSTEM

The proposed system is build around Raspberry Pi processor. In this system, we will set the timer by means of a processor. The activation and deactivation times are programmed with processor. Real time clock chip DS1307 is used to set the schedule. LCD display is provided to display the current time. DS1307 is interfaced to the Raspberry Pi processor for real timing performance. A 3V battery can be attached to DS1307 just for precaution for time disturbances caused by power failures. Data stored remains in the memory even after power failure, as the memory just make sure for reading of the latest saved settings by the processor. This system uses regulated 5V, 12A adjustable power supply. Unregulated 12V DC is used as relay and 7805 three terminal voltage regulator is used as voltage regulation.

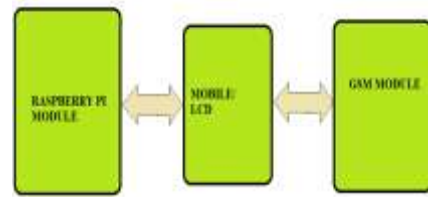


Figure 1: Overall Architecture of Proposed System

We are now developing such system who can send text message those who don't have smart phone through GSM Module also can able to send WhatsApp message for those who have smart phone with the help of Raspberry Pi module. In addition to this there is LCD Display who can displays the information as well.

## 5. FLOWCHART AND ALGORITHM

### 5.1 Flowchart

The system flow is given in figure 2.

### 5.2 Algorithmic steps

1. Start
2. Raspberry Pi Configuration
3. GSM Configuration
4. WhatsApp Configuration
5. Extract Time
6. Check time Range, and here we set the flag for time range. If flag sets at 1 then message will be send otherwise if flag sets at 0 then it will initiated once again and it will go again for time checking.
7. If timer set at within range then text message will be send through GSM module.
8. Also if mobile is Android/smart used then whatsapp message or broadcast message will be sending through Raspberry Pi Module.
9. Stop

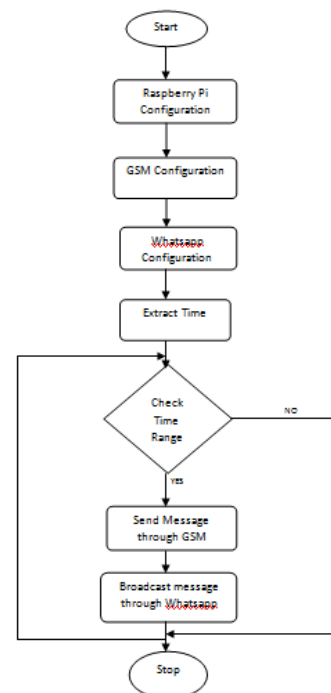


Figure 2: Flow Chart

## 6. EXPERIMENTAL RESULTS



Figure 3: Experimental Setup for GSM Module

Figure 3 shows the Hardware implementation with GSM Module. Text message can be send through this GSM module. There is SD card slot in GSM Module through which message can be sent.



Figure 4: Experimental setup with Raspberry Pi Configuration

Figure 4 shows the Hardware implementation with Raspberry Pi Module. This module is configured at the back side of LCD display so that circuit becomes more compact. WhatsApp message can be sent through this module for those who have Android/Smart phones.

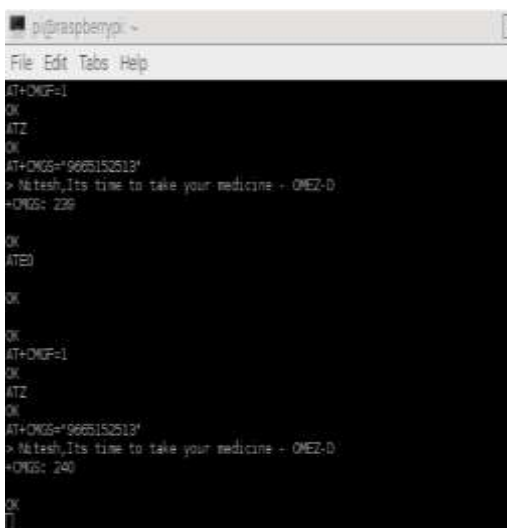


Figure 5: Text Message through GSM Module.

Figure 5 shows how text message can be sent from GSM Module through which we can able to see which text message are sending to the mobile about reminding of required medicines.



Figure 6: Text Message received through GSM module

Figure 6 show that how text message can be received for reminding of required medicine. It reminds the medicine on accurate time with proper dosage.



Figure 7: WhatsApp message through Raspberry Pi Module.

Figure 7 shows how WhatsApp message can be sent through Raspberry Pi module. For sending message contacts must be sync and saved properly. Like GSM module it reminds the required dosage on time.

Figure 8 shows WhatsApp message is received by Smart/Android phone through Raspberry Pi Module. If Ethernet is not available it can also work on mobile network through hot spot facility which works as wifi.



**Figure 8: WhatsApp message received through Raspberry Pi Module**

## 7. CONCLUSION

Different messaging and various reminding of medicine techniques have been reviewed. Now we have proposed such system which is very useful for older persons who suffered with chronic diseases like Diabetic and also different types of cancer and for pregnant women as well. This project, implemented using the Raspberry Pi and GSM module. By using this system Text message as well as Broadcast message or whatsapp message can be sent. By using the Raspberry Pi, there is scope to optimize different methodologies in reminding of medicines more users friendly and wide application areas. In future this system can be modified for showing the heart rate and also it will monitor the patient's condition with the help of sensors who continuously displays the patient's temperature and pulse rate.

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