

Comprehensive Survey on Automatic Reminder Systems

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Abstract - In today's world old people, pregnant women's needs the medicines on daily basis and on exact time. People who suffered with cronical diseases like Diabetics, Dementia, Heart patients need the exact dosage of medicine on right time otherwise it will affect their body. So we need to see such useful reminding system which helps to above people to take their medicine on exact time. It's Automatic Medicine Reminder System which can be used with latest technologies. Today, GSM Module can be used to send the Text messages for reminding purpose of medicine those who don't have smart phones, and for those who have Smartphone's can get same reminding message but with advance feature and its Whatsapp messaging with the help of latest processors like Raspberry Pi module, which can operates through Ethernet or WIFI. This paper summarized the various techniques used for reminder purpose basically medical treatments.

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

I. INTRODUCTION

Now a day's Technological innovation is updating the way patients are receiving care services. Smartphone's are not only used for calling purpose but now can be used as an ensemble of embedded sensors that collectively enable new applications in vast areas such as healthcare, e-commerce, homecare, healthcare, social networks, environmental monitoring, transportation and safety. Today in healthcare systems, the utilization of mobile devices is becoming more and more useful. In addition with, mobile technology is playing vital role in chronic disease management, empowering the elderly and pregnant women, to take medication at the right time, extending service to underserved areas, and improving health conditions and medical system efficiency.

Mobile phones are powerful and rich in features and also less costly due to advances made in various technology domains. Now a day's Mobiles are not only used for personal communication and entertainment, but it can also interestingly used in various health and Wellness monitoring applications. The proliferation of multimedia, enhanced computing and multi-touch interface, provides strong embedded system offers easy to use smart phones like iPhones and other smart phones who generally has touch pad and other features. And hence smart phone with internet facility can be used widely all around the world starting from past few years. All types of Mobiles have user friendly design as well as intuitive usage, such that this mobiles can be used by everyone even by disabled and elderly patients.

Normally, patients' health information records were recorded in the form of paper and stored. Now we can use mobile phones to remind the dosage of medicine by sending text message through GSM module. Also if mobile is Smart/Android phone then an advance feature is introducing for reminding of medicine and it is WhatsApp messenger. This Whatsapp message can be received through Raspberry Pi module. So it can be useful for all type of people such as rich people those who have smart phone and also middle class people those who don't have smart phone.

Reminding systems are so helpful for the nurses and Doctors who daily work for patient. With the use of this system lot of time is saved for them. Also this System is useful for those people who take care of patient apart from Doctors and Nurses such as Relatives and Friends.

II. LITERATURE SUREVY

Many times patient forgot to take medicine on time once they discharged from hospital and due to this negligence it may causes to death. So to avoid such situation HSU CHUN-LIANG developed such system who reminds the medicine on time. For such system he uses local web-net, LCD Display, GSM communication, voice-DSP, and sensors techniques to produce a medicine-box and its co-related monitoring mechanism suitable for both in hospital and patient's house.

Mei-Ying Wang et. Al. proposed in 2009 Wedjat System [2]. This can be used to take the medicine on correct time and also take the record of intake of medicine. Wedjat has two important features. First is it can alert patient about the right medicine with

proper intake with food instruction and second is it can revised the amount of medicines when dose was missed. G. Mougiakakou et. al. [3] presents the modular system for management of medicine, medical image archiving, telematic cooperation and diagnosis support. Guanling Chen et. al. [4] suggested Mobile-phone based Patient Compliance System (MPCS) that can reduce the time-utilization facility and error-prone processes of existing self-regulation practice to facilitate non-compliance detection, self-reporting, and compliance reminders.

Mark Donnelly et. al. in 2010 developed such a system which delivers a series of static message such as “visit the doctor” or “take lunch” for the patients who suffered with dementia. This system is designed to offer support via control of the environment and also delivery of reminders through a touch-screen device embedded in the home. It has specific feature to set the reminders directly on to the device with proper time and date which deliver necessary reminders.

For maintaining incontinence among dementia subjects at nursing care center, it is difficult to have timely diaper change with exact checks of scheduled. Delays in diaper change may cause serious implications in social, economic and clinical aspects. So A. A. Phyowai et.al developed intelligent Continence Management System (iCMS) to enable timely change diaper by sensing wetness of diaper. Apart from reliable wetness detection, a easy and simple to use reminder which is important to attract immediate attentions from care givers [6].

The most common diseases in the world is Sickle cell disease which affects patient lives from childhood. This disease requires frequent medical monitoring, such as severity, tracking the frequency, and duration of painful events. So to reduce the efforts for the patients Chihwen Cheng et. al. developed a prototype of Sickle cell disease Monitoring Telemedicine system and Reporting (Sickle REMOTE), focusing to solve the limitations of conventional monitoring diaries [7]. An automated short message service text (SMS-text) developed by this system that arrive at a mobile phone anywhere on a cellular network. Lanlan Huang et. al. introduced the location based mobile health system on which system prototype was developed [8].

People with disabilities or chronic long-term conditions (LTCs) need to take more care at home. So Marilyn McGee-Lennon et. al. developed technology that can support or augment [9]. This care at home is often referred to as independent living technology (ALT) or assisted which is more accepted as key in continuing to supporting our older people. Assisted living technologies which include sensor based devices that alert the

user or other people who take care of the patient such as family or friends. These technologies are very useful to live people at home independently for longer, also to improve wellbeing and health and support self care of long term conditions.

Marilyn McGee-Lennon et. Al. [10] describes the user centered development of a home care reminder system which multimodal. This system reminds in different way with a variety of sensory modalities and highly configurable. It has facility that users can select which reminders to receive and also exactly how they wish to receive them. Development of this reminder system includes formative based Co-Design with six groups (N=25) of older users (age 60+) where they were interacted with prototypes running on mobile devices also with paper-based interface prototypes. Royana Afwani et.al. developed the prevention solution for Tuberculosis (TB) in Indonesia with the help of reminding of health system which is designed on the basis of cloud computing.

Ljilja Ruzic Kascak [12] demonstrated the Mobile technology, which can help to improve lives of older adults through remote health monitoring, memory aids including personal data management, medicine reminders, and social and communication assistance. Authors explain redesign of the remote patient monitoring (RPM) mobile application UI for older adults and usability studies. KeeHyun Park and SeungHyeon Lim [13] proposed the medicine synchronized reminder system which consists of medication reminder manager which is installed in medication server and medication reminder agents which are installed in medication reminder. Bhadane Ashwini [14] developed the Android based medicine reminder application which reminds the patient about the exact quantity of medicine on exact time by setting up the reminders in mobile. Vishal Gawade et. al. [15] proposed the medicine reminder system which is the combination of smart phone application and automatic pill dispenser. This system is useful for user to manage complex medication regimes. Marika Hettinga et. al. suggested the Real Time Medicine monitoring system which has customized message reminding facility due to which people become adhere about the medicine reminding system [16].

J.X. Tan et. al. [17] presented the user friendly medicine reminder system which automatically generates the alarm signal for reminding the patient for medicines. M.M. Alotaibi et. al. in 2014 [18] developed an intelligent mobile educational system and diabetic management system for patients in Saudi Arabia who suffered with type two diabetes. Alexander Batrakov et. al. [19] developed the MRAAGILE, which is a device designed for reinforce and monitor medication consumption as well as promote a healthy daily regimen for older people who choose to

live independently. The device gives reminder messages to inspire the user to follow directions. The reason of this is to implement motion detection following a reminder to determine that user is responding or not. The device will get the instructions from the user manually on the device or by using a wireless link to transmit the times such as bluetooth for which medicine is to be taken.

Souad SADKI et. al. presented a Privacy-Preserving Approach for Mobile Healthcare named PPIAMH. The proposed solution allows patients to maintain the disclosure of their private medical data while using their mobile phones which is used as an intelligent mobile application which easily predict their privacy options. The solution for this is to aim to help patients to make preferences concerning the disclosure of their sensitive data [20].

Ljilja Ruzic Kascak et. al. in 2014 demonstrates the Mobile technologies for older adults which are really need to be engaging, meaningful, usable, easy to use and motivate. Before this system, Current mobile technologies at that time do not fulfill the needs, limitations of older adults and experiences. In critical case patients are supposed to be monitored continuously for their SPO₂, temperature and Heart Rate. In the earlier methods, the doctors need to be present physically or in other cases SMS will be sent using GSM module. The history of the patient cannot be displayed, only current data is displayed in earlier days. In this paper Maradugu Anil Kumar et. al. uses a novel idea for continuous monitoring patient's health conditions [22]. The health care scheme is focus on the Monitoring various biological parameters of patient's body like oxygen saturation level in blood, heart rate, and temperature using a web server and android application, where doctor can monitor the patient's condition continuously on his smart phone using an Android application.

In this paper Prabhkannan et. al. discuss methods and technologies used in Android Database for medicine intake and encrypted and decrypted implementation for scheduling of reminder of medicines [23]. Priyadharshini. R, Ramya et. al. [24] proposed the system which uses Microcontroller, normal 4x4 matrix keypad, Real time clock module and LCD Display for reminding of medicines on time. K.Gomathi et. al. [25] developed the medicine reminder system which uses Unified Technology Learning Platform Kit (UTLP) on which medicine name and time can be changed as per users need through the connected keypad.

Deepti Ameta et. al. [26] proposed medicine reminder system which is based on Android application. In this system automatic

alarm system is used. This system focuses on patient and Doctor Interactions. I. M. N. Christiansen et. al. [27] demonstrated such system which improves the adherence among the Parkinson's patients; this system has automatic pill-dispenser. Corey McCall et. al. [28] developed the medicine reminder system which describes the prototyping and development of RFID based Medication Adherence Intelligent System.

Nitesh et. al. developed a medical reminder system [29] in which authors used ARM-11 processor for getting reliability. With the use of latest Embedded system, it becomes faster and working in real time manner. Similarly ARM 7 [30, 31], Raspberry pi [32, 33], Arduino [34] based embedded systems can be used for this purpose as they are having open source platform and system development can be easy.

III. CONCLUSION

As per above information, the automatic medical reminding system evolves, more sophisticated applications will use the capability of receiving and store medicine dosage. The various systems and technologies are discussed for reminding the required dosage of medicine for the older people who suffered with chronic diseases like dementia, cancer, diabetics and many other and also for the pregnant women. Now a days, some systems was developed which reminds the medicine with the help of text-message but with advanced feature which the whatsapp messaging for those people who have smart phones.

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