

LINUX BASED SPEAKING MEDICATION REMINDER SYSTEM

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Abstract - Medication reminder solutions have become a matter of concern in health-care research, as advancements in treatments and medication may be offset by patients' low attention to medication schedule. Medication mix-ups are extremely dangerous. Most of times patients may forget to take the medicines at proper time as per the specification in the prescription which may cause in late recovery from the disease/illness or some life-threatening mistakes. So, it is necessary to take proper medicines in proper quantity at proper time. In this context, an efficient reminder system should empower patients to accurately follow the prescribed medication program. This system will remind their user to take proper medicines in proper quantity at proper time by automatically setting the reminders in the system. These reminders will have to set up by users or their care takers as per the prescription. This reminder will remind their user patient that now it's time to take the medicine with inputs provided as per user.

Key Words: Raspberry pi 3, audio playback board(APR33A3), Linux Operating System, Medical Prescription, Python Language, LCD Display.

1. INTRODUCTION

1.1 Need for the Device

Any living being which is undergoing through medication can come across life-threatening adverse effects of improper medication habits. These living beings can include human, pets, animals etc. The patients under human being category may include businessman, social workers, politicians, teachers, students, IT employees etc. These people may be busy in their daily routine life schedule or else we can consider elder people who usually forgot to take their medicines. If they are suffering from any kind of serious disease/illness like diabetes, heart problem or some neural disease then it's their duty to take proper medicines in proper quantity at specific intervals as suggested by doctors. Any kind of miss in medicine dosages will directly put their life in threat. This comes to think me out for such medication reminder.

1.2 Sources Causing Improper Medication

There are sources which causes improper medication:

a) Irregular medicine intakes due to the patient's busy schedule

b) Complicated intake schedules due to the large number of medicines taken by the patient

c) Adverse drug reactions caused by un-reconciled prescriptions obtained from different sources

d) Lack of knowledge about proper use of medicines

e) High Dosage Intake of some medicine

f) Memory Loss in Alzheimer Disease

2. Proposed Solution

To solve the problem of medication mix-ups in case of senior citizens and illiterate people suffering from severe diseases, I proposed "Linux Based Speaking Medication Reminder System" which will remind patient/user for him/her medication.

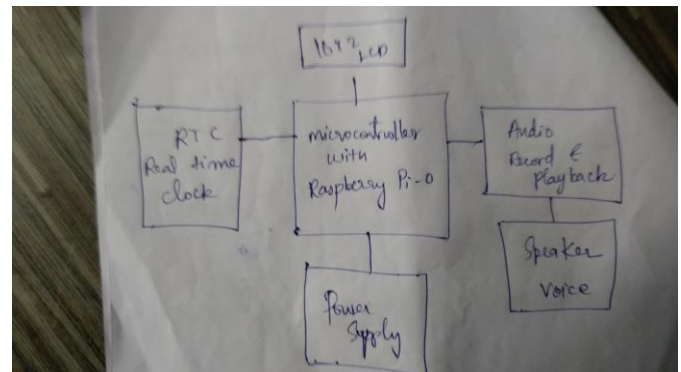


Fig -1 Block Diagram of System

There were many solutions provided earlier for medication mix-ups problem like development of Android application for reminder, Development of Smart Pill Box, etc.

2.1 Speaking Medication Reminder System

The proposed system will be reset by user wherever he is prescribed by doctor for any kind of regular medication. User can feed input in the system through audio playback board in any kind of language he knows. Input to the system can be symbolic also, like one can store input according to color and size of the tablets also.

Same input will be feed to Raspberry pi which will be programmed to set particular interval triggers to set reminders.

At those specific intervals the stored input will be played back and also displayed on the LCD board.

2.2 Components Used in System

A) Raspberry Pi

The Raspberry Pi is a series of small single-board computers developed in the United Kingdom by the Raspberry Pi Foundation to promote the teaching of basic computer science in schools and in developing countries. Raspberry Pi 3 Model B released in February 2016 and is bundled with on-board Wi-Fi, Bluetooth and USB boot capabilities. All models feature a Broadcom system on a chip (SoC), which includes an ARM compatible central processing unit (CPU) and an on-chip graphics processing unit (GPU, a Video Core IV). CPU speed ranges from 700 MHz to 1.2 GHz for the Pi 3 and on-board memory range from 256 MB to 1 GB RAM.

B) Real-Time Clock

None of the current Raspberry Pi models have a built-in real-time clock, so they are unable to keep track of the time of day independently. As a workaround, a program running on the Pi can retrieve the time from a network time server or from user input at boot time, thus knowing the time while powered on. To provide consistency of time for the file system, the Pi does automatically save the time it has on shutdown, and re-installs that time at boot.

A real-time hardware clock with battery backup, such as the DS1307, which is fully binary coded, may be added (often via the I²C interface).

C) Audio Play Back Board

Audio playback board using APR33A3 IC for 8 channels of recording will be used to store medical prescription. 12 Volt 8 channels (M0 to M7) having capacity to store total 11 minutes voice data.

D) Linux

The Linux open source operating system, or Linux OS, is a freely distributable, cross-platform operating system based on Unix that can be installed on PCs, laptops, notebooks, mobile and tablet devices, video game consoles, servers, supercomputers and more. Linux might be the perfect platform for you. Linux has evolved into one of the most reliable computer ecosystems on the planet. Combine that reliability with zero cost of entry and you have the perfect solution for a desktop platform. That's right, zero cost of entry...as in free. You can install Linux on as many computers as you like without paying a cent for software or server licensing (including costly Microsoft Client Access License – CALs).

E) Programming Language: Python

Python is a powerful high-level, object-oriented programming language created by Guido van Rossum. Python is a general-purpose language. It has wide range of applications from Web development (like: Django and Bottle), scientific and mathematical computing (Orange, SymPy, NumPy) to desktop graphical user Interfaces (Pygame, Panda3D). It's much easier to read and write Python programs compared to other languages like: C++, Java, C#. The syntax of the language is clean and length of the code is relatively short. It's fun to work in Python because it allows you to think about the problem rather than focusing on the syntax. You can move Python programs from one platform to another and run it without any changes. It runs seamlessly on almost all platforms including Windows, Mac OS X and Linux. To develop the application, I will be going with Python 3.5 version.

3. CONCLUSIONS

Features of the System:

- a) It can be used by elderly people.
- b) It can be easily handled by literate users.
- c) This system can save human beings from extreme effect of improper medication mix-ups.
- d) Cost effective system.

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