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Electro Visits in Primary Care, Schedulling Policies, Modelling and its Analysis

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Abstract

The aim of the project is to provide their exact to improve the primary care access, many healthcare organizations have introduced electronic visits (or e-visits) to provide patient–physician communications through securing messages. The purpose of this project is to implement a system where visitors can get appointment for concern person by avoiding queues and rush. VIPs visits have become more complex for every one since life style of people become such that every minute is precious to them, to visit the person now a day also time consuming process to avoid this problem we have implemented one system which can help the people to get the appointment on his or her mobile by using RTC (Real Time Clock) on first call basis.

Keywords: Microcontroller, Power supply, EEPROM, MAX 232, GSM Modem, RTC, LCD Display (16*2 lines)

1. INTRODUCTION

The rapid development of information technology has made the delivery of healthcare over a distance possible, which introduces substantial opportunities. The project constitutes a microcontroller, GSM modem, RTC and an EEPROM, the visitor need to call the person number, by calling it will be receive by the GSM modem connected to controller, by using RTC we can get date and time of the call. And depending on the call the time slot and token number is assigned to that particular number which will be stored in EEPROM. And token number will be send to the person by a text message. At the same time it will be displayed in LCD.

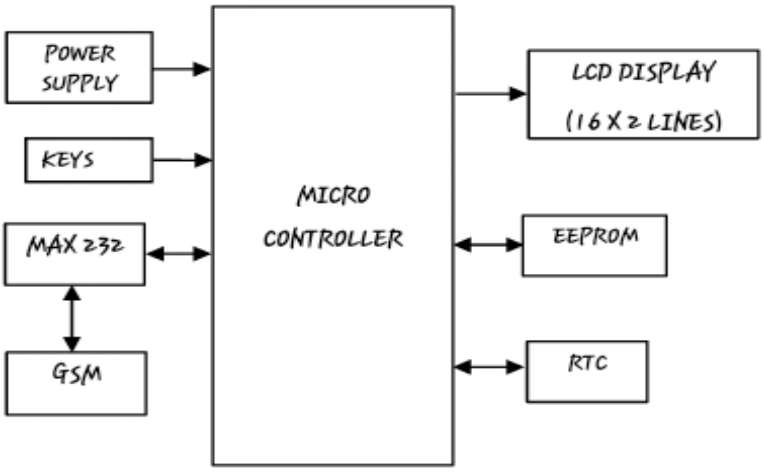
Many healthcare organizations have introduced online electronic visit programs, referred to as e-visit (or e-portal, e-service, and so on), to provide the patient's physician communication through securing messages. Recent studies demonstrate that by introducing e-visits, significant savings can be obtained with improved access to care, and increased provider efficiency and patient satisfaction. To better understand and implement e-visits, a mathematical model of primary care delivery through both the office and the e-visits is aspired. It can provide the care delivery process a fresh look from an integrated systems engineering perspective. However, few quantitative models on e-visits are available in the current literature. How primary care physicians manage their operations in response to the introduction of e-visits is still an open question. Therefore, this is devoted to develop an analytical tool to investigate e-visit's impact on physician's practice, and identify the conditions that e-visits can improve patient accessibility.

2. PROPOSED SCHEME

This project is used to implement a system where visitors can get appointment for concern person by avoiding queues and rush which is served by using the above proposed system. The circuitry is simple and easy to implement and low power consumption and cost effective.

ARM stands for Advanced RISC Machines. It is a 32 bit processor core, used for high end application. The Micro controller used in this project is LPC 2148.

Microcontroller: This section forms the control unit of the whole project. This section consists of a Microcontroller with its associated circuitry like Crystal with capacitors, reset circuitry, pull up resistors (if needed) and so on. The Microcontroller mainly forms the key role of the project because it controls the devices being interfaced and communicates with the devices according to the program being written.



Power Supply: This is meant for supplying Power to all the sections. It basically consists of a transformer to step down to convert 230V ac to 12V or 5V ac followed by diodes. Here diodes are used to rectify the ac to dc. After rectification then the obtained rippled dc is filtered using a capacitor Filter for further use. A positive voltage regulator is used to regulate the obtained dc voltage.

MAX 232: The microcontroller can communicate with the serial devices using its single Serial Port. At TTL logic level the serial port operates. But some of the serial devices operate at RS 232 Logic levels. MAX 232 will be connected between UART 0 & GSM modem. It is also known as Voltage converter IC. A mismatch occurs between logic levels when communicating with the Microcontroller with either GSM modem or PC and so serial driver is used to avoid mismatch and to match the logic levels. MAX 232 establish communication between microcontroller and PC (or GSM) as it is a Serial Line Driver.

LCD Display: Liquid Crystal display this section is basically meant to show up the status of the project. In this project Liquid Crystal Display is used to display / prompt for necessary information.

EEPROM: EEPROM Electrically Erasable Programmable Read-Only Memory, is a type of non-volatile memory which is mainly used in computers and other electronic devices to store small amounts of data that is to be saved when power is removed, e.g., calibration tables or device configuration.

EEPROM is used for storing the command data and appointment data that we sent from mobile.

GSM modem Section: This section consists of a GSM modem. The modem is used to communicate with microcontroller using serial communication. The modem is interfaced to microcontroller using MAX 232, which is a serial driver.

The Global system for mobile communications is a TDMA based wireless network technology that is used for Communication between cellular devices. GSM Phones make use of a SIM card to identify then user’s account.

3. CIRCUIT HARDWARE

ARM stands for Acorn RISC Machine later began to be Advanced RISC Machines. It has 32bit processor core, used for high end application. It is widely used in many Advanced Robotic Applications.

Key features:

1. It has 16-bit/32-bit ARM7TDMI-S microcontroller in a tiny LQFP64 package.
2. It supports 8 kB to 40 kB of on-chip static RAM and 32 kB to 512 kB of on-chip flash memory.
3. 128-bit wide interface/accelerator enables high-speed 60 MHz operation is used in the ARM.
4. In spite it also provides LPC2146/48 provides 8 kB of on-chip RAM accessible to USB by DMA.
5. LPC2148 has 10-bit ADCs which provide a total of 6/14 analog inputs, with conversion times as low as 2.44 μs per channel.
6. A Single 10-bit DAC provides variable analog output (LPC2142/44/46/48 only).
7. There are Two 32-bit timers/external event counters with four capture and four compare channels each of them, a PWM unit and a watchdog.
8. In this Low power Real-Time Clock (RTC) with independent power and 32 kHz clock input is used.
9. There are Multiple serial interfaces including two UARTs (16C550), two Fast I2C-bus (400 kbit/s),
10. Arm has an On-chip integrated oscillator which operates with an external crystal from 1 MHz to 25 MHz.

4. METHODOLOGY

In this project we make use of operating voltage for ARM board to control is 12V. And for that 12V D.C. power supply is needed for the ARM board. This 12V regulated voltage is generated by stepping down the voltage from 230V to 5V now the step downed A.C voltage is being rectified by the Bridge Rectifier using 1N4007 diodes. The rectified A.C voltage is now filtered using a ‘ C’ filter. Now the rectified, filtered D.C. voltage is fed to the Voltage Regulator. This voltage regulator provides/allows us to have a Regulated constant Voltage which is of +12V. In order to remove ripples the rectified filtered and regulated voltage is again filtered using an electrolytic capacitor 100μF. Now that the output from this section is fed to microcontroller board to supply operating voltage.

Features

SIM900 GSM module which is extremely popular is used in this project.

For easy connection to computers and other devices standard serial RS232 interface is used.

It also provides serial TTL interface for easy and direct interface to Microcontrollers which is optionally available USB interface for easy interface to laptops, computers, etc

The SIM900 allows serial baud rate from 1200 to 115200 bps which can be adjustable.

Modem a low power consumption of 0.25 A during normal operations and around 1 A during transmission

Operating Voltage is from 7 – 15V AC or DC (board has onboard rectifier).

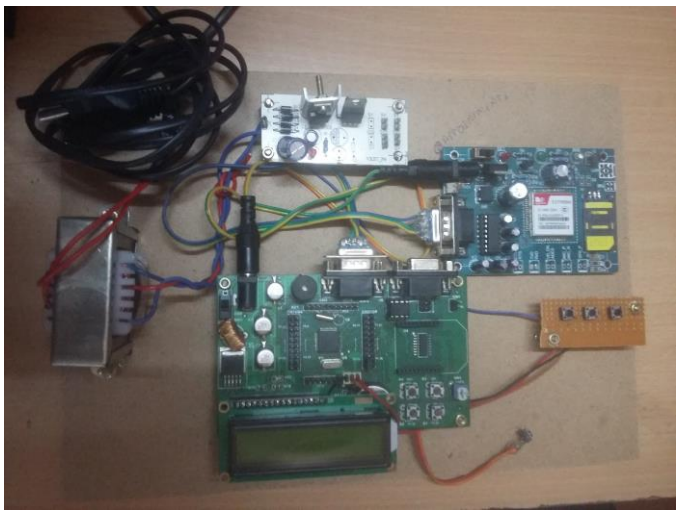
5. RESULTS AND OBSERVATION

1. Initializing of the kit

Whenever we initialize the circuit we have arm board with reset button and three functional keys (Increment /Decrement /Enter) keys.

2. Initializing of RTC

By clicking reset and enter buttons. The lcd is displayed with □Welcome to the project" message. and by that EEPROM will be initialized.

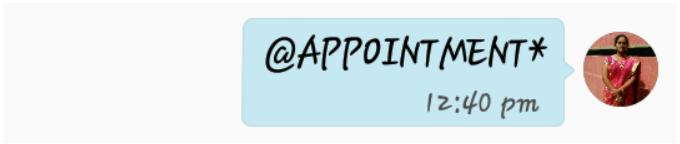


3. Setting up time and Date in RTC

By using reset and enter buttons and by increment and decrement keys time and date are set by incrementing or decrementing the keys.

4. Command for booking Appointment

Command used to book an appointment from our mobile is " @APPOINTMENT*" . Then the message sending is appeared in the LCD.

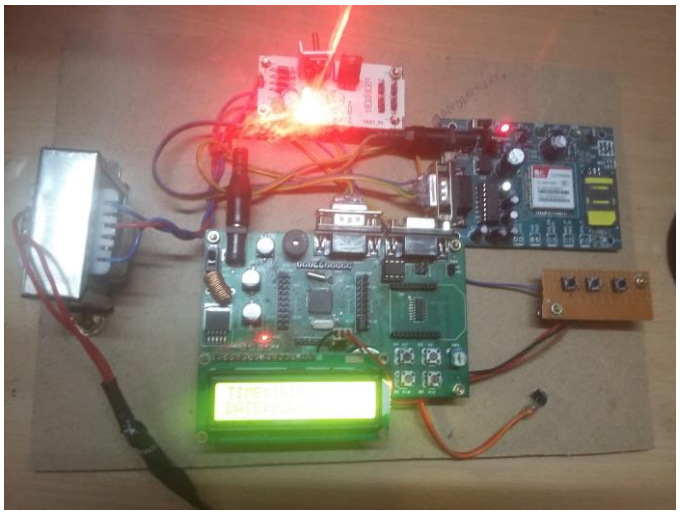


5. Appointment Confirmation Message

To confirm the appointment a sample message is sent from our mobile to the GSM modem which is connected to UART 0 (A sim card is placed in the GSM modem). The LCD response will be as shown.

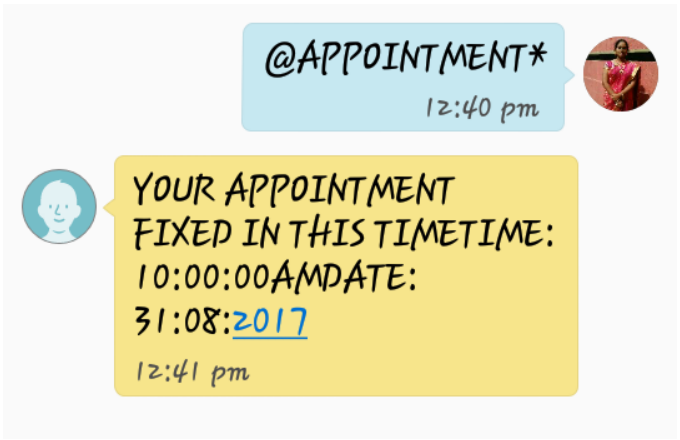
6. Proposed KIT

The final response will be appeared in ARM 7 board.



7. Result

The result can be seen in our mobile where we can get the appointment details.



6. CONCLUSION AND FUTURE SCOPE

By using this project the appointment has been fixed by sending the message to the GSM module which is connected to UART 0 in the arm board.

It can be used in latest technology by using ARM 11 which has an in built Wi fi technology, can be used in mobile to book an appointment through online.

If we use GPS module in the circuit connected to UART 1 which is used to track the

location. We can have an appointment through online which can be stored in web page (IoT applications).

By using GPRS module IoT can be used.

In future call can also be done to have an appointment. Cancel command can be used in order to cancel the appointment.

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