The Student Performance Monitoring Using ARM9

Engineering

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ABSTRACT

Starting and growing a business always require capital. There are a number of alternative methods to fund growth. These include the owner or proprietor's own capital, arranging debt finance, or seeking an equity partner, as is the case with private equity and venture capital. Private equity is a broad term that refers to any type of non-public ownership equity securities that are not listed on a public exchange. Private equity encompasses both early stage (venture capital) and later stage (buy-out, expansion) investing. In the broadest sense, it can also include mezzanine, fund of funds and secondary investing. Venture capital (VC) is financial capital provided to early-stage, high-potential, high risk, growth startup companies. The venture capital fund makes money by owning equity in the companies it invests in, which usually have a novel technology or business model in high technology industries, such as biotechnology, IT, software, etc. The typical venture capital investment occurs after the seed funding round as growth funding round (also referred as Series A round) in the interest of generating a return through an eventual realization event, such as an IPO or trade sale of the company. It is important to note that venture capital is a subset of private equity. Therefore all venture capital is private equity, but not all private equity is venture capital. India is poised for technological revolution with the emergence of new breed of entrepreneurs with required professional temperament and technical know how. To make the innovative technology of the entrepreneurs a successful business venture, support in all respects and more particularly in the form of financial assistance is all the more essential. This has necessitated the setting up of venture capital financing Division/ companies during the latter part of eighties.

1.Introduction

Sudent performance and monitoring system system implies the new way to gather the required information about any private organization or about anything without having any problem and to provide required information for the user without any problems. This project shows the solution for many problems that we are facing in old conventional methods by using so popular method called as +Short Message Service (SMS) related query system.

In this project we are making use of ARM 9 micro controller which is the best micro controller when compared to old micro controllers in all aspects such as power, interfacing the devices, memory, hard ware size, speed of operation and etc.ARM9 has a support for porting linux which makes this IC so powerful to use in real time industries, projects and real time products. Due to this feature there is no mediator like operator is required in between a company or a private organization and a enquirer. So there is no need for the enquirer to wait for the reply that is coming from the operator of a company which is a main problem in olden days.

The general information required for the enquirer will be stored in internal database. Simply by using this project the private organization can update the data base at any time that is being sent to the enquirer by using an USB device. This project makes use of TFT touch screen to send the emergency data to group of customers those have been saved in the data base with the help of GSM modems. There are separate options for deleting and updating the new contacts so that organizations can manage their contacts efficiently. By using the touch screen and keypad we can update and delete contacts. This data base for contacts will be visible on touch screen. The total process of receiving the queries and sending the relative information to the enquirers, managing the contacts of enquirers like updating the data base of contacts and deleting the old database such things will be visible on LCD .

2. The principle of work and frame of system

ThGSM is one of standard realization contents and can provide fast data transmission speed. As shown in Figure 1, ARM microprocessor chip connect to GPRS modem through the serial interface, then by sending AT commands to communicate with GPRS modem and achieve SMS communication by the corresponding function.
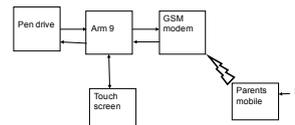

Figure1.Block Diagram

A.SMS

The message service which is defined in GSM standard allows point-to-point communications between the mobile and the message service centre, the typical framework of SMS system is depicted in figure.1 as follow: Figure.2
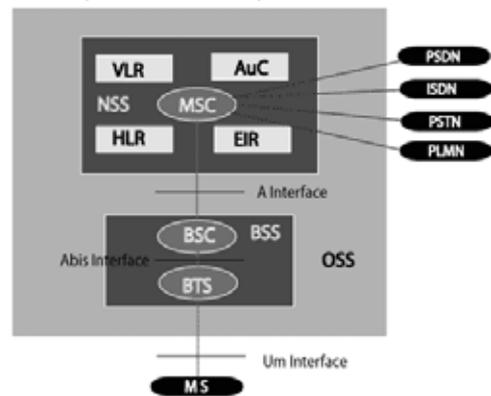

Figure 2 SMS Architecture

illustrates the SMS architecture. When a handset sends out an SMS, the Base station subsystem (BSS) will relay this data to the SMS–Gateway MSC (SMSGWMS).The SMS–GWMS will then access the home location register (HLR), search to locate the cellular phone address at the end point, and then to (VLR)Visitor location registor send route information to the mobile switching center (MSC).After that it checks (AUC)Authentication registor And then (ECR)Equipment checking registor it checks wheater SIM is registor or not.

After receiving this data, the MSC will determine which SMSC

to contact for this end point. The process of the mobile or the GSM module contact with the mobile information centre: Mobile Module (phone or GSM module) contact with Mobile Centre (MSC) in communications using base stations (BSS), and achieve interaction with Short Message entities (SME) though Message Service Center (SMSC) .

The terminal prototype system is composed of twoparts: the main System, and the communications Subsystem. The Main System is based upon Samsung's S3C2410A ARM920T processor; The Communications Subsystem. is mainly an GSM module. Computer connected with GSM module through the standard RS232 serial port, which can achieve SMS transceiver functions. This paper adds the terminal which based on the microprocessors of the S3C2410, BENQ's GSM Module and computer. The software environment is the fedora-c 6 operating system, arm-linux-gcc compiler. As follows arranges in order the code translated under this compiler. The architecture of SMS system is depicted in figure.2.

A. System hardware platform

We use SamSung company's S3C2440A chip as microprocessor, it is based on the ARM9 core which has 32-bit high-speed processors, high-performance, high real-time, low-cost, etc character. At the same time, we configure a (12MB FLASH) and a (64MB SDRAM) for S3C2440A chip, which respectively were used to store procedures and system memory. We use Siemens Company's SIM300 as GSM modem. This module has 40-pin and supply 9-pin normal RS-232 interface which can satisfy the system requirement, in order to full duplex, it should connect MAX3232 to S3C2410 UART1 port through level conversion chip. The system hardware platform is illustrates in Fig.3.
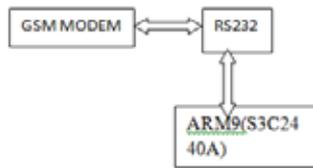
Fig3 sysem hardware platform

B. GSM hardware circuit

We use Siemens Company's SIM300 as GSM modem. This module supply 9-pin normal RS-232 interface, in order to full duplex, it should connect MAX3232 to S3C2410 UART1 port through level conversion chip. GSM baseband processor

is the core part of SIM300 and deal with the AT command which send from serial port.U211 is the GSM SIM card. The diagram of GSM hardware circuit is illustrates in Fig.4.
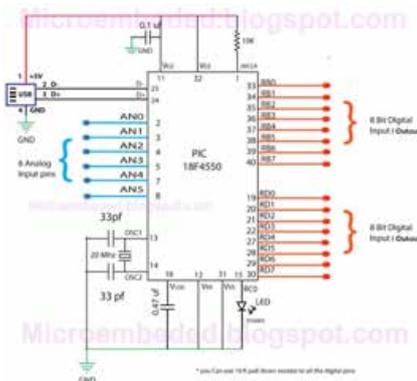
Figure4:GSM Hardware Circuit

3. IMPLEMENTATION OF SYSTEM

The system is based on the ARM9 processor, using principal component analysis (PCA) of STUDENT PERFORMANCE AND MONITORING SYSTEM . Achieved information from the PC machine. System uses the common USB device for getting information, Linux-based operating system software, and ARM9 S3C2440. Based on this hardwareplatform, Embedded Linux

operating system and drivers are developed firstly, and then student performance system is achieved on the operating system.

We develop a low-cost, student performance and monitoring system which has important practical significance. The system uses ARM9 as the system control chip, the system achieved low cost, portability, miniaturization requirements

A. Transplantation of Embedded Linux Kernel

The Linux kernel version that the system choose is special for the embedded systems: Linux Kernel v2.4.18, in the kernel source code directory by typing "make menuconfig" command can configure the kernel. After entering the main interface the kernel can be configured in many aspects. Generally the commands, which are used to compile the kernel, are as follow:

root# make dep
root# make zImage

Kernel C source code files have a certain dependency relationship with header files; Make file has to know this relationship in order to determine which parts of source codes are needed to be compiled. But using "make menuconfig" command to configure the kernel, the command will automatically generate the required header files for compiling kernel. Therefore, after we change the configuration of the kernel and input the command, the correct dependency relationship should be reestablished. But this step in the kernel2.6 version is no longer required

B. Implementation of Drivers Development

Linux device driver can be divided into the following parts: Registration and cancellation of the driver; Opening and releasing the device; Reading and writing the device; Controlling the device; the interrupts of device and the cyclic process.

Embedded Linux kernel which already contains many source codes of general purpose hardware device driver for different hardware platforms, they are only needed to be done some simple modifications and then can be used. For some of the more special equipments (such as the camera drive), you need a detailed understanding of the hardware and then finish the driver development. Linux provides a unified programming interface for the USB pendrive.

In this paper, the USB pendrive device file is primary to store the information of the students for the corresponding programs.

C..Embedded monitoring student performance System by sending and receiving sms

In this system, we use GSM technology and embedded technology to achieve short message service, there are three methods to control sending and receiving message: Block mode; based on AT commands Text mode TEST not only contain information which can be shown, also includes many other information, such as: SMS service center number (SMSC), target number, back number, encoding method and services time.

Transmission Control orders are as follows:
- Call number command: Command code is 30H, no data. In initialization, send from the host to the module and prompt SMS sending and receiving module to send SMS's call number and do not need to save the parameters.
- Terminal number command: Command code is 31H, no data. In initialization, send from the host to the module and prompt SMS sending and receiving module to receive SMS's local numbers and need to

save the parameters.
- SMS command: Command code is 32H, have data. Sending from the host to the module and prompt SMS sending and receiving module to send the receiving

data as message method to the call numbers, then the host waiting for response

D.Alogithm description

We first go on initialization :system initialization, MMU initialization; system clock initialization; setup Nand Flash register; S3C2410's GPIO initialization; selection serial port 1; setup baud rate is 115 200; then respectively call GSM module initialization; port 1 receiving interruption function ; GSM command function and GSM sending message function etc.

▯▯GSM module initialization: after system started, it need to initialize, such as: serial port 1 initialization; enable serial port 1 receiving interrupt.

▯GPRS command function: GPRS communicate with S3C2410's port 1, send AT command char to GSM through port 1 and show through port 1GSMsending message function: send a message to * mobile phone whose number is *number, parameter explanation: *number is the destinations number which will receive message; *text is the sending message content.
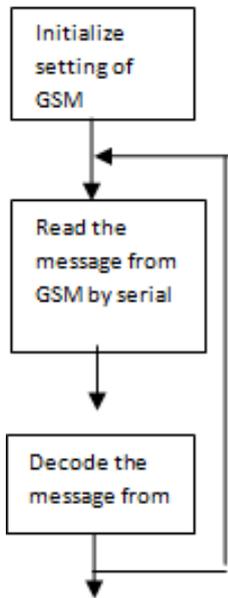

Figure5.the flow of SMS receivivg system

The hardware platform composes of GSM module and computer. The flow of SMS system▯ Send the "AT"commands at the end with enter to test the state of module at the first. If the module returns "GSM Modem initialized !"▯which indicate that module is in a normal state. Then we can realize SMS transceiver. The flow of SMS receiving and dispatching system is depicted in figure.5 and figure6
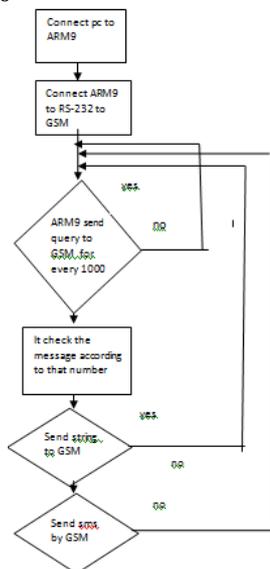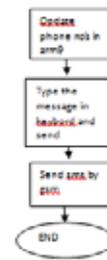

Figure6.The flow of SMSdispatching system.

Figure7.sms dispatching by organization

4. AT commands control over GSM module

AT commands are issued to the modem to control the modem's operation and software configuration. AT Command is sent from the terminal equipment (like a computers) to the terminal (GSM wireless module), which control the functions of mobile GPRS network and interact by AT commands. The service, such as calls▯message▯ telephone▯ data services▯ supplementary services▯ the fax function, can be achieved by sending commands to the different modules. The paper only introduce AT commands on SMS transceiver realization. BENQ GSM provides many AT commands to user. We list AT commands of the pattern of receiving and dispatching in the PDU mode and the simple explanation as following table 2.For more detailed information, please refer to AT commands Manual. The following table 2 lists the AT commands that are related to the writing and sending of SMS messages

Through the preparation software, send above AT commands to GSM module by the serial. Then the encoded message is sent to module or the decoded message is read from module .Finally, Module driven by the mobile station, we will be able to complete SMS transceiver.

AT Commands
AT commands Function
AT$NOSLEEP Not deep sleep
AT+CREG Network registration
AT+CLIP Display telephone number of
calling party
AT+CMGF SMS format
AT+CMEE return error messages
AT+CSCS Select TE character set
AT+CNMI Display new incoming SMS
AT+CMGS Send message
AT+CMGR Read SMS message from storage
AT+CMGL List SMS
AT+CMGD Delete message

5. SMS implementation process

Before SMS transmission to the GPRS module, it must first be sent AT commands, if it returned "OK", illuminating that GSM initializes successfully. Here is the prototype definition of function: gprs_init(n_tty_port ▯9600); And n_tty_port value of the serial, 9600 for the corresponding serial port baudrate.. After initializing successfully, the module can be sent a series of AT commands to send SMS and receive from other terminals through public GSM network. The system takes the public GSM net as the SMS channel, so in the GSM module it must certainly have one piece of effective SIM card. The Chinese SMS main surface of sending and receiving as follows:

6. Conclusions

The project "STUDENT PERFORMANCE AND MONITORING USING ARM 9" has been successfully designed and tested.

It has been developed by integrating features of all the hardware components and software used. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit.

Secondly, using highly advanced ARM9 board and with the help of growing technology the project has been successfully implemented.

REFERENCE   [1] Samsung Electronics Co Ltd. Users' Manual S3C2440A V0.12. | [2] Steve Ferber, "ARM System-on-Chip Architecture," PEARSON. | [3] Richard Stevens, "Advanced Programming in the UNIX(R) Environment", 2nd Edition. | [4] Karim Yaghmour, "Building Embedded Linux systems," O'Reilly Media | [5] www.google.com | [6] www.friendl-yarm.net/ | [7] www.embedded.com | [8] www.alldatasheets.com | [9] www.arm.com | [10] www.wikipedia.org | [11] http://www.linuxfordevices.com | ss[12]http://en.wikipedia.org/wiki/Global_Positioning_System | [13 http://en.wikipedia.org/wiki/Bluetooth | [14] http://www.edaboard.com/ | [15] http://www.linuxforums.org/ | [16]http://www.arm.linux.org | [17]http://www.data-sheetarchive.com.