

## Implementation of an Ethernet Based Electronic Information Desk

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### **ABSTRACT:**

The availability of up-to-date information to people is an important requirement in many scenarios such as companies and civil institutions. In this regard, most establishments either use websites, emails or notice boards. However, in developing countries internet access is not available to many people on their mobile devices because of high costs. Moreover, having an electronic notice board requires that people need to go to one place to get the required information thus resulting in long queues as well as inconvenience on the part of the person. In this paper, we propose a system that can be used to provide up-to-date information to students or employees of any institute using latest and most common technology. This is an automated system that utilizes GSM technology along with an embedded server using Ethernet.. The system is designed to work independently without the need of any human operator and when a student or employee needs any information, they will need to send an SMS to this system which will respond with the information required by user. The system also has the facility to inform students or employees about any instant update via SMS and it can also be remotely updated with new information. Furthermore, the system has the capability to store previous notifications which have been sent and is designed to work 24/7.

### **INTRODUCTION:**

Information dissemination among employees of a company is necessary for management and administration purposes.

Consequently this has been of interest for system designers in a diverse set of applications ranging from development of generalized chatbots or forming an online help assistant. An information exchange tool for knowledge transfer can exist in two ways, the first is performed in the form of a question answer system in which a person readily answers all the queries that one might have. Alternately, there could also be a social forum for information transfer. In companies and educational establishments, information is usually disseminated by means of information counters and notice boards. However, with such organizations usually having personnel spread over a large area, it is not always possible for every employee to be able to get access to the most up-to-date information. Educational institutions also have a similar situation wherein students can be present in any part of the campus and might miss important updates such as rescheduling of classes etc. Furthermore, students and employees might not be able to know important information in-time for it to be useful to them as they might not be able to pass through those notice boards regularly. Paper based notice boards are especially cumbersome to maintain due to many people posting information with no mechanism for removing them. It would therefore be beneficial as well as convenient for there to be some mechanism by which users could be updated immediately about a change in normal routine or be able to access the most current information at their will.

## **II. LITERATURE SURVEY:**

An electronic assistant for a home was designed to give the occupants access to various type of information about the home such as consumption of electricity, water, gas, indication of a fire, gas leak or burglary with alarm functionality. It also allows the user to control appliances. This is accomplished by means of a central unit called a junction station. The junction station is connected to the electronic meters within the house; it not only collects usage information for various utilities but also stores the information in memory.

### **A) Chatbot implementation using the ALICE system:**

Furthermore, it also provides alarm functionality in case of an altercation in the house as well as facilitates the scheduling of appliances. The junction station is communicated with by means of a mobile meter reader which is based on the S3C44B0X module. The mobile reader communicates by means of infrared communication and can be used and then developed a Chatbot called University FAQbot (UFAQbot) to answer the queries of humans using natural expressions and study student satisfaction with the chat bot answers. They use this chat bot interface as an advisor for undergraduate students in a university. Their implementation uses the ALICE system (Artificial Linguistic Internet Chat Entity) to answer frequently asked questions and also to act as a student advisor. The UFAQbot responded with information about admissions, faculty members and courses. The study revealed that a high degree of satisfaction was present for such a information dissemination system.

### **B) Services system based on Short Messaging Service (SMS):**

Then few proposed a student services system based on Short Messaging Service (SMS) for colleges. Their system consists of a computer connected to a GSM modem. Student records such as results, attendance, events in the campus, rescheduling of lectures and other on-demand services are conveyed

via SMS to the concerned students and/or parents. Student records are updated on the server via the internet through authorized users which are college faculty and administration staff. The server contains a database consisting of information about every student such as name, ID number, contact number of student and parent etc. Once a record such as a test result has been uploaded, the server prepares an SMS string for every student's record and communicates with the GSM module by means of AT commands to send the information to the student via SMS. The proposed scheme is advertised as a low cost computer based SMS information dissemination system. However, it requires a computer and is expensive in that regard.

### **C) The Online Announcement Displaying System (OADS):**

The Online Announcement Displaying System (OADS) for Tanzanian colleges which requires users to log in to the e-notice board system to get relevant information. Once a user gets registered with this system, he/she can access all information that is posted to the notice board system. This system requires internet access to be available for all students or faculty members wanting to access information. Furthermore, the information repository of the OADS can be updated online or on the server computer itself after validating the user.

## **III. EXISTING SYSTEM:**

In every institute and/or industry there is always an information desk that provides information about the staff, institute, and its departments and about everything related to that institute. For this purpose we may use notice boards and internet. We may create a webpage related to particular institution and its details and we can provide authentication. For this purpose one need to have What if the information is not updated over internet? in those cases where the information is not being updated over internet, we need to call customer support. Some designed a device that has all the information stored in its database, whenever someone needs information they

have to use that device and get related information through that device. Moreover in developing countries most of the people cannot afford for internet whenever they want to access the website. We can place any important notifications of any institution in the notice boards. The problem is that it requires some staff that is dedicated to that purpose and that must have up to date information about the institute and the recent happenings in the institute. The second issue is that a person needs to go in the institute at the information desk in order to get information from them.

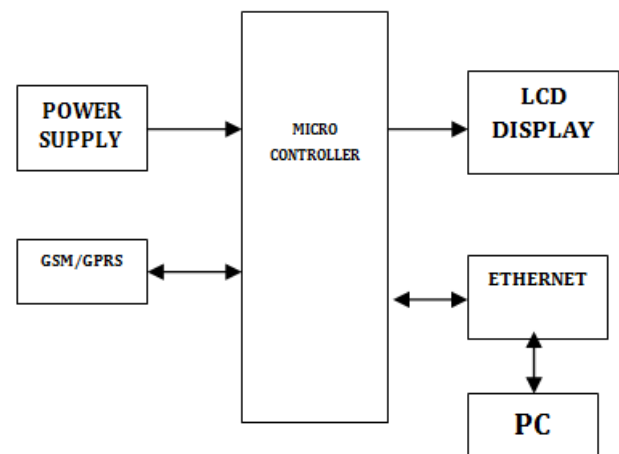
#### IV. PROPOSED SYSTEM

##### ELECTRONIC INFORMATION DESK:

The system is designed to work independently without the need of any human operator and when a student or employee needs any information, they will need to send an SMS to this system which will respond with the information required by user. The system also has the facility to inform students or employees about any instant update via SMS and it can also be remotely updated with new information. The cell numbers of Employees are stored in the EEPROM of the ARM7, when an employee will send an SMS with starting text of “broadcast:”, the system will forward same message without text “broadcast:” to all employee cell phone numbers. This feature is useful to communicate or quickly deliver important information all employees. The same message will be received by the information broadcaster too. Another feature in this system is quick information broadcast to all employees, in case if the Head of Department or any employee wants to convey any important information to all employees on urgent basis, he/she has to send a message to that system with specified format to broadcast that information to all employees automatically. If message is not decoded properly, it will send back the proper format of messages to the sender. In order for the system to be updated via the internet, an Ethernet Shield is also included in the system and through internet all the files to pc are updated. Hence there is no need to detach the SD Card for management of information files.

The designed system consists of ARM7, GSM Module SIM900D, Ethernet Shield and PC. All the information is placed in memory of a pc as text files (.txt). There is also a general file “updates.txt” that will inform employees and students about other available documents like results and notifications etc. .When any student or employee will send SMS to this system, the system will process message text and required information will be sent via SMS to sender's number. To determine the kind of information required, some SMS formats have been defined. We have associated various codes to each update. The system interacts with users through a GSM Module; any messages received by the GSM module are decoded by microcontroller which acts as the central controlling unit. The microcontroller decodes the received message and stores sender’s information in memory. If message is decoded then system reads pc via Ethernet Shield and reads the required information from memory of pc and this information is sent back to sender's number.

#### V. BLOCK DIAGRAM AND HARDWARES



**Fig 1: Block Diagram**

##### i) LPC2148 CONTROLLER:

**ARM7 LPC2148** is ARM7TDMI-S Core Board Microcontroller that uses 16/32-Bit 64 Pin (LQFP) Microcontroller No.LPC2148 from Philips (NXP). All resources inside LPC2148 is quite perfect, so it is the most suitable to learn and study because if user can learn and understand the applications of all resources

inside MCU well, it makes user can modify, apply and develop many excellent applications in the future. Because Hardware system of LPC2148 includes the necessary devices within only one MCU such as USB, ADC, DAC, Timer/Counter, PWM, Capture, I2C, SPI, UART, and etc. The LPC2141/42/44/46/48 microcontrollers are based on a 16-bit/32-bit ARM7TDMI-CPU with real-time emulation and embedded trace support, that combine microcontroller with embedded high speed flash memory ranging from 32 kB to 512 kB. A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at the maximum clock rate. For critical code size applications, the alternative 16-bit Thumb mode reduces code by more than 30 % with minimal performance penalty. Due to their tiny size and low power consumption, LPC2141/42/44/46/48 are ideal for applications where miniaturization is a key requirement, such as access control and point-of-sale. Serial communications interfaces ranging from a USB 2.0 Full-speed device, multiple UARTs, SPI, SSP to I2C-bus and on-chip SRAM of 8 kB up to 40 kB, make these devices very well suited for communication gateways and protocol converters, soft modems, voice recognition and low end imaging, providing both large buffer size and high processing power. Various 32-bit timers, single or dual 10-bit ADC(s), 10-bit DAC, PWM channels and 45 fast GPIO lines with up to nine edge or level sensitive external interrupt pins make these microcontrollers suitable for industrial control and medical systems.

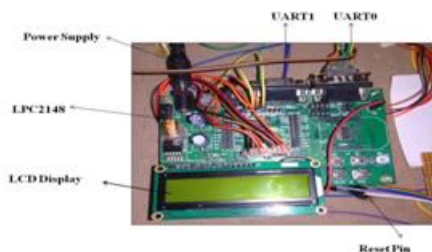


Fig 2: LPC2148 Board

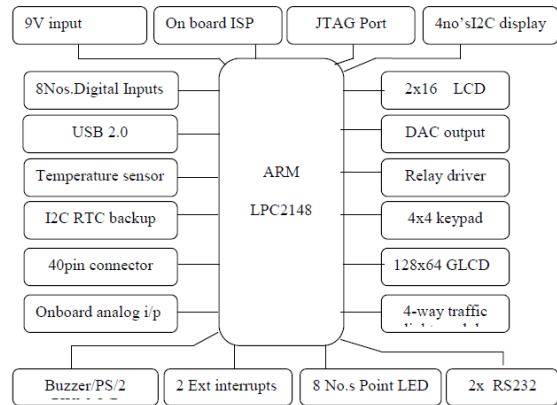


Fig3: General block diagram of ARM7 LPC2148

## ii) GSM MODEM



Fig 4: GSM Modem

It is a globally accepted standard for digital cellular communication. GSM is the name of standardization group established in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900MHZ. Presently GSM supports more than one billion mobile subscribers in more than 210 countries throughout the world. The GSM commercial modem is an approved modem for embedded applications. It provides a 5v TTL compatible serial interface to host data terminal equipment. Call control is provided by using the Hayer AT command set. By sending a code from a transmitter GSM equipped mobile to other mobile which is a receiving GSM equipped mobile.

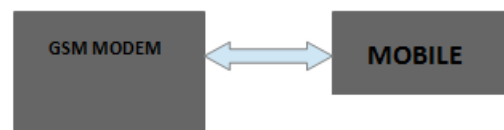


Fig 5: Communications through GSM

**iii) ETHERNET:**

**Key Features:**

1. Support TCP Server, TCP Client and UDP
2. 10BaseT/100BaseTX auto negotiation
3. Support auto MDI/MDIX
4. Support UDP multicasting
5. Support DHCP (Dynamic Host Configuration Protocol). Acquire dynamic IP and other Network parameters from DHCP server
6. UART data format can be configured. UART Baud rate is from 1200bps to 230400bps
7. UART interface supports 5V (or 3.3v) TTL (CMOS), RS-232C and RS-485

**EXPLANATION:**



**Figure 6: HS-ENG1000/1000 usage structure**

HS-ENG1000C is an integrated serial to Ethernet module. It has power supply, RJ-45 and DB9/M etc. it is easier to use.



**Figure 7 : HS-ENG1000C Module**

**Operation mode:**

After HS-ENG1000 power on or reset, it checks CONFIG, RUN and cable connection respectively. If cable connection is abnormal, HS-ENG1000 will stop working. After a series of checking operation, HS-ENG1000 will detect Gateway (Router). HS-ENG1000 returns the detecting result to MCU through UART. Using Hyper Terminal, It will be shown in PC.

**IV. SOFT WARE DESIGN TOOLS**

**KEIL SOFTWARE:**

Keil compiler is software used where the machine language code is written and compiled.

After compilation, the machine source code is converted into hex code which is to be dumped into the microcontroller for further processing. Keil compiler also supports C language code.

**PROLOAD:**

Proload is software which accepts only hex files. Once the machine code is converted into hex code, that hex code has to be dumped into the microcontroller placed in the programmer kit and this is done by the Proload. Programmer kit contains a microcontroller on it other than the one which is to be programmed. This microcontroller has a program in it written in such a way that it accepts the hex file from the keil compiler and dumps this hex file into the microcontroller which is to be programmed. As this programmer kit requires power supply to be operated, this power supply is given from the power supply circuit designed above. It should be noted that this programmer kit contains a power supply section in the board itself but in order to switch on that power supply, a source is required. Thus this is accomplished from the power supply board with an output of 12volts or from an adapter connected to 230 V AC.

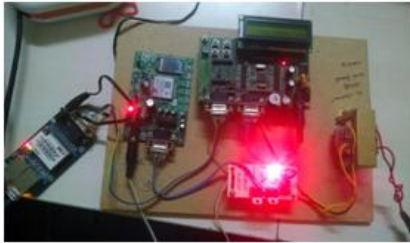
**EXPERIMENTAL RESULTS**

**1. Hardware kit in off mode**



**Figure 1: Hardware kit in off mode**

**2. Hardware kit with power on to all modules**



**Figure 2: LAN and GSM in ON position**

**3. Connecting and Configuring GSM**



**Figure 3: GSM connected**

**4. Sending SMS from output device (mobile) to GSM**



**Figure 4.1 : Sending SMS on LCD in Kit**



**Figure 4.2 : Data sending from GSM to PC (server)**

**5. Sending message from PC to hardware**



**Figure: SMS on Hyper LAN**

**6. Data sent from PC to kit**



**Figure 6: SMS sent to device**

**VI. CONCLUSION AND FUTURE ENHANCEMENT:**

Implementation of an Ethernet based electronic information desk system was proposed and implemented. The system consists of a small embedded system, a GSM module and an Ethernet shield to perform communication with the outside world and a pc for storage of information to be distributed. The system was shown to work well when requiring information remotely on a mobile device via SMS. A complete framework was described on the organization and storage of the information to be distributed. This system has wide ranging utility as an add-on to notice boards for convenience of information transmission and use as a standalone help assistant in various applications. Future improvements to this system could be the hardware design for adding this to an electronic notice board. This would form a complete system for information distribution in public places.

**REFERENCES:**

[1] S. Ghose and J.J. Barua, "Toward the implementation of a topic specific dialogue based natural language chatbot as an undergraduate advisor", 2013 International Conference on Informatics, Electronics & Vision (ICIEV), 2013, pp. 1-5.

[2] Weissenborn. and F.J. Sanchez, "TekPAC (Technical Electronic Knowledge Personal Assistant Capsule)", 2001 IEEE International Semiconductor Manufacturing Symposium, 2001, pp. 29-31.

[3] R. P. Schumaker, Ginsburg, M., Chen H., Liu Y., "An evaluation of the chat and knowledge delivery

components of a low-level dialog system: The AZ-ALICE experiment”, Decision Support Systems, 2007.

[4] J. Chai and J. Lin, “The role of natural language conversational interface in online sales: a case study,” International Journal of Speech Technology., Nov. 2001, vol. 4, pp. 285-295.

[5] Schultz, T, “Mass media and the concept of interactivity: An exploratory study of online forums and reader email”, Media, culture & society, vol. 22, issue. 2, pp.205-221.

[6] B. Adkins, E. Grant “Backpackers as a community of strangers: the interaction order of an online backpacker notice board”. Qualitative Sociology Review, vol. 3, issue. 2, 2007.

[7] Kaisheng Zhang and Jinhao Liu, “Design Of Home Intelligent Electronic Assistant System Based on Embedded Module of 3C44BOX”, 2nd IEEE International Conference on Computer Science and Information Technology, 2009 (ICCSIT 2009), 2009, pp. 27-29.

[8] WALLACE, Richard. The elements of AIML style. Alice AI Foundation, 2003 [9] Mengawade, Tejas et Mogal, Mayur, “SMS Based Student Services Administration”, Global Journal of Computer Science and Technology, vol. 13, no 1, 2013

[10] Semakuwa, Senzota K., Rashid, Florence U., Fungo, Debora C., et al. “Migrant from on wall notice-board to an online announcement displaying system for tanzanian, college’s”, 2014.

[11] S. R. Nivetha, Pujitha, R., Preethi, S., Yashvanthini, S.M., "SMS based Wireless Notice board with Monitoring System", International Journal of Advanced Electrical and Electronics Engineering ,(IJAEEL), 2013, vol. 2, pp. 58-62.

[12] J. M. Darshil, Vishal, S. Vora, "Advertising Display System using LED and Graphical LED”,

International Journal of scientific Research & Development, 2013, vol. 1, pp. 153-157

[13] P. Kumar, V. Bhrdwaj, K. Pal, S. N. Rathor, and A. Mishra, "Gsm Based e-Notice Board: Wireless Communication," International Journal OF Soft Computing and Engineering (IJSCE), 2012, vol. 2, pp. 601-605

[14] P. U. Ketkar, K. P. Tayade, A. P. Kulkarni, and R. M. Tugnayat, "GSM Mobile Phone Based LED Scrolling Message Display System", International Journal of Scientific Engineering and Technology, 2013, vol. 2, pp. 149-55

[15] Dogo, E. M., Akogbe, A. M., Folorunso, T. A., et al. “Development of Feedback Mechanism for Microcontroller Based SMS Electronic Strolling Message Display Board”, 2014.

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