

Attendance Monitoring System & Applications

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ABSTRACT

In Schools, Colleges, Institutions there is a problem of irregularity of system in form of attendance this paper clears the idea of attendance monitoring used specifically in home automation system For this home automation and security system we are targeting Android platform since it has huge market and open source. Android is a software stack for mobile devices that includes an operating system, middleware and key applications. also we have used Radio Frequency Identification (RFID) technology was laid by past generations, only recent advances expanding application range to its practical implementation.

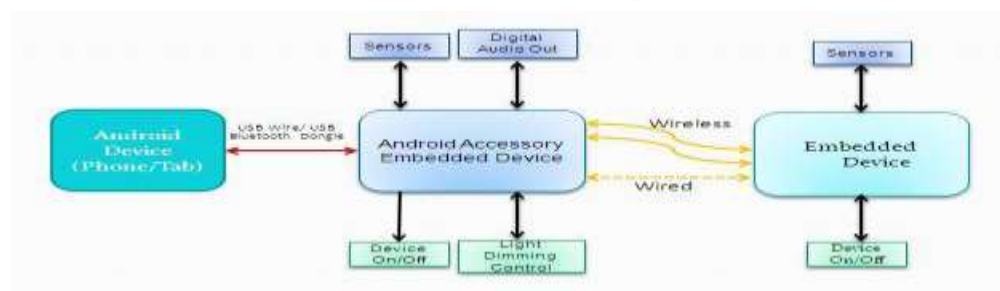
Keywords: GSM, Keil C Compiler, RFID, Android, Bluetooth, zigbee, 5 Raspberry pi home automation and arduion.

1.INTRODUCTION

ANDROID HOME AUTOMATION

For this home automation and security system we are targeting Android platform since it has huge market and open source. Android is a software stack for mobile devices that includes an operating system, middleware and key applications. The Android OS is based on Linux. Android Applications are made in a Java-like language running on a virtual machine called 'Dalvik' created by Google. The Android SDK provides the tools and APIs necessary to begin developing applications on the Android platform using the Java programming language. Accessory mode is a feature of Android OS since version 2. For this home automation and security system we are targeting Android platform since it has huge market and open source. Android is a software stack for mobile devices that includes an operating system, middleware and key applications. The Android OS is based on Linux. Android Applications are made in a Java-like language running on a virtual machine called 'Dalvik' created by Google. The Android SDK provides the tools and APIs necessary to begin developing applications on the Android platform using the Java programming language. Accessory mode is a feature of Android OS since version 2.3.4 Gingerbread and Honeycomb and above ADK.

ADK stands for Accessory Development Kit. Android accessory is a physical accessory that can be attached to your Android device. [12] These particular devices perform specific actions. For USB accessories to supported on a particular device, there must be support for the accessory-mode, a special means of connecting over the USB port



1.1. Block Diagram of Home Automation and Security System using Android

RFID HOME AUTOMATION

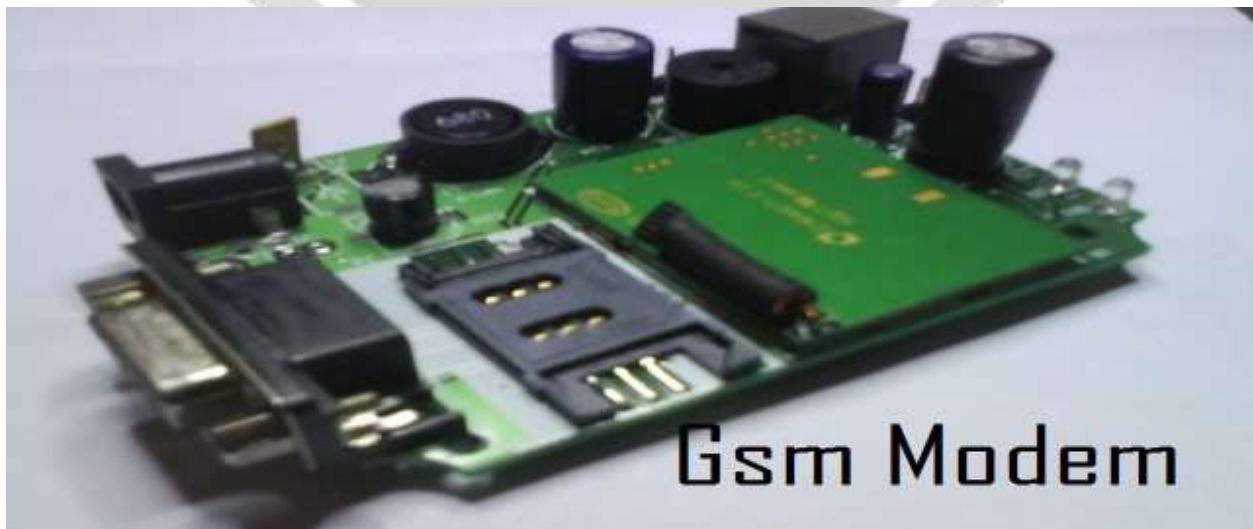
Radio Frequency Identification (RFID) technology was laid by past generations, only recent advances expanding application range to its practical implementation. RFID is only one of numerous technologies grouped under the term Automatic Identification such as bar code, magnetic inks, optical character recognition, voice recognition, touch memory, smart cards, biometrics etc. Auto ID are a new way of controlling information and material flow, especially suitable for large networks

The RFID technology is a means of gathering data about a certain item without the need of touching or seeing the data carrier, through the use of inductive coupling or electromagnetic waves. The data carrier transmit information to a reader (or transceiver) within a given range, which can forward the information to a host computer. The middleware (software for reading and writing tags) and the tag can be enhanced by data encryption for security-critical application at an extra cost, and anti-collision algorithms may be implemented is a microchip attached to an antenna (together called transponder or tag), the latter enabling the chip to for the tags if several of them are to be read simultaneously.

One important feature enabling RFID for tracking objects is its capability to provide unique identification. One possible approach to item identification is the EPC (Electronic Product Code), providing a standardized number in the EPC global Network, with an Object Name Service (ONS) providing the adequate Internet addresses to access or update instance-specific data. However, currently, ONS cannot be used in a global environment, and since it is a proprietary service, its use is relatively expensive, especially for participants with limited resources such as SMEs. As an alternative, researchers from the Helsinki University have proposed the notation ID@URI, where ID stands for an identity code, and URI stands for a corresponding Internet address. This allows several partners to use the system and still guarantee unique identification. The project 'Identity-Based Tracking and Web-Services for SMEs' (<http://www.traser-project.eu>) currently working on further development of this concept.

GSM HOME AUTOMATION

In these days, automobile thefts are increasing at an alarming rate all over the world. So to escape from these thieves most of the vehicle owners have started using the theft control systems. The commercially available anti-theft vehicular systems are very expensive. Here, we make an attempt to develop an instrument based on 8051 microcontroller and operated using GSM technology. The Global System for Mobile communications (GSM) is the most popular and accepted standard for mobile phones in the world established in 1982 and it operates in 900 MHz frequency. Over billion people use GSM service across the world.



1.2. GSM MODEM

The utility of the GSM standard makes international roaming very common between mobile phone operators, enabling subscribers to use their phones in many parts of the world. GSM differs significantly its predecessors in both signaling and speech clarity, as its channels is digitized. It means that the GSM system is now considered as a third generation (3G) mobile communication system.

Bluetooth

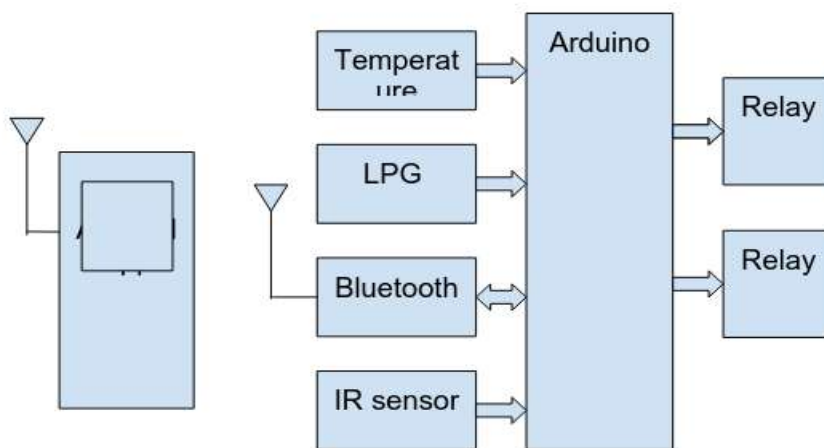
The system can have a variety of Bluetooth ranges. Depending upon the use, required Bluetooth range module can be used the system. It thus makes the system cost dependent upon the kind of use of the system

makes automatic connection with environment via Internet, telephone One of the smart phone applications that have been developed is smart homes technology [3]. Smart home technology is the technologies that are used in homes with various apparatus converse over a local network. According to the Smart Homes Association the best definition of smart home technology is: the

combination of technology and services through home networking for a better value of living. This technology can be used to monitor, alert and execute, according to the desired functions. Smart homes technology or regular fixed phones. Smart homes actually have the ability to make life easier and more proper. Home networking can also offer peace of mind. Whether you're at job or on holiday, the smart home will aware you to what's going on, and security system can be built to offer some help in emergency situations. For example, not only would a house owner be woken with warning of a fire

alarm, the smart home would also release doors, call the fire department and light the pathway to safety [4].The use of Bluetooth technology in a smart phone today is not just for the transfer of data and files only. In recent years, smart home automation is one of the applications of Bluetooth technology. Bluetooth technology operate over unlicensed, its available at

2.4GHz frequency, it also can link digital devices within a range of 10m to 100m at the speed of up to 3Mbps but it depending on the Bluetooth device class [5]. With these qualifications of Bluetooth; we offer a door automation system based on Bluetooth technology, especially in door automation system.



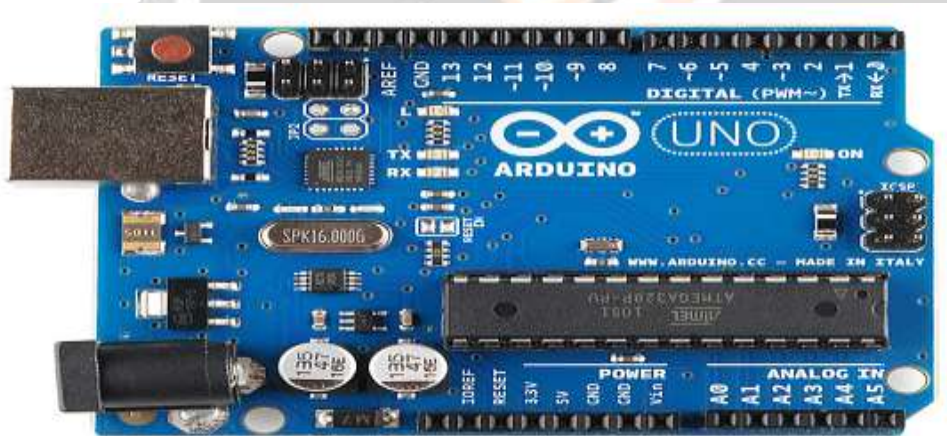
1.3. Bluetooth based system

ZigBee

It is a low-cost, low-power, wireless networking standard. The low cost allows the technology to be widely deployed in wireless control and monitoring applications, the low power-usage allows longer life with smaller batteries, and different networking topologies provides high reliability and larger range model of zigbee



1.4. Zigbee Module



1.5. Arduino UNO Board

- Android is an open source operating system which means that any manufacturer can use it in their phones free of charges.
- It was built to be truly open. Android is built on the open Linux Kernel. Furthermore, it utilizes a custom JAVA virtual machine that was designed to optimize memory and hardware resources in a mobile environment.

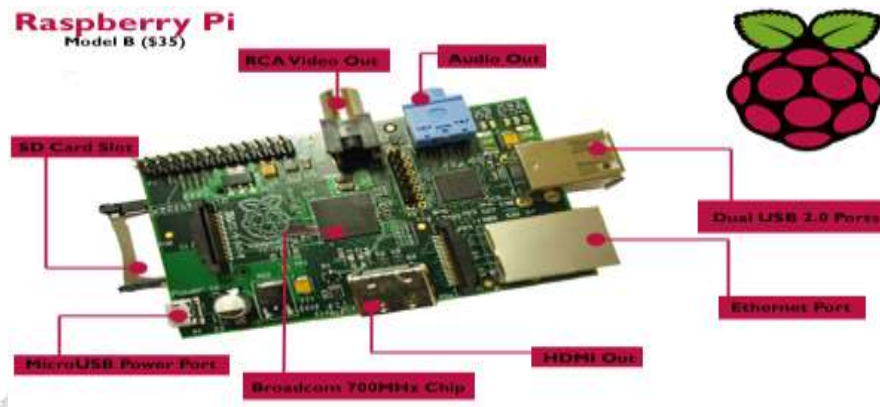
Arduino uno

- The Arduino Uno is a microcontroller board based on the ATmega328P.
- It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs,

A 16 MHz quartz crystal, a USB connection a power jack, an ICSP header and a reset button

•Simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

RASPBERRY PI HOME AUTOMATION



1.6. Raspberry pi based Home Automation System

Raspberry Pi is a simple one-board computer (device) on sale since February 29, 2012 [17] for 30\$. So it is a good candidate for cheap option to build home automation around it. Raspberry Pi is small device so it does not take much space and it does not use up much electric energy. Raspberry Pi is open to be used with many operating systems (OS), but mostly it is used with some Linux OS distribution (e.g. Raspbian). Linux versions prepared for Pi home. Raspberry Pi is constantly upgraded and currently there are five versions of Raspberry Pi: Model A, Model A+, Model B, Model B+, and Model B – There is also a compute module that can be used for more professional work. Raspberry Pi's recent sales data are as follows: 3.8 million October 23, 2014, 5 million February 17, 2015, 6 million June, 8, 2015.

Raspberry Pi software is mostly open source and various programming languages can be used like C, C++, Python, and Java. Github search for term Raspberry gave around 11.000 projects. Almost half of them have been written in Python. This is not oddly because from the beginning Raspberry Pi has been promoted as "little device that enables people of all ages to explore computing, and to learn how to program in languages like Scratch and Python." [20] Support for other programming languages, and for instance Java as the most popular language of all, has come later in 2013

References

1. D. Norris, *The Internet of Things: Do-It-Yourself at Home Projects for Arduino, Raspberry Pi and BeagleBone Black*. Tab Electronics, 2015.
2. <http://developer.android.com/about/index.html>.
3. J. Haartsen, "BLUETOOTH—The universal radio interface for ad hoc, wireless connectivity", Ericsson Review No. 3, pp. 110-117, 1998. [3] Why Android ?, <http://www.android.com/about/>, last seen on October 2013.
4. R. Llamas, R Reith, M. Shiere, "Apple Cedes Market Share in Smartphone Operating System Market as Android Surges and Windows Phone Gains, According to IDC" 7th August 2013, IDC Press Release, <http://www.idc.com/getdoc.jsp?containerId=prUS24257413>.
5. N. Sriskanthan, F. Tan, A. Karande, "Bluetooth based home automation system", *Microprocessors and Microsystems*, Elsevier, 26, pp. 281- 289, 2002.
6. S. Panth, M. Jivani, "Designing Home Automation system (HAS) using Java ME for Mobile Phone", *International Journal of Electronics and Computer Science Engineering*, Vol. 2 No. 02, pp. 798-807, July 2013