Monitoring System using Internet of Things

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Abstract—**presently everything is based on digital technology; every person is connected with each other by many ways, where most common means of communication is internet. But Unfortunately all over the world, the number of crime is increasing specially over children, as mishaps and missing of children are happening often .So this paper proposes a solution which is nothing but a monitoring system in schools for parents so that they may track their children in real time ,based on IOT . This proposed idea takes the advantage of the location services by SMS, when the child enters/exits the school. RFID (Radio frequency identification) and GSM (Global system for mobile communication) have been chosen as an appropriate technology for this purpose.**

Keywords— **IOT (Internet of Things), GSM, RFID TAG**

I. INTRODUCTION

The vision of the Internet of things has been evolved due to the convergence of multiple technologies including wireless communication, real-time analysis, machine learning, wireless sensors, and embedded system. This means that the traditional fields of technology involving the prime objective of automation (including home and building automation), and all other have contributed and provided a platform to enable a very revolutionary and real time technology , Internet of things (IOT) [1],[2],[3]. It refers an excellent ability to sense and collect data from the world around us and then share the data across the Internet where it can be processed and utilized for various purposes. As technology is increasing rapidly, crimes are also more frequent in every field. Particularly Children safety is one of the major factors in this scenario so in this busy and fast moving life this is one of the most important and notable issue for parents which should not be neglected. School going infant children, are not able to protect them self and may end up in a situation that endangers their life. So in this paper we are introducing a monitoring system that will monitor the different status of the child such as whether the child is entered in school or out from the school or in danger. The information of child will reach to their respective parents by sms using the GSM module and can be monitored through the internet simultaneously. So this advanced system can be adopted as a safety measure for the children in real time.

II. EXPERIMENTAL DETAILS

In this monitoring system RFID module is used that is able to provide additional security applications for children. However the existing systems are not powerful enough to prevent the crime against children. [5] Each student carries a card which contains a unique identification number. When the student enters the school. The RFID card will be send message through GSM to the parents that their child has entered the school. If the student is in danger panic switch is attached to the RFID card, when he/she presses the button then message is shown in parent's cell phone that "I am in danger" and simultaneously will available in the internet.

A. Key components

Fig.1 ATMEGA16 Microcontroller.

ATMEGA16 Microcontroller.ATMEGA16 is an 8-bit high performance microcontroller from the Atmel's Mega AVR family. Atmega16 is a 40 pin microcontroller based on enhanced RISC (Reduced Instruction Set Computing) architecture with 131 powerful instructions. It has a 16 KB programmable flash memory, static RAM of 1 KB and EEPROM of 512 Bytes [6]
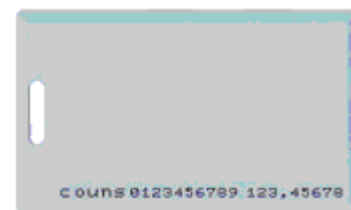

Fig.2.RFID Module

Fig.3 RFID Tag

RFID READER - RFID (Radio Frequency Identification)
The wireless non-contact use of radio-frequency electromagnetic fields to transfer data, for the purposes of automatically identifying and tracking tags attached to objects The function of the RFID reader is integrated with RFID tags. It contains the reader module, which works as both the transmitter and receiver of radiofrequency signals. The transmitter consists of an oscillator to create a carrier frequency, a modulator that impacts on data commands, and amplifier to enhance the signal enough to awaken the signal the microcontroller forms a control unit that stores data and then sends it to the network. It can read any RFID card within range, and any microcontroller can easily read it. RFID tag scanned from a distance and as well as to capture the signals and send them to reader, thus it detects each and every tag and sends the data to the server.A basic RFID system consists of three components of a An antenna or coil A transceiver (with decoder) A transponder (RF tag) No "line of sight" requirements: RFID tags can be read through materials without line of sight. More automated reading: RFID tags can be read automatically when a tagged product comes past or near a reader, reducing the labor required to scan product and allowing more proactive, real time tracking. Improved read rates: [4] RFID tags ultimately offer the promise of higher read rates. Greater data capacity: RFID tags can be easily encoded with item details such as lot and batch, weight, etc. Write" capabilities: Because RFID tags can be rewritten with new data as supply chain activities are completed, tagged products carry updated information as they move throughout the supply chain.

Fig.4 GSM Kit

 GSM. GSM is a mobile communication modem; it stands for global system for mobile communication (GSM). The idea of GSM was developed at Bell Laboratories in 1970. It is widely used mobile communication system in the world. GSM is an open and digital cellular technology used for transmitting mobile voice and data services opera GSM system was developed as a digital system using time division multiple access (TDMA) technique for communication purpose. A GSM digitizes and reduces the data, then sends it down through a channel with two different streams of client data, each in its own particular time slot. The digital system has an ability to carry 64 kbps to 120 Mbps of data rates at the 850MHz, 900MHz, and 1800MHz and1900MHz frequency bands. [1], [2] in this prototype SIM 800A is used.
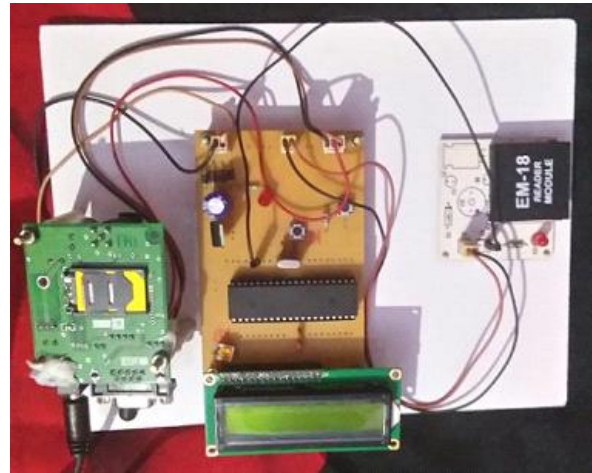

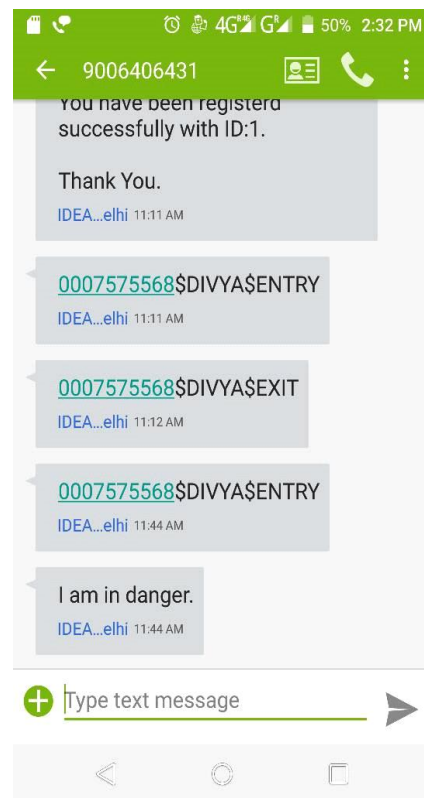Fig 5.Prototype of IOT based system

III.RESULS AND DISCUSSIONS

Fig 6. Sms in mobile phone of IOT based system

Fig7.information shown simultaneously in internet based on the monitoring system

This project presents IOT based systems using RFID TAGS that enhance the safety of child during the going to the school. The implementation of project focuses on monitoring child's position and is send to its parent. IOT network benefits not one but all i.e. individuals, society, stake holders of businesses etc. due to the fact that IOT network saves time and money.IOT system delivers faster and accurately with minimum utilization of energy. [5], [7]. The effectively utilization of RFID with GSM technology is successfully designed and implemented on laboratory scale. The accuracy level or security level may be extended to the public level. Development in RFID and GSM technology continue to wider reading ranges yields faster processing as real time system. There are many tracking system available in present time, these systems use different technologies but each of them has one or more limitation such as not suitable for many children or monitor how far the child from their parent without monitoring the environment surrounded the children or can monitor only one state at a time. While the designed tracking system allows parent to monitor multiple children and they will be alarmed if any child be in danger state. So in simple words IOT based monitoring system for children is a matchless tool via which one can monitor the status of their kids through mobile phone messages accompanied by GSM module and also through the internet in real time.

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