Implementation of Child Tracking System Using Raspberry-pi

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ABSTRACT- Security for children including of criminal activities in metropolitan cities.This problem has extend TO TRACK infants and toddlers is a great concern nowadays due to the increasing amount the position of the child. The current position of the child is accessed from the GPS and sends to the monitoring section using IOT. The values are received to such a state that it is out of the control of government authorities. So each individual is also responsible for theirchildren's security. So here we are introducing a child security tracking system which helps the parent or guardian of the child to track the latter's position at any time and make sure they are safe. In this we are using a GPS MODULE by the receiving end by another web page. At the same time the location of child is also shown in the monitoring side.

Keywords:- *GPS, IOT, MEMS, SMS*

I. INTRODUCTION

There is an increasing needs for tracking devices, which can be a life saving devices. During periods of disasters, people can use these systems to keep track of victims. Tracking provides several services such as, locating stolen assets, keep track of employers to monitor where they are at all times during the workday, teenagers to control their movements, smaller children and elders when they go missing and for many other purposes. The evolution to location-dependent services and applications in wireless systems continues to require the development of more accurate and reliable positioning and tracking systems. This paper goes through one of the efficient tracking systems. Security for children including infants and toddlers is a great concern nowadays due to the increasing amount of criminal activities in metropolitan cities. This problem has extended to such a state that it is out of the control of govt authorities. So each individual is also responsible for their children's security. So here we are introducing a child security tracking system which helps the parent or guardian of the child to track the latter's position at any time and make sure they are safe. In this we are using a GPS MODULE TO TRACK the position of the child. The current position of the child is accessed from the GPS and sends to the monitoring section using IoT. The values are received by the receiving end by another web page. At the same time the location of child is also shown in the monitoring side.

II. PROPOSED SYSTEM

An A microcontroller controls the system architecture of the wearable with an Raspberry . A 5 pin header allows for power (+3 V) and ground connections as well as providing access to TX, RX, and reset pins of theRaspberry. The illustrates the architecture of the child safety wearable device, which depicts the various technologies and technological standards used. The system architecture of the wearable is based and controlled by an raspberry microcontroller with an Raspberry boot loader. The Raspberry collects various types of data from the different modules interfaced to it, such as the GPS module upon being triggered by the Raspberry GSM shield. The GSM shield is used as an interface to send the data received by the Raspberry via SMS or MMS to a Smartphone over GSMlGPRS. The GSM shield functions as a trigger for the Raspberry Uno to request data from its various modules. If an SMS text with distinct characters is sent to request the current location or GPS

III. EXISTING SYSTEM

Safety device with wearable's which help track the daily activity of children and also help find the child using Wi-Fi and Bluetooth services present on the device. Wi-Fi and Bluetooth appear to be an unreliable medium of communication between the parent and child.

BLOCK DIAGRAM

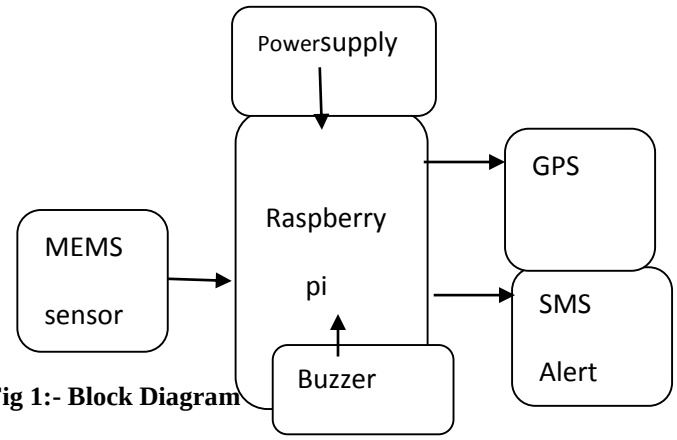

Fig 1:- Block Diagram

The wearable device, for now, is not built on a SoC model, rather has been proposed using larger components and can later build on the SoC platform once put into manufacture. The wearable loT device tasked with acquiring various data from the all the different modules connected. It comprises of Raspberry pi microcontroller. It receives the data from its various physically connected modules, anatomizes this data and refines the data in a more user understandable format to the different available user interfaces. The user, therefore, can conveniently vie w the information on their cell phone. The physical characteristics of the wearable device are proposed to be as a wrist watch which remains placed around the wrist of the child during timeswhen the child is not being accompanied by an adult/parent. For the moment the design is not made compact, since the main focus now has been to show that this concept of smart wearable's would be highly impactful for the safety of children. The wearable system runs on a battery with an output voltage of 5V. In order to maximize power consumption, the wearable device has been programmed to provide G P S and image information only upon request by SMS text via GSM shield

IV. HARDWARE COMPONENTS

Raspberry pi

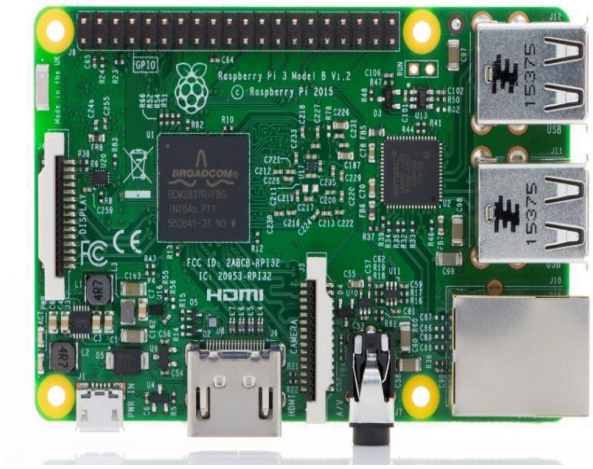

Fig 2: Raspberry pi Board

The Raspberry Pi is a low cost, credit-card sized computer that plugs into a computer monitor or TV, and uses a standard keyboard and mouse. It is a capable little device that enables people of all ages to explore computing, and to learn how to program in languages like Scratch and Python. Here's how it works: An SD card inserted into the slot on the board acts as the hard drive for the Raspberry Pi. It is powered by USB and the video output can be hooked up to a traditional RCA TV set, a more modern monitor, or even a TV using the HDMI port. The Raspberry Pi is a credit-card-sized computer that costs between $5 and $35. It's available anywhere in the world, and can function as a proper desktop computer or be used to build smart devices.Raspbian comes preloaded with Python, the official programming language of the Raspberry Pi and IDLE 3, a Python Integrated Development Environment. We're going to show you now how to get started with IDLE and write your very first, albeit simple, Python program.

MEMS SENSOR

Fig 4: MEMS Sensor

Micro-electro-mechanical Systems (MEMS) Technology is one of the most advanced technologies that have been applied in the making of most of the modern devices like video projectors, bi-analysis chips and also car crash airbag sensors. This concept was first explained by Professor R. Howe in the year 1989. Since then many prototypes have been released and revised and has thus become an integral part of the latest mechanical products available in the market today.During its early stage, the MEMS chip had two parts. One part included the main structure of the chip and the other part included everything needed for signal conditioning. This method was not successful as the total space taken by the device was larger, and thus the different parts of a single chip needed multi-assembling procedures. The output obtained from such a device had less accuracy and the mounting of such a device was difficult.As the technology became more advanced the idea of integrating multi-chips was applied on to produce a single chip MEMS with high performance and accuracy.The main idea behind this technology is to use some of the basic mechanical devices like cantilevers and membranes to have the same qualities of electronic circuits. To obtain such a concept, micro-fabrication process must be carried out. Though an electronic process is carried out, an MEMS device cannot be called as an electronic circuit. MEMS duplicate a mechanical part and have holes,

cantilevers, membranes, channels, and so on. But an electronic circuit has a firm and compact structure. To make MEMS from silicon process, the manufacturer must have a deep knowledge in electronics, mechanical and also about the materials used for the process.

GSM MODEM:

Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication. GSM is the name of a 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 900 MHz.

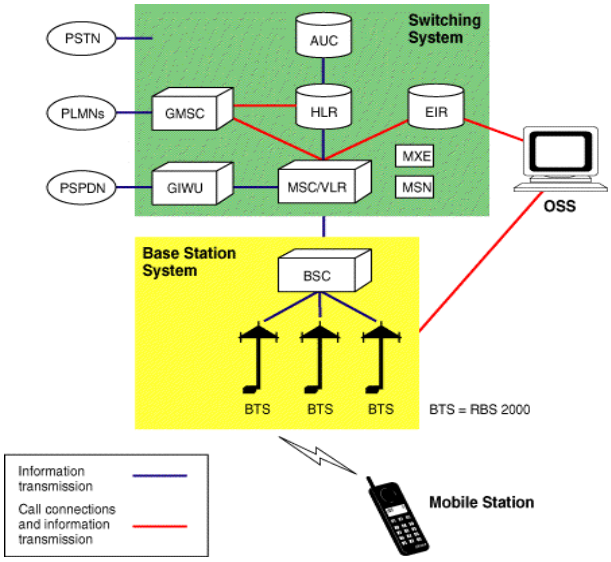

Fig 5:*GSM Network Element*

A GSM modem is a wireless modem that works with a GSM wireless network. A wireless modem behaves like a dial-up modem. The main difference between them is that a dial-up modem sends and receives data through a fixed telephone line while a wireless modem sends and receives data through radio waves.

A GSM modem can be an external device or a PC Card / PCMCIA Card. Typically, an external GSM modem is connected to a computer through a serial cable or a USB cable. A GSM modem in the form of a PC Card / PCMCIA Card is designed for use with a laptop computer. It should be inserted into one of the PC Card / PCMCIA Card slots of a laptop computer. Like a GSM mobile phone, a GSM modem requires a SIM card from a wireless carrier in order to operate.

As mentioned in earlier sections of this SMS tutorial, computers use AT commands to control modems. Both GSM modems and dial-up modems support a common set of standard AT commands. You can use a GSM modem just like a dial-up modem.

BUZZER

Fig 6:- Buzzer

A buzzer is a mechanical, electromechanical, magnetic, electromagnetic, electro-acoustic or piezoelectric audio signaling device. A piezo electric buzzer can be driven by an oscillating electronic circuit or other audio signal source. A click, beep or ring can indicate that a button has been pressed.

In a buzzer, the simplest sort of doorbell, an electromagnet is used to operate a self-interrupting circuit. You can see how this system works in the diagram below. Click and hold the doorbell button to see how the buzzer works. ... This breaks the doorbell circuit, which shuts off the electromagnet.A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric [piezo for short]. Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

V. SOFTWARE COMPONENTS

Linux

Linux is a free open source operating system and it belongs to the Unix operating systems. Actually Linux means the kernel itself which is the heart of the operating system and handles the communication between the user and hardware. Normally Linux is used to refer to the whole Linux distribution. (Upton, E. & Halfacree, G. 2012, 28.)

Linux distribution is a collection of software based on the Linux Kernel. It consists of the GNU-project's components and applications. Because Linux is an open source project, anyone can modify and distribute it. That is the reason why there are many variations of Linux distributions. Most popular distributions are Ubuntu, Red Hat Linux, Debian GNU/Linux and SuSe Linux.

Raspbian Wheezy

Raspbian Wheezy is a free operating system based on Debian distribution. It is created by a small team of developers who are fans of Raspberry Pi. Raspbian is optimized for the Raspberry Pi's hardware and it comes with over 35 000 packag-es and pre-compiled software. Raspbian is still under active development and it aims to improve the stability and performance of the Debian packages. (Raspbian [Ref. 15.2.2015]) Raspbian is officially recommended for beginners and it includes the graphical desktop environment called LXDE. Raspbian Wheezy is one of the fastest ways to setup and get the RasPi running

Python programming language

Python programming language is developed in the late 1980s at the National Re-search Institute by Guido van Rossum. Python has grown in popularity, and it is widely used commercially. (Upton, E. & Halfacree, G. 2012, 152.) Python is a flexible and powerful programming language but still it is easy to learn and follow. The clear syntax of Python makes it a valuable tool for users who wants to learn programming. This is one of the reasons why it is recommended by the Raspberry Pi Foundation. Python is published under an open-source license and it is available for different operating systems. Python runs on Linux, OS X and Windows computer systems. (Upton, E. & Halfacree, G. 2012, 152.)

Cross-platform support guarantees that the programs which are written in Python are also compatible in other platforms. There are few exceptions where the pro-grams are not compatible. For instance, when the Python is addressed to use the specific hardware such like Raspberry Pi's GPIO.

VI. RESULTS

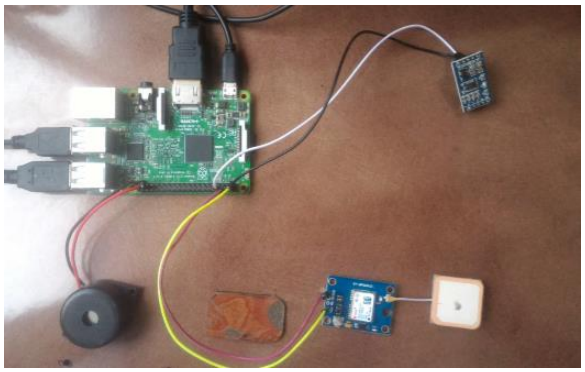

Fig 7:Hardware result

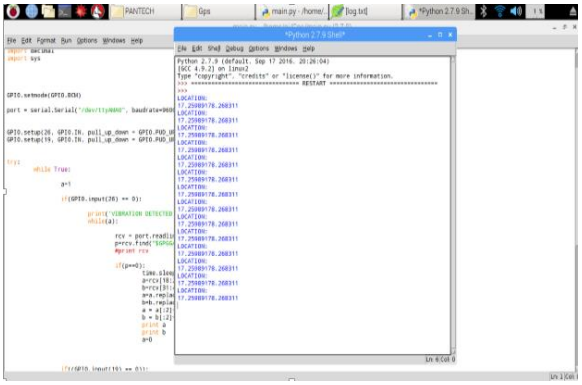

Fig 8: Child Tracking display

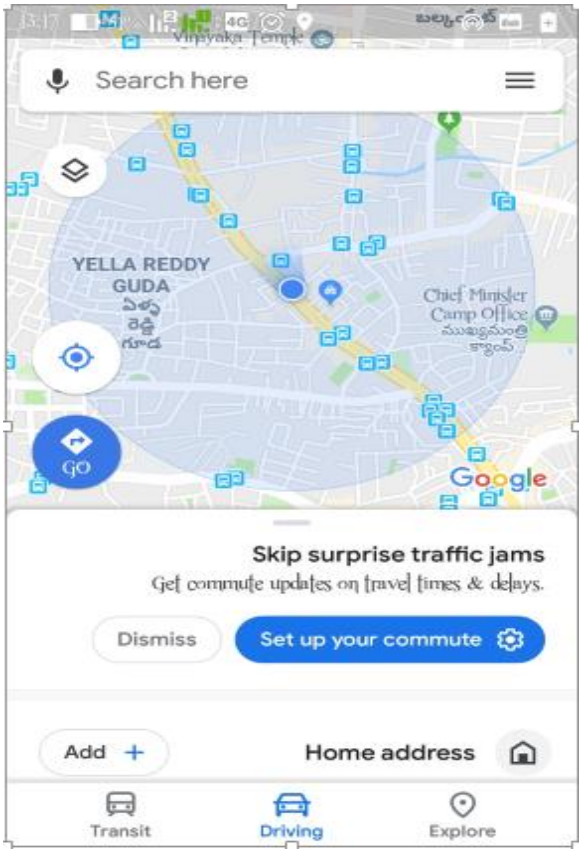

Fig 9:Location in Google Map

VII. CONCLUSION

After the project completion, a GPS tracking system has been successfully designed and implemented. All objectives were accomplished with a reasonable degree of reliability and quality. The system has successfully received GPS signals, processed and transmitted the data to the tracking

centre. In the tracking centre the coordinates have been displayed properly on Google maps, which refresh automatically every10 seconds to get the new location. The system can be evaluated by its accuracy and delay.

VII. REFERANCES

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