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"IOT Based Wireless Industrial Home Automation System To Display On Web Page Using SMS, GPRS and E-mail Alert"

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Abstract: Now a days, automation plays An important role in all work places and living homes. Presently automation techniques are implemented either using microcontroller. The biggest challenge faced by deaf and hard of hearing people is communication. The people with hearing difficulty need to be alerted in any conditions of danger such as fire, siren, telephone and Doorbell. There are more than ten million people who are hearing impaired and many more who have some degree of deafness. The main aim of this system is to overcome these problem. The wireless alert system for blind and hard of hearing people is helpful. This system consists Raspberry pi, camera module, Internet of Things, Alert device, SD card, Bluetooth. This system is helpful for deaf people who are unaware of the visitor to the home.

Keywords: Global system for mobile (GSM), Alert system, Raspberry Pi, Camera module, Bluetooth.

I INTRODUCTION

This IoT based project focuses on building a smart wireless home security system which sends alerts to the owner by using Internet in case of any trespass and generate an alarm optionally. It can also be utilized for home automation by making use of the same set of sensors This paper also describe the study of various systems and technologies available for deaf and hard of hearing people. The most serious consequence are difficulty in communicating with others, some people are unable to receive information from normal sensory channels (hearing and vision). Some people with hearing impairment like deaf, hard of hearing and blind are unable to use telephone for oral communication and cannot receive the information from radio, television etc.[1]. This system consists raspberry pi which is based on Linux operating system. The main advantage of using Raspberry pi is its portability. If the distance between two people is less than 32 meters i.e. 105 feet then system will use Wi-Fi or Bluetooth to communicate between them. When distance between them is more than 32 meters then GSM module is used to send data to the cloud which can be retrieved at other end [2].

II RELATED WORK

A novel approach for communication among Blind, Deaf and Dumb people is designed by Rohit Rastogi in March 2015[3]. They have proposed a new system- prototype called the SHAROJAN BRIDGE is an effort to bridge the communication gap between Blind, deaf and Dumb people. The design and implementation of low cost, low power consumption and GSM or GPRS based based wireless home security system is designed by Yanbo Zhao and Zhaohui Ye [4]. This [5] paper describe the development of an Advanced Speech Communication System for Deaf People. This system is useful for high availability and disaster recovery, the replication of data on cloud storage needs to be implemented efficiently [5]. Riyaz Kazi,"IoT based Interactive Industrial Home Wireless System, Energy management system and embedded data acquisition system to display on web page using GPRS, SMS alert". This paper describe the personal alerting technology for people with hearing difficulty [6]. Ben Shirley, James Thomas, "Voice chat for deaf and of hearing people" describe that voice over Internet protocol (VoIP) services, equipment transferring telephony worldwide. Currently hearing impaired and deaf users are excluded from those VoIP services, unless the message is in text form to begin with the hearing loss user [7].

III SYSTEM DEVELOPMENT

The figure shows architectural diagram of wireless alert system using IOT. This system consists Raspberry pi, Internet of Things (IOT), camera module, Bluetooth, Microcontroller, GSM for mobile communication and alerting device.

1. IOT

The internet of Things are applied to a number of applications ranging from home automation to the industrial purposes. IOT connecting physical things from anywhere through network. This will give immediate access to the information about the physical world which increase efficiency and productivity. The status of IoT system can be

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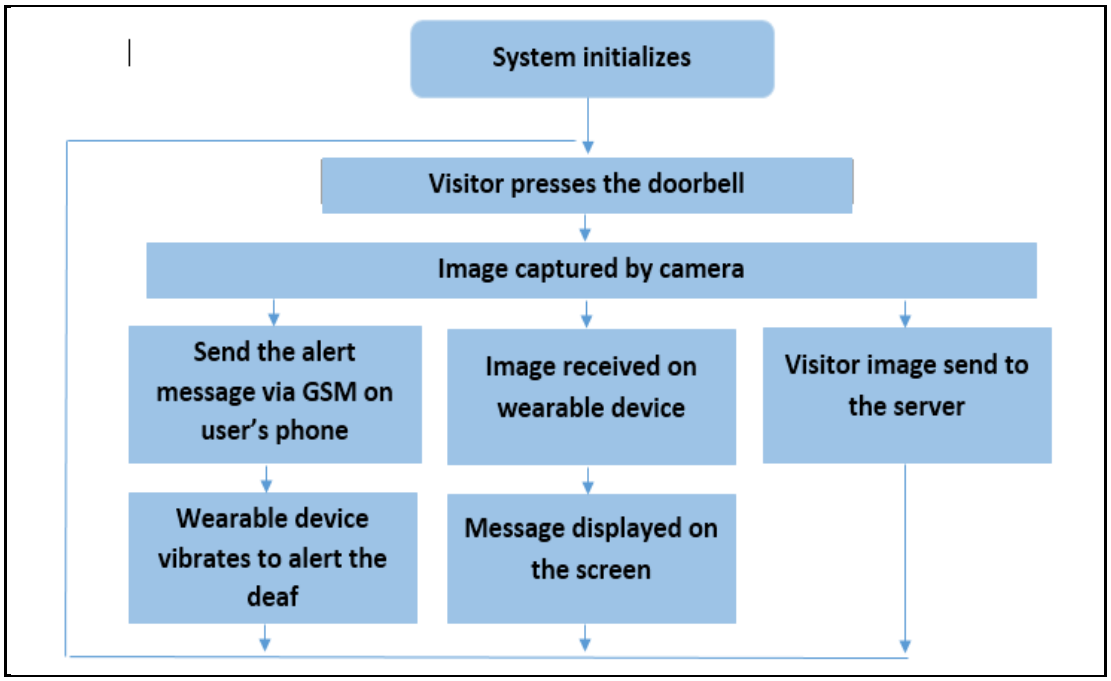

Fig: 1 Flow chart

accessed by the user from anywhere. When internet connectivity is not readily available, it is not necessary for the mobile phone to be connected to the internet. Only Raspberry pi board is required to have an access to Wi-Fi [7]. The IoT based smart environments based on the conducted survey. The IoT based smart environment consists smart cities, smart homes, smart grid, smart buildings, and smart industry.

2. Raspberry Pi

The raspberry pi is low cost credit card sized single board computer & it is controlled by modified version of Linux. Raspberry pi using advanced instruction set computing machine (ARM) technology. This technology is used in Raspberry pi board which reduced cost, heat and power consumption. This board is available in three names A, B, B+. The Raspberry pi B+ board is the latest version among them and it runs on ARM11 processor with 512MB RAM which is operating at 700 MHz frequency. The Raspberry Pi board has SD card slot which is useful for booting the operating systems like Raspbm, Pidora, Raspbian. It consists four USB ports to connect to the peripherals like keyboard, mouse and Wi-Fi adapter.

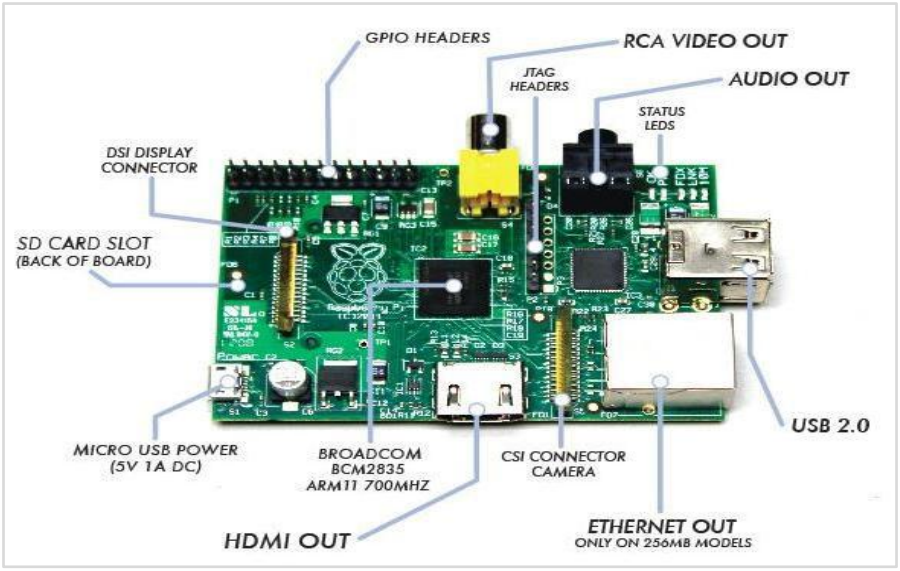

Fig: 2 Raspberry Pi

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3. GSM

The global system for mobile communication, Modem RS232 is built with Dual band GSM/GPRS engine- SIM900A. It work on frequencies 900/1800MHz with RS 232 interface. It consists TCP/IP stack to enable you to connect with internet via GPRS. It is suitable for voice communication, SMS as well as data transfer application. GSM having on board power supply which allows you to connect wide range unregulated power supply. By using this modem, you can attain voice calls, messages and internet, attain incoming calls through simple AT commands.

4. LCD (16*2)

A liquid crystal display (LCD) is a flat panel display which uses the light modulating properties of liquid crystal. These liquid crystal do not emit light directly instead using backlight to produce images in colour. A 16x2 LCD means it can display 16 characters per line. Each character is displayed in 5x7 pixel matrix. The LCD has two registers namely command and data.

- 16 characters *2 lines display
- It consists built in controller
- 5x8 dots with cursor
- Two registers command & Data

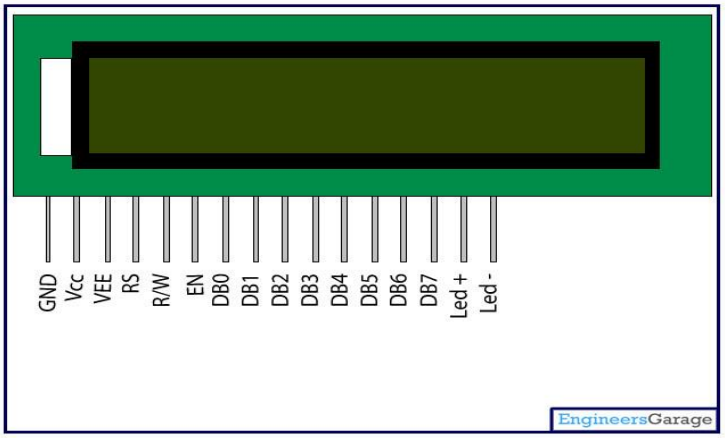

Fig: 3 LCD

5. Pin Description

Pin no	Description	Name
1	Ground	Gnd
2	Supply voltage	VCC
3	Contrast adjustment	VEE
4	Command register =0 Data register = 1	Register select
5	Low = write High = Read	Read/ write
6	Sends data to data pins when a high to low pulse is present	Enable
7-14	8- bit data pin	DB0- DB7
15	Vcc (5V)	Led+
16	Gnd (0v)	Led-

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IV. PERFORMANCE ANALYSIS

The Raspberry Pi, is based on Linux operating system and it supports all programming languages like python, C, C++. Out of those, Python programing language used to communicate with General Purpose Input output ports and simple connection is made with databases. For sending the message to alert the user Serial module is used.

The proposed system can work with the help of following steps:

- Import all the required modules Simple CV, serial module.
- The transmitter consists Raspberry pi, switch, camera, GSM and doorbell. This device installed at the door.
- When visitor presses the doorbell, the image is captured by Raspberry Pi camera.
- The visitor's image along with date and time is send to the user.
- The receiver is wearable device which display the image.

1. Screenshot of sms

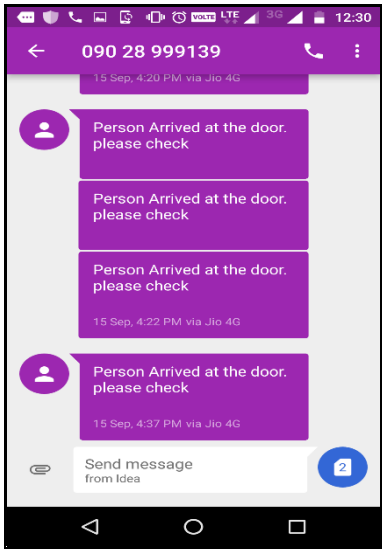

Fig 4: Screenshot of sms

2. E-mail Alert Received

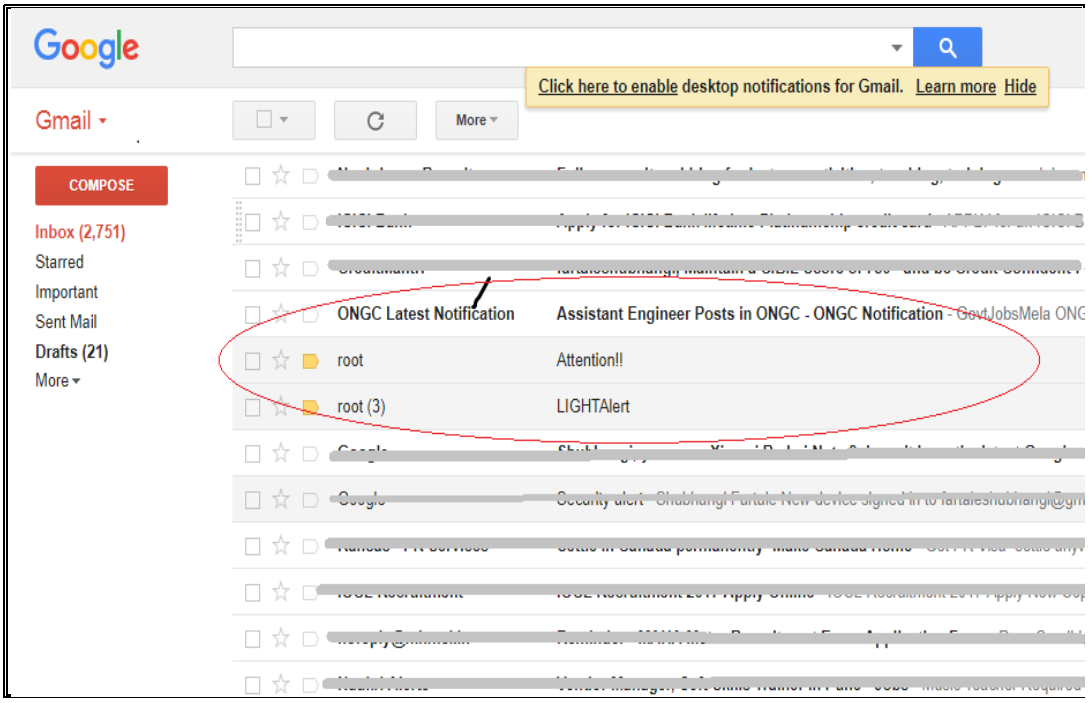

Fig 5: E-mail Alert Received

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V. CONCLUSION

This system describes implementation of low cost IOT based alert system for people for their safety purposes. When visitor presses the doorbell, image is captured and alert message is send to the wearable device via IOT. The message is received on user's phone through GSM and data is updated on server through IOT. This systems has low power consumption, moderate cost and is a convenient way to control real-time monitoring. Moreover, it can also be useful for the people who are blind and Deaf.

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