

## A Review Paper on Sensor Based Remote Attendance Monitoring System Using IOT

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### **Abstract**

*This paper presents a Sensor based Remote Attendance Monitoring System using IOT. Counter system is designed with IR sensors and Raspberry pi to count the persons in conference room, auditorium, offices, malls, industries etc. In today's scenario keeping the exact count of visitors is required either for a building used as a mall, classroom or a factory purpose. This goal can be achieved by implementing the highly accurate counters, so that we can keep accurate records of count of visitors for management of services as per the required density in that building premises.*

*Keywords— IR sensors, IOT, Raspberry Pi, counter, attendance*

### **I. INTRODUCTION**

The rapid development of Information Technology (IT) industry has brought forward a hyper connected society in which internet is being used for connecting objects with mobile devices. In the 21st century we want effortless life. The potential benefits of Internet of things (IOT) are almost limitless and IOT applications are changing the way we work by saving time and resources and opening new opportunities for growth, innovation and knowledge creation. The IOT has vast potential to support an ageing society, to improve the energy efficiency and to optimize all kind of mobility and transport. As attendance is a major parameter through which the performance of a student or an employee can be judged, it is of utmost importance that the institution or company should monitor it. But, the traditional method of taking attendance is a timely process, moreover, maintaining the records of attendance is a lengthy job. This gives way to wastage of paper, increased human involvement and thus human errors, possible manipulation of data, etc. Our project focuses on automating this process and ensuring minimal human involvement in the process. We have used the IR sensors to get the detection of person on the entrance and then sensor data is managed using raspberry pi. The data is visualized on the Cloud website as well as on the display attached to the kit. The use of multiple IR sensors reduces the chances of bypassing the system. The transmitter of an IR sensor emits infrared light towards the receiver continuously, whenever a person passes through the gateway he/she cuts the infrared light and sensor receives a negative pulse and count increases. By using website user can access the current status of count. The proposed system which includes a website as user interface, a cloud database to store and retrieved data's. The main theme of this is key way for making smarter by make utilize of well growing IOT platform and information and communication technology ICT to reduce the work and energy.

The existing method of attendance record was manual therefore time taking and deficient. Other technologies which have been available to replace manual system including finger print, retina scan, voice recognition, face recognition etc. Problem with manual system is that it is time taking and inefficient while technology-based system is quite expensive.

In recent years, electronic industry becomes an essential sector that decides the economic growth of any nation. The main theme of this is key way for making smarter by make utilize of well growing IOT

platform and information and communication technology ICT to reduce the work and energy. As attendance is a major parameter through which the performance of a student or an employee can be judged, it is of utmost importance that the institution or company should monitor it. But, the traditional ways of taking attendance is a time taking process, moreover, maintaining the records of attendance is a lengthy job. This gives way to wastage of paper, increased human involvement and thus human errors, possible manipulation of data, etc.

The Raspberry Pi is a small single-board computers developed by the Raspberry Pi Company. The original model became more popular than expected.

## II. RELEVANCE

The relevance of the project shows how efficient the outcomes of the project is expected to be with the given goal, the internet of things is fastest growing platform now a days for connecting the all hardware modules like (sensors, electronics, devices etc.) together and embedded those with software making on own creative devices applications with the help of this technology we create the website that will updated the regularly data of the count. IR sensor based remote attendance monitoring system have its own differences than other systems because of the way in which IR sensors are installed at the entrance and programmed to detect presence of the person, and also used IOT for transfer of the data over the internet, the counter system calculates the number of people entering and exiting into a particular room. The data is sent using the internet to the before mentioned the web address of the user in a particularly defined interval of time using the real time clock extraction process. NFC and RFID based systems has its own disadvantages these systems can be bypassed for example other person can directly use another person's card for login through the entrance. This is the major disadvantage of the system and one card can be used many times. With the all the analysis and processing of the data proposed system can eliminate all the disadvantages of all existing systems.

## III. LITERATURE REVIEW

Ekansh Gupta, Nidhi Singh shows smart Attendance Monitoring and Counting System based on IOT. Counter system is designed to count the objects in class room, auditorium, offices, malls, industries etc. In today's scenario the effective utilization of power management is required either for a building used as a mall, classroom or a factory purpose. This goal can be achieved by counting the number of person or object in that building, so that we can manage the power and lightening conditions as per the required density in that building premises. The designed system can count and with the help of Internet of Things, anyone can remotely monitor the presence of persons in the premises. The entry and exit of the person is determined by this system. It will display the count on LCD panel in real time basis and also mail the number of count to the specified email ID. This system can be used for conserving the energy by automatically switching off the fans and lights when no one is present inside that building. [1]

Cheah Boon Chew, Manmeet Mahinderjit-Singh shows attendance system is a system that is used to track the attendance of a particular person and is applied in the industries, schools, universities or working places. The old ways of taking attendance has its own drawbacks and the major one is keeping record or tracing student and reuse of data is much harder. The technology-based attendance systems such as sensors and biometrics based attendance system can reduce human involvement and thud errors can be also reduced. Thus in this paper, a comparative study between this both NFC and RFID is also presented. [2]

B. JOSHAN DEVI, A. GODAVARI, shows IOT is a productive international organization management with self-configuring capabilities occupying on ideal and interoperable information protocols in the IOT, environmental and in all but name hinge have identities, environmental attributes,

and tacit personalities and use smart impart The environmental and pragmatic clothes are seamlessly multi-cultural into the info organization RFID is brainwash ultimate a prominent unit of being for the Internet of Things (IOT). RFID (Radio Frequency Identification) strategies are cellular motherboard used for tagging objects for automatic testimony RFID structures incorporate an examination design termed an editor, and one or many tags the announcer is a powerful design with spacious memoir and computational wherewithal RFID can find objects radiology out-of-doors line-of-sight. Attendance technique will produce a mechanical technique whatever gives best practice and adaptability than the long-established purpose of penetrating graduate. Furthermore, RFID automation can help to select and to survey items (products, population, junior, etc) radiology not beyond a detailed radius (numerous centimeters to the throng of meters). In this script, we recount the scheduled RFID process for recognizing and controlling appearance. In this arrangement, the RFID tags set up the school/college operation folk to take care of the pupil faction thoroughly of the quad. When RFID tags crack the RFID scholar in reading line zone, then technique will work the data from the RFID tags to the bibliography techniques. [3]

Aditi Purohit, Kumar Gaurav presented in this paper that any institution or company, keeping the records of attendance of the staff and students or employees is a repetitive task. Main theme of this project is automating the attendance process using a biometric scanning technique. As, the finger print is a feature that is distinctive to an individual, it would help in efficiently identifying the person and would help in saving a great deal of paper work and other problems such as keeping the records. Though fingerprint recognition is an established field today, but still identifying individual from a set of enrolled fingerprints is a lengthy process. Hence, we have developed a project to efficiently and easily identify the individual's finger print, check its authenticity and store the information in a database with various details like time and date of the entry. [4]

Shubham Mathur, Balaji Subramanian presented in this paper a novel initiative towards the digital image processing technique with the High-level programming language Python, booted with the help of Raspberry Pi microcontroller with a RaspiCam to capture moving images of objects passing under. The project utilizes image samples in top-view which are used to set predefined models containing a great number of motion variations for identification of humans entering a room through a door or gate. Pair of Passive Infra-Red (PIR) sensors has been used to tell the system to capture images of incoming or outgoing objects. This method of image detection combined with a sensor feedback with an ability to send data via Bluetooth to local servers for security or record purposes. [5]

#### IV. SYSTEM DESIGN

Our project consists of three main parts, which are IR sensors, Raspberry Pi and IOT, which are explained below:

IR Sensors:

**An infrared sensor is an electronic device which is used to sense some characteristics of its surrounding. It does this task by either emitting or detecting infrared radiation. Infrared sensors are also capable of detecting the heat being emitted by an object and detecting motion.**

Infrared technology is used not just in industry, but also in daily life. T.V. remotes, for example, use an infrared detector and emitter. Passive Infrared sensors are used for motion detection, and LDR sensors are used for outdoor lighting systems. The key benefits of infrared sensors include their simple circuitry, low power requirements and their portable features.

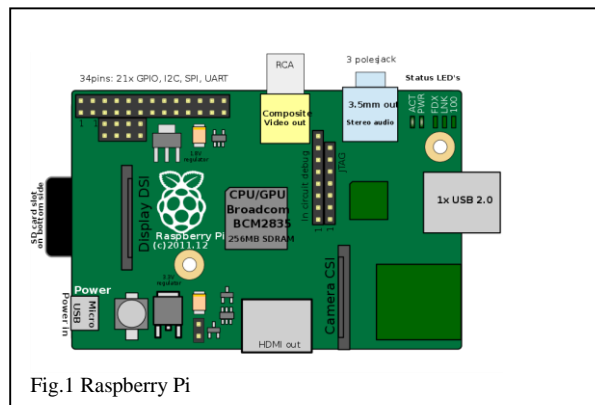
Types of Infrared sensors:

Thermal infrared sensors: Their photo sensitivity is independent of the wavelength being detected. Thermal detectors do not require cooling but do have slow response times and low detection capabilities, use infrared energy as heat..

Quantum infrared sensors: Their photo sensitivity is dependent on wavelength. Provide higher detection speed and faster response speed.

### Raspberry Pi:

The Raspberry Pi is a cheap, credit-card sized computer that can be plug into a computer monitor or TV, and uses a standard keyboard and mouse. It has been used in a wide array of digital maker projects, from music and weather stations and tweeting birdhouses with infra-red cameras. It is a capable of handling high level programming, and to learn how to program in languages like Python. It's capable of doing everything you'd expect a desktop computer to do, from browsing the internet and playing high-definition video, to making, playing games, word-processing, and spreadsheets.



### Raspberry Pi Specifications:

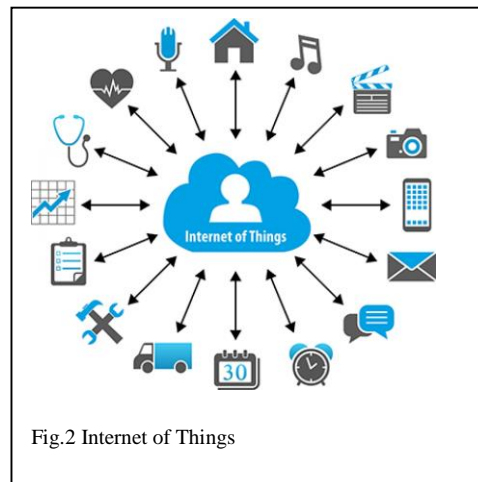
- **SoC:** Broadcom BCM2837
- **Storage:** microSD
- **CPU:** 4× ARM Cortex-A53, 1.2GHz
- **GPU:** Broadcom VideoCore IV
- **Bluetooth:** Bluetooth 4.1
- **RAM:** 1GB LPDDR2 (900 MHz)
- **Networking:** 10/100 Ethernet, 2.4GHz 802.11n wireless
- **GPIO:** 40-pin header, populated
- **Ports:** HDMI, 3.5mm analogue audio-video jack, Display Serial Interface (DSI), 4× USB 2.0, Ethernet, Camera Serial Interface (CSI).

### Internet of Things(IOT)

IOT (Internet of Things) is a system during which all electronic and mobile devices are connected in network via internet. the internet of things (IoT) is a system of reticulated computing devices, mechanical and digital machines, objects, animals or those that ar supplied with distinctive identifiers (UIDs) and also the ability to transfer knowledge over a network while not requiring human-to-human

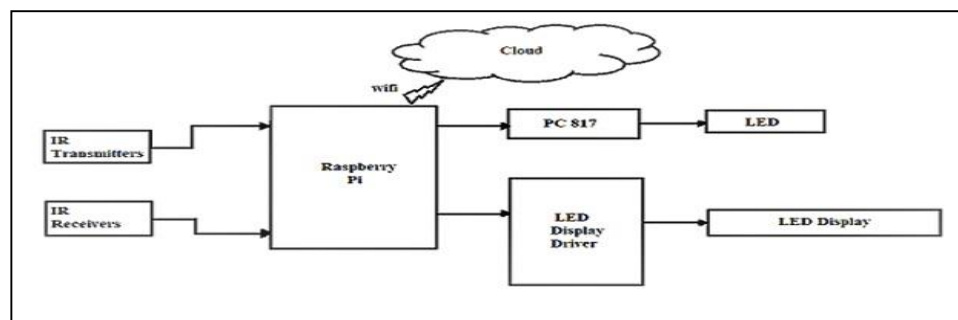
or human-to-computer interaction.

The definition of the net of things has evolved thanks to the convergence of multiple technologies, period analytics, machine learning, artifact sensors, and embedded systems.[1] ancient fields of embedded systems, wireless device networks, management systems, automation (including home and building automation), and others all contribute to enabling the internet of things. within the client market, IOT technology is most substitutable with product concerning the thought of the "smart home", covering devices and appliances (such as lights, home security systems and cameras, and alternative home appliances) that support one or additional common ecosystems.



## V. SYSTEM WORKING

The main theme of this project is key way for making smarter by make utilize of well growing IOT platform and information and communication technology IOT to reduce the work and energy as well as increased accuracy aspects in attendance system. The proposed system for monitoring count of the persons through IOT technology is comprises, Data Acquisition, Data upload to Sensor Cloud, Data Visualization and remote access.



We have used the IR sensors to get the detection of person on the entrance and then sensor data is managed using raspberry pi. The data is visualized on the Cloud website as well as on the display attached to the kit. The use of multiple IR sensors reduces the chances of bypassing the system. The transmitter of an IR sensor emits infrared light towards the receiver continuously, whenever a person passes through the gateway he/she cuts the infrared light and sensor receives a negative pulse and count increases. By using website user can access the current status of count. The proposed system which includes a website as user interface, a cloud database to store and retrieve data.

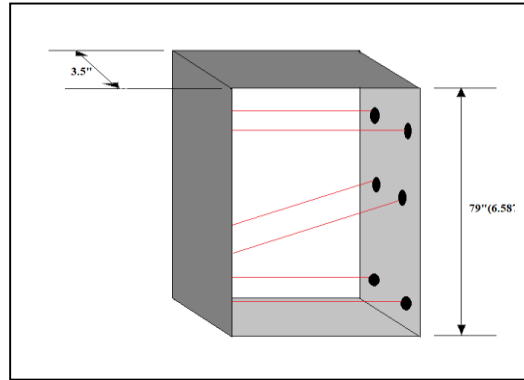


Table of comparison of existing systems:

Attendance System	Take attendance	Reuse attendance information	Prevent bypass issue	Price
Traditional	√			low
Biometric	√	√	√	high
Barcode	√	√		medium
Smart card	√	√		medium
RFID	√	√		high
NFC	√	√		high
IR Sensor	√	√	√	medium

Table.1 comparison of existing systems

## VI. CONCLUSION

This Proposed design used for attendance purpose can operate effectively in order to collect various type of information that required by users. The brain of the design is the raspberry Pi minicomputer. Architecture and Functionality of both technologies are discussed in depth. Benchmarking between these technologies with other type of attendance system are also given. Overall, a brief discussion on the security related the IR sensor based attendance system demonstrated. In addition the merges between biometrics identifies such a facial features and sensors features IR will be implemented. As a whole, this new technology, IR sensor based attendance system projected to provide some beneficial to the current generation Y students in universities.

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