Workplace Monitoring System

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***Abstract*—The problem with the facility of entrance doors provided by offices is the lack of adequate security. Now a days it can be a problem if someone who is not permitted to enter the workplace still enters unknowingly. So care must be taken that only the people who are actually working at the workplace are only allowed to be present there and not anyone else. So there should be a facility that restricts the entry of a random person and allow only the employees. There should also be a facility that keeps a record of the employees that for how much time they are at the workplace. Another problem at the workplace is that when everything is locked at the end of office hours and nobody is supposed to be at the workplace after that time but still there is some intrusion taking place, so there should be a device which will detect that intrusion and notify the person in charge by alerting through his phone or tablet immediately so that he can quickly take some action. Some of the other facilities which should be available at workplace is of smoke detection which will give an alert to the office employees if they are not in the office and there is smoke in the office because of fire or anything else. There should also the temperature detection because of which the employee on the way to the office could check the temperature at the workplace and use the facility of remotely controlling the ac and fans so that he can get the required temperature when he reaches at the workplace. The system proposed will attempt to overcome these trade-offs by providing a wireless sensor network in a workplace to collect useful information about the temperature, smoke ,etc., in the workplace. The data collected will be accessible to the user via the internet. Another key aspect of the project is keyless entry into workplace and intruder detection.**

***Index Terms*—intrusion detection, keyless entry, monitoring, raspberry pi, sensors, wifi module,**

I. Introduction

Present innovations in technology mainly focus on controlling and monitoring of different activities. These are increasingly emerging to reach the human needs. Most of this technology is focused on efficient monitoring and controlling different activities. An efficient environmental monitoring system is required to monitor and assess the conditions in case of exceeding the prescribed level of parameters (e.g., noise, CO and radiation levels). When the objects like environment equipped with sensor devices, microcontroller and various software applications becomes a self-protecting and self-monitoring environment and it is also called as smart environment. In such environment when some event occurs the alarm or LED alerts automatically. The effects due to the environmental changes on animals, plants and human beings can be monitored and controlled by smart environmental monitoring system. By using embedded intelligence into the environment makes the environment interactive with other objectives, this is one of the application that smart environment targets. Human needs demands different types of monitoring systems these are depends on the type of data gathered by the sensor devices. Event Detection based and Spatial Process Estimation are the two categories to which applications are classified. Initially the sensor devices are deployed in environment to detect the parameters (e.g., Temperature,Humidity, Pressure, LDR, noise, CO and radiation levels etc.) while the data acquisition, computation and controlling action (e.g., the variations in the noise and CO levels with respect to the specified levels). Sensor devices are placed at different locations to collect the data to predict the behavior of a particular area of interest. The main aim of the this paper is to design and implement an efficient monitoring system through which the required parameters are monitored remotely using internet and the data gathered from the sensors are stored in the cloud and to project the estimated trend on the web browser.

II. Literature Survey

Bulipe Srinivas Rao, Prof. Dr. K. Srinivasa Rao, Mr. N. Ome[1] worked on Internet of things (IOT) based weather monitoring system. The system proposed in their paper is a modern and advanced technique for monitoring the weather conditions at a particular location and make its information visible anywhere in the world. The technique used behind this it Internet of things (IOT) ,which is an modern and efficient technique for connecting the entire world of things like electronic gadgets, sensors and automotive electronic equipment , to a network through internet. The data updated from the implemented system can be accessible in the internet from anywhere in the world. SHINICHI MASUDA and TETSUO HATTORI [2] , worked on Development of a Wireless Remote Monitoring System Utilizing Multiple Wireless Sensors .The system proposed is for all day outdoor observation with the help of wireless sensors and wireless communication. The system prorposed in their paper consists of three parts viz., a host station that is a PC (personal computer), a remote station that contains a camera controlled by a CPU and a power supply (battery attached by solar cell), and multiple wireless sensors each having its own ID signal. This paper describes the details of the system and evaluates the possibility of the application of the system. Amit Rana and Dr. Smt. A.S. Bhalchandra [3], worked on Machine Monitoring on Cloud using Raspberry Pi and Internet of Things. The paper demonstrated an approach towards industrial machine monitoring on cloud server using internet of things implemented on a raspberry pi. Credit Card sized Raspberry Pi is a computer which can directly send data on the cloud server. Any kind of industrial machine can

be connected to this Raspberry pi using logical inputs and can be monitored on the internet based server so that the work currently going on, real time production data, the rate of production, the employee who is working on a particular machine, causes of delays and downtimes everything can be monitored by the authorities sitting at a remote location almost anywhere in the world. The system proposed in this paper is very simple and can be operated by unskilled workman working on the floor.

III. Working

A. System Architecture

The proposed system is basically divided into two subsystems the server and the distribution machine. The distribution system is an Raspberry Pi based embedded system which is used for user authentication, validation and notification. The server will keep all the records. It also manage some activities such as user identification, updating of the database. The admin can login into the system to access the server data. The complete architecture of the system is illustrated in Fig. 1.

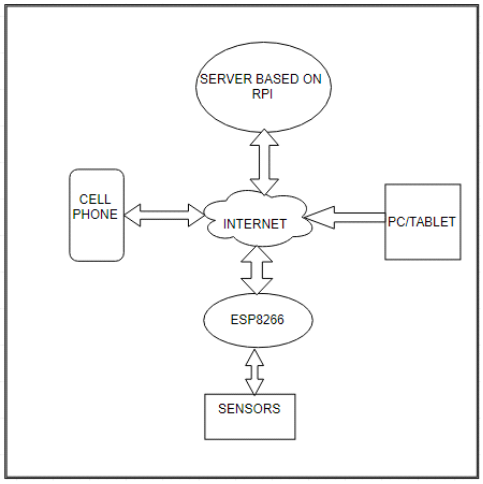

Fig. 1. Block diagram

The system is comprised of a host station, remote station, and wireless sensors. As can be seen in Fig. 1, by using several sensors a remote area can be set up as a monitored area. The remote station operates using an event-driven mode based on signals from the wireless sensors and com- mand signals from the host station. The data is collected from the sensors. From the sensors it is given to the ESP8266 wifi module which is connected to internet through a server which is based on Raspberry pi. Because of which the data is available on internet and can be monitored on PC's, Tablets and smart phones by typing the IP address of the server which is based on Raspberry Pi on the browsing window.

B. Flow Chart

1) Flow chart for keyless entry: From the flow chart shown in Fig.3, we can understand the sequence of operation and steps for key less entry. First we read the unique ID from the RFID card. After that store the unique ID in a buffer and send a connect request to the RPI server. Then check that if the server accepts the request or not. If server does not accept the request then retry. If the server accepts the request then access the file with all UID's on the server. Now compare the UID read from the card with all the UID's stored on the server. Now check weather the UID of card matches with any of the UID's on the server. If it does not match then the acces is denied. But is the UID read from the card matches with any f the UID's on the server the access is granted and the operation of keyless entry is operated successfully .

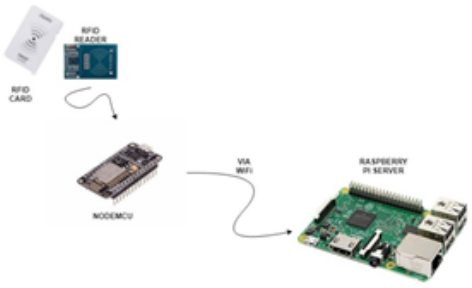

Fig. 2. Hardware setup

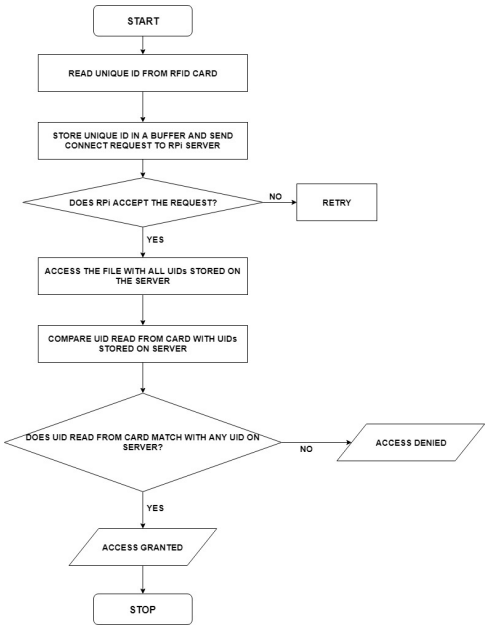

Fig. 3. Flow chart for keyless entry

2) Flow chart for workplace monitoring: From Fig. 4 we can understand the procedure for workplace monitoring system. First of all we must connect the sensors with the ESP8266 wifi module. After that gather the data from the server and store it on the local database server host. Now get that data from the ESP8266 wifi module on RPI through an application using HTTP get and post request. In the end plot the data and display the monitoring parameters on a website and stop.

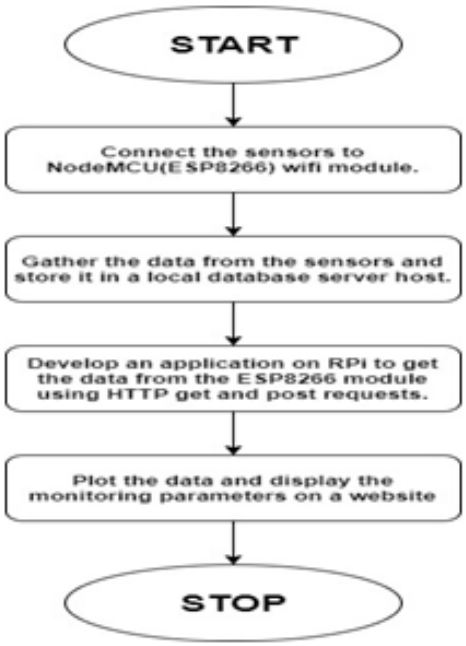

Fig. 4. Flow chart for workplace monitoring

C. Website Architecture

The website consists of three different levels of monitoring
1. Temperature Monitoring
2. Humidity Monitoring
3. Smoke detection

The Website acts as a bridge between the server and these three levels. User can monitor these three conditions which are displayed using website as shown in the Fig. 5.

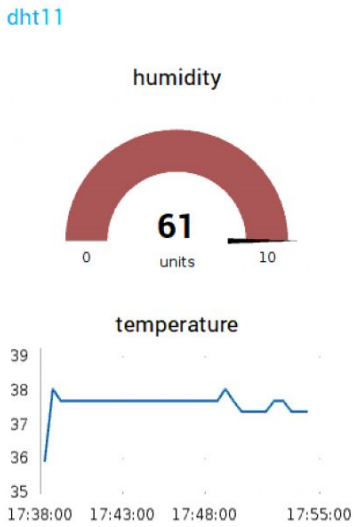

Fig. 5. Website Interface

IV. Conclusion

Using the proposed system we can Monitor these parameters and can also get notified when there some intrusion taking place at workplace. This user friendly system would enable the users to know that what is happening inside the workplace when nobody is supposed to be there. The main usp of the system is its easy accessibility and installation. Also the system can be accessed from anywhere using the internet and this enables for remote monitoring of the workplace. Thus a physical presence is not required 24*7 saving costs and human labor.

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