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# Industry & Home Monitoring and Controlling Through IOT

**G.Naveen Kumar**
**P.G. Scholar,**
**Department of ECE,**
**Sri Venkateswara Institute of Science And Technology,**
**Kadapa.**

**V.Shavali**
**Assistant Professor,**
**Department of ECE**
**Sri Venkateswara Institute of Science And Technology,**
**Kadapa**

*ABSTRACT*

***In this paper we discuss about implementation of monitoring Industrial as well as regular domestic condition using low cost sensing devices .The daily using small devices can make a communication with human being by using networking concept and Internet of things . The description about the integrated network architecture and the interconnecting mechanisms for reliable measurement of parameters by smart sensors and transmission of data via internet is being presented. The proposed system was able to provide automation mechanism for better operations of the devices in monitoring stage. Here we try to make machines intelligent so, they can tell about their state and requirements .So that taking care devices and operating them become more easy. In another words we can say that it is a new way of communication in which short range transreceivers are embedded in a daily using gadgets and forming communication between human and things , It makes machine more intelligent and providing them decision making quality.***

*Keywords:* ***Internet of Things (IOT), Zigbee, Wireless Sensor network, ARM7 Microcontroller, Energy***

## 1. INTRODUCTION

The Internet of Things (IoTs) can be described as connecting everyday objects like smart-phones, Internet TVs, sensors and actuators to the World Wide Web where the devices are intelligently linked together enabling new forms of communication between things and people, and between things themselves. Building IoTs has advanced significantly in the last couple of years since it has added a new dimension to the world of information and communication technologies. According to [1], in 2008, the number of connected devices surpassed connected people and it has been estimated by Cisco that by 2020 there will be 50 billion connected devices which is seven times the world population. Now anyone, from anytime and anywhere can have connectivity for anything and it is expected that these connections will extend and create an entirely advanced dynamic network of IoTs. The development of the Internet of Things will revolutionize a number of sectors, from wireless sensors to nanotechnology. In fact, one of the most important elements in the Internet of Things paradigm is wireless sensor networks (WSNs). WSNs consist of smart sensing nodes with embedded CPUs, low power radios and sensors which are used to monitor environmental conditions such as temperature, pressure, humidity, vibration and energy consumption [2]. In short, the purpose of the WSN is to provide sensing services to the users. Since, the number of users of the Internet is increasing therefore; it is wise to provide WSN services to this ever growing community.

In this paper, we present the design, development and integration of an extensible architecture for
WSN with the IOT based sensor data platform, where info-graphic of different data streams can be displayed, accessed and shared from anywhere with Internet connectivity. The collected data from the sensor nodes are processed, and analyzed server via an Application Programming Interface (API). We have used REST based Web services as an interoperable application layer that can be directly integrated into other

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application domains like e-health care services, smart homes, or even vehicular area networks (VAN). For proof of concept in a smart industry/home, we have implemented a REST based Web services on an IP based low power WSN test bed, which enables data access from anywhere for the smart industry/home.

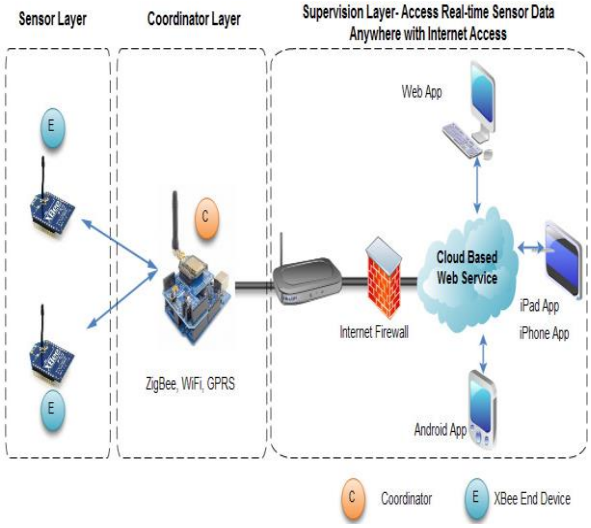



Figure1.Architecture of IOT Based monitoring system

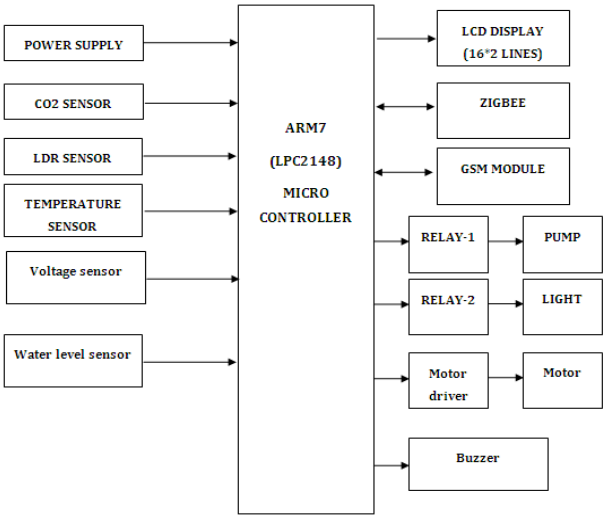
## 2. RELATED WORK

Wireless sensor platforms have been widely deployed in a number of applications ranging from medical such as Alarm-Net [6], or CodeBlue [7] to environmental monitoring [8-10]. The architecture of these systems has been designed in a very ad hoc fashion and is not flexible to adapt to other applications or scenarios while the core problem is the same, remote monitoring using sensor networks. During the last few years, many researchers have investigated on ways to connect wireless sensor networks to the Cloud [11]. Authors in [5, 6] have presented Internet protocols for connecting wireless sensor networks to the Internet but no real implementations have been shown. Much of the previous work has been on theoretical aspects of system architecture rather than actual deployment and testing of wireless sensor networks with the Clouds. Use of Web services to connect sensor networks with external networks have also been suggested by researchers in [7, 8]. However, their work was mainly focused on the feasibility of SOAP based Web services in terms of energy and bandwidth overheads. SenseWeb [1] is one of the first architectures being presented on integrating WSN to the Internet for sharing sensor data. Users were able to register and publish their own sensor data using the SenseWeb API. The main drawback of SenseWeb is that all the decision making process is executed at a single central point called the Coordinator. The Coordinator is the central point of access for all applications and sensor contributors where all the sensor data is stored and analyzed. That is, all the intelligence to control and to make a decision is located at this central point and if the Coordinator fails, the entire network is disrupted.

## 3. DESCRIPTION OF PROPOSED ARCHITECTURE

The block representation of the proposed system is divided into three nodes (Figure 1): (a)Sensor Node, (b) the Coordinator Node and (3) the Supervision node.

### (A)Sensor node:




The Sensor Node consists of sensors that interact with the industry/home. Every sensor was integrated with wireless nodes using an XBee platform called End Devices. These End Devices form a Mesh network and send the information gathered by the sensors to the Coordinator Layer through the sink node called the

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base station. Messages are routed from one End Device to another until they reach this base station. Each XBee module with microcontroller unit has the capability to directly gather sensor data and transmit it to coordinator node. The proposed system we present the sensors like Temperature, light intensity, voltage, Co2 and water level sensor with automation equipment.

### LM35 (Temperature sensor)

The LM35 series square measure exactitude integrated-circuit temperature sensors, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature. The LM35 therefore has a plus over linear temperature sensors tag in ˚ Kelvin, because the user isn't needed to cipher an outsized constant voltage from its out place to get convenient Centigrade scaling.

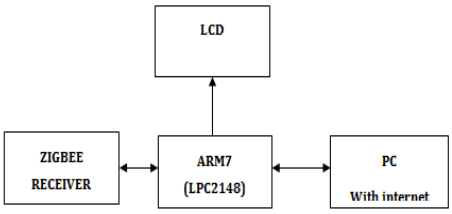
### LDR (light dependent resistor)

A photo resistance or light-weight Dependent resistance or CdS (Cadmium Sulphide) Cell may be a resistance whose resistance decreases with increasing incident strength. It also can be brought up as a photoconductor. a photograph resistance is formed of a high resistance semiconductor. If light-weight falling on the device is of high enough frequency, photons absorbed by the semiconductor offer certain electrons enough energy to leap into the conductivity band. The ensuing electron conducts electricity, thereby lowering resistance.

### ZIGBEE Module

Zigbee is that the name of a specification for a set of high level communication protocols exploitation tiny, low-power digital radios supported the IEEE 802.15.4-2006 commonplace for wireless personal space networks (WPANs), like wireless headphones connecting with cell phones via short-range radio. The technology is meant to be less complicated and cheaper than alternative WPANs, like Bluetooth.

### (B) COORDINATOR NODE




The Coordination Layer is responsible for the management of the data received from the sensor network. It temporarily stores the gathered data into buffer and sends it to the Supervision layer at predefined intervals. Base station which comprises of ARM7, UART shield and XBee is connected to the PC using RS232 cable and is powered using power supply circuit. It serves as a server between the wireless sensors and the dedicated network and has more advanced computational resources compared to the End Devices found in Sensor Layer. At the base station, the sink node gathers data from wireless sensors using the ZigBee protocol and sends this data to Cloud based sensor data platforms. Here the ARM7 microcontroller read the sensor information from different wireless sensor networks through Zigbee and fed to the PC where the data tobe uploaded into the internet.

### (C). SUPERVISION NODE

Finally, the Supervision Layer accommodates the base station with a Web server to connect and publish the sensor data on the Internet. This layer stores the sensor data in a database and also

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offers a Web interface for the end users to manage the sensor data and generate statistics. For the Supervision Layer, we have used Gmail HTTP Service which provides a REST based API to publish and access the sensor data. Thus, allowing existing networks to be connected into other applications with minimal changes. Open.Sen.se offers a graphical interface for real-time monitoring of systems using info graphic data streams and to retrieve the sensor values using device type and timestamp. Alerts can also be automatically generated to notify the user each time if the desired event has been sensed by the domain rules programmed in the base station.

## 4. RESULT

The proposed system was fully developed and tested to demonstrate its feasibility and effectiveness. The screenshots of the developed system has been presented in Figure bellow.

Figure 4.1 sensor node


Figure 4.2 Coordinator node

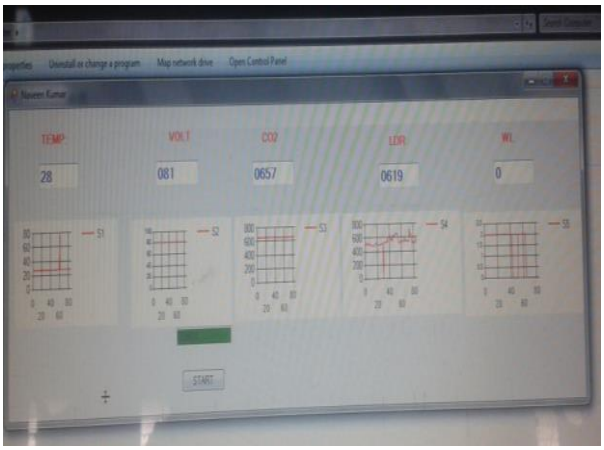

Figure 4.3 Supervision node

## 5. CONCLUSSION AND FUTURE SCOPE

Design And implementation of observation and automatic controlling in homes and industries that has the potential of analyzing and to possess larger management over security and customization and conjointly ability to adapt to alternative wireless device networks and sends the device data to laptop and transfer to web server and might send an SMS so as to grasp the conditions of the system.

In future scope implementation of project as conjointly check the sensor's knowledge in mobile and that we can provide time schedule's to every and each sensor's and can also store the report and knowledge collected from the sensor's.

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**Author Details**

**G.Naveen kumar (M.Tech)** Pursuing M.Tech Department of Electronics & Communication Engineering, Sri Venkateswara Institute of Science And Technology, Kadapa. Doing the project under the guidance of V.SHAVALI M.Tech, (ph.D).

**V.SHAVALI M.Tech (Ph.D),** Assistant Professor in Department of Electronics & Communication Engineering, Sri Venkateswara Institute of Science And Technology, Kadapa.