

# Industrial Automation using Internet of Things (IOT)

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**Abstract**— Internet of Things (IoT) is rapidly increasing technology. IoT is the network of physical objects or things embedded with electronics, software, sensors, and network connectivity, which enables these objects to collect and exchange data. In this paper, we are developing a system which will automatically monitor the industrial applications and generate Alerts/Alarms or take intelligent decisions using concept of IoT. IoT has given us a promising way to build powerful industrial systems and applications by using wireless devices, Android, and sensors. A main contribution of this review paper is that it summarizes uses of IoT in industries with Artificial Intelligence to monitor and control the Industry.

**Index Terms**— Artificial Intelligence, IoT, Sensors, embedded electronics.

## I. INTRODUCTION

In recent years a wide range of industrial IoT applications have been developed and deployed. Evolution of this starts from RFID technology, which allows microchips to transmit the identification information to a reader through wireless communication. By using RFID readers, people can identify, track, and monitor any objects attached with RFID tags automatically. Another technology is the wireless sensor networks (WSNs), which mainly use interconnected intelligent sensors to sense and monitoring. Its applications include environmental monitoring, industrial monitoring, traffic monitoring. Both RFID and WSN are used to develop IoT[1]. Then upcoming technology is IoT with Artificial

Intelligent. In previous year, Industry was monitored manually, but this paper introduces Artificial Intelligent to monitor as well as control the Industry autonomously without human intervention.

## II. GOALS AND OBJECTIVES

To develop a system which will automatically monitor the industrial applications and generate Alerts/Alarms or take intelligent Decision using concept of IoT. And also design the system to Take Intelligent Decision and Control Devices.

## III. EXISTING SYSTEM

No ways to detect un-even condition in industry. Manual intervention required for monitoring. CCTV used which only monitor but no Alert generation. Alert and their appropriate actions not present manually. Time consuming approach to detect and generate Alert Manually

## IV. NEED OF SYSTEM

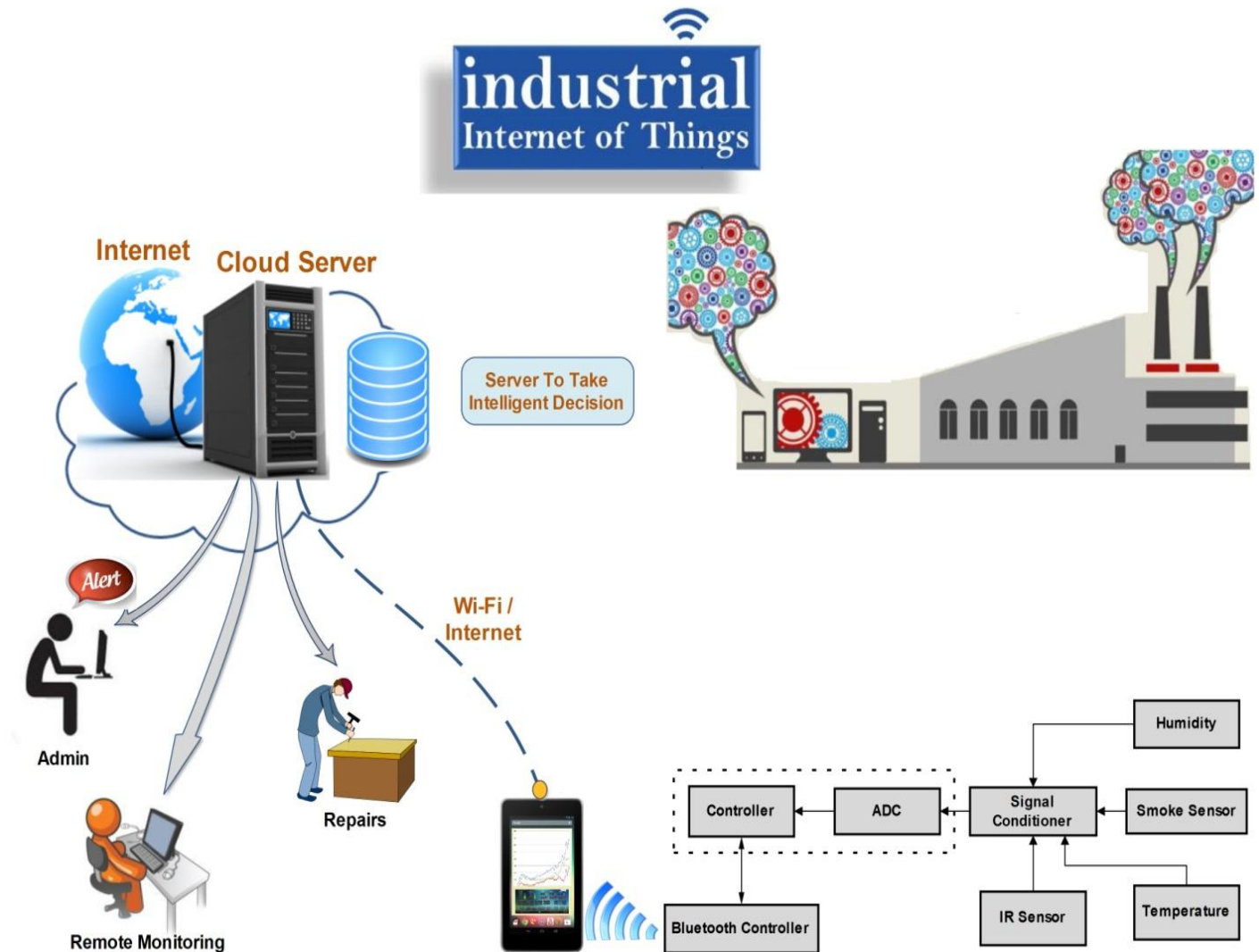
Industry alert are based on manual intervention. Notification for any circumstances in Industry not provided. Appropriate action for this condition taking.

## V. OVERVIEW OF SYSTEM

In this modern era of automation and advanced computing using IoT with Artificial Intelligence offer promising

solutions towards the automation of Industry. In order to understand the development of IoT in industries, this paper reviews the current research of IoT, key enabling technologies, major IoT applications in industries, and identifies research trends and challenges. The Internet of

Things allows objects to be sensed and controlled remotely across existing network infrastructure. This is implemented as in figure1.



**Fig 1: Block diagram of the system**

Sensors (Temperature sensor, Pressure sensor, Humidity sensor, Vibration sensor, Intrusion sensor) are used to percept the environment and object conditions. Analog signal are provided to android device produced by sensors. Admin set threshold to every sensors placed in Industry. Android check

this threshold against incoming analog signal. When it encounter an uneven condition devices (Buzzer, Alarm, motor, fan) are use to take accurate measures such as Alarm/Alert are generated, it send messages and email to Admin. Then with the help of Artificial Intelligent it takes

adequate steps to solve the problems. This can be possible through past experience and similar previous condition stored in database. In this we use cloud as database for scalability.

## VI. MATHEMATICAL MODEL

Let,

$$S = \{ \text{USER, SEN, DB, DEV, THVAL, GRAB(), SETTH(), MAPR}() \}$$

It is the main function containing all the sets.

where,

**USER** is the set comprising all the clients to the system.

**U** is set of unit connection in the system.

**SEN** is the set for all the sensors used for hardware implementation of the system. The sensors are Temperature sensor, Pressure sensor, Humidity sensor, Vibration sensor, Intrusion sensor.

**DB** is the set for database.

**DEV** is the set of all the devices.  $DEV = \{ \text{Buzzer, Alarm, motor, fan} \}$

**THVAL** is the set for complementing the sensor values.

**EMAIL** is the set of email address for user alert of user to whom alert is send

**CMD** is set off control commands

**MOBNO** is set of mobile numbers

**GRAB()** is the function for storing all the values given by the sensor and hence sending it to the other sets.

**SETTH()** is the function for setting the value of the sensors which would be handled manually.

**MAPR()** is the function for converting the values from analog to digital. Here MAPR stands for mapper function.

Hence,

$$S = \{ \text{USER, SEN, DB, DEV, THVAL, GRAB(), SETTH(), MAPR}() \}$$
$$\text{USER} = \{ U1, U2, U3, \dots, UN \}$$
$$\text{SEN} = \{ \text{SEN1, SEN2, SEN3, } \dots, \text{SEN}_i \}$$
$$\text{DB} = \{ D1, D2, \dots, DN \}$$
$$\text{DEV} = \{ \text{BUZZER, ALARM, MOTOR, FAN} \}$$
$$\text{THVAL} = \{ V1, V2, V3 \}$$
$$\text{SEN}_i \leftarrow \text{GRAB}()$$

GRAB (VALUES OF SENSORS)

SETTH (SEN<sub>i</sub>, THVAL)

The SETTH function contains all the sensors and their corresponding values.

MAPR (VALUES OF SENSORS, DIG)

## VII. APPLICATIONS

**Industry and office:**-We can implement sensors in wide area over the machines and instruments. Control and Monitor circumstances by using concept of Artificial Intelligence and IoT.

**Hospital and Labs:** -We can plot sensors on patient's body and Doctor can check current status on his android phone and also take necessary actions and decisions.

**Home:**-We can implement sensors to household appliances and monitor and control with the help of Artificial Intelligence.

## VIII. CHALLENGES TO OVERCOME

Wi-Fi/Internet Connection is fluctuating which may create problems. SMS/Email Alerts has to send but may have range problem. Decision Making is very difficult as this is question of many life & industry. Wrong tool Selection for Development.

## **IX. CONCLUSION**

Nowadays we need everything computerized. Earlier we can only monitor the situations with the help of cameras. In industries to reduce manual overhead we have implemented Internet of Things (IoT) in Industry to monitor as well as to inform the responsible person to take appropriate measures, but this will partially fulfill our requirement. As sometimes it will be late in this process and it will harm to property as well as life. For this purpose we are developing a system for Industrial Automation using IoT with the help of Artificial Intelligence to make system automated which will take intelligent decisions.

## **X. ACKNOWLEDGMENT**

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