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IOT based load control over standalone Wi-Fi

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ABSTRACT: Industrial Internet of Things (IIoT) is a part of IoT (Internet of Things) technology that has provided an opportunity to build powerful industrial system and applications by using different IoT devices like sensors, actuators,Resistance Temperature Detectors, pH analyzers, Level Transmitters, RFIDs, wireless andmobile devices. High-speed internet has given a new hike in development of IIoTdevices, as it makes remote access facility at ease. Various IIoTapplications andsystems have been developed and deployed in recent years. To understand thedevelopment of IIoTtechnology, this study addresses IIoT concepts through asystematic review of various white papers, research papersand online database.This paper will provide an overview of IIoT technology, key enabling technologies
and their applications in industries. To control any load through the Internet network over cloud remotely on the basic principle of the Internet of things (IOT). For this real-time scenario we use webpage with user configurable front end to control and monitor the load. The data sent from a password protected webpage returns commands through allotted IP fed to it. A Wi-Fi Module is configured with any nearby wireless modem to access internet. The received internet commands are fed to the Wi-Fi module.

I. INTRODUCTION

FIGURE 1

The industrial internet of things (IIoT) refers to the extension and use of the internet of things (IoT) in industrial sectors and applications. With a strong focus on machine-to-machine (M2M) communication, big data, and machine learning, the IIoT enables industries and enterprises to have better efficiency and reliability in their operations. The IIoT encompasses industrial applications, including robotics, medical devices, and software-defined production processes.

The Industrial Internet of Things or IIoT is defined as "machines, computers and people enabling intelligent industrial operations using advanced data analytics for transformational business outcomes".

Benefits of IIoT in manufacturing and beyond

One of the greatest benefits of Industrial Internet of Things has to be seen in thereduction of human errors and manual labor, the increase in overall efficiency and the reduction of costs, both in terms of time and money. We also cannot forget the possible underpinnings of IIoT in quality control and maintenance.The Industrial Internet of Things is part of the Internet of Things. Internet of Thingsor IoT is data-rich: large amounts of data get collected, aggregated and shared in ameaningful way. Here again the goal is to increase the automation level at domesticand commercial levels. In the Industrial Internet of Things, data is crucial as well and this causes a change in the human tasks in an Industry 4.0 context whereby automation leads to a decrease of specific types of work but at the same time requires new skillsets. The goal of the Industrial Internet of Things is also not to fullyreplace human work, its goal is to enhance and optimize it by, for example, creating new revenue streams and business models with a big role for data (analysis).

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How does IIoT work?

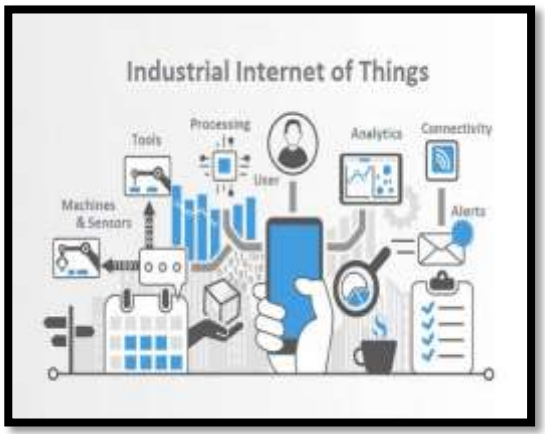

FIGURE 2

IIoT is a network of intelligent devices connected to form systems that monitor, collect, exchange and analyze data. Each industrial IoT ecosystem consists of:

- ★ connected devices that can sense, communicate and store information about themselves;
- ★ public and/or private data communications infrastructure;
- ★ analytics and applications that generate business information from raw data;storage for the data that is generated by the IIoT devices and people.

These edge devices and intelligent assets transmit information directly to the data communications infrastructure, where it's converted into actionable information on how a certain piece of machinery is operating. This information can be used forpredictive maintenance, as well as to optimize business processes

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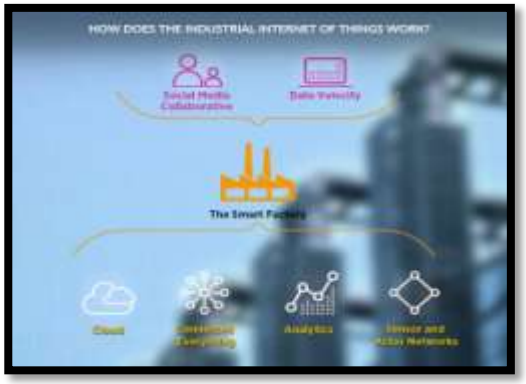

FIGURE 3

KEY ENABLING TECHNOLOGY

IIoT is developed from the intelligent integration of several existing technologies. In this section, several technologies their applications and integration with other technologies discussed briefly.

A) Cloud Computing– Cloud computing provides computing, on demand of users as a service. It can provide platforms, infrastructure and software as a service. Since sensors have limited memory and processing power it can only store andprocess local data. Cloud also allows IoT applications to monitor and analyze all the objects. It also supports artificial intelligence for the decision, thus bypassing human intervention.

B) Big Data – Big data is the term used to represent a large amount of data on which normal data processing application are unable to perform data related operations. Some special techniques like Hiveql and Hadoop used to manage these large volume data in Big data. Big data is very useful in many areas, like social networking, research fields, in governments etc. In IIoT technology, a large amountof collected information is supported by cloud computing, when combining this with big data, it provides an excellent support to retrieve and store useful information.

C) Ubiquitous Computing – The main objective of the ubiquitous computing is to include invisibly embed technology in the environment. Mark Weiser (father of ubiquitous computing) defines ubiquitous computing as “the physical world that is richly and invisibly interwoven with sensors, actuator, displays and computational elements, embedded seamlessly in the everyday objects of our lives, and connected through a continuous network”. The goal of IoT is to sense the environment without the intervention of human and ubiquitous computing is a way to achieve this goal.

D) Smart Devices – A smart device is an electronic device, which can operate to some extent autonomously and generally connected with other devices or networks with the help of different protocols like Wi-Fi, 4G and Bluetooth etc. Some examples of these types of devices are smartphones, tablets, smart band and watches. IoT technology uses many of these devices to gather and analyze information.

E) Sensors and Actuators –A sensor is a device which converts one form of signal to another form which can be measured. Types of sensors are temperature, proximity, vision, gyroscope, compass, acceleration/tilt etc. The actuator is a

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hardware device which converts the command into physical change, this change is mostly mechanical. (E.g. position or velocity)

F) Artificial Intelligence (AI) – Human or animal-like intelligence shown by machine is known as artificial intelligence. In IIoT it is shown by smart objects. (e.g. sensors etc.) Due to this intelligence nowadays machines can alerts before any unwanted situation occurs or they can take necessary actions based on their applications in different types of industries.

G) RFID (Radio Frequency Identification) – RFID technology is used tomonitor objects. This system has mainly two components, RFID reader and RFID tag. RFID reader starts communication with a tag by sending a query to RFID tag toidentify it. RFID tag is a small chip with an antenna and associated with a unique ID.This tag can be attached to any object which needs to be tracked. There are two types of RFID tags are available. One is passive RFID tags which don't have any battery. It takes power from the query signal transmitted by the reader while another one is active RFID which contains a battery.

H) GPS (Global Positioning System) Technology – GPS is a network of satellites which was originally developed by the US government for their military, butnow anyone with a GPS device can receive signals from these satellites. GPS uses a process known as trilateration when it has information about at least three satellites to pinpoint the location. This technology is used in logistic departments of industries.

I) Advanced Robotic and Automation Technology - - A robot can be defined as an automatic, controllable, reprogrammable, multipurpose intelligent machine which can be programmed to do such tasks those consumes time or manpower. Automation is the use of various control technologies for operating equipment such as machines, turbines, ovens, boilers, heat exchangers, processes in industries etc.

J) Wireless Sensor Networks (WSN) – Wireless sensors are used for sensing and controlling environmental parameters. Each sensor consists of the sensor interface, small memory and processing units, transceivers, converters for analogue to digital and vice versa .These sensors can sense, communicate with other sensors in the environment and can process data. Many such sensors combine to form awireless sensor network

The Role of IoT in Smart Manufacturingrole-of-IoT-in-smart-manufacturing

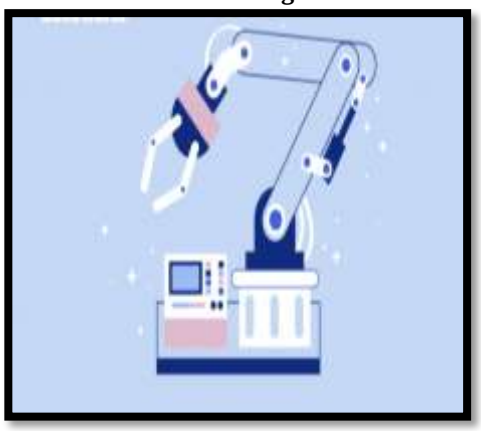

FIGURE 4

The biggest industry in the world, manufacturing, cannot but be influenced by modern technologies. Today, the Internet of Things has an increasing influence on manufacturing, transforming both production and business management processes and creating smart factories. And it's true to say that IoT is one of the core driving forces behind Industry 4.0 (aka the Fourth Industrial Revolution). In this article, we discuss the role of IoT in smart manufacturing and explain how connected devices can help manufacturers reduce production risks.

Smart Manufacturing Defined

Manufacturing is the production of a wide range of goods using human labor and machines. In recent decades, the industry has been implementing various digital technologies that have been gradually reducing human participation in production processes.

The following are the current top digital trends in manufacturing:

The Internet of Things — connected sensors and devices collect valuable data to simplify and improve industrial activities.

AI and machine learning— advanced algorithms analyze raw data and transform it into effective actions.

Robotics — industrial robots have been working in factories alongside human workers for quite some time. They help create efficiencies at all stages, from raw material to final product, are able to operate 24/7, and are highly cost effective.

Big Data and industrial analytics— these technologies enable manufacturers to manage, update and analyze increasing amounts of digital content (consumer and product information), while decreasing cost and downtime.

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Many enterprises have by now transformed their processes into smart manufacturing — the industrial branch based on intelligent automation and empowered by smart digital solutions with the aim to optimize production.

What is smart manufacturing?

Smart manufacturing accelerates productivity, increases efficiency, minimizes downtime and provides a competitive edge for businesses.

Internet of Things in Smart Manufacturing

In 2017, the Internet of Things reached the enterprise level, and is now at the very heart of industrial digital transformation. IoT solutions for smart manufacturing have created a subset of the technology — the Industrial Internet of Things (IIoT).

Manufacturing is the sector most affected by IIoT, with a potential economic impact of $3.9 trillion to $11.1 trillion a year by 2025.

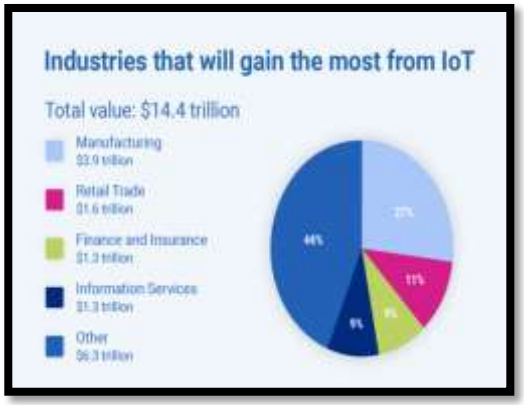

FIGURE 5

II. RESULTS

```
void setup() {
  // put your setup code here, to run once:
pinMode(A0,INPUT);
pinMode(D2,OUTPUT);
Serial.begin(9600);
}

void loop() {
  // put your main code here, to run repeatedly:

int s=analogRead(A0);

//digitalWrite(D2,s);
 Serial.println(s);
 if(s<300)
 {
  digitalWrite(D2,HIGH);
 }
 else {
  digitalWrite(D2,LOW);
 }
 //delay(500);
}
```

REFERENCES

[1]. A Gluhak, S. Krco, M. Nati, D. Pfisterer, N. Mitton, T. Razafindralambo, A Survey on Facilities for Experimental Internet of Things Research, IEEE Commun Mag. 49 (2011) 58–67.

[2]. 2)L. Haiyan, C. Song, W. Dalei, N. Stergiou, S. Ka-Chun, A remote markerless human gait tracking for e-healthcare based on content-aware wireless multimedia communications, IEEE Wireless Communications 17 (2010) 44–50.

[3]. G. Nussbaum, People with disabilities: assistive homes and environments, Computers Helping People with Special Needs. (2006).

[4]. A. Alkar, U. Buhur, An Internet based wireless home automation system for multifunctional devices, IEEE T Consum Electr. 51 (2005) 1169–1174.

[5]. M. Darianian, M.P. Michael, Smart Home Mobile RFID-based Internet-Of-Things Systems and Services, 2008 International Conference on Advanced Computer Theory and Engineering. (2008) 116–120.

[6]. H.S. Ning, Z.O. Wang, Future Internet of Things Architecture: Like Mankind Neural System or Social Organization Framework? IEEE Communications Lett. 15 (2011) 461–463.

[7]. S. Sharma, K. Chen, A. Sheth, "Towards Practical Privacy-Preserving Analytics for IoT and Cloud Based Healthcare Systems" IEEE Internet Computing, March-April 2018.

[8]. K. Chen and L. Liu. Geometric data perturbation for outsourced data mining. Knowledge and Information Systems, 29(3), 2011.

[9]. C.Dwork. Differential privacy. In International Colloquium on Automata, Languages andProgramming. Springer, 2006.