ISSN (Online) 2394-2320

International Journal of Engineering Research in Computer Science and Engineering (IJERCSE)
Vol 4, Issue 11, November 2017

Industrial Automation Using Internet of Things (IoT)

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Abstract: **- In this paper, we have presented the present status of industrial automation using IoT. The internet of things is a network of the physical object that contains embedded technology essence communicate with the extrinsic environment. The industrial internet of thing is part of the internet of thing that focuses on devices and object used in a business setting.The vision of the Internet of things has evolved due to a convergence of multiple technologies, including ubiquitous wireless communication, real-time analytics, machine learning, commodity sensors, and embedded systems. No ways to detect the un-even condition. Manual intervention required for monitoring. CCTV used which only monitor but no Alert generation.It helps to connect everything around you to the internet including wearable devices, metering devices and an environmental sensor.This paper summarizes the current applications and implementation of IoT in the automation industry.In future, we hope that IoTs will further enhance and make a revolution in industry and also in home appliances.**

***Keywords*---** **Automation, IoT, sensors, Artificialintelligence, Embedded electronics.**

I. INTRODUCTION

Industrial Internet of Things (IoT) is the best way of connecting industrial machineries and sensors, to each other, over the internet, allowing the authorized user of the industry to use information from these connected devices to process the obtained data in a useful way. IoT-connected applications typically support data acquisition, aggregation, analysis, and visualization. The IoT architecture includes latest technologies such as computers, intelligent devices, wired and wireless communication and cloud computing. Previously Bluetooth and RF (Radio Frequency) technologies were used to control and monitor the industrial applications but were limited to short distance. The operator had to be in the range of the Bluetooth connectivity or in the Radio Frequency area .Solution to the short distance communication is the IoT based industry automation. Here we can have controlling as well as monitoring from anywhere in the world.

Model Example of Industrial Automation

II. HISTORY

First time automation in industries was done through the use of steam and water power. As the advancement took place, electricity was introduced and was used in industries for mass production. The term Internet of Things is 16 years old. But the actual idea of connected devices had been around longer, at least since the 70s. Back then, the idea was

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often called "embedded internet" or "pervasive computing". But the actual term "Internet of Things" was coined by Kevin Ashton in 1999 during his work at Procter&Gamble. Ashton who was working in supply chain optimization, wanted to attract senior management's attention to a new exciting technology called RFID. Because the internet was the hottest new trend in 1999 and because it somehow made sense, he called his presentation "Internet of Things". Even though Kevin grabbed the interest of some P&G executives, the term Internet of Things did not get widespread attention for the next 10 years.

III. CURRENT TECHNOLOGY

When computers were invented, it was designed to perform multiple functions. As time went on, computers became cheaper and then almost all industries started using it for automation because it reduced a major work load experienced by the humans and still it is considered as the best option to control and monitor a application. Automation is done through the technologies such as Bluetooth and radio frequency which can be employed for short distance communication.

The following six use cases are examples of how manufacturers are putting IIoT to smart business use:

1. Rapid Costing: In many industries, manufacturing functions are considered as internal suppliers to the product management group or the sales team and, therefore, must provide cost estimates during tendering and business developmentcycles. Tough market dynamics require rapid costing on price indications about a particular piece of equipment, and this quick turnaround can be a decisive factor in whether the enterprise wins or loses major orders. Historical data including hit-rates, customer preferences, footprint requirements, past tendering records, executed projects and product definitions must be combined in an IIoT strategy to inform tendering feedback, reduce lead time and increase quality of tendering.

2. Non-Conformance Report (NCR) Analytics: Manufacturing organizations usually collect data points regarding non-conforming events that arise on the factory floor. An NCR is issued when a product, process or procedure does not comply with set standards. It can also represent a significant deficiency. An NCR is generally used as a tool to reduce errors as much as possible and keep faulty products and equipment from reaching customers. IIOT technologies can help analyze NCR data, find relationships between NCRs and support the prediction of future non-conformances.

3. Plant Load Optimization: Sales and Operations Planning (S&OP) processes are the core of a manufacturing company. They allow management not only to get a handle on the business but also to create a command and control system that integrates strategic business plans and tactical day-to-day operations. S&OP helps guide daily operations and monthly plans toward long-term business goals and aligns manufacturing, suppliers and customers. Depending on the product´s lifecycle, the S&OP process can define the load forecast over time, which helps determine which products an enterprise will manufacture at which plant—and creates the basis for plant loading. This decision has implications on operational and financial performance. Historical load, industrial footprint, executed projects, scope changes and customer behavior are data points that can optimize plant loading. To understand and balance the trade-offs to optimize loading requires an IIoT strategy.

4. Shop Floor Operational Improvements: Manufacturers are increasingly interested in the use of low-cost sensors attached to machines for preventive maintenance and condition-based monitoring. Some are finding wireless connectivity and big data processing tools can make it cheaper and easier to collect actual performance data and monitor equipment health. For example, critical machine tools are designed to operate within certain temperature and vibration ranges. Sensors that can actively monitor and send an alert when the tool deviates from these prescribed parameters can aid in preventing malfunctions. When critical equipment fails, operations can quickly fall behind and miss on-time delivery, leading to delayed projects and cost overruns. Big data in an IIoT solution can help improve overall equipment effectiveness (OEE), minimize equipment failure and enable proactive maintenance to reduce or eliminate downtime.

5. Suppliers and Supply Chain: Access to real-time supply chain information helps identify issues before they happen, reduces inventory and potentially reduces capital requirements. The IIoT can help manufacturers gain a better understanding of this information. By connecting plants to suppliers, all parties involved in the supply chain can trace interdependencies, material flow and manufacturing cycle times. IIoT-enabled systems can be configured for location tracking, remote monitoring of inventory and reporting of parts and products as they move through the supply chain. They can also collect and feed delivery information into ERP, PLM and other systems.

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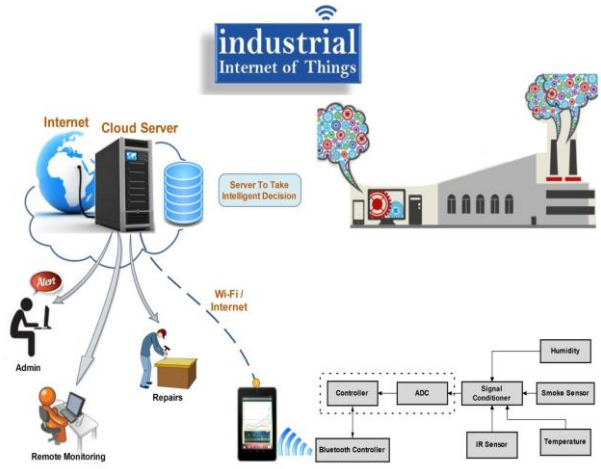
6. Health, Safety and Environment: Key Performance Indicators (KPIs) for health, safety and environment (HSE) include data for injury and illness rates, short- and long-term absences, near-misses, vehicle incidents and property damage or loss during daily operations. These measurements are typically stored in myriad systems, spreadsheets and emails and are reported sporadically during management reviews or audits. Lagging indicators do not have any relational value and companies rarely perform thorough root cause analyses. A well-defined Industrial Internet and analytics strategy will help isolate and address HSE issues.

RFID based automation in manufacturing industry



Block Diagram of IoT

IV.IOT ADOPTION BARRIERS

Lack of interoperability and unclear value propositions

Despite a shared belief in the potential of IoT, industry leaders and consumers are facing barriers to adopt IoT technology more widely. "Instead of convincing consumers that they need complex systems to serve needs they don't have, we should fix real problems people struggle with every day." Many gadgets in the consumer IoT space have appealed to early adopters, yet failed to demonstrate relevance to ordinary people's lives."In order to boost sales and drive demand beyond the early adopter set, we need to stop making toys no one cares about and instead work on building simple solutions to real, everyday problems for real people."

A recent study by Ericsson regarding the adoption of IoT among Danish companies, has suggested that many are struggling "to pinpoint exactly where the value of IoT lies for them". A company must identify where the value of IoT lies in order to capture it, otherwise non-action is the consequence.This indicates that a major roadblock to IoT adoption is not technical but analytical in nature.

Privacy and security concerns

According to a recent study by Noura Aleisa and Karen Renaud at the University of Glasgow, "the Internet of things' potential for major privacy invasion is a concern"with much of research "disproportionally focused on the security concerns of IoT."Among the "proposed solutions in terms of the techniques they deployed and the extent to which they satisfied core privacy principles",only very few turned out to be fully satisfactory. Louis Basenese, investment director at Wall Street Daily, has criticized the industry's lack of attention to security issues:"Despite high-profile and alarming hacks, device manufacturers remain undeterred, focusing on profitability over security. Consumers need to have ultimate control over collected data, including the option to delete it if they choose...Without privacy assurances, wide-scale consumer adoption simply won't happen."In a post-Snowden world of global surveillance disclosures, consumers take a more active interest in protecting their privacy and demand IoT devices to be screened for potential security vulnerabilities and privacy violations before purchasing them. According to the 2016 Accenture Digital Consumer Survey, in which 28000 consumers in 28 countries were polled on their use of consumer technology, security "has moved from being a nagging problem to a top barrier as consumers are now choosing to abandon IoT devices and services over security concerns."The survey revealed that "out of the consumers aware of hacker attacks and owning or planning to own IoT devices in the next five years, 18 percent decided to terminate the use of the services and related services until they get safety guarantees.

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V. 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 fulfil our requirement. As sometimes it will be late in this process and it will harm to property as well as life.We hope that in near future using IoT we can nearly control every automation and will be even more evolved and useful than it is at present.

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Chaudhar1, SudarshanJadhav, SandeepBatule, SandeepHelkarStudent, Computer Engineering, AISSMS COE, Pune, India.This paper provides an application how to monitoring industrial appliance. They aim to serve as an efficient backbone for achieving a network of sensors and actuators which can help for improving the performances of the day to day gadgets/activitiesfor industry use.

3.IRJET-V4I634-
BhosaleKiranUttam,GalandeAbhijeetBaspusaheb,JadhavPappuShivaji, Prof.Pisal.R.S, 1,2,3B.E ,Dept. of E&tc Engineering, S.B. patilcollege,Indapur ,Maharashtra, India Prof. Pisal.R.S, Dept. of E&tc Engineering, S.B. patilcollege,Indapur, Maharashtra, India.This paper says how to implentingIot systems to access the live data and also control the device interfaced with our system.