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INDUSTRIAL INTERNET OF THINGS (IIOT) – A BRIGHT FUTURE AHEAD FOR INDIA

Information Technology

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ABSTRACT

Industrial Internet of Things (Industrial IoT) is made up of a multitude of devices connected by communication software. The resulting systems including the comprising individual devices can monitor, collect, exchange, analyze, and instantly act on information to intelligently change their behavior or their environment -- without any human intervention. With the use of IIOT, industries can improve the efficiency of their business, create new models & products and provide better services to their customers.

Today, the world is building more and more intelligent machines that interact with other machines, with their environments, with data centers and with humans. IIoT will fundamentally transform the way people will work through new interactions between humans and machines. The Industrial Internet (of Things), the latest wave of technological change will bring unprecedented opportunities, along with new risks, to business and society. In coming decades, the Industrial Internet of Things (IIoT) revolution is going to dramatically alter manufacturing, energy, agriculture, transportation and other industrial sectors of the economy, which accounts for nearly two-thirds of the global gross domestic product (GDP). India has immense potential for deriving benefits from the technology, if it improves existing infrastructure and skills that will help support the adoption of new technologies.

INTRODUCTION

A decade before, the internet revolutionized people to people communication, e-commerce, business, social networking etc. The next wave of the Internet is going to connect machines and devices together to function intelligent systems. These interconnected devices — the Industrial Internet of Things (IIoT) — will work together with unprecedented speed, scale and capabilities.

Industrial Internet of Things (Industrial IoT) specifically is a conjunction of complex physical machinery with high end software, coupled with network sensors and imaging devices. Industrial Internet of Things (Industrial IoT) is made up of a multitude of devices connected by communication software. The resulting systems including the comprising individual devices can monitor, collect, exchange, analyze, and instantly act on information to intelligently change their behavior or their environment -- without any human intervention. Industrial Internet (IIoT) incorporates machine learning and big data technology, harnessing the sensor data, machine-to-machine (M2M) communication and automation technologies that have existed in industrial settings for years. The driving philosophy behind the IIoT is that smart machines are better than humans in terms of accuracy, consistency, and capturing & communicating data. This data can enable industries to pick up on inefficiencies and problems, saving time and money & supporting business intelligence efforts. With the use of IIOT, industries can improve the efficiency of their business, create new models & products and provide better services to their customers.

In manufacturing specifically, IIoT has a greater potential for quality control, sustainable and green practices, supply chain traceability and overall supply chain efficiency. With the advent of machines & software, different technologies like big data, Machine 2 Machine (M2M) learning, IoT etc. are also contributing to IIoT. A major concern surrounding the Industrial IoT is interoperability between devices and machines that use different protocols and have different architectures. The Industrial Internet Consortium (IIC) founded in 2014, focuses on creating standards that promote open interoperability and the development of common architectures.

In coming decades, the Industrial Internet of Things (IIoT) revolution is going to dramatically alter manufacturing, energy, agriculture, transportation and other industrial sectors of the economy, which accounts for nearly two-thirds of the global gross domestic product (GDP). IIoT will fundamentally transform the way people will work through new interactions between humans and machines. The Industrial Internet (of Things), the latest wave of technological change will bring unprecedented opportunities, along with new risks, to business and society. It will combine the global reach of the Internet with a new ability to directly control the physical world including the machines, industries and infrastructure that define the modern landscape. However, the industrial internet is currently in its early stages and many important questions remain unanswered such as how it will impact existing industries, value chains, business models and workforces and actions needed to ensure long-term success. By 2020, there will be more than 26 billion devices both living and non-living entities connected together. IIoT is expected to add $10- $15 trillion to global GDP through efficiency gains in next two decades.

INDUSTRIAL IOT (IIOT) Vs. INTERNET OF THINGS (IOT)

The Industrial IoT (IIoT) connects critical machines and sensors in high-stakes industries such as aerospace, defense, healthcare and energy. These are systems in which failure often results in life-threatening or other emergency situations. On the other hand, IoT systems tend to be consumer-level devices such as wearable fitness tools, smart home thermometers and automatic pet feeders. They are important and convenient, but breakdowns do not immediately create emergency situations.

Secondly, for Industrial IoT (IIoT), the infrastructure must be built before IoT applications can be developed. In other words, the IoT, to certain extent, depends on the Industrial IoT (IIoT). While, IoT is essentially a network of devices where all the devices:

- Have local intelligence
- Have a shared Application Programme Interface (API), so as they can talk to each other effectively
- Push and pull status and command information from the networked world

On the other end, the Industrial IoT (IIoT) focuses strongly on intelligent cyber-physical systems. These systems comprise machines connected to computers that interpret, analyze and make decisions almost instantly, based on sensor data from many widely distributed sources. Today, the world is building more and more intelligent machines that interact with other machines, with their environments, with data centers and with humans.

Vast amounts of data are generated and transmitted between devices, system sensors and real-time systems. Real-time means as

fast as machines can react, even if there are thousands of devices in a system, and millions of messages traveling through the system. The communications software simply has to work (reliability) and work fast (speed), no matter how many devices are involved (scalability), and help secure confidential system information (security) along the way.

A BRIGHT FUTURE AHEAD FOR INDIA

Today, IIoT is at a budding stage with only 1% of world devices connected; this means that the wealth of information that is generated remains unutilized without any corporate systems mining them for insights. IIoT can open up opportunities for improving operational efficiency, customer care and insights.

General Electric (GE) coined the term "Industrial Internet" in late 2012. It is effectively synonymous with the Industrial Internet of Things and abbreviated as Industrial IoT or IIoT. GE has used the power of IIoT and created a service of Digital Wind Farm, wherein physical windmills have digital twin, thereby making the analysis instaneous and improvement in performance easy. According to GE, IIoT could boost a wind farm's energy production by as much as 20% and create $100 millions in extra value over the lifetime of 100 megawatts farm.

The Industrial Internet of Things (IIoT) is a major trend with significant implications for the global economy. The IIoT as defined by Accenture is "*a universe of intelligent industrial products processes and services that communicate with each other and with people over a global network*". This connected web is becoming increasingly ubiquitous across a wide range of industries. With the IIoT taking off, it has been estimated that the number of internet-connected devices are likely to multiply to billions. The combination of IIoT and big data analytics promises to drive further operational efficiencies along with more innovation and ultimately new sources of revenue. Through the IIoT, operations and information technology will blend together and become more intelligent through the use of sensors, analytics and machine applications – a development that will share and create even more data. The insights gleaned from this big data and new types of data can bring many benefits for businesses, including operational savings and revenue opportunities.

India has immense potential for deriving benefits from the technology, if it improves existing infrastructure and skills that will help support the adoption of new technologies. With increasing connectivity, there is an immediate need for cyber security solutions that take a measured approach to managing the industrial IT lifecycle. Increasing plant reliability by using next generation cyber security solutions will be critical. The key challenge for industries is to drive actionable insights and ultimately, incremental value from data generated by IIoT. To do so, industries need to think about how the data will be collected, stored and analyzed. Today, many industries are examining their current data systems and looking for ways to complement them with emerging tools and technologies, creating hybrid technology environments that can meet their business needs. Such environments help companies analyze their data in real time to make decisions that can benefit customers, improve their business performance and disrupt their industries.

CONCLUSIONS

The Industrial Internet of things (IIoT) is the next wave of innovation impacting the way the world connects and optimizes machines. The Industrial Internet of Things (IIoT) is connecting the physical world of sensors, devices and machines with the internet and by, applying deep analytics through software is turning massive data into powerful insights and intelligence.

IIoT is expected to foster growth and competitiveness in manufacturing and is a huge business opportunity for companies to come up with solutions that will pave the way for that. The concept has brought pace in the transformational journey of industries such as manufacturing, retail, and transportation, among others. IIoT will have a demand and supply side impact across the globe. "Besides the B2B (Business 2 Business sector), where machine-to-machine analytics will play a major role, IIoT will also impact the consumer-oriented industries such as eCommerce (for real-time analytics of consumer behavior), healthcare (with wearable devices for analysis), education etc.

IIoT is really at an early stage of growth, and it will make an impact over a wide variety of sectors. IIoT is definitely on its way to be adopted by many global firms in their quest to connect the digital and physical worlds. IIoT would not only help the services industry in reducing costs, but also aid in preventing downtime of machines, improve the efficiency of the entire value chain, decrease energy consumption, and improve customer service.

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