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Industrial Internet of Things in India

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Contents

Table of Figures

Industrial Internet of Things.

The use of intelligent sensors and actuators to improve manufacturing and industrial processes is known as the industrial internet of things (IIoT). IIoT, sometimes referred to as industry 4.0 or the industrial internet, makes use of real-time analytics and smart machines to make the most of the data that "dumb machines" have been producing in industrial settings for years. The underlying tenet of IIoT is that smart machines are superior than people in both data collection and real-time analysis, as well as at conveying critical information that can be utilised to make business choices more quickly and correctly.

Connected sensors and actuators enhance business intelligence initiatives by allowing businesses to identify inefficiencies and problems earlier, save time, and money. The IIoT has enormous potential for improving supply chain efficiency, supply chain traceability, sustainable and green manufacturing methods, and quality control in particular. IIoT is essential to activities like Predictive maintenance (PdM), improved field service, energy management, and asset monitoring in an industrial context.

Industrial 4.0, Make in India, and Smart Factories that are prepared to enable IIoT evolution are heralding the Industrial Internet of Things (IIoT) revolution. By 2025, the IIoT may have a $6.2 trillion global economic effect, according to the McKinsey Global Institute. Having said that, IIoT is poised to transform the industrial industry by making it possible to access a massive quantity of data at previously unheard-of rates and with unprecedented efficiency. To make their factories "smart," a number of forward-thinking businesses have launched Industry 4.0 initiatives and are leading IIoT projects.

Alternatively known as the Industrial Internet, the IIoT integrates machine learning and large-scale information technology, bridging the sensor data, machine-to-machine (M2M) communication, and computerization breakthroughs that have long been present in the contemporary environment.

Ultimately, the usage of IIoT in contemporary settings such as paper manufacturing facilities, electricity, oil, and gas production lines, and production lines will allow

organisations to handle enormous amounts of big data quickly, which can be used to reduce waste and inefficiencies. By collecting process data on weights, temperatures, flow rates, RPM, vibration, and other specialised data, IIoT programming will enable factories to operate more efficiently, securely, and dependably. The potential benefits of IIoT in industry are enormous. Through IIoT, we are putting the knowledge we have acquired in data centres into practise in the factories. By empowering all areas of the company—from material management to tasks and maintenance to production and completion to winding up—the manufacturing costs are reduced.

The IIoT is motivated by the reality that robots are more effective than people in accurately and consistently capturing and communicating data. Thus, the data supports business intelligence goals of the company by helping organisations identify and address problems in less time, saving money. Particularly in manufacturing, where the emphasis is on sustainability, green practises, supply chain efficiency, and quality control, IIoT offers enormous significance and promise.

How Does IIoT Works?

The Internet of Things (IIoT) is a network of intelligent devices linked together to create systems that gather, share, and analyse data. A typical industrial IoT ecosystem includes:

- People, public and/or private data communications infrastructure.
- Analytics and applications that provide business insights from raw data.
- Storage for the data created by the iiot devices.
- Linked devices that can detect, communicate, and store information about themselves.

These intelligent assets and edge devices transfer data directly to the data communications network, where it is transformed into useful information about how a certain piece of equipment is doing. Both predictive maintenance and business process optimization may be done using this data.

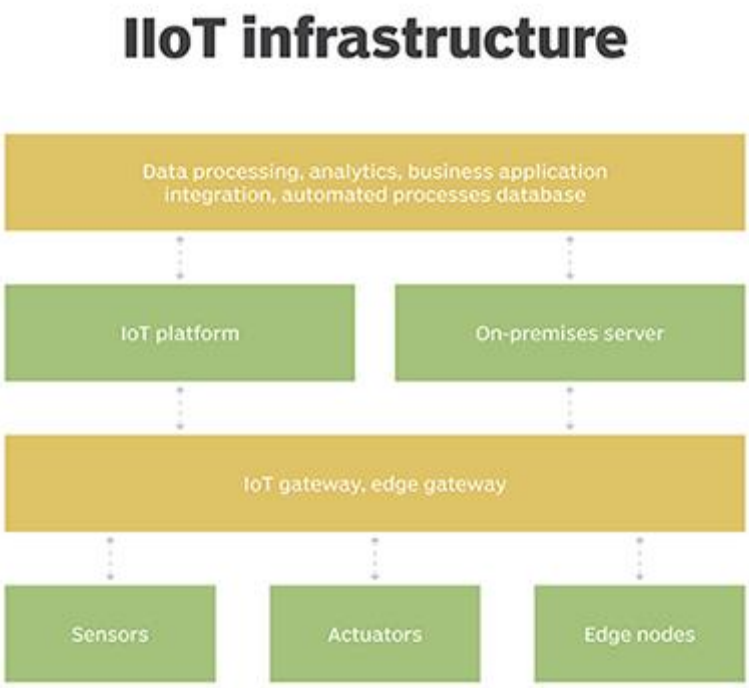

Figure 1-IIoT infrastructure components include the IoT or edge gateway, sensors, actuators and edge nodes

How is IoT Driving Industry 4.0 in India?

With the aid of the Internet of Things (IoT), big data analytics, the cloud, autonomous robotics, artificial intelligence, machine learning, augmented reality, and access to real-time data, Industry 4.0 elevates the emphasis on digital technology to a completely new level.

IoT is like the motor oil that is propelling Industry 4.0 in India at a breakneck speed. Currently, supply chain management, customer interaction, virtual meetings, etc. are where IoT is most commonly used. A subtype of IoT, called Industrial IoT (IIoT), is the technology utilised in industrial manufacturing. Four key phases make up the path with IoT adoption in India's Industry 4.0 evolution:

- Connecting to a Common Network: In order to collect and utilise big data, every industrial asset has to be connected to the Internet and cloud computing platforms.
- Obtain Big Data Insights: Access to extensive information about the whole lifespan of an asset is made possible through remote monitoring.

- Enhancing fundamental business value by removing inefficiencies and cutting expenses via the optimization of operations and processes.
- Develop more effective business models by analysing the particular firm's core competencies.

When the space, data accessibility, and affordability of the Indian domestic market are taken into account, the adoption of IoT for industry becomes more seamless.

In order to increase India's manufacturing GDP to 25% by 2025, more than two-thirds of Indian firms are expected to adopt digital transformation.

In India, MSMEs account for 33% of manufacturing output and about 50% of exports in the areas of textiles, food technology, electrical equipment, etc.

Research demonstrates that by funding digital solutions like SaaS-based and Cloud services to deploy non-core operations, the issues experienced by MSMEs in scaling up Industry 4.0 may be resolved.

Industry 4.0 Adoption in Indian Sectors

Cobots for FMCG (fast-moving consumer goods): A cobot is a robot that enables secure human-robot interaction while remaining nearby employees. With limited infrastructure and human resources, India's FMCG sectors utilise cobots to speed up operations while increasing energy efficiency.

Sectors related to telecommunications: For instance, Vodafone Business Services provides cutting-edge IoTs communications solutions for a range of industries, including transportation, smart cities, healthcare, and more.

Healthcare Sector: The finest example of how people may use the IoT to monitor their blood pressure, blood sugar, and other parameters to manage their health is smart glucometers.

Thanks to rising investment in foundational technologies like the cloud and IoT, the Indian industrial sector has started to shift toward digitalization. There is still a lot of

work to be done even if certain measures have already been taken. The emphasis should be placed on increasing the present asset base rather than just spending additional money. Smart manufacturing, data analytics, and the Internet of Things will all boost Indian business.

What are the risks and challenges of IIoT?

Security-related hazards are the ones that concern IIoT use the most. Even after they have been put into production, IIoT devices frequently retain their default passwords. Similar to this, a lot of IIoT devices provide data in clear text. Due to these circumstances, it would be quite simple for a hacker to intercept data flowing from an IIoT device. Similar to this, an attacker might seize control of an unsecure IIoT device and use it as a base to target other network resources.

For people in charge of an organization's IIoT devices, security is a major concern, but so is device management. Adopting an efficient device management strategy will be more crucial as a business deploys more and more IIoT devices. To avoid the usage of malicious devices, companies need to be able to positively identify IIoT devices. Establishing a system for uniquely identifying each device is also essential for operations like repairing a broken device or carrying out a device refresh.

Regarding IIoT devices, patch management is still another significant difficulty. Periodic firmware upgrades from device makers are becoming more and more typical. Organizations must have a reliable method for determining if devices are running the most recent firmware version and, if not, for installing new firmware. In order to avoid interfering with business activities, such a tool must also follow the organization's defined maintenance plan.

Examples and Applications of IIoT

ABB, a power and robotics company, employs connected sensors in a real-world IIoT deployment of smart robotics to monitor the maintenance requirements of its robots and to alert repairs before components fail.

Similar to this, Airbus, a manufacturer of commercial jetliners, has started what it calls the factory of the future, a digital manufacturing drive to improve operations and increase output. To reduce mistakes and improve worker safety, Airbus has incorporated sensors into equipment and machines on the shop floor and provided personnel with wearable technology, such as industrial smart glasses.

Fanuc, a different robotics firm, uses sensors in its robots and cloud-based data analytics to foresee when parts in its robots would break. This gives the plant manager the ability to arrange maintenance at affordable periods, cutting expenses and avoiding unnecessary downtime.

The IIoT is being used by Magna Steyr, an Austrian automaker, to track its assets, including tools and car components, as well as to automatically purchase new stock when it runs low. In order to track components in its warehouses, the corporation is also experimenting with "smart packaging" supplemented with Bluetooth.

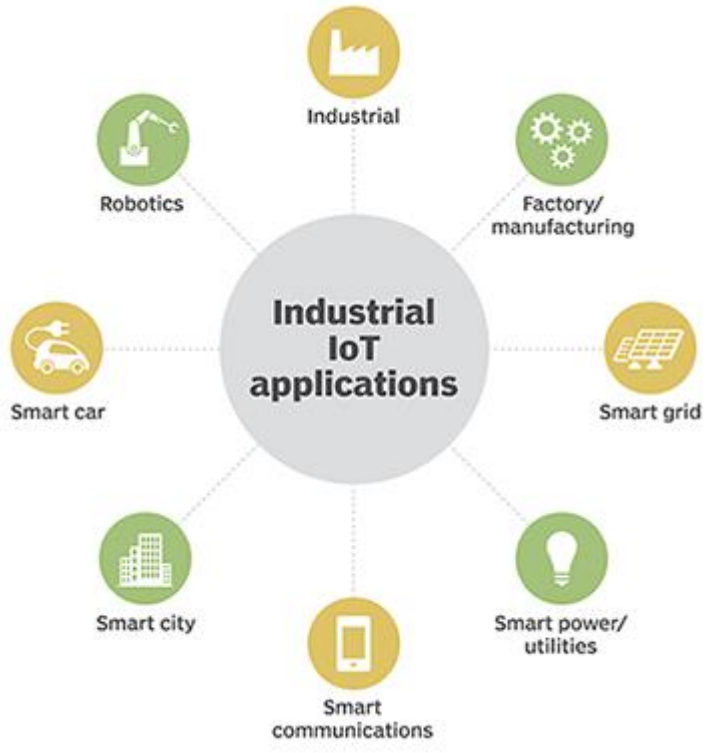

Figure 2- Industrial Applications of IIoT

Future of IIoT

The future of IIoT is tightly coupled with a trend known as Industry 4.0. Industry 4.0 is, essentially, the fourth Industrial Revolution.

Industry 1.0 was the first Industrial Revolution and occurred in the late 1700s as companies began to use water-powered or steam-powered machines in manufacturing. Industry 2.0 started at the beginning of the 20th century and was brought about by the introduction of electricity and assembly lines. Industry 3.0 occurred in the latter part of the 20th century and was tied to the use of computers in the manufacturing process.

Industry 4.0 is where we are today. Industry 4.0 is based on the use of connected electronic devices -- particularly, IIoT devices.

Going forward, IIoT devices will play a major role in digital transformations, especially as organizations attempt to digitize their production lines and supply chains. Additionally, big data analytics will evolve to incorporate IIoT data. This will make it possible for organizations to detect changing conditions in real time and respond accordingly.

Although IIoT devices have been around for several years, real-world adoption is still in its infancy. This is sure to change as 5G becomes increasingly prevalent and more and more organizations begin to realize what IIoT can do for them. There are a number of resources available online for organizations that want to get up to speed on IoT and IIoT.