

INDUSTRIAL INTERNET OF THINGS (IIOT)

The application of the IoT to the manufacturing industry is called the IloT (or Industrial Internet or Industry 4.0). The IloT is revolutionizing manufacturing by enabling the acquisition and accessibility of far greater amounts of data, at far greater speeds, and far more efficiently than before. A number of innovative companies have started to implement the IloT by leveraging intelligent, connected devices in their factories.¹

There are countless industries that make use of IloT. One example is the automotive industry, which uses IloT devices in the manufacturing process. The automotive industry extensively uses industrial robots, and IloT can help proactively maintain these systems and spot potential problems before they can disrupt production.



Figure 4. IloT is used in many industries and sectors, including robotics, manufacturing and smart cities.²

The agriculture industry makes extensive use of IloT devices, too. Industrial sensors collect data about soil nutrients, moisture and more, enabling farmers to produce an optimal crop.

The oil and gas industry also uses industrial IoT devices. Some oil companies maintain a fleet of autonomous aircraft that can use visual and thermal imaging to detect potential problems in pipelines. This information is combined with data from other types of sensors to ensure safe operations.¹²

Although IoT and IloT have many technologies in common, including cloud platforms, sensors, connectivity, machine-to-machine communications and data analytics, they are used for different purposes.

IoT applications connect devices across multiple verticals, including agriculture, healthcare, enterprise, consumer and utilities, as well as government and cities. IoT devices include smart appliances, fitness bands and other applications that generally don't create emergency situations if something goes amiss. IloT applications, on the other

¹ [What is IloT? | Inductive Automation](#)

² [What is IloT? Industrial Internet of Things Explained \(techtarget.com\)](#)

hand, connect machines and devices in such industries as oil and gas, utilities and manufacturing. System failures and downtime in IIoT deployments can result in high-risk situations, or even life-threatening ones. IIoT applications are also more concerned with improving efficiency and improving health or safety, versus the user-centric nature of IoT applications.¹²

IIoT infrastructure

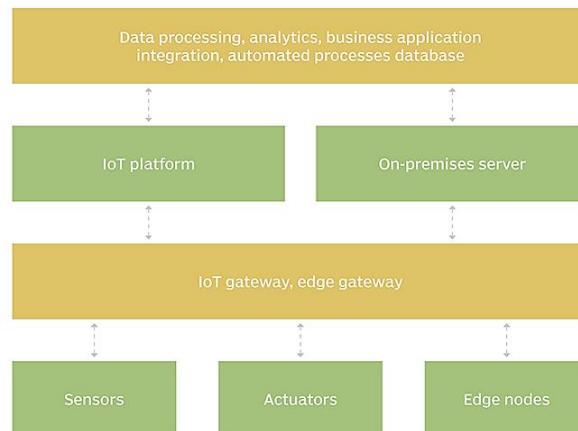


Figure 5. IIoT infrastructure components include the IoT or edge gateway, sensors, actuators and edge nodes.³

1. What are the Benefits of IIoT?

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.

The IIoT can greatly improve connectivity, efficiency, scalability, time savings, and cost savings for industrial organizations. Companies are already benefitting from the IIoT through cost savings due to predictive maintenance, improved safety, and other operational efficiencies. IIoT networks of intelligent devices allow industrial organizations to break open data silos and connect all of their people, data, and processes from the factory floor to the executive offices. Business leaders can use IIoT data to get a full and accurate view of how their enterprise is doing, which will help them make better decisions.¹¹

³ [What is IIoT? Industrial Internet of Things Explained \(techtarget.com\)](https://www.techtarget.com/what-is-iiot/)

One of the top touted benefits of IIoT devices used in the manufacturing industry is that they enable predictive maintenance. Organizations can use real-time data generated from IIoT systems to predict when a machine will need to be serviced. That way, the necessary maintenance can be performed before a failure occurs. This can be especially beneficial on a production line, where the failure of a machine might result in a work stoppage and huge costs. By proactively addressing maintenance issues, an organization can achieve better operational efficiency.¹²

Another benefit is more efficient field service. IIoT technologies help field service technicians identify potential issues in customer equipment before they become major issues, enabling techs to fix the problems before they inconvenience customers. These technologies might also provide field service technicians with information about which parts they need to make a repair. That way, the technician has the necessary parts with them when making a service call.¹²

Asset tracking is another IIoT perk. Suppliers, manufacturers and customers can use asset management systems to track the location, status and condition of products throughout the supply chain. The system sends instant alerts to stakeholders if the goods are damaged or at risk of being damaged, giving them the chance to take immediate or preventive action to remedy the situation.¹²

IIoT also allows for enhanced customer satisfaction. When products are connected to the internet of things, the manufacturer can capture and analyze data about how customers use their products, enabling manufacturers and product designers to build more customer-centric product roadmaps.¹²

IIoT also improves facility management. Manufacturing equipment is susceptible to wear and tear, which can be exacerbated by certain conditions in a factory. Sensors can monitor vibrations, temperature and other factors that might lead to suboptimal operating conditions.

2. Challenges of the IIoT

Interoperability and security are probably the two biggest challenges surrounding the implementation of IIoT. As technology writer Margaret Rouse observes, “A major concern surrounding the Industrial IoT is interoperability between devices and machines that use different protocols and have different architectures.” Ignition is an excellent solution for this since it is cross-platform and built on open-source, IT-standard technologies.

Companies need to know that their data is secure. The proliferation of sensors and other smart, connected devices has resulted in a parallel explosion in security vulnerabilities. This is another factor in the rise of MQTT since it is a very secure IIoT protocol.⁴

⁴ [What is IIoT? | Inductive Automation](#)

3. What is the 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.⁵

The IIoT is widely considered to be one of the primary trends affecting industrial businesses today and in the future. Industries are pushing to modernize systems and equipment to meet new regulations, to keep up with increasing market speed and volatility, and to deal with disruptive technologies. Businesses that have embraced the IIoT have seen significant improvements to safety, efficiency, and profitability, and it is expected that this trend will continue as IIoT technologies are more widely adopted. The Ignition IIoT solution greatly improves connectivity, efficiency, scalability, time savings, and cost savings for industrial organizations. It can unite the people and systems on the plant floor with those at the enterprise level. It can also allow enterprises to get the most value from their system without being constrained by technological and economic limitations. For these reasons and more, Ignition offers the ideal platform for bringing the power of the IIoT into your enterprise.¹⁴

4. Risks

The implementation and use of IIoT devices develops exponentially bringing with it software of IIoT developed without the implementation of security control or risk management.

IIoT devices use public Internet in most cases, so access technologies include mobile or wireless communications, such as 3G, 4G-LTE, 5G, or even older - 2G, and bluetooth or old wireless protocols. These access networks connect to corporate, government, domestic, and global data centres. These interconnections, if not properly secured, can turn into major risks. The risks are exacerbated by vulnerabilities in the devices and their environments from threats such as unsecured physical access, poorly developed software, and even unsecured firmware and hardware.⁶

⁵ [What is IIoT? Industrial Internet of Things Explained \(techtarget.com\)](https://www.techtarget.com/whatis/definition/IIoT)

⁶ [The Industrial Internet of Things \(IIoT\): OPPORTUNITIES, RISKS, Mitigation \(dhs.gov\)](https://www.dhs.gov/industrial-internet-things-iiot-opportunities-risks-mitigation)