# Developing a global Industrial IoT solution – challenges and how to overcome them

IoT has been a rapid development shaping the industry and the world in the last decade. Several technological developments make this possible: new and smart sensors, faster networks, growing cloud performance, to name a few. At the same time the challenges have grown in complexity with the increasing number of online devices, and its capabilities. Furthermore, value creation is lagging in the industry, that is failing to scale beyond pilots. This article focusses on the main challenges in building a global Industrial IoT solution for Predictive Maintenance and how you can overcome them, based on our experience.

The scale effect of Industrial Internet of Things (IIoT) improves operational efficiency globally

There are many examples of industrial sites that have deployed IoT achieving significant benefits. The question is how to scale these solutions to a global coverage. In our case we wanted to create a solution that would connect to machines in industrial facilities located across all continents, building a predictive maintenance solution with global footprint. By doing this, the benefits of Industrial IoT (IIoT) are available to the individual machines of each connected site, while the harvesting the power of the crowd of machines connected, learning from each other.

The difference between IoT and Industrial IoT
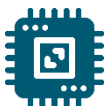
The **Internet of Things (IoT)** is a network of items which are connected to the Internet. These items are a sensor or equipped with sensors to collect data. This data can be shared among them and with other systems (i.e. to a cloud platform).

The **Industrial Internet of Things (IIoT)** contributes to the industrial sector focusing on improving its production activities and supply chain with tools like the Internet of Things (IoT), Big Data, Could Computing, Artificial Intelligence, to name the main ones.

What differs IIoT from IoT? While IoT makes the consumers´ life more convenient and easier, IIoT enables industries and enterprises to have better efficiency and reliability in their operations.

We achieved this using three main components: sensors, edge devices and a cloud platform. Below, we reveal some insights which are important to build a global IoT solution.

Only quality data is actionable data – ask the right questions to find the right sensors and results

Sensors aren't new. They have been around for the last 60 years. In case your machine or product isn't already equipped with own sensors, the careful sensor selection is on top of the list to realize a global IoT solution. Thanks to technological developments, they are nowadays more capable and affordable ever. For every application the sensor selection must follow a clear criterion, to address the right questions:

- Which parameter is monitored?
- Why is that parameter relevant?
- How to best measure the value?
- What sampling measurement is required?
- Which accuracy is accepted?

Only quality data is actionable data. Furthermore, sensors must be robust to their application and easy to install. Finally, since IoT will help visualize the results in a fast way, the sensor selection must also be validated and continuously updated.

Extend resource constraints of sensors with edge devices and IoT gateways

Available sensors have different resource constraints: limited storage and computation, short battery life, and in many cases, they lack the ability to communicate to each other or to the cloud. For these reasons many IoT architectures address these challenges by relying on an edge device or IoT gateway. This is a physical device that will collect and process the sensor generated data with remote capabilities for monitoring and management. It can make low-latency decisions and provide secure connectivity for the data transfer to the cloud. The cloud is then the platform for big data, analytics, AI and much more.

Improved mobile coverage provide the missing internet connection

Availability of a reliable internet connection is not guaranteed in many cases, particularly in remote locations. Having network access is therefore a priority. Growing number of connected devices can also be a burden for existing IT network capabilities, confronted with a fast number of connected devices. Improvements in geographical coverage of mobile networks 3/4/5G help to solve this issue, providing a reliable communication link. Once network is provided, identification and authentication will provide a secure data transfer, protected from manipulation and accessible only to trusted parties.

People – the hidden success factor

People are the key factor to make Industrial IoT a success. Without persuaded people, the technology won´t be accepted. Therefore, it is not only crucial to involve people within the organization from the beginning of the Industrial IoT project, but also that the technology is easy to install & use. This led us to build our platform to be "plug & play". Technology should support people in their daily business. Therefore, it is crucial that the results will be presented in a meaningful way, focused on the end users to draw actionable conclusions. These factors enable user acceptance and will translate into platform success.

Modular and flexible – capture the value of Industrial IoT with cloud-based platforms

Cloud based platforms today offer the best combination of tools to capture the value of IIoT. Thanks to their modularity, scalable resources, analytics, AI, ML, interfaces (APIs), it is possible to address the needs of a growing Industrial IoT infrastructure. Established platforms provide the infrastructure to address cybersecurity concerns while offering a reliable, open, and interoperable resource. They support latest internet standards while creating the space for custom application developments. This is crucial to deliver the answer to the specific needs of the industry environment, and thus to provide the value sought on the solution.

Choosing the right components is crucial to realize a global Industrial IIoT solution

Industrial IoT has emerged in the past years to become one driving force of the digital transformation. Thanks to technological developments available today it is possible for business to capture the value of Industrial IoT. The selection of the right components is instrumental for a successful deployment, particularly at a global scale. They need to be a good fit for their application, easy to install and flexible for future improvements and extensions. In the solution we have built for predictive maintenance, this selection helped us to overcome the challenges given by the distance while increasing acceptance of the users, and thus the delivered benefit.

In the next articles soon to be available, we will detail more the importance of sensor selection as a key factor in building a successful IoT platform.

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