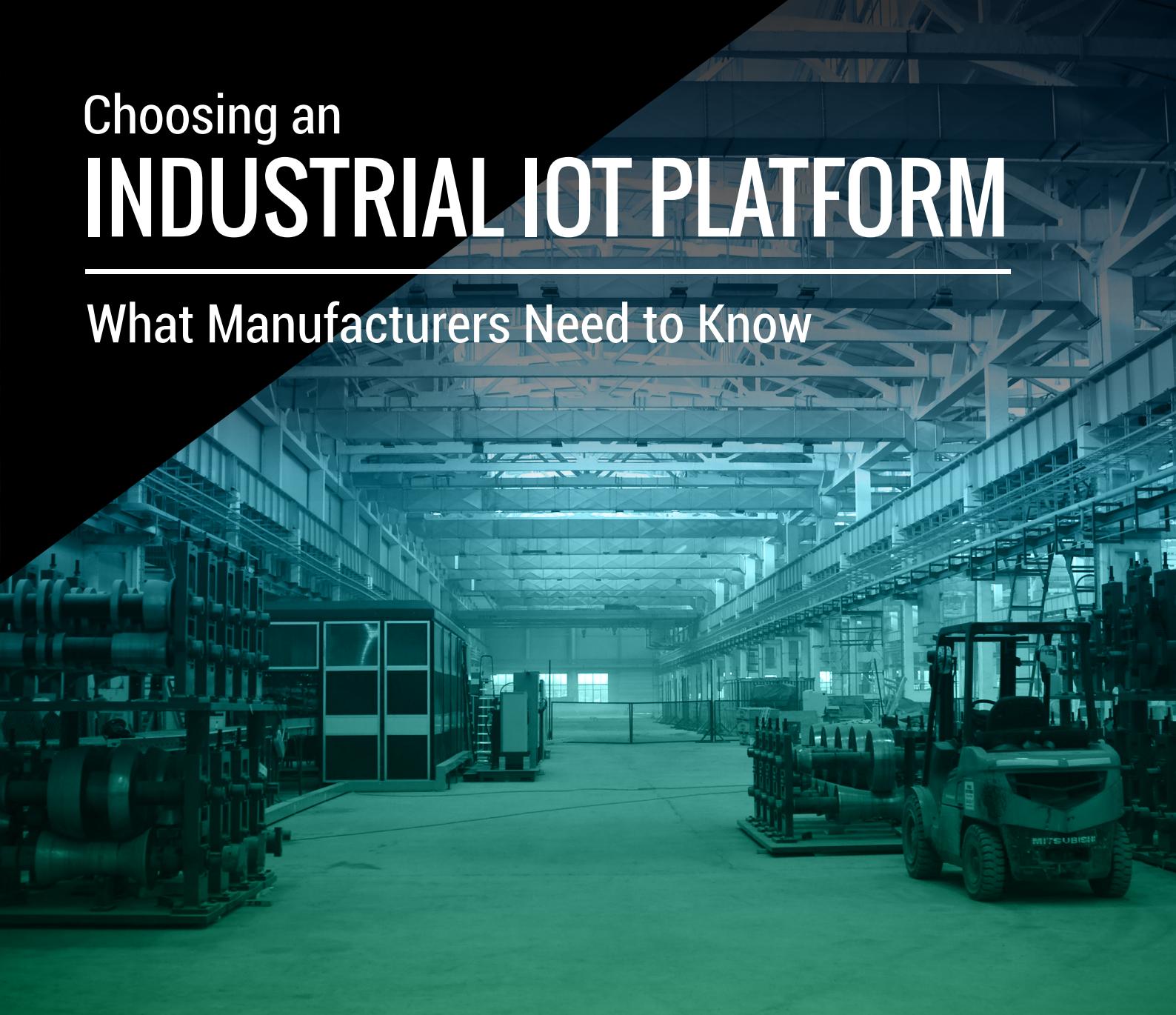


Choosing an INDUSTRIAL IOT PLATFORM

What Manufacturers Need to Know



Manufacturing is regarded as the number one industry to benefit from the Internet of Things implementation. Original equipment manufacturers (OEMs) in domains such as healthcare, pharma, automotive, and aerospace are in for a sea change with the advent of smart connected machines. Information that was once unavailable can now be gathered and processed in near real-time to drive product efficiency and better customer service.

However, the challenges in implementing IoT (Internet of Things) are not to be overlooked in the light of the obvious benefits. A well-thought-out strategy is the first step towards successful adoption. The choice of solution is critical and an integrated IoT platform offers many benefits. When the provider is experienced and capable of handling the multifarious aspects of industrial IoT implementation, including big data analysis and application development, manufacturers can look forward to a smooth journey.

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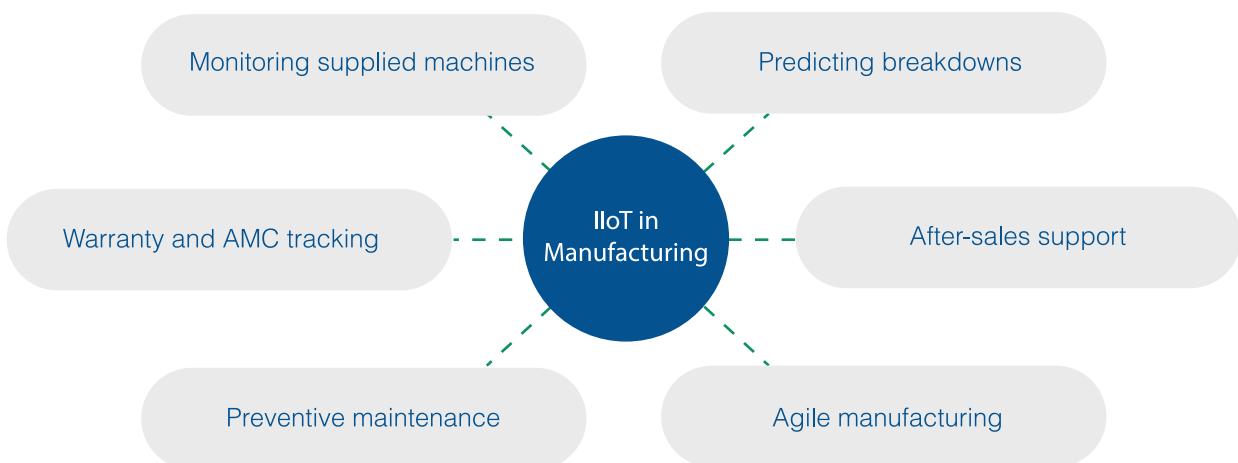
What IoT Brings to the Table for OEMs

Connected physical objects and devices that communicate with each other are the hallmarks of an IoT-enabled world. With the potential to streamline processes and deliver transformative results, IoT adoption is spreading like wildfire, and the world is now moving towards a conflux of data, devices, and people.

Applying IoT to the industrial segment has given rise to what is being dubbed as the fourth industrial revolution or Industry 4.0. Smart connected machines capable of communicating with each other and transmitting data to remote locations are opening up a world of opportunities for manufacturers.



Typically, manufacturers lose sight of their products as soon as it leaves the factory. They remain unaware of the product's performance once it has shipped to the customer. With IoT invading the manufacturing domain, machines can capture and transmit relevant data back to the manufacturer. Manufacturers are thus able to track, manage, and control the entire machine lifecycle with diverse benefits for them and their customers.



6 Ways Internet of Things Helps Manufacturers

Tracking Machines

Connecting machines deployed at various client locations to an IoT platform provides manufacturers a single dashboard with a consolidated view. Monitoring of machines on the field becomes easier, and manufacturers can configure the IoT platform to send them alerts or reminders for each of the connected machines.

Warranty and AMC Tracking

Keeping track of warranty and annual maintenance contracts on supplied machines is another concern for manufacturers. With machines connected to the IoT cloud, all service and repair details can be stored and retrieved from a central location. Maintenance contractors can be given access to service schedules or alerted of upcoming service dates and contract renewals.

Preventive Maintenance

In the light of worldwide competition, it is imperative for manufacturers to keep defect rates to a minimum. Real-time alerts on the performance and status of machines from the factory floor can be passed to even offshore manufacturers in IoT-enabled production units. Through constant monitoring, such as vibration sensing, even imperceptible abnormalities are easily flagged and resolved improving the operational efficiency and life of supplied machinery.

Predicting Breakdowns

Machine data, such as usage pattern, speed, production rates, can aid manufacturers in assessing wear-and-tear and anticipating breakdowns. OEMs are thus able to plan and initiate repair or replacement strategies such that factory owners do not face any disruption to their production schedules.

Winning in the Aftermarket

OEMs' ability to leverage machine data to improve after-sales service will contribute to greater customer satisfaction. With insight into machine data, manufacturers can effectively monitor utilization, predict failures, and perform maintenance as required. Proactive after-sales support and timely maintenance will keep customers happy, paving the way for lasting relationships.

Agile Manufacturing

There is pressure on manufacturers to rapidly respond to changes in customer demand. Customers want to be treated as individuals, and the manufacturer's flexibility to respond to personalized needs is a critical differentiator. An OEM with insight into customer's usage of a machine can initiate enhancements or customizations even before the customer requests them.

Challenges Faced by Manufacturers in IoT Implementation

Bowled over by the benefits, many manufacturers jumped on the IoT bandwagon without fully analyzing the challenges that lay ahead. Some of them have been successful in their effort to implement the Internet of Things and data analytics to bring efficiency. These early adopters are now wiser and able to guide new entrants. While security and privacy are quoted as the top challenges in a smart connected world, there are several other areas of concern.

Data Capture and Connectivity

Connected machines are not new to factories as automation made machine-to-machine communication possible in most mass-production units. With IIoT, however, the closed connectivity changes to remote connectivity over the Internet, taking matters to a whole new level.

Manufacturers who do business on a global level may have machines installed at factories located in remote parts of the world. The lack of requisite telecommunications infrastructure in rural areas poses a challenge in effective implementation of IoT.

Much of the communication within factories happens over Ethernet network, so upgrading the internal network with new devices that are TCP/IP-compatible may be necessary. Moreover, factory owners may not be willing to share their network with OEMs wanting to connect machines to the Internet.

Adding to the complexity is the need to connect diverse controllers (PLCs) to the Industrial IoT platform. The machine controllers speak different protocols, so a gateway device may need to convert that to TCP/IP, which is the protocol of the internet.

Data Storage and Management

For an OEM, data coming in from deployed machines is going to be enormous. Imagine capturing three data points per second for every supplied machine for a year. Cloud solutions can be a great option to scale infrastructure in accordance with the amount of data to store.

Sometimes continuous streams of data can add more to noise than value. Real time may not be a necessity always. Also, certain data need not be stored forever. Storing just abnormal values can also bring down the volume of data to be stored.

A solid data strategy to define such criteria is critical in any industrial IoT implementation. Decisions on what data to capture, the frequency of capture, and duration of storage will be dictated by the business goal of the IoT implementation.

Partner Community

From sensor devices to cloud storage and telecommunication services, IIoT implementation is heavily dependent on diversified services that add to the whole big outcome. Manufacturers will need to forge relationships with numerous software and hardware vendors in order to complete the ecosystem and successfully implement IoT.

Digging out meaningful inferences from the big data that is being gathered and stored is yet another challenge for successful IoT implementation. While data analysis talent is not easy to find², manufacturers will need to partner with experienced analytics service providers to turn their data mess into actionable know-how. App development and data visualization capabilities are critical for an IIoT system to bear fruit. The challenge lies in identifying an implementation partner who can handle these diverse facets with ease and expertise.

Omnia: An Integrated Solution for Industrial IoT Implementation

Programmable logic controllers, sensors, cloud storage, Internet connectivity, analytics, data visualizations, and end-user apps—all together make up the IoT solution. A solution provider who ensures end-to-end implementation, starting from the investigative analysis of the factory environment to the development of end-user app for anywhere anytime access, will make a reliable partner.

Having worked with many clients who faced similar barriers, QBurst realized the pressing need for fast and smooth implementation of the Internet of Things in the industrial sector. Omnia is an integrated Industrial IoT platform born out of the vision to easily connect machines and enable smart factories.

Configurable Edge Devices With Extensive Compatibility

For manufactures trying to connect all of their supplied machines to the cloud for better monitoring, Omnia provides a gateway device that can be installed at customer premises. Preconfigured to connect to a variety of endpoints, this device collects and consolidates machine data from multiple sources including PLCs and sensors.

Omnia's edge device is compatible with OPC (Open Platform Communications), Modbus/TCP, and CANbus protocols as well as low-cost serial buses such as Inter-Integrated Circuit and Serial Peripheral Interface. Compatibility with BLE (Bluetooth Low Energy), IEEE 802.15.4, or ZigBee in addition to WiFi protocol provides for low cost, low power consuming communication with machines.

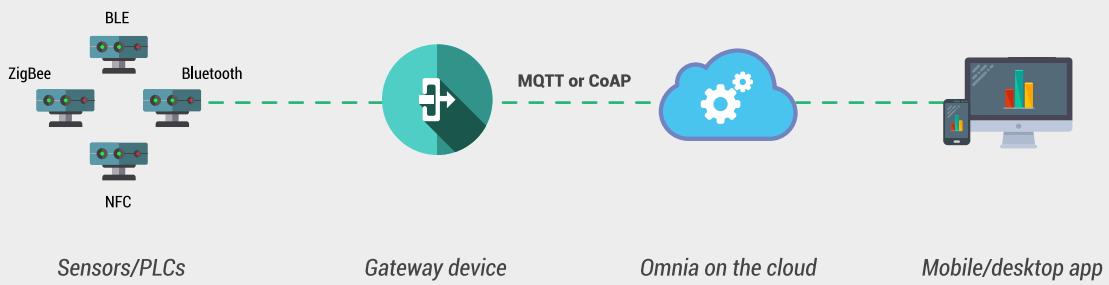
These edge devices, which act as a central hub for data collection and transfer, are available with varying degree of capabilities. Depending on the number of machines to be connected or the amount of data to be handled, the edge devices can range from basic versions with minimal processing power to high-end units that can store and process large amount of high speed data.

In the event of loss of Internet connectivity, the gateway device will store the data locally and send it across when connection is restored. This ensures that manufacturers do not lose data due to intermittent connection failures, especially in remote localities.

Secure and Efficient Connectivity Options

Data routed through the gateway device is sent to Omnia's cloud-based big data platform over lightweight messaging protocols, such as MQTT or CoAP, ensuring low overhead. Authenticated and encrypted transfer ensures the data remains private and secure.

While wireless edge devices significantly simplify installation, compatibility with wireless standards also presents additional benefits to manufacturers. WiFi enabled edge devices can connect to the cloud using a factory's existing internet connection. Alternatively, where factory owners put a restriction, connection can be handled through GSM and independent of the factory network.



Scalability and 24/7 Availability

The investigative phase of IIoT implementation also provides answers to what data to capture, at what intervals, for how long, and so on. Sometimes data need not be stored forever. Cloud solutions provide a viable option to scale storage infrastructure as needed. Omnia is a cloud-powered solution; captured data is securely transferred to a central location on the cloud, which can be public or private as per the requirement.

Additionally, manufacturers can use this cloud space to store service records, warranty details, user manuals, electrical drawings, and other machine related documents. Omnia on the cloud serves as an always-available repository for any authorized person to access and find machine related information.

Powerful Analytics and Visualization

True worth of an industrial IoT solution lies in its ability to ingest data from manufacturing facilities and spit out meaningful information to OEMs and factory owners. A highly-scalable data processing engine with the capacity to connect millions of edge devices is the backbone of the Omnia platform. Designed by experienced big data engineers, this data processing engine relies on Apache Spark and related big data technologies for near real-time data crunching. The multi-node cluster environment accounts for built-in redundancy ensuring minimal downtime.

Customized integration with third-party visualization tools brings the analyzed data to life through interactive representations. These can be viewed by users on a web dashboard or via mobile apps from anywhere, anytime.

Comprehensiveness

The key advantage that Omnia presents to manufacturers is the comprehensiveness of the solution—various components packaged together as a single product. Manufacturers planning to transition to a smart connected system, need not look for or negotiate with individual service providers and vendors for hardware and software components.

The Omnia industrial IoT platform³ pack includes:

- **Microcontroller-based gateway** to collect data from endpoint devices
- **Pre-configured cloud connectivity** for storage and processing of gathered data
- Integrated third-party tools for **advanced big data analytics and visualizations**
- **Mobile and web applications** for anywhere, anytime access to insights

QBurst extends consultation and implementation support to OEMs in connecting machines to the Omnia platform for improved tracking and monitoring. For more details, write to us at info@qburst.com.

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