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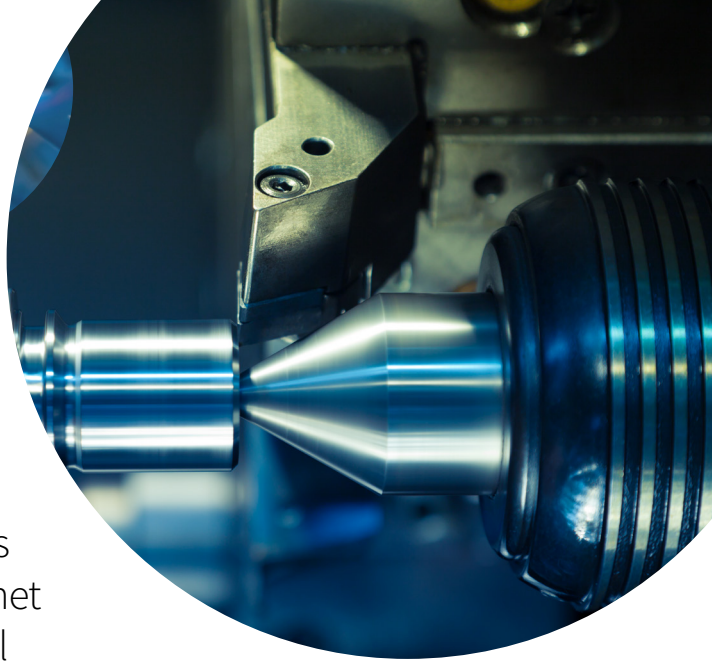
Industrial IoT - Secure Simple and Scalable



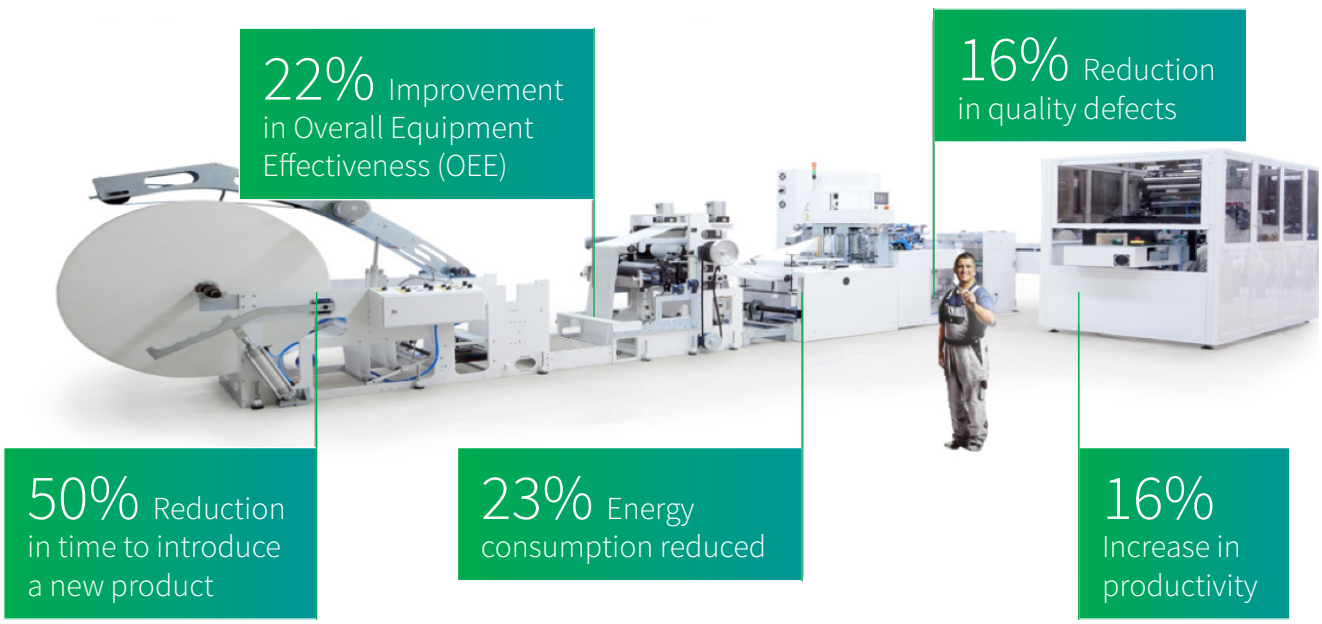
Introduction

The manufacturing sector is going through its fourth industrial revolution, which highlights the trend towards automation and data exchange in manufacturing technologies and processes. It includes the industrial internet of things (IIoT), cloud computing, and artificial intelligence among others that promise to deliver significant productivity improvements across the entire supply chain.

To identify digitalization related trends in industrial sectors, IHS Markit conducted a survey for Cisco of technology buyers to understand key issues. This survey was based on a sample of 100 respondents directed to the Manufacturing industry globally. This infographic highlights findings on issues of **Scalability, Complexity and Cybersecurity** in IIoT.

IIoT implementation has huge transformational potential, but only 53% **of companies that have completed a proof of concept** or full deployment have 'succeeded' and seen sufficient payback; a clear sign of the size of both challenge and opportunity.

Based on our research of 500 Industrial IoT projects IHS Markit identified the average payback for a range of KPIs (Key Performance Indicators)



Source: IHS Markit IIoT project database

Scalability

Industrial IoT enabled device shipments reached 1.3 billion in 2018. Whilst device functionality is increasingly commonplace, in the manufacturing sector implementation is still lagging. **With 90% of IIoT devices not connected**, there is still a significant untapped potential for digitalization projects that can be achieved through utilization of connectivity technologies and processes for collecting and analysing the data.

Ethernet is better suited to support IIoT since it is IP-based, compared to the more prevalent Fieldbus technology. Currently, 2/3 of the install base of industrial automation products are not IP addressable, meaning they do not support IIoT, which hinders the rate of IIoT adoption. However, Industrial Ethernet provides better bandwidth, an important factor to be considered when handling large amounts of data.

Unlike Fieldbus and Ethernet, cloud connectivity is still nascent, but the fastest growing connectivity medium on the market. This highlights that cloud usage by manufacturing organizations is increasing as they look to vastly increase the scale and reach of their connectivity.

Survey highlights:

The proportion of companies planning to use a remote cloud for analytics of operational data is expected to double over the next three years from

16 to 34%. Cloud adoption is growing since more data is being generated than ever before; cloud will be central to data storage and analytics

92% of companies have **critical real time requirements** for their manufacturing operations (such as robotics and motion control), where low latency is crucial and that cannot be performed on the cloud

44% **of companies** expect to do **analytics of operations data on Edge devices** (either on the controller / gateway devices) to support low latency applications and reduce bandwidth requirements

The level of comfort with the cloud used for manufacturing is growing; the optimal arrangement will be a hybrid approach combining both cloud and Edge technologies depending on the criticality of a given application.

The untapped potential of analytics of data is increasingly being addressed with growth in Cloud and Edge technologies

PC, Industrial Gateways

Span of benefits of each deployment

CLOUD
Data Centers

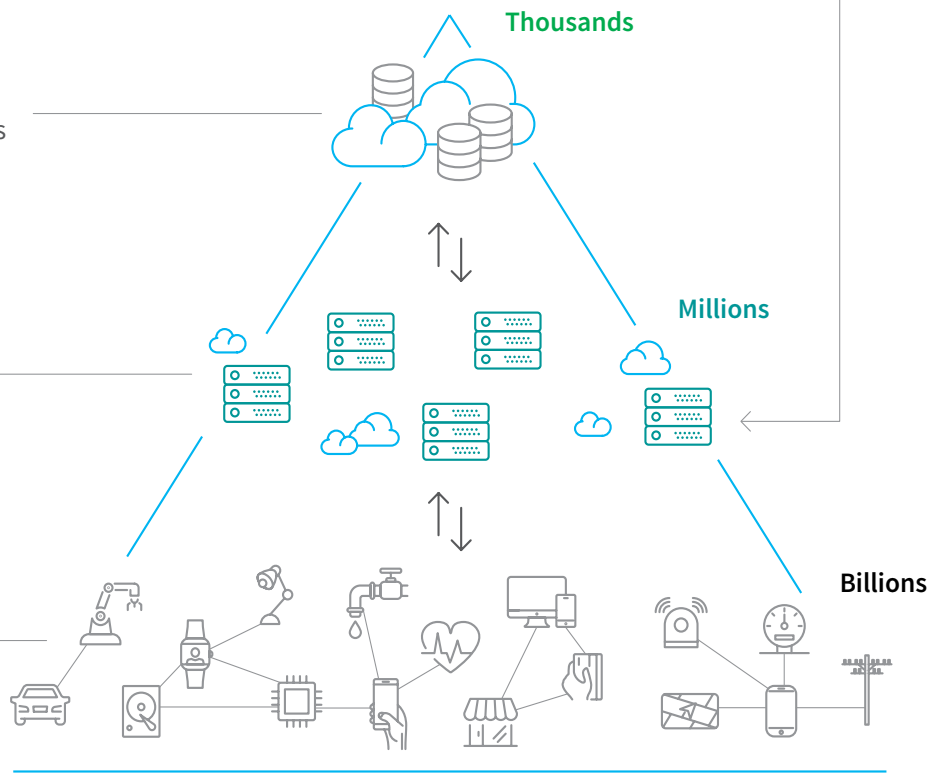
- Greater processing power
- Reduced cost in data transmission

FOG
Nodes

- Privacy and Security

EDGE
Devices

- Lower latency
- Reduced energy consumption



Complexity

Allowing data to flow across the organization, from the factory floor to the enterprise level, and across multiple facilities requires interoperable networking equipment

Survey highlights:

Connectivity from **“shop floor” to “top floor”** has been achieved by three quarters of manufacturing companies, a key to providing visibility of manufacturing data, integrating enterprise and manufacturing applications etc. Additional focus is needed on creating robust and secure networks Network design is a crucial to this, ensuring availability, integrity and confidentiality. only a third of companies have zoned their OT networks.

39% **of respondents** identified having **“ease of interoperability with existing technologies”** as the main requirement from their industrial networking connectivity solutions. Vendors, currently leading the adoption of proprietary protocols in different regions of the world are reluctant to adopt new, open, interoperable solutions that do not lock in users

Despite these challenges, there will be competing goals between different departments; IT and OT teams may have differing views of the top business outcomes for digitalization projects

	IT Enviroment	OT Enviroment
Employees	Younger generation,computer science graduates, more tech savvy	Older staff, typically blue collar workers , less technologically aware
Objectives/priorities	IP protection and asset security	Maintaining process uptime,maximising equipment utilization
Impact of device failure	Work around possible, delays acceptable	Loss of production critical
Equipment lifetime	<5 years	up 20 years +
Updates and upgrades	Automatically pushed during uptime	Scheduled during planned downtime
Data type	Not real-time, delay and jitter acceptable	Real-time,minimal jitter and delay
IP addressing	Primarily dynamic	Primarily static
Networking technology	Standard open networking	Mainly proprietary protocols

Cybersecurity

Security is an important and immediate concern to cloud adoption. Industrial companies are reluctant to release, often sensitive, data to the cloud to be managed by a third-party vendor

Survey highlights:

More than 50% of companies identified **'fear of cybersecurity'** as one of the biggest challenges for digitalization projects, since connectivity increases the potential of cyberattacks that are becoming mainstream

57% **of manufacturing companies experienced a cybersecurity breach** within the last three years. However, a third of companies have either maintained or decreased their focus on cybersecurity, compared to just 29% that have made this a major focus

More products are being connected, **more** data is being used to improve manufacturing process, but there is also **more** of a cybersecurity threat as the "surface area of attack" grows.

A holistic approach to cybersecurity is crucial for manufacturing companies introducing digitalization projects, this includes

- Technology with built-in security
- Robust networks
- Procedures for regularly testing the network
- Cybersecurity policies

Find out more

IHS Markit provides timely insight and analysis for more than 30 connectivity technologies in 34 application segments used for the Internet of Things.

For more information on wired and wireless connectivity technologies and the opportunities offered by the IoT, please see our Comprehensive IoT research

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