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.

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

- **22%** Improvement in Overall Equipment Effectiveness (OEE)
- **50%** Reduction in time to introduce a new product
- **23%** Energy consumption reduced
- **16%** Reduction in quality defects
- **16%** Increase in productivity

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.

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.
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

About IHS Markit

IHS Markit (NYSE: INFO) is a world leader in critical information, analytics and solutions for the major industries and markets that drive economies worldwide. The company delivers next-generation information, analytics and solutions to customers in business, finance and government, improving their operational efficiency and providing deep insights that lead to well-informed, confident decisions. IHS Markit has more than 50,000 key business and government customers, including 80 percent of the Fortune Global 500 and the world’s leading financial institutions. Headquartered in London, IHS Markit is committed to sustainable, profitable growth.

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