ROBOTICS & AUTOMATION NEWS
Briefing
Industrial internet
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Virtual paths to digital worlds

The industrial internet is no longer a fanciful idea to keep in mind for the future, it's a reality for most industrial operations, even small companies with a relatively small number of machines and personnel.

Essentially, what we're talking about is very simple: attaching sensors to machines so they can collect and transmit data, attaching those sensors to gateways which can then send that data to a computer.

That computer can be located either at the same facility as the machine and sensor, or it can be somewhere remote on the internet.

The data the sensor collects can be analysed and presented using a variety of software, whether it's developed in-house or bought off the shelf.

That's the industrial internet of things, or IIoT, which is also referred to in the term Industry 4.0.

Sounds simple, but in reality, it's probably not. There are a variety of choices to make at each point as to what type of product or service to procure and from which company – whether you're talking about sensors, gateways, computers, or even connection leads. And that's all if you decide to buy everything in rather than build solutions from scratch yourself.

But whatever choices you make, one decision that most people would probably agree on is that connecting as many of your machines to the internet as possible and getting data from them is generally a good idea.

One of the only drawbacks is the risk of hackers or someone accessing the data. But all data tends to be encrypted using a variety of methods.

It's easy to imagine the huge value of getting data from machines from the point of view of the factory owner. Machines can be monitored to see how well they're running and whether they need any maintenance, or just switching off – all through one computer interface, usually available as a mobile app as well.

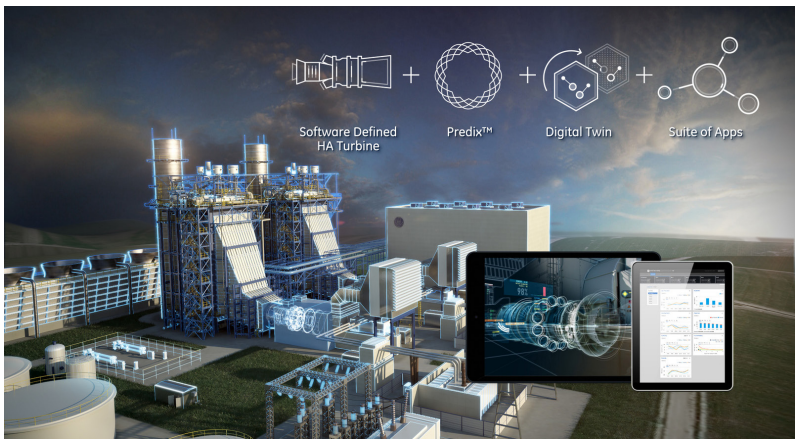
And this value has provided the foundation for many businesses to grow, whether they are the digital divisions of large, multinational industrial companies or relatively new startups whose main experience might be only in the computer software sector.

There are literally hundreds of companies now providing solutions for industrial internet applications in countless different products and services categories.

This briefing aims to provide an overview, a high-level view, of the industrial internet. Future briefings on the same subject will look at individual categories of products and services, as well as specific companies.

Your feedback would be welcome. ■

News



GE Digital to adopt Open19 standards for future Predix applications

GE Digital is continuing to build its Predix industrial internet platform and will adopt something called Open19 standards.

GE Digital is said to be fastest growing business unit within its parent company General Electric, with forecasts suggesting it will go from its current annual revenue levels of around $6 billion to $15 by 2020.

Open19 refers to a data centre hardware infrastructure which uses open standards, and is supported by LinkedIn and HPE.

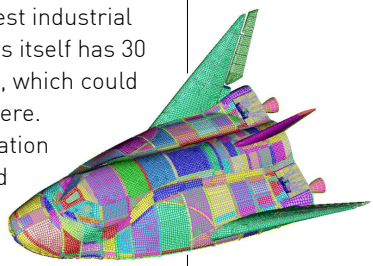
Essentially, what GE Digital will do is pre-load server computers with the Predix platform – which includes hardware and software – and install them within the Open19 hardware infrastructure.

GE Digital is now one of the top 10 software companies in the world.

Interview: goo.gl/hdrKyG | News story: goo.gl/FVC8xb

Siemens touts MindSphere's simulation capabilities

Siemens MindSphere is one of the largest industrial internet platforms in the world. Siemens itself has 30 million automation devices in operation, which could potentially all be connected to MindSphere.



The company has pushing the simulation capabilities of MindSphere, which would enable engineers to remedy situations early or in design.

Matthias Lutz, Siemens business development, sees the industrial internet market dominated by two or three companies.

Interview: goo.gl/twXVrm

Bosch emphasising AI for industrial internet

Bosch is one of the largest manufacturing companies in the world and, therefore, its industrial internet platforms is one of the largest.

Bosch Sensortec recently reached an agreement with Arrow Electronics to distribute its microelectromechanical systems sensors. Bosch is said to have manufactured 8 billion MEMS sensors and holds 1,000 patents in the technology, largely used in industrial internet applications.

goo.gl/f9fSD6

Kuka builds on its Connyun IIoT platform

Kuka initially built its Connyun industrial internet platform with Huawei earlier this year.

The company's particular interest was to bring deep learning to advanced manufacturing processes.

Since that time, Kuka has been networking all its industrial robots into a cloud platform with help from software company Infosys.

More recently, it has been working SAP to design the "factory of the future", a digital environment for system design.

goo.gl/hokhRn

Fanuc developing app store for its Field platform

Fanuc is the world's largest industrial robot manufacturer, and was probably the first company to network all its robots into a cloud for one of its major manufacturing customers, namely General Motors.

In fact, the work Fanuc undertook for GM may be the basis for its Field IIoT platform, for which it is said to be developing a sort of app store for industrial applications.

Field stands for Fanuc Intelligent Edge Link and Drive, and is built on open standards.

goo.gl/TgdguX

ABB claims its Ability can save 30 per cent on costs

ABB says its Ability IIoT platfom can enable operating cost savings of up to 30 per cent through the use a new app called MNS Digital.

ABB Ability is also providing the foundation for other initiatives such as the development of a network of charging points for electric vehicles, and for managing operations for the hundreds of paper mills the company supports in the US.

The company also has extensive power generation sector, where IIoT is proving critical.

goo.gl/NoGAhG

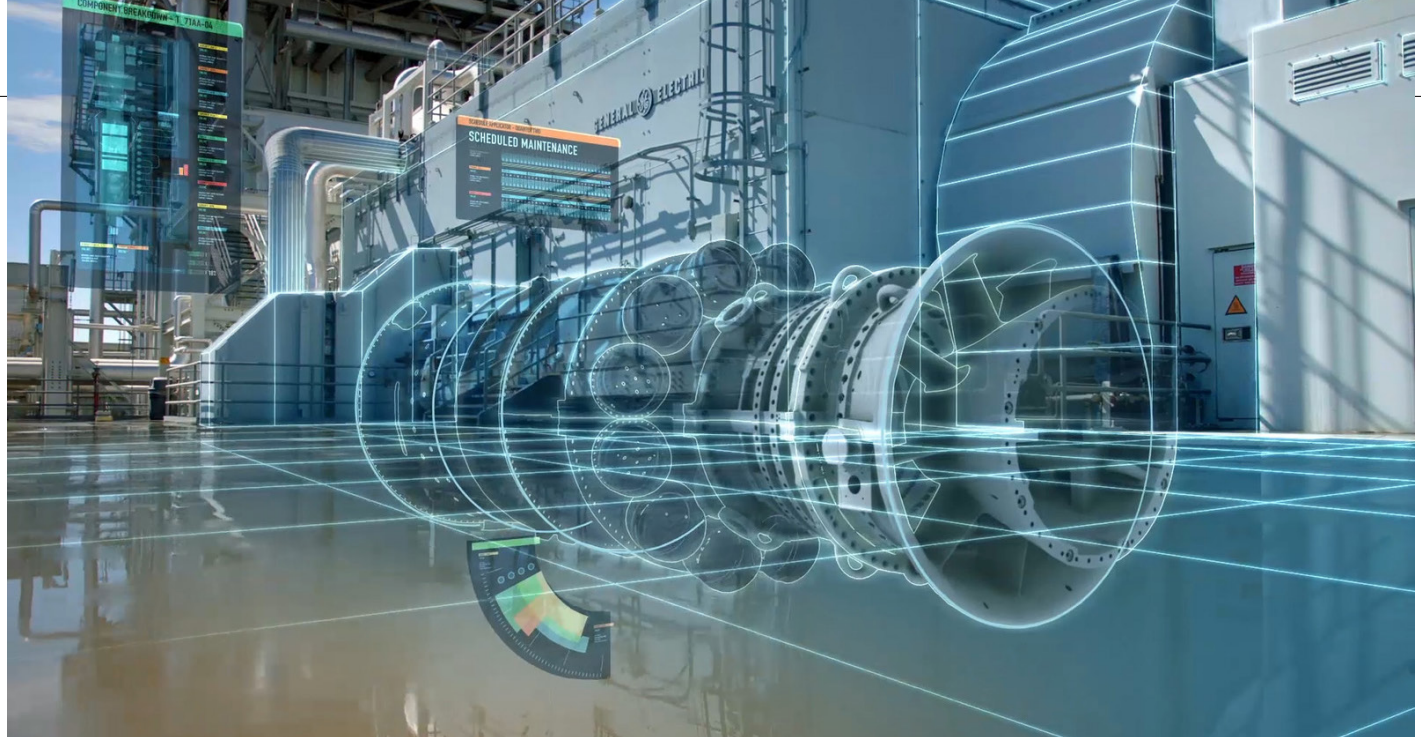
Honeywell launches computer to make IIoT easier

Honeywell has been making huge gains in IIot, partly because of its history in the petrochemicals business.

The company recognised that one of the crucial components in building an IIoT network is programmable logic controllers, a special type of computer used in the industrial sector.

So, Honeywell decided to optimise its latest PLC –called ControlEdge – to make connecting to the IIoT easier and faster, reducing the risk of downtime.

goo.gl/WGqzZF



The reality of digitisation

Digitisation, or digitalisation as most call it, is probably the single most important trend in industry

The process of making everything in the industrial sector digital is ongoing, and it's very unlikely that anything will be left behind – from individual components to entire factories or global networks of facilities, everything is likely to be represented in digital form, and much of it already is.

Not only are these merely "digital twins" of static objects, they are also increasingly being given real-world physics properties. So, the way a machine operates in the real world is exactly the way a machine will behave in the digital world.

For all this to happen, what's required is an industrial internet, which is being created using standards-compliant networking hardware, such as industrial ethernet gateways, and software platforms, such as GE Digital's Predix and Siemens's MindSphere, which are also emerging and growing fast.

On top of those platforms are the individual software applications, or apps, much like the apps you might find in a smartphone app store, except these are for industrial operations and processes.

https://goo.gl/6L2feQ

This is just the early phase

There's a palpable excitement about the industrial internet at the companies developing platforms and applications for it. GE Digital has shown just how much money there is in the sector, money that may not have been there before. The IIoT is a truly new market.

For decades, machines and electrical items of all types in industry were not connected to any data collection device, so all of the information they could provide was being lost. Now, with sensors, gateways and all manner of systems, the data is being collected, and the information they provide is being analysed.

For companies like Rockwell, Siemens, Bosch and other large industrials, this must be like finding a goldmine by chance. And as Bosch's Stefan Hartung told Robotics and Automation News, exponential productivity gains are possible through the IIoT, and this is just the early phase.

https://goo.gl/7Z1JNw

Software is taking over the world

Such is the interest in the industrial internet, and with the huge amounts of money that can be made, it sometimes seems that companies that previously were known for something like manufacturing are now becoming more like software companies.

GE Digital, for example, is now one of the world's largest software companies. And it's not the only one rebranding and repositioning itself in that way.

Hannover Messe earlier this year revealed that most big companies are looking to gain share in the industrial software market.

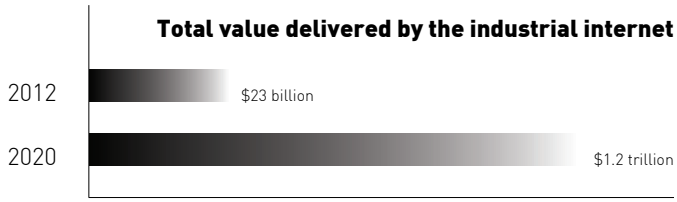
Moreover, companies more closely associated with computer technology – such as IBM and Microsoft – are also moving in to the space, offering their vast infrastructure to industrial companies.

https://goo.gl/JtPzcP

Infographics & tables

The industrial internet is often described as potentially being a trillion-dollar market. Some estimates suggest it will be worth more than that. For now, it's already delivering billions of dollars worth of productivity gains and added value.

According to Wikibon, from $23 billion in 2012 to $1.2 trillion in 2020, the IIoT really is a goldmine.



Source: Wikibon

Some important companies in the industrial internet market

goo.gl/6L2feQ

Nº	Company name	Link to recent news or company website	Product
1.	GE Digital	http://roboticsandautomationnews.com/?s=ge+digital&x=0&y=0	Predix
2.	Siemens	http://roboticsandautomationnews.com/?s=siemens&x=0&y=0	MindSphere
3.	Schneider Electric	http://roboticsandautomationnews.com/?s=schneider+electric&x=0&y=0	WonderWare
4.	Honeywell	http://roboticsandautomationnews.com/?s=honeywell&x=0&y=0	CPS
5.	Bosch	http://roboticsandautomationnews.com/?s=bosch&x=0&y=0	IoT Suite
6.	Kuka	http://roboticsandautomationnews.com/?s=connyun&x=0&y=0	Connyun
7.	Fanuc	http://roboticsandautomationnews.com/?s=fanuc+field&x=0&y=0	Field
8.	ABB	http://roboticsandautomationnews.com/?s=abb+ability&x=0&y=0	Ability
9.	IBM	http://roboticsandautomationnews.com/?s=ibm&x=0&y=0	Watson
10.	Microsoft	http://roboticsandautomationnews.com/?s=microsoft&x=0&y=0	Azure

The above list contains a couple of computer technology companies – Microsoft and IBM – because they have been among the most active in the industrial sector.

However, there are many other computer technology – or software companies – which offer cloud platforms, hardware components and services suitable for industrial internet applications.

Some of them may be specifically optimised for the IIoT while others may need further customisation.

The list on the right mentions some companies.

SAP Hana IoT	Infor Cloudsuite IoT
Cisco IoT	Prevas Industrial Cloud
Amazon Web Services IoT	AT&T IoT
Google Cloud IoT	NTT IoT
PTC IoT	ARM / SoftBank IoT