

PRESS RELEASE

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When and where will Industry 4.0 actually happen?



There are a great many people now invested in working towards achieving the goals set out by Industry 4.0. For a concept that started life as a German government strategy project it is fair to say that it has captured the imaginations of many engineers and futurists from around the globe.

With so much effort being put into talking about the concept, it is interesting to look at the aspects of it that are close to being realised and with so much momentum, consider who it benefits and if everyone is on-board with it. Looking closer at manufacturing in particular you can argue that a summary of the four design principles that define Industry 4.0 are being realised right now:

Interoperability: Machines, devices, sensors and people connecting with each other via the Internet of Things (IoT) or Industrial Internet of Things (IIoT)

Information transparency: The aggregation of raw sensor data to higher-value context information.

Technical assistance: Systems aggregating and visualizing information for humans to make informed decisions and solve urgent problems. Plus, cyber physical systems undertaking tasks too taxing for human co-workers.

Decentralized decisions: The ability of cyber physical systems to make decisions on their own and to perform their tasks as autonomously as possible.

Mitsubishi Electric Automation Systems is acting as a development partner for achieving all four of the Industry 4.0 principles. Whether that be by developing hardware and software products that enable the functions laid down in the principles, or working with partners to create systems and solutions that realise them, we are to a greater or lesser degree responsible for making it happen.

Like all cultural and technological changes, it won't be universal, neither will it be conclusive. What we can be sure of though, is that for those engineers, designers and companies that are searching for new industrial solutions and taking an active role in automation, it will happen.

It doesn't matter if that is a system integrator working with a standard industrial articulated arm robot to make it work interactively with the process, or connecting machines spread around the world for an improved maintenance strategy, the driving force behind those developments is greater efficiency, increased competitiveness, extended functionality and improved reliability. These drivers are universal and current, it simply depends on how much a business or organisation is able to invest in terms of time and resource to achieve those ends.

By helping customers gain the greatest benefit possible from advancing automation we are in many ways part of the global process of digitalisation. For us, all activities relating to the increasing digital transformation of companies - creating the 'smart factory' if you like, fall under the 'e-F@ctory' umbrella, which is a fundamental part of the Mitsubishi Electric automated factory approach. This encompasses the e-F@ctory Alliance, which is a global network of partners with over 300 members worldwide, it includes manufacturers of industrial components as well as specialist system integrators and software



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providers. All partners offer complimentary technologies that provide the customer with “best in class” solutions.

These partner companies collaborate at an individual level to offer flexible, optimised solutions for various customer requirements and play a large role in delivering new technology that comprises the steps on the road to digitalisation, Smart Manufacturing and Industry 4.0. The way the organisation works also mirrors the interoperability and decentralised decision making aspects of the Industry 4.0 principles.

Delivering real-world projects that clearly illustrate the points we have raised is of course the only way to validate what we have said, so here are two great examples that help define how and where Industry 4.0 will actually happen.

Working with Intel on an IIoT gateway to process big data for savings worth millions of dollars

This project defines each of the principles above very well: Intel has developed more than a dozen big data projects that have bolstered both operational efficiency and the bottom line - reducing product test times is one of them.

Every Intel® chip produced undergoes a thorough quality check involving a complex series of tests. Intel found that by using historical information gathered during manufacturing, the number of tests required could be reduced, resulting in decreased test times. Implemented as a proof of concept, this solution avoided significant test costs for one series of Intel® Core™ processors. For Intel®, this pilot is forecast to save millions of dollars annually and provide other significantly valuable business benefits.

The big data project was realised in-part by using a Mitsubishi Electric MELSEC-Q series C Language Controller, (which is an Intel® Atom™ processor-based gateway) to aggregate and securely input data into a big data analytics server. The data input process involves validating, filtering, and reformatting the data to make it easier for the big data analytics software to work on it.

The controller is an embedded solution equipped with numerous features characteristic of intelligent systems, including robust network connectivity and the high computational performance needed to process large amounts of data collected from sensors

or via the network when supporting sophisticated system control and operations. It was built to satisfy the diverse requirements of an automated factory solution, including excellent reliability, tolerance of harsh environments, and long-term availability. These features make it a robust and reliable product that requires little maintenance for realising IIoT manufacturing applications.

A holistic approach to predictive maintenance realised by working with e-F@ctory Alliance member FAG Schaeffler

This solution is also indicative of all the principles in Industry 4.0. It builds on the capabilities of the latest FAG SmartCheck condition monitoring sensors by integrating them with an intelligent PLC based sensor controller for a more holistic approach to condition monitoring. The Smart Condition Monitoring (SCM) solution adds to the usual ‘traffic light’ alerts with detailed diagnostics, in-depth analysis and recommended actions to minimise unscheduled downtime and maximise asset availability for an entire plant.

Increases in operating temperature, excessive current draw, changes in vibration characteristics and significant shifts in other operating parameters that are indicative of impending problems in rotating machines are reported over Ethernet. The technology has been developed to allow the sensors to monitor the full range of parameters 24/7, allowing this information to be interpreted to give an overview on the asset health both now and in the future.

Linking multiple sensors into the control system enables the controller to analyse patterns of operation that are outside the norm, with a series of alarm conditions that can provide alerts when attention is needed. The SCM analysis provides detailed diagnostics, offers suggestions for where additional measurements should be taken and provides maintenance staff with more precise error identification. It even provides recommendations as to the remedial actions that should be taken, with clear text messages presented to personnel. Further, this information can be networked to higher-level systems for ongoing trend and predictive maintenance analysis across all of the assets around the plant.

Early recognition of deterioration, in for example bearings or other motor driven system components, can prevent costly breakdowns and allow preventative



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action to be carried out, maximising production time and efficiency.

About Mitsubishi Electric

With over 90 years of experience in providing reliable, high-quality products to both corporate clients and general consumers all over the world, Mitsubishi Electric Corporation is a recognized world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, as well as in products for the energy sector, water and waste water, transportation and building equipment.

With around 124.000 employees the company recorded consolidated group sales of 39.3 billion US Dollar* in the fiscal year ended March 31, 2014. Our sales offices, research & development centres and manufacturing plants are located in over 30 countries. Mitsubishi Electric Europe, Industrial Automation – UK Branch is located in Hatfield, United Kingdom. It is a part of the European Factory Automation Business Group based in Ratingen, Germany which in turn is part of Mitsubishi Electric Europe B.V., a wholly owned subsidiary of Mitsubishi Electric Corporation, Japan.

The role of Industrial Automation – UK Branch is to manage sales, service and support across its network of local branches and distributors throughout United Kingdom.

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