

COMMENTARY

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I-AUTOMATION PROVIDES THE PATH TO PERFECT PRODUCTION

When we think of the Industrial Internet of Things (IIoT), we often regard it purely in terms of operational excellence and productivity gains. Although the financial gains to manufacturers from these improvements are extremely valuable, focussing purely on raw production metrics loses sight of some of the longer term trends in the marketplace and goals of the IIoT – that it enables manufacturers to become more agile and respond quickly to changing consumer demands. Making a larger number of product more efficiently is only a benefit if the end product is what the consumer desires.

More and more, what the consumer desires is not mass produced. In fact, the current trend is for consumers to demand a greater number of choices. Manufacturers must then offer a larger variety of sizes and types of similar goods to satisfy that customer desire, meaning smaller, dedicated batch sizes. One vision for the end-point of the IIoT is a batch size of one, where a production line can change after every product to tailor exactly to each individual customer's needs. It may take time to reach that point, but it is where current trends are pointing and what consumers are moving toward. Consumers are also impatient.

The age of Internet shopping has made purchasing quick and simple, and consumers expect the same experience everywhere. They want to buy in the channel they choose, and are not willing to wait for any longer than a minimal amount of time. Consumers also demand the highest levels of service and quality. If manufacturers don't meet these demands, then the consumer is likely to look elsewhere and buy from a competitor.

These market pressures also come with several other changes that manufacturers have to deal with that can be categorised into three areas – social, environmental and technological. Social changes affect the workforce. Our population is growing older, meaning there are less workers in general, and skilled workers in particular.

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Manufacturers are already experiencing difficulties in recruiting adequate staff, and this will get worse in the near-term future as today's engineers retire. Environmental changes will affect every industry, and manufacturers must also move to more sustainable ways of working by conserving energy and materials and maximising efficiency whenever possible throughout the whole production process.

Technological change is happening at a breakneck speed. The latest technology from only a few years ago can now seem dated as new innovations, such as AI control, are introduced. Manufacturers making capital investments need to be assured that their investment is safe and machinery can be easily updated as technology advances. They must also be aware of how each new technology has the potential to enhance their business and their products.

To assist manufacturers, Omron has launched its i-Automation programme, which is intended to provide manufacturers with a consistent, reliable way of ensuring they can meet both consumer demands and the changing needs of industry. i-Automation is based on three 'i's - integrated, intelligent and interactive. Together these three pillars can combine to provide manufacturers with the highest levels of quality, sustainability and operational excellence that will help meet any future demands.

Integrated Automation

The predicted large gains from the IIoT have encouraged many manufacturers to release a wide selection of products for IIoT applications. These products come in a variety of formats that use different standards and protocols to operate and communicate, making it more difficult and time consuming than necessary to integrate them into the production line, while still attaining maximum performance and efficiency.

All Omron sensing and control products are designed with integration in mind. As each physical component is controlled by Omron's Sysmac automation platform, and is designed to be interoperable with any other Omron component, integration into any production environment is made simple. The Sysmac platform provides a single software development environment to ease application development. Standard form factors and protocols also facilitate the upgrade and maintenance of the line.

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Intelligent Automation

The IIoT relies on the collection and organisation of large amounts of data from the factory floor to ensure that the line is always operating at maximum efficiency. Omron's intelligent machines incorporate sophisticated machine learning techniques that provide their ability to make the correct decisions close to where they are needed on the line. The company's controllers also feature an integrated SQL database to simplify communication between the factory floor and the IT layer to allow data and control commands to flow freely in both directions. The combination of local intelligent decision making, access to control data and long-term IT layer information improves productivity and ensures product and equipment failure is prevented whenever possible. Advanced visualisation technology makes access to process and performance data available wherever it is needed in an easy to understand format.

Interactive Automation

The IIoT production environment needs both the cognitive skills and flexibility of humans and strength, accuracy and data capability of robots to work together to achieve manufacturing excellence. Creating a safe working environment is essential to allow both humans and robots to work together. A new generation of collaborative robots have been introduced that allow humans and robots to work in close proximity to each other. For example, the Omron LD Platform is an autonomous intelligent vehicle (AIV) that can dynamically guide itself around the production line and react in real-time to changes in its environment to avoid collisions. As well as working beside robots, interaction also applies to how easy it is for humans to program and operate machinery. Omron's Sysmac Studio programming software is designed to provide an easy-to-use, single environment to program, integrate, configure and monitor every aspect of the production line. The familiarity that a single interface brings makes the software easy to learn and intuitive to use.

Summary

Manufacturers face many challenges when moving towards an agile and flexible production environment. It is only when they are confident of meeting both the demands set by consumers and the markets that they can begin the journey to truly flexible manufacturing and the ultimate goal of the digital factory.

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Omron's complete range of hardware and software products have been designed from the ground up to assist that process by providing the highest levels of integration, highly advanced intelligence capabilities and safe and easy interaction with the complex technology. The i-automation philosophy is the shortest and quickest route for manufacturers to surpass customer expectations and achieve manufacturing excellence. A batch size of one may be much closer than you think.

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About Omron

Omron Corporation is a leading industrial automation company that leverages its core sensing & control technologies to expand into businesses, such as control components, electronic components, automotive electronic components, social infrastructure, healthcare, and the environment. Omron was established in 1933, and has around 36,000 global employees, offering products and services in over 117 nations and regions. In the industrial automation business, Omron is contributing to making an affluent society by offering automation technologies which drive innovation in manufacturing as well as products and customer support. For more detail, industrial.omron.eu.

About "*innovative-Automation!*"

As a leader in industrial automation, Omron has extensive lines of control components and equipment, ranging from image-processing sensors and other input devices to various controllers and output devices such as servo motors, as well as a range of safety devices and industrial robots. By combining these devices via software, Omron has developed a variety of unique and highly effective automation solutions for manufacturers worldwide. Based on its reservoir of advanced technologies and comprehensive range of devices, Omron set forth a strategic concept called "*innovative-Automation!*" consisting of three innovations or "i's"-- "*integrated*" (control evolution), "*intelligent*" (development of intelligence by ICT), and "*interactive*" (new harmonization between people and machines). Omron is now committed to bringing innovation to manufacturing sites by materializing this concept.

Note for the editor

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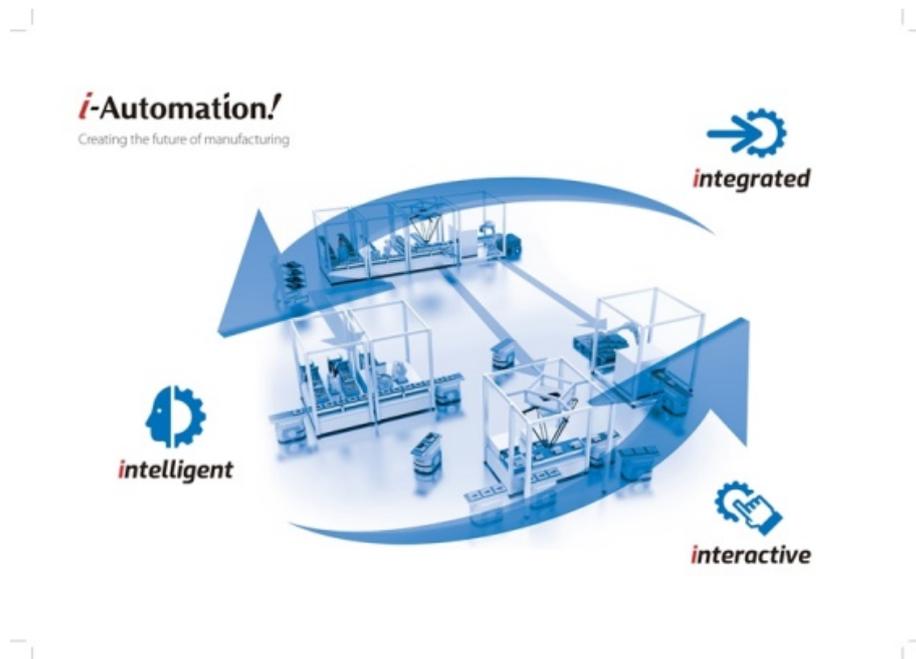
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The three pillars of i-Automation which provide manufacturers with the highest levels of quality, sustainability and operational excellence. (Photo: Omron, PR068)

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