Industry 4.0 - where the Internet of Things meets industry

By Klaus Dieter Rennert
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When we talk about the Internet of Things (IoT), we tend to think of connected homes and smart devices making our lives easier and more efficient through the use of technology. However, when the same technology is applied to manufacturing, the potential for improvements is immense; from optimising entire supply chains, predictive analytics that identify problems before they happen to reducing energy costs at an individual manufacturing site.

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By connecting multiple machines a manufacturer can create an intelligent network of machines that can autonomously communicate and work in sync, which significantly reduces the need for intervention by operators.

This manufacturing transformation, through application of IoT sensors, system logic and big data, has even been directly supported by the German government, where the trend has been dubbed Industry 4.0. Leveraging vast amounts of real-time data in a factory environment, Industry 4.0 represents the 'fourth industrial revolution' - following the steam engine, the conveyer belt, and the first phase of IT automation.

Companies are beginning to see the benefits of leveraging IT to enhance their operations and better address the challenges that traditional industries are facing. Frost & Sullivan now sees a groundswell emerging where Industry 4.0 offers a prime opportunity to fill the efficiency void in the global shift towards social innovation. Frost & Sullivan defines social innovation as "the deployment of technology and new business models to bring about real positive change to the lives of individuals and societies".

Social innovation is about creating a shared value for all stakeholders. In spite of slight differences in interpretations, there is one common theme: convergence. Technology that was commonplace in only one industry is now being adopted across a multitude of areas. We need only look at the development of in-car entertainment, navigation and autonomous driving systems to see how the IT world has converged with the automotive.

New business models

Convergence is not only about technology but also new business models too. Sectors that were seen as distinctly separate in the past are now converging and resulting in innovations that will help provide breakthrough changes for society. Consider digital imagery in the medical arena for example. All of this underlines what the supporters of Industry 4.0 believe: the use of IT to enable smart manufacturing in industries will bring about significant positive change at each and every level.

The IoT will impact on every business sector, but the potential to transform traditional industrial businesses such as manufacturing, utilities and aviation radically is particularly notable. Manufacturing companies will use analytics to make more informed decisions and build more efficient operations. The IoT, analysis of big data and 'always on' IP networks will, for the first time, allow manufacturers to understand fully the context of their operations. Manufacturers will have the

knowledge and access to information that will help them forecast, diagnose, react and respond to unexpected events. This heightened understanding will help them to prolong the lifespan of their assets, reduce waste of scarce resources and also potentially shorten the time to market for their products.

Prospects for manufacturers

The latest IDC Manufacturing Insights Report looked at prospects for manufacturers and found that IoT applications for processes and products are fundamental to future prosperity. It also found that manufacturers have high expectations for the IoT's impact on lowering operational costs. The report predicts that, by 2020, at least half of all corporate processes will have automated data acquisition (DAQ) systems, while a quarter will have self-correction capabilities.

To deliver on the promise of Industry 4.0, existing enterprise systems must be modified so that they can interface with and monitor IoT sensor-based technology. With a host of disparate manufacturing, logistics, procurement, order, and other systems already in place that must also be integrated into a single system to any manufacturing executive this task can appear daunting.

In Europe, the global e-service provided by Hitachi uses IT integration to allow asset owners to be more aware of the current state of their assets. E-service helps monitor and collect data from a fleet of plant equipment, thereby enabling optimal resource efficiency through data analytics. Land and Water Group Plant Hire is using Hitachi's global e-Service to enable its customers to reduce their negative impact on the environment and also reduce and control costs for the operators - a critical requirement for small and local businesses. By giving operators a full, clear picture of the logistics, performance and condition of their construction fleets through a centralised and connected service Hitachi is empowering operators to have the information they need to meet their deadlines and budgets.

The adoption of smarter systems helps users identify inefficiencies and enables the users to take corrective action. Once inefficiencies in a system are eliminated, businesses can take the resulting savings and invest in the future growth of their business. Savings are not always simply financial. A smart system can also save time, reduce stress on equipment or optimise a labour workforce. In effect, a smart system, offering such tools as predictive analytics inventory and supply chain visibility can help reduce the costs associated with expected risks in a system. This is a key effect of Industry 4.0 and social innovation. Hitachi is approaching Industry 4.0 with alacrity because when technological advances, industry trends and social need combine, the opportunity for shared value is at its greatest.

ABOUT THE AUTHOR

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