

## IoT in Manufacturing: It's Not Just About Efficiency

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When you imagine how manufacturing companies might be making use of the Internet of Things (IoT), chances are the first image that comes to mind is of factory robots. These and SCADA systems have been providing remote monitoring and management systems for many years, well before the term IoT was coined. And, as you'd expect, manufacturers are integrating IoT-based solutions into their M2M systems to gain increased efficiencies.

For example, in a series of pilots run in collaboration with Dell, Cloudera, Mitsubishi Electric, and Revolution Analytics, Intel investigated how the use of IoT and data analytics could be applied to factory equipment and sensors to deliver operational and cost efficiencies. By integrating sensors on automated test equipment (ATE)'s testing interface unit (TIU), Intel was able to identify defective TIUs that were wrongly categorizing good units as bad. This was able to predict up to 90% of potential failures before they were triggered by the factory's existing process control system and, by replacing the TIUs early, Intel was able to reduce yield costs by up to 25% and reduce spare parts costs by 20%.

Another Intel pilot applied image analytics on microchips with the result that defective chips were identified ~10 times faster than using manual methods. And in another case, Airbus embedded electronics into its assembly line tools and used PTC's IoT platform to enable engineers to rely less on user manuals for determining, for example, the level of torque required for the assembly of specific parts.

So, is IoT being used purely as an efficiency play by manufacturers? In short, no! The advantage of IoT is that it isn't restricted to the manufacturing machines or tools – manufacturers can attach sensors to everything. There have been numerous cases of using wearables to monitor workers' locations to increase safety, for example.

Manufacturers are also looking to IoT to build relationships with their clients. For example, a printer manufacturer contacted HCL to use its printers' existing sensors together with an IoT platform in order to monitor the use of its products after sale. Whereas before the deployment of the IoT solution the manufacturer interacted with the client once during the sale, by monitoring the products' usage the manufacturer was able to offer aftermarket sales and service which it estimates to be a \$2bn revenue stream. Similar projects have been able to 'aaS'ify other types of products.

Generally, every vendor building an IoT offering is targeting the manufacturing industry due to the large opportunities it presents. Just a few vendors operating in this space are:

- Atos' work with John Deere
- CGI's elevator maintenance with ThyssenKrupp
- Dell's work with Scapa Group to use IoT to automate manual processes
- PTC remote diagnosing of Diebold ATMs
- Tech Mahindra increasing the efficiency of a ready-mix concrete manufacturer
- Wipro's contract with ESAB Welding & Cutting Products to track, monitor and optimize welding equipment.

So, while increased efficiency is the leading driver of IoT projects within the manufacturing industry, this is not the only game in town. The influence of IoT on building new services and improving the manufacturing experience for workers is also significant.

NelsonHall estimates that the manufacturing IoT market is currently worth \$220m and forecasts 46% growth (CAGR) over the next five years, taking it to \$1.45bn by 2020.

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