



Bosch – Manufacturing solutions

The connected world has arrived, and it continues to grow and evolve every day. With an expected 7 billion people and 50 billion connected devices by 2020, the Internet of Things (IoT) is transforming the way we live, work, communicate, and interact with one another.

It is also enhancing processes and procedures in the manufacture, transportation and warehousing of goods. The Fourth Industrial Revolution is setting new standards, enabling manufacturing to be simpler, more efficient and more flexible. The concept of connecting all elements in a manufacturing value chain is called Industry 4.0. It involves the use of technology to monitor, modify and customise products in a production line.

Historically, many independent processes were used for the manufacture of products, from receiving customer requirements, design, research, development and prototyping to material sourcing, assembly lines, sub-systems supply, quality assessment, packaging, warehousing and transport. These processes acted interdependently of each other. However, the connecting of all of these via the internet creates a fully integrated ecosystem delivering faster, more customised products for the end user.

Industry 4.0 gives more control to the people at the core of making things. It allows for richer collaboration, rapid flow of information and it cross-references in real time to automatically correct errors or provide the information companies need to optimise their systems.

Robert Bosch Australia is both a provider and user of Industry 4.0 technologies. With 290 manufacturing plants across the world, application of Industry 4.0 is an evolution not a revolution. Bosch's own reference projects for implementation range from large-scale mass production to multi-variant assembly quantities.

The Bosch approach is strategic all the way to its global Board of Directors, which recognises that Industry 4.0 will be different for different applications. In the same way that Lean manufacturing has evolved from individual use cases to widespread adoption, Industry 4.0 requires collaboration, engagement and understanding.

For example, the introduction of RFID technology is a good first step. The prerequisites for implementation are: firstly a standardised process in the context of Lean principles, and secondly, an IT foundation that allows for basic connectivity and the exchange of data. Standardised processes enable the targeted capture of important information based on the RFID raw data.

In turn, KPIs can be generated and monitored in real time. The resulting transparency can be integrated into management routines as a key management tool, and savings potential is fully expended due to introduced improvement measures. Utilising this quick introduction, additional connectivity steps, such as independent communication of virtual images or self-optimising processes can be implemented.

This approach starts with a small hardware and connectivity investment that opens up possibilities for understanding and optimisation, and can lead to covering the entire value stream and a wide variety of processes through subsequent investments. Some of Bosch's own reference projects have started in this way as 'pilots' and expanded upstream and downstream as process steps, ultimately rolled out in an international production network.

Bosch's Industry 4.0 applications are all customised to the requirements of the respective plants and integrate existing equipment in a 'Brownfield' approach. The process is iterative with short control loops. Small steps reduce the complexity, achieve desired results faster, and are measured against KPIs.

Australia has a rich manufacturing environment, comprising approximately 6.0% of GDP. However, 97% of Australian manufacturers are considered small-to medium-enterprises by global standards. Industry 4.0 principles will become the norm, but the journey will start via small steps such as RFID connectivity, which will expand and improve productivity with additional measures. Bosch Australia Manufacturing Solutions develops special-purpose equipment that leverages Bosch's extensive global manufacturing footprint and brings Industry 4.0 knowledge, solutions and services as a core competency tailored to local companies.

Robert Bosch Australia

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