Getting the competitive edge in manufacturing

Noel Sheppard* and **Paola Hopwood****
discuss how manufacturers can realise the benefits of edge computing through network automation

The future of automation and mechanical engineering undoubtedly lies in the unstoppable digitisation of data. In today's modern production process, it is becoming increasingly inefficient to use single-purpose equipment for individual processes, with its high costs and insufficient productivity. However, automation and rapid change can present challenges and opportunities in equal measure for the manufacturing industry.

Complex software has to be utilised to programme and parameterise every sensor in a production line. This means the traditional PLC programmer now has to become an IT expert, or have sound IT knowledge, which can be difficult in terms of recruitment. On the other hand, it is precisely the increased memory and computing power of automation components that means we are able to simplify processes while making its uses more complex.

Future viability and sustainability - The driving innovation factors in mechanical engineering

Entire industries had to reinvent themselves virtually overnight when the coronavirus pandemic took hold. Now we are finding a sense of normality, it is more important than ever to come out the other side stronger than before. Those who succeed are best placed to gain large market shares in the next upswing, while others will be forced out of the market.

The mechanical engineering sector has lost out somewhat in terms of innovation and digitisation, but in return it also has the potential to catapult itself back to the top under its own steam. In times of tight budgets and resources, however, the question remains: How sustainable and flexible is my development, and will I be able to keep up with the growing pace of innovation in the future?

If innovation cycles are becoming shorter and shorter, how can manufacturers extend the service life of machines and keep overall equipment effectiveness (OEE) at a high level for several years? IIoT, artificial intelligence and 5G are just some of the "innovation puzzle pieces". Unfortunately, many implementations have been delayed. The problem is that the picture is never complete, with new technologies always being developed, and some of them become accepted as standards.

That is why it's important to use technology that can future-proof your operations with the flexibility to adapt as your requirements change. A modular design allows companies to add additional edge computing hardware to incumbent systems as the needs and capacities increase. Again, this allows companies to utilise the benefits of edge computing and retain agility in the market, responding to opportunities that arise when demand changes.

With that in mind, how can manufacturers effectively migrate to an automated edge computing model?

Solve complex tasks more easily

One of the key advantages of edge computing is the intelligence it can provide companies about their systems. In industries such as manufacturing, businesses often use proprietary systems that can't communicate with each other or provide data about their processes.

The initial step is data acquisition, where data from several PLCs and other data sources are merged into a common database. Using a single source of data enables faster processing of information for true automation. What's more, remote monitoring and a complete visualisation can extend the benefits of data management in manufacturing.

By combining all data-relevant tasks in one automated device, data management becomes unified. Different platforms are controlled centrally through a single pane of glass, which means control of all connected systems is achieved through so-called "edge" automation.

Higher-level IT systems that are connected can also receive a clearly defined data image, already pre-processed, with relevant production key figures instead of bloated, unorganised datasets.

Fit for the standards of the future

Businesses invest in technology because it serves a purpose, but overtime requirements may change due to rapid growth or a shift to different working practices, such as remote working. Whilst it is important to find an architecture that works for the business now, new technology also needs to be adaptable to be able meet future needs. By picking a flexible edge computing solution, businesses can reduce the need for costly hardware changes.

Industrial networking

One thing that ties all the capabilities of edge computing together is a network, and more importantly a network that can cope with and manage the needs of the business. Those needs could range from remote access, rugged conditions, large data sets and integration with legacy networks. A strong industrial networking solution is the foundation from which edge computing can make your business thrive. It allows machines to talk with one another, give you vital data, reducing your costs and increasing your profits.

Working in tandem together, both industrial networking and edge computing will help you to both enhance your existing sites to allow them to work at their full potential and create a more efficient system for setting up new plants. It gives you the platform in the present that you need for your future. ∎

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