

INDUSTRY 4.0 – THE FOURTH INDUSTRIAL REVOLUTION

Steve Brambley, Deputy Director, Industrial Automation at GAMBICA looks at Industry 4.0, comparing it to the emergence of the internet in the late 1980s and looking at how it could change the manufacturing business model



Over 200 years ago, the first industrial revolution began in the UK, using water and steam to power to mechanise manufacturing processes. Within another 100 years, electricity revolutionised the mass production of goods and by the 1970s electronics and computing helped make the leap to automated manufacturing. Now we are predicting the next revolutionary step in manufacturing – Industry 4.0, a title reminiscent of software versioning that represents the fourth industrial revolution. But it's a concept that is often bundled up with several other industry buzz words, trying to figure out exactly what it is and where it fits.

And so we hear a variety of terms such as Industry 4.0, smart manufacturing, the connected factory,



AUTOMATION
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LABORATORY TECHNOLOGY

GAMBICA is the Trade Association for Instrumentation, Control, Automation and Laboratory Technology in the UK. It has membership of over 200 companies including the major multinationals in the sector as well as smaller and medium sized companies.

The Association's primary objectives are to further the successful development of the industry and to promote the competitiveness and profitability of member companies.

the Internet of Things, Big Data or Machine-to-Machine, and we explore the similarities, the overlaps, and the links between these concepts.

I look at it as comparable to the emergence of the internet in the late 1980s, a technical evolution that would eventually lead to a revolution in communication, commerce and society.

At that time, people were similarly trying to figure out these new terms such as world wide web, cyberspace, internet and hypertext. In the days of the Netscape browser and 56K dial-up modems, nobody could predict all the ways in which the internet would change our daily lives, but it was clear that the technology opened up a great deal of potential. I think this is where we are now with Industry 4.0 – we are in the early days of talking about what it means now and what possibilities it might open up in the future.

If I had to try and sum it up in one sentence:

“Industry 4.0 is a connected network of people and technology that allows manufacturing to do the things we already do better, faster and cheaper whilst at the same time enabling us to develop new things that were not possible before.”

It is important to realise that it is a concept, not a product or off-the-shelf package. It refers to connecting up people, devices, machines, products, material and systems, so that they can communicate effectively, access large amounts of data, make autonomous decisions and improve flexibility. It is a convergence of the worlds of IT and automation, integrating manufacturing systems with material planning, resource management, enterprise systems and the supply chain.

One of the aims of Industry 4.0 is to switch the business model of manufacturing from mass production to mass customisation. Instead of placing large facilities in low labour cost countries and then shipping product

around the globe, it allows the flexibility of “batch size = 1”, with manufacturing distributed locally to where the customer markets are.

This flexible manufacturing, with shorter lead times and customised products will better serve the market needs. The increased productivity and reduction in energy and transport will allow higher wage economies to remain competitive. In the UK, we could stimulate investment in new jobs and re-shored manufacturing capacity.

DISRUPTIVE TECHNOLOGY

So the idea of an industrial revolution raises an interesting question - Could manufacturing be disrupted in the same way that the telecommunications, entertainment, retail and media industries have been by the development in information technology?

An example of such disruptive technology is additive manufacturing, sometimes referred to as 3-D printing. Imagine designing your own customised product and sending the file for printing at a local manufacturing centre. Is this an opportunity for entrepreneurial SMEs to bring a different business model to market? In the same way that Amazon didn't have physical bookshops when it started and Ocado didn't have physical grocery shops, could a start-up break into custom manufacturing and become a new household name?

The future holds some exciting possibilities for industry in the UK, and that future has already started. The automation technology largely exists already and is being used in manufacturing today. The technology will continue to evolve, doing more with less and seamlessly communicating with the systems around it. The revolution will be when connecting all these processes, systems, machines, devices and people leads to major changes in manufacturing techniques and strategies.

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