Rolling out Industry 4.0:

the manufacturer's
perspective

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Introduction

The theory that we're on the edge of a Fourth Industrial Revolution has gained momentum over the last few years. For manufacturers, this revolution is being driven by the concept of Industry 4.0 – a vision where greater automation and data exchange, encompassing everything from the Internet of Things to cloud computing, can combine to facilitate a 'smart factory'.

Evangelists of Industry 4.0 portray a futuristic world where products can feed back information in real time to fully automated factories in which advanced robotics technology is operating the production line. This depiction of a manufacturing utopia has stirred the imagination and excited the future gazers. But for others the prospect is more frightening.

When we talk about a forthcoming revolution the perception is that a dramatic shift in the status quo is about to occur. For an SME, faced with the harsh daily realities of fulfilling orders on time and maintaining a healthy bank balance, it can be unsettling.

The capital outlay alone can seem terrifying enough but when you also consider the plethora of technology trends being mentioned in the same breath – augmented reality, telematics, 3D printing, the Internet of Things, virtual reality, Big Data, etc. – it can seem a little overwhelming.

Industry need not be scared though. In spite of the talk about a revolution, the path for most companies is likely to be more of an evolutionary process. And while the concept sounds grandiose, the truth is that many companies have already started to take steps towards Industry 4.0 – whether they realise it or not. Many have begun connecting their physical manufacturing by installing digital systems and processes. It's just that some are further along in the journey than others.

In this paper, we talk to some of those manufacturing companies and professionals who are at different stages in their journey towards Industry 4.0. We share the main lessons they have learnt along the way and provide a guide to creating a digital platform ready to build on for the Fourth Industrial Revolution.

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Current Industry thinking – we're still in the early stages

The concept of Industry 4.0, or more connected, digitised factories, came to prominence in Germany around four years ago but has since been accepted around the world. The numerous industry reports that have followed have also shown there is a huge appetite for the idea.

The incentives are clear. A report published by PwC last year found that organisations expect Industry 4.0 to deliver greater productivity and efficiencies. PwC found that, on average, companies expected to see a 2.9% increase in revenue and a 3.6% reduction in costs by 2020. Furthermore, almost three quarters, are expecting to achieve better customer relationships as a result.

But how is this possible? What does Industry 4.0 provide for us that will allow such gains? Well, a separate report by EEF, The Manufacturers' Organisation, claims that for 99% of manufacturers the Fourth Industrial Revolution is all about getting actionable insight from data – and connected factories will help us to do that. There is a need to collect real-time data that allows for better decision making. This will require organisations that are focused solely on the production line to pay greater attention to the back-office systems that support the business as a whole.

There is, however, an acknowledgement that not everyone is ready for this. According to EEF, less than half of manufacturers fully understand the concept of the Industry 4.0, while just 11% think the UK is geared up to take embrace it. PwC's global study, meanwhile, found that just one third of companies feel they have already achieved an advanced level of digitisation.

What these reports recognise, however, is that when companies move towards Industry 4.0, they will do so in stages. The concept of a new industrial revolution is in itself so large, that it will take time for many organisations to wholly accept this way of thinking. Once they do, they will then need to install the digital systems that will enable them to gather insights from the connected factory. Only when this is complete will companies go on and start to realise the true benefits of Industry 4.0.

7 ways in which manufacturers can enhance their operations

The Fourth Industrial Revolution will be driven by digital technology and systems. The amount of innovation in this space can seem overwhelming but it's easier to think about what an organisation wants to achieve first and then discuss the technology that can make this happen. Here are seven ways manufacturers can enhance their operations with digital technology:

Improve customer relations

Competition among SME manufacturers can be intense and it's becoming increasingly important for businesses to provide customers with confidence in the reliability of their supply.

Digital systems are helping to reassure customers and improve those relationships from first contact through to the completion of an order. For instance, by connecting a customer relationship management (CRM) to an enterprise resource planning (ERP) system a salesperson will know the customer's details, sales history and whether they can fulfil an order. Better still, using past sales data, organisations better forecast those orders in advance – particularly if the ERP system supports direct imports of customer orders and forecasts via EDI.

Organisations can also use their systems to provide customers with updates throughout the process, by sending them reports, emails or alerts and can even allow online collaboration during the planning phase.

Increase automation

Improving efficiency is one of the major drivers of Industry 4.0 and this is being brought about by automating manual processes where possible.

By reducing paper-based processes for such things as timesheets or expenses, companies can strip layers of administration out of the business. By eradicating stand-alone systems, such as those run via an Excel sheet, companies can also speed up processes and lower the potential for human error through repeated data inputting. Better still, reduced admin enables companies to redeploy staff in areas where they can offer greater value to the business.

Optimise schedules

With greater grasp over your supply, and materials on order, it is possible to optimise the production schedule, speed up processes and cut costs. Planning systems are helping companies to ensure materials are delivered on time, in the right order and the correct number of staff are ready and prepared to manage the workload.

The streamlining of processes also extends to the warehouse. Companies that can pick stock in a logical order will be able to get deliveries out to customers faster.
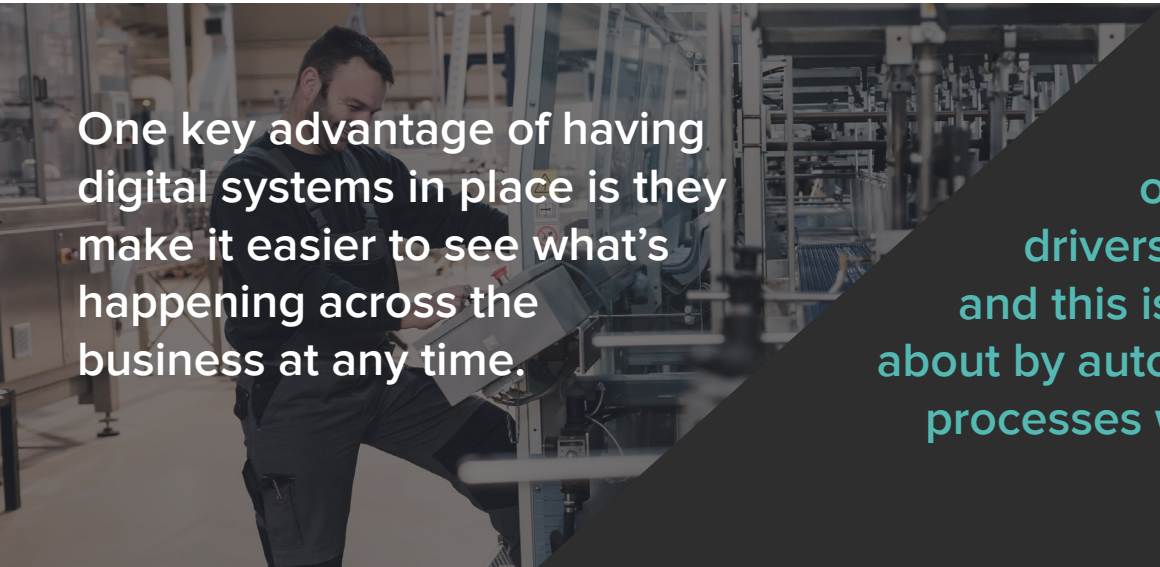
Better inform decision makers

One key advantage of having digital systems in place is they make it easier to see what's happening across the business at any time. The ability to convert this data into actionable information, often with the help of business intelligence (BI), dashboards, and analytics tools, is enabling managers to make better decisions for the organisation.

Managers can identify problems, such as bottlenecks in the production process, and put measures in place to resolve these issues. Crucially they can see where the company is making and losing money and take the appropriate actions to increase profitability.

Greater traceability

It is becoming increasingly important for companies to be able to trace the origins of the materials used in production and ensure they comply with a range of compliance standards. For example, food producers may need to prove provenance; aerospace manufacturers may be asked to demonstrate tolerance levels and chemical firms could be required to meet good manufacturing practice (GMP).

As regulations on supply chains continue to grow, organisations are requiring documentation management tools to ensure they can demonstrate they are compliant.

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Capture data

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It's vital that the appropriate scanners and sensors are in place to collect and store data. By capturing production data, organisations can also become more sustainable. They will be able to retain information previously held by key personnel – thus, making a business less dependent on a select number of individuals.

Enhance security

As the manufacturing industry embraces digital technology, companies cannot ignore the threat that cyber espionage and cyber crime present.

Organisations need to protect themselves by working with software companies that understand and adhere to best practice principles. To reduce vulnerabilities, it is also essential that businesses regularly update their systems and educate their workforce to the potential threats.

With cyber attacks constantly evolving no one can be 100% secure, however. So, it's essential organisations put business continuity plans in place in the event of a disaster of any kind.

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Rolling out Industry 4.0

Understanding what technology is available to help you achieve your goals is one thing but knowing how to approach the roll out is another. We interviewed three manufacturing professionals who are currently rolling out digital systems within factories and championing Industry 4.0. They offered three clear pieces of advice:

TIP 1: Get internal buy-in

A common theme for professionals leading industry 4.0 projects is that it's vital to get internal support, from all levels of the business. This can be easier said than done, especially if investments in digital systems are competing with the need to spend money on machinery.

"OEM outsourcing leaves SMEs picking up the tab for investment in capital equipment" says Jeremy Wisner, a business systems analyst with a manufacturer of aerospace parts in the East Midlands. "Adding a further layer of complexity to this investment by adopting relatively uncharted '4.0' technology, can make the analysis too risky"

"It's not as easy to get people excited about processes - it's just not as sexy as robots. But if your investments don't flush through to the supply chain, they are nothing more than window dressing."

He continues, "You hear people describe a vision of the future where everything is automated and integrated with robotics and it sounds very exciting. The reality is though that there are some mundane fundamentals that have to be in place first, such as making sure materials arrive at the factory in the right order," he adds.

Jeremy explains that when faced with the pressure to perfect a product and fulfil orders, it can be hard to step back and look at the bigger picture. He adds that when people have engineering at their heart, some of the more tedious aspects of improving vital supporting back-office systems can struggle to gain attention.

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To ensure the success of a digital initiative Mike Cosby, FD at Burts Potato Crisps, believes projects also need to be sponsored by someone at board level. He says you can't just pass responsibility to an IT manager and tell them to get on with it.

"It won't work. They won't necessarily understand the requirements of each business function. You need someone sponsoring the project who has a broader view of the business, such as the financial director or the operations director," he says.

TIP 2: Don't run before you can walk

Simply getting resource planning in place can be revolutionary for many SMEs, according to Jeremy. He believes that this will be the logical first step for many companies. Technology analyst Gartner estimates that as companies build a solid foundation for Industry 4.0, 50% will renovate their enterprise resource planning (ERP) systems.

"We had data siloed in different departments and if you asked five people what the sales figures were last month you could get five different answers. We wanted to get a better view of what's happening in our business."

The theory that you should take things step by step is supported by Mike Cosby. He started moving Burts towards the process of digitisation five years ago, well before most people had heard of Industry 4.0. "We were just trying to fix problems we had," says Mike.

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Burts set about increasing visibility over the business by installing a number of digital systems. These have enabled the organisation to curtail wastage and increase labour efficiency – and the difference has been remarkable. The business has been transformed from a company making a loss on £10m turnover to one generating 10% profit from revenues of £30m.

The business didn't get to where it is in one big jump, however. It started with its financials, then installed a basic ERP system before adding further solutions such as production scheduling and business intelligence dashboards.

"The best advice I can give to companies starting on this journey is to go vanilla," says Mike. "Start with a basic system that you can modify and add to. Don't try and get too clever too quickly because it will delay implementation and could see you break deadlines and budgets. You don't need a monster system on day one but give it six months to a year and you'll know exactly what you need."

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TIP 3: Technology will only get you so far

Understanding how your business stands to benefit from the technology it is installing is vital. But so too is the realisation that technology can only take you so far.

This has been a key affirmation for Adam Hooper, operations director at Martin's Rubber Company – a bespoke supplier of rubber products to the defence, aerospace and automotive sectors, including Formula 1. Founded in 1865, shortly after the end of the first Industrial Revolution, Adam began the process of building a foundation for the Fourth Industrial Revolution four years ago, with the business having developed its own bespoke software for the previous 20 years.

"Vitally we can see who owes us what, which customers and sectors are profitable and where we could make a loss."

This has already proved fruitful for the company as turnover increased 25% last year and forecasts predict another 15% growth this year. "We're growing quickly but we're confident we can manage that growth comfortably as we now have the systems in place. Previously that kind of increase would have had us running around like headless chickens," says Hooper.

With the greater visibility it provides, it's easier to see orders and optimise production schedules. We can make sure our staff are picking up jobs in the right sequence and we always have the right amount of people working. Vitally we can see who owes us what, which customers and sectors are profitable and where we could make a loss. This is helping us to not just prioritise jobs but where to focus our marketing as a company."

The process hasn't been easy though. The company installed an ERP system in order to replace numerous existing but disparate systems. It found, however, that extra work was required to improve the quality of the data being fed into the system.

Adam comments: "You quickly realise that if you put garbage in, you'll get garbage out. So, we spent the first year doing lots of admin to get the right processes in place and ensure we had the right tech to collect good quality data, focusing especially on real time data collection from the shop floormaking it as simple as possible for users to deliver accurate information into the system.

"Don't let anyone tell you all this is easy because getting it right is a long, hard slog. You also need to free someone up – with the appropriate skill set – to analyse the data and turn it into usable information." He adds: "What we affirmed was our previous experience of implementing software; essentially that technology will only get you 80% of the way there – the rest is down to you."

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Concluding thoughts

The path to Industry 4.0 will not necessarily be simple but research conducted for EEF found that 80% of manufacturers believe that the Fourth Industrial Revolution will become a reality for many by 2025.

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"The thinking around Industry 4.0 may still be nebulous for many SMEs, who have previously been more inward looking when it comes to growth, but it's clear that this is a logical next step," says Jeremy Wisner.

It's a view echoed by Adam Hooper: "I don't see an alternative. If we are going to drive efficiencies we need to be competitive against other businesses both in the UK and abroad." He adds: "If we are going to ensure our customers keep faith in us we need to get these systems in place."

Although there is a sense of inevitability about Industry 4.0 and the road may be difficult for some, it's also important to remember the gains that can be achieved along the way.

"The way I see it, it's about getting the machines to do what they do best – the menial work – and getting people to do what they do best – talking to each other and making decisions. It's common sense really," adds Mike Cosby.

Choosing the right technology and approaching this challenge in the right way will no doubt help manufacturers in the global market. Learning from the experiences of our peers will also go a long way towards ensuring the country makes the Fourth Industrial Revolution as successful as the first one was for the UK.

Thanks to our contributors:
Jeremy Wisner, Business Systems Analyst
Mike Cosby, Finance Director, Burts Potato Chips
Adam Hooper, Operations Director, Martin's Rubber Company

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