INDUSTRY 4.0 USER MANUAL FOR SMEs

ARE _YOU_ READY FOR

DIGITAL MANUFACTURING?

◖ access

A practical guide to manufacturing software.

And not a robot in sight!

INTRODUCTION

Whatever industry you're in, and wherever your business is in the supply chain, you'll know that technology is changing the way you work.

Big manufacturers, like Bosch, Siemens and Daimler, now operate what are known as 'smart factories' – where every aspect of production is linked via a digital network.

We've seen robots with artificial intelligence capable of building parts and making decisions, and 3D modelling being used to develop products and address defects before hitting the assembly line.

Search for 'Industry 4.0' on Google and it returns more than 3,400,000 results – but just 439,000 for how it relates to SMEs.

How do you drill down to the information you need?

WHAT DOES THIS MEAN FOR ME?

From engineering and aerospace, to food production and pharmaceuticals, Industry 4.0 is happening at the top of the supply chain and rapidly rippling down to businesses like yours.

Your workplace has always relied on manpower not software, so you might be wondering why it's so important.

The reason is simple: Tier One companies use technology to improve productivity, demonstrate traceability, drive down costs and boost profits. Smaller factories, however, have yet to see the same rewards.

More importantly, the big players are now pushing for change right through the supply chain, down to Tier Two, Three, Four and lower.

Even if you don't sell directly to the top level, your customers may – and they'll need to prove where every component and raw material came from.

Investment in technology and changes to workflow are always daunting, so we've produced this manual for factory owners, engineers and logistics and production managers at the sharp end of manufacturing and distribution.

A feature of Industry 4.0 is the 'smart factory' (also referred to as the 'connected', 'digital' or 'networked' factory). Linked by a central network, machines are not only automated, they are also capable of learning processes independently, adapting to change, generating orders, understanding quality issues and even assigning tasks to other machines.
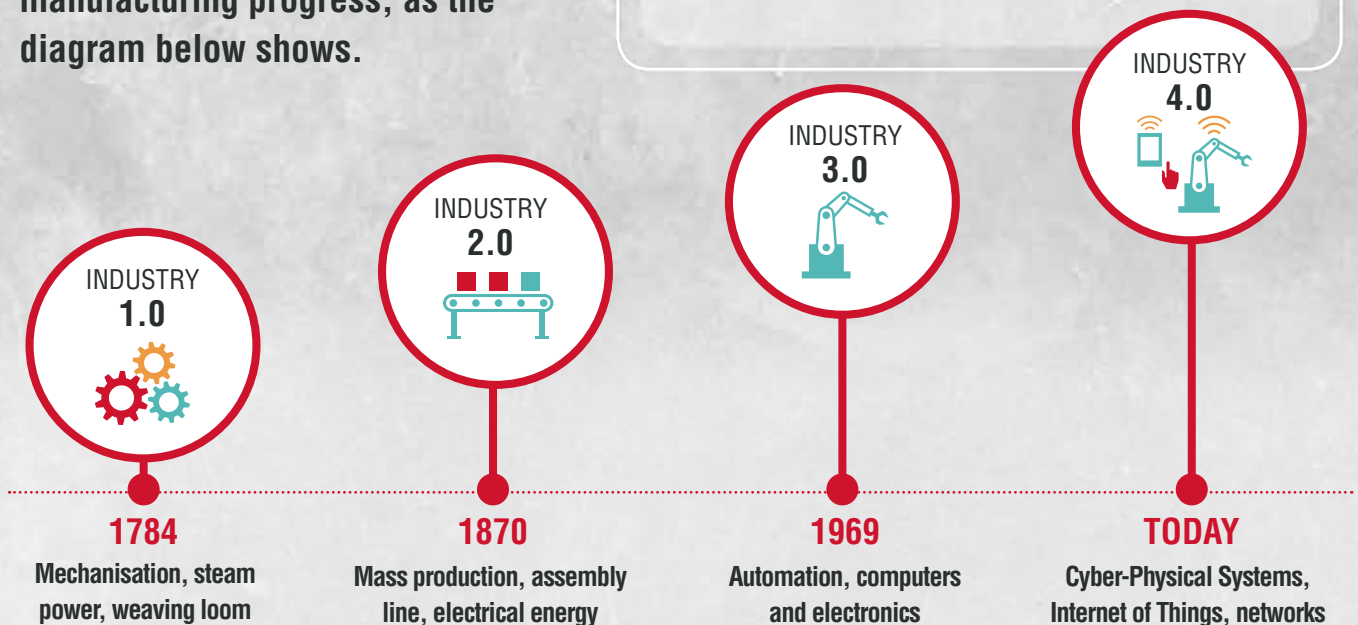
The term Industry 4.0 was coined in Germany (where it is called Industrie 4.0) when its government set out the High-tech Strategy 2020. Also known as the 'Fourth Industrial Revolution' (4IR), it is the next stage in manufacturing progress, as the diagram below shows.

WHY DOES IT MATTER?

No factory operates in isolation, even before Industry 4.0 and digital supply chains. As a supplier, you have always needed to provide an audit trail showing where materials and components came from, ensuring they meet quality standards and legal guidelines.

Supply chain software now allows you to prove traceability with automatically-generated reports, available by logging on to the system, rather than being stored – often insecurely – on paper and spreadsheets.

INDUSTRY **1.0**

INDUSTRY **2.0**

INDUSTRY **3.0**

INDUSTRY **4.0**

1784
Mechanisation, steam power, weaving loom

1870
Mass production, assembly line, electrical energy

1969
Automation, computers and electronics

TODAY
Cyber-Physical Systems, Internet of Things, networks

From the era of coal mining and steam engines, to the fully-automated factories of the future, technology has always given us the power to speed up production, cut waste, reduce human error and increase output.

A REVOLUTION IS COMING

In order to compete on the world stage, either directly or indirectly, manufacturing businesses will need standardised supply chain processes, only possible with software.

At the moment, you can keep your customers happy if you make the products or components they want to the right specification, price and time.

They may turn a blind eye to the fact that you keep all your records on paper, especially in highly-specialist fields where they have no choice other than to buy from you. But how safe will your contracts be if your competitor invests in supply chain technology?

Read more about how manufacturer Martin's Rubber is implementing Industry 4.0 on page 10.

67% of manufacturers are familiar with the phrase '**Industry 4.0**'

85% have either implemented digital systems or plan to.

Only **a quarter** of survey respondents believe they have the skills to make Industry 4.0 work for them

Three-quarters described their understanding as '**inadequate**'.

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. If we are going to ensure our customers keep faith in us, we need to get these systems in place.

Adam Hooper, Operations Director for Martin's Rubber "

Source: Annual Manufacturing Report 2017, the Manufacturer

With everyone from the UK government to businesses and trade bodies throwing their weight behind Industry 4.0, now is the time to find out what help and funding is available.

The UK's Industrial Strategy: See how the government plans to create jobs and boost the economy with investment in skills, infrastructure and industry. There's also information on cutting-edge projects across different sectors and policies that will impact your business.

EEF - The Manufacturers' Organisation: Find a wide range of resources about Industry 4.0 and see how your business could benefit. If you're a member, you can access business support, share best practice and make contacts.

The Manufacturers' Association: An industry body and member organisation that provides training in new technology, plus conferences and networking opportunities.

The Knowledge Network: Skills drive innovation, so this organisation links experts who can share their experience. As well as providing industry news, it also highlights funding opportunities.

Manufacturing Technology Centre: Partnerships between universities and industry are putting pioneering research into practice. A member organisation that includes the likes of Airbus and HS2, it provides programmes tailored to SMEs.

Access Group: Firms like Access are making Industry 4.0 a reality for even the smallest of manufacturers, with software that can be scaled up according to need and is quick to implement.

ROCKET SCIENCE?

As Industry 4.0 develops, different industries are discovering how it can benefit them specifically – perhaps none more so than in aerospace where it has become known as Aerospace 4.0.

With a global supply chain, aircraft manufacturers rely on the rapid transfer of production data to ensure every component meets their specifications when it arrives on site.

Leading the way is the Aerospace Defence Security (ADS), which has a special interest group (SIG) dedicated to digital manufacturing.

It supports businesses as they use technology to achieve their goals, including information transparency, reduced time-to-market and greater flexibility.

> "A digital transformation is underway that will revolutionise manufacturing industries, including Aerospace. Through incorporating automation and data exchange into processes, Industry 4.0, as it is generally referred to, aims to boost productivity, increase efficiency, improve quality and reduce waste across the entire value chain.
>
> - Aerospace Defence Security (ADS)

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3.1 ON THE [SMART] FACTORY FLOOR

With intelligent robots and automated equipment, smart factories look like something from science fiction. Human operatives, along with the noise and grime of industry, have all been replaced with screens and precision machinery that make plants look clean, modern and high-tech.

※ Your traditional factory might look nothing like this, even with the introduction of new technology. Nobody would know, for instance, that you are using enterprise resource planning (ERP) software to manage production scheduling, invoicing and inventory – although your customers are likely to see a better service. Your accountant would notice a healthier balance sheet too - and your competitors may wonder why you're winning more contracts.

> Access ERP is helping us scrutinise every area of our business. It's already saved us thousands of pounds through greater efficiency and faster access to information.
>
> - Mike Cosby
> Finance Director
> at Burts Potato Chips

MANAGING MATERIALS PLANNING AND PRODUCTION

FactoryMaster MRP is built so that you can tailor customer sales orders on an ongoing basis.

This updated information is imported directly into the system to drive MRP, scheduling, purchase orders, works orders, job cards, packing lists, and despatch notes and then invoices.

Ultimately, it gives you the flexibility to amend imports rapidly and add new customers to the system as your business grows.

The diagram below shows how Access FactoryMaster MRP manages workflow. To onlookers, it seems like a typical factory – but there is plenty going on behind the scenes automatically with MRP.

KEY
☐ ◄► Automation   ☐ EDI Imports S/O direct to FM
····· Traceability
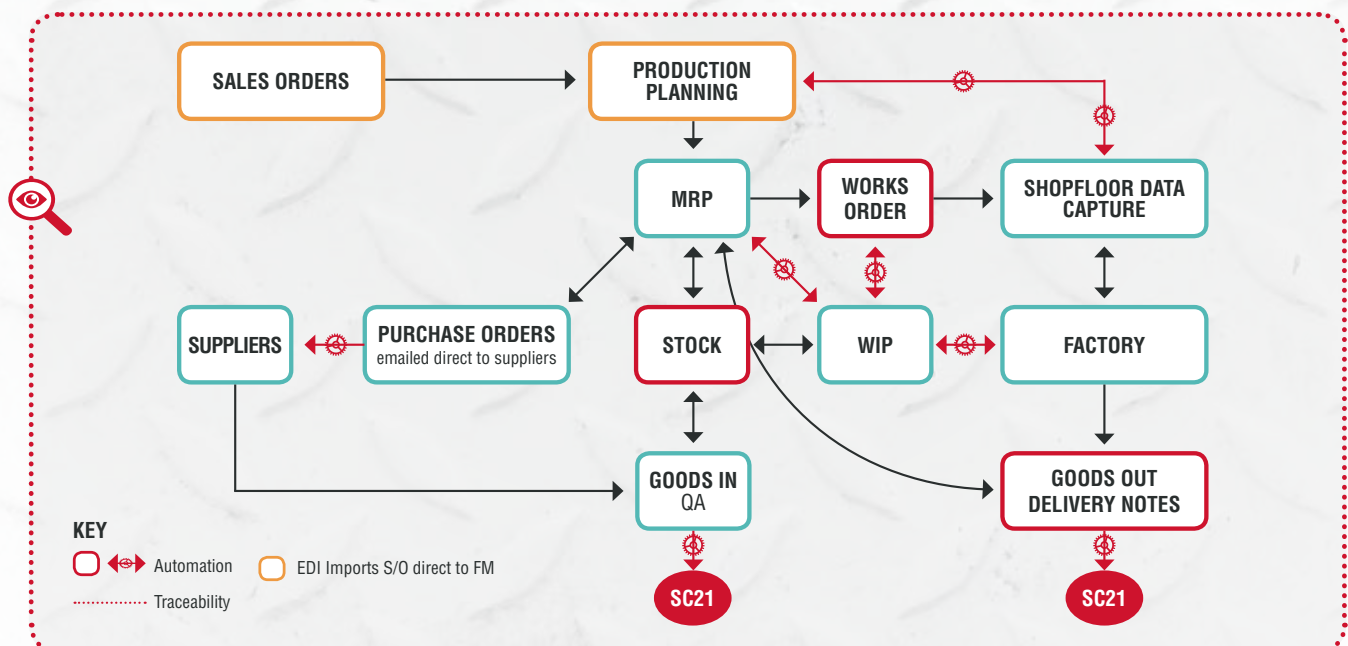
If every customer in the supply chain demands full traceability, including instant access to information, do you want to be the 'weak link' that causes operations to stall? And can you afford to work with suppliers who cannot guarantee their parts and materials are fit for purpose?

Checking goods as they arrive on, and leave, your site is nothing new. However, supply chain software makes this process more transparent and robust. When your reputation is on the line, you need to be sure that everything you sign off is of the standard expected and won't be rejected by further on in the chain.

WHERE DID THIS PART COME FROM?

WHO SAID IT'S OK?

WHERE IS IT NOW?

STILL AWAKE WHEN YOU CLOCK OFF?

Technology is not a silver bullet that solves your day-to-day problems at the click of a button. Suppliers who turn up late or customers that don't pay on time won't go away, but digital systems make it far easier to manage them.

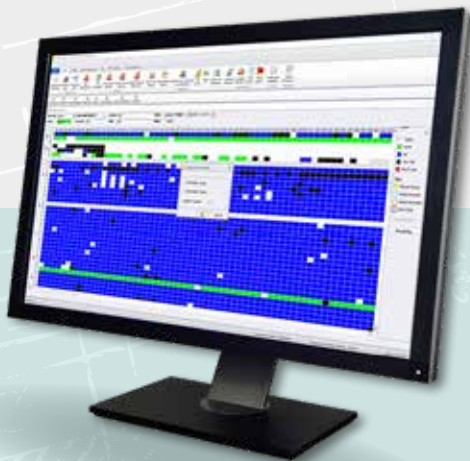It's about reducing the amount of time you spend on admin and freeing you up to run the factory.

Suppose a contractor delivers defective goods, or gets your order wrong. With supply chain software, you can prove exactly what the consignment should be – and if it falls short of the mark, you can reject it outright. Technology allows you to vet suppliers according to your strict standards, while automated MRP makes sure nothing is missed and machines don't grind to a halt.

Most worrying of all, if you can't prove compliance and quality, what else have you missed? Many of Access Group's customers say the software brings to light issues they had not previously considered.

BETTER TRACKING OF PRODUCTS

Just like manufacturers, the warehousing and logistics industry is now seeing the time and cost-saving benefits of warehouse management systems (WMS).

Software like Access Delta WMS integrates with other platforms to give you peace of mind that goods will arrive with the customer on time. More importantly, Delta's web portal allows your customers to view stock levels and movements on line to speed up communications and answer questions 24/7.

FOCUS ON: ACCESS DELTA WMS

Software links your business to other manufacturers, but it can also help you work more closely with distribution centres. Access Delta WMS integrates with standard courier services such as TNT, so customers can see exactly where their order is.

As well as giving you a real-time view of goods in and out, it ensures delivery documents are correctly signed-off and accessible via the system. This is particularly relevant if you trade internationally and your driver needs to present customs documents on arrival – after all, you don't want to risk a delay just because someone in the office didn't fax them over in time.

Access Delta WMS has been developed for rapid implementation and ease of learning, so staff can start using it with minimum training.

GBUK GROUP: USING ACCESS DELTA WMS TO MAXIMISE CAPACITY

GBUK Group, a medical product manufacturer and distributer, tells us why it made the move from manual systems to online operations.

"

Driving our decision was the need to prove GS1 Compliance, a standard now compulsory in the NHS. At the time, our warehouse workforce was at capacity and paper audit trails were proving cumbersome and costly.

Access Delta WMS allows us to apply GS1 regulations quickly, so we can provide a stronger audit and better customer service. The drag-and-drop warehouse map means the team can make instant decisions, while improved picking and stocking accuracy has led to faster turnaround times and an increase in shipping capacity.

"

Research shows that *44% of manufacturers see better connectivity as a way to move into new markets, while 20% believe it will help them secure more business from existing ones.

But even if they recognise the long-term commercial benefits of Industry 4.0, some SMEs still see more barriers than opportunities. Below, we debunk some of the most common myths and explain why the hurdles are not as big as they first appear.

I'LL LOSE MY JOB

Think automation and you may worry that your job is going to be replaced with machines. Supply chain software is capable of eliminating many administrative tasks, but that doesn't make your role as a production manager redundant. It actually frees you up to 'see the bigger picture' and make important strategic decisions.

Not only that but if you fail to invest, your business could well be pushed out of the market, leading to lost contracts and jobs.

TECHNOLOGY IS TOO EXPENSIVE

Like any piece of factory equipment, software requires investment and time to train employees. And if your paper-based systems have served you well for years, why bother with digital? In fact, supply chain and warehouse management software has never been so affordable. It's designed to be scaled up according to your business' needs and rolled out quickly, so you see a return quicker than you might think. Access Delta WMS and Access FactoryMaster MRP, for instance, can be implemented in as little as seven and eight weeks respectively.

IS THE SOFTWARE SECURE?

Internet security and cyber-attacks are often in the news, so you might be cautious about moving some or all of your operations online.

While no system is completely safe from hackers, software providers are continually developing products to reduce the chance of attack. They're also far more secure compared to unsupported on-premise software, and paper documents and spreadsheets, which can easily be lost – or stolen by a disgruntled employee.

*Source: Annual Manufacturing report 2017, The Manufacturer

MEET THE SUPPLIER

You might think that Industry 4.0 is still a long way off, or that it's only relevant to big manufacturers. However, growing numbers of SMEs are now seeing real results from integrated supply chain software.

TEA BREAK:
10 MINUTES WITH MARTIN'S RUBBER

Based in Southampton, leading elastomer manufacturer Martin's Rubber deployed Access ERP and Access Orchestrate Scheduling software to grow production capacity, improve productivity and stay on top of costs. Operations director Adam Hooper explains more:

"By integrating our existing software, Mestec Manufacturing Execution Systems, with the Access products, we have more confidence in the data we're collecting – which gives us a better handle on stock, labour and materials reporting. Because we can accurately measure actual values against expected, we can assess where we are against our plan and, if necessary, do something about it.

Access Orchestrate gives us visibility of all the jobs that we have in the system, including the time that those jobs should take and the resources they require in terms of machines and people. It juggles those various constraints and comes up with the most effective manufacturing sequence. Mestec then sends work-to lists to operators' portable tablets in this priority order at a work-centre level.

Operators record their activities as they happen including the time they start and complete operations via simple touches on the tablet screen. A sub-set of this information, including the progress against each job, is fed back into Access ERP.

When we re-schedule, which we do several times during the day, Orchestrate takes the next snapshot from the shop floor and updates the plan. The system lets us know where we are and the capacity we have to fit in further work during that day, week or month."

7.1 WHAT'S IN STORE FOR UK MANUFACTURERS?

In an uncertain world, where you're faced with problems like labour shortages, overseas competition, tighter regulation and higher costs, it's easy to push investment in technology down the list.

Supply chain software won't make these issues disappear – but failing to act will prove costly long-term. Even if you've decided to invest in the technology, you may still have concerns about whether now is the right time to implement it.

WHAT ABOUT BREXIT?

Be careful not to use Brexit as an excuse for inaction. Whatever happens, you'll need to plan your next business strategy, whether it's proactive or defensive, and you're unlikely to achieve this if you spend half the day doing admin. Transferring customs documents and product certifications electronically means you don't have to spend hours faxing them to clients overseas, unsure whether they have been received.

ARE MY TEAM UP TO THE JOB?

Modern platforms are designed to be as easy as possible for employees to use, so anyone with a basic grasp of Windows or Microsoft Office can work with them. Your workers know how to use Facebook, or buy things online, and supply chain software is not much different. Most of the time, workers will simply be scanning barcodes or using touch-screens, ensuring component information is carried through.

STAY UP-TO-DATE

There are a growing number of Industry 4.0 events held in the UK throughout the year, including:

INDUSTRY 4.0 SUMMIT:
This international convention deals with the future of manufacturing and includes talks from industry and government leaders. There is now a real focus on how SMEs can implement technology successfully.

FUTURE LOGISTICS SUMMIT:
Covering everything from robotics to automated vehicles and augmented reality, this conference is an opportunity to learn about the digitalisation of logistics.

SMART FACTORY EXPO:
Billed as the biggest Industry 4.0 showcase in the UK, it is an opportunity to find out about the latest products, meet others in your sector and find out what is on the horizon.

DON'T FORGET THERE ARE OFTEN EVENTS AND WORKSHOPS AIMED AT SMALLER BUSINESSES IN YOUR AREA. A GOOD PLACE TO START IS THE LOCAL CHAMBER OF COMMERCE.

APPROVED

8.1 THE FINAL STAGE: READY FOR SIGN-OFF?

Few workers today will have experienced the kind of radical shifts in manufacturing we are now seeing. Industry 4.0 is not just a case of survival – but an opportunity to prove your capabilities and win bigger, more valuable contracts.

You might be the person making the decision, or researching supply chain software on behalf of your colleagues, so I hope we have answered some of your questions. If you'd like to find out more about Access Supply Chain Solutions, MRP, ERP, Scheduling and Warehouse Management software, visit our website or call one of our team on **0845 345 3300**.

Working with Access Group

"Our customers value what we do because of our practical approach. We might be a software company, but our team are not nerds – many of them have worked in manufacturing themselves and understand the challenges you face. We're also a UK-based company that writes its own software, providing continuous support to clients. Our software is quick to implement so that you see the return-on-investment.

**- Zaeem Batavia,
WMS Consultant at Access Group**