

Harnessing the Power of Industry 4.0

How European manufacturers
can make the most of the
fourth industrial revolution

INTRODUCTION

Setting the Scene in EMEA

Why we must seize the opportunity to transform European manufacturing with both hands

European manufacturing stands on the edge of an industry-defining shift.

Speak to any decision-maker in the industry and they'll tell you 2023 is proving a challenging year. Rising costs of production, rapidly shifting customer demands, increased product complexity and ever-mounting economic competition from the US and China mean decision-makers need new ways to drive efficiency to retain their competitive edge.

The need for agility and personalisation in manufacturing processes has never been so important. The constant feedback and improvement environment created by subscription-based consumer models means we all now expect more customised, sustainable, and better-quality products than ever before. And thanks to delivery giants like Amazon, we also expect them fast.

But challenge also breeds innovation and excellence. Increased competition has led to calls from France for a **'Made in Europe'** strategy to counteract some of the above issues and keep production in Europe as competitors like China and the US edge ahead.

Europe's factories are already showing they are more than willing to rise to the challenge. According to the **purchasing managers index**, manufacturing in Europe has already beaten economist's predictions by almost a full point for a third straight month.

But it'll take more than this to secure the long-term competitiveness of the industry in Europe.

As with so many major turning points in history, technology may well hold the answer. Decision makers are busy integrating new technologies such as Internet of Things (IoT), cloud computing and analytics, AI and machine learning and robotics throughout their operations.

We now have a huge opportunity in front of us – one which will guide the future of European

manufacturing. As early discussions around 'Industry 5.0' and what this may look like begin, it's vital we ensure we are all making the most of Industry 4.0. Many manufacturers are still very much on this transformation journey. Already, we're seeing Industry 4.0 help the most progressive and forward-thinking manufacturers weather the storm by:

- Empowering employees to make faster, more accurate, and more confident decisions
- Handing teams rich data and process-redefining technology
- Reducing burdens on team members and freeing up time for high-value work

61% of companies now report industry 4.0 as a competitive differentiator. Another 37% say that it will be in the future. It's no longer a question of whether Industry 4.0 will help manufacturers or not – it's how best to harness it today for a more productive and profitable tomorrow.

In offering higher customer satisfaction, stronger brand loyalty, and a competitive differentiation in the market, Industry 4.0 has become indispensable to a manufacturing business.

So, how can you harness its power best to empower your employees, revolutionise your way of working and remain competitive?

Every manufacturer will approach industry 4.0 from a unique starting point. Your journey, no matter where it begins, will require consultative partners who are dedicated to your business and your unique needs.

In this report, we'll unpack the basics of how you can make industry 4.0 a success for your business – including how to make the most of the latest tools, technologies and ways to support your employees.

Read on to discover how you can make the most of the fourth industrial revolution.

Industry 4.0 – The Technologies Defining an Era

The journey to Industry 4.0 so far...

The fourth industrial revolution is part of a long history of innovation. Yet each of these revolutions, while different in their own right, share one common trait – we still feel their effects to this very day.

The first industrial revolution

Where it all began. The first industrial revolution started in the late 18th century, ushering in an era of mass production by using water and steam power to replace human and animal power. Finished goods were built by machines instead of produced by hand.

The second industrial revolution

In the late 19th century, the second industrial revolution brought assembly lines and oil, gas and electric power. Coupled with more advanced communications via telephone and telegraph, this even brought a level of automation to our manufacturing processes.

The third industrial revolution

In more recent memory, the third industrial revolution added computers, more advanced telecommunications, and data analysis to manufacturing. The development of lean manufacturing to maximise productivity gave way to the digitisation of factories. Technology began to have a larger role automating processes and collecting shareable data.

The fourth industrial revolution

Where we are now (also known as 'Industry 4.0'). Smart factories are the defining feature of this revolution, characterised by increasing automation, smart machines, informed data to help create products more efficiently across the entire supply chain. Where tech amplified the effectiveness of the previous revolutions' breakthroughs, AI is now emerging to take this even further.

Though when we look back years from now, the revolution we find ourselves in today will ultimately be defined by transparency – the ability to understand the complete story of a manufacturing business from factory floor to shop window and everywhere in-between.

“The Fourth Industrial Revolution is still in its nascent state. But with the swift pace of change and disruption to business and society, the time to join in is now.”

- Gary Coleman, Global Industry and Senior Client Advisor, Deloitte Consulting

WHICH TECHNOLOGIES ARE AT THE HEART OF INDUSTRY 4.0?

No matter where you are on your own digital transformation/Industry 4.0 journey, you'll either already be using these technologies or will soon encounter them.

Internet of Things (IoT) – a series of devices embedded in everyday objects that allow them to send and receive data. Can also help spot malfunctions before they happen.

Cloud computing – the foundation of Industry 4.0. Cloud computing connects engineering, supply chain, production, sales and distribution, storing huge quantities of data.

AI and machine learning – allow manufacturers to take full advantage of their data across their business, including third-party sources. Machine learning can even help businesses perform predictive maintenance.

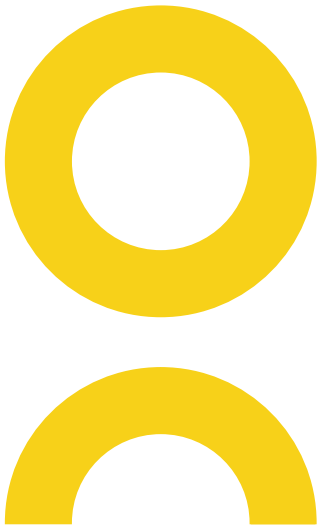
Edge computing – real-time production often demands analysis be done right at the point the data is created at. Edge computing means the detection of a safety or quality issue is possible in real-time action with the equipment.

Cybersecurity – the interconnectivity of a smart factory can also leave it vulnerable. Cybersecurity underpins the entire Industry 4.0 strategy, ensuring everything runs as smoothly as possible.

Robotics – used to carry out dangerous, repetitive, or mundane tasks in the manufacturing process – or those requiring exceptional precision, time and time again – allowing humans to focus time on value-add tasks.

Digital twins – digital twins are replicas of processes, production lines, factories, and supply chains. They are used to increase productivity, workflows, and to create new products.

CPQ software – allows manufacturing businesses to generate quotes quickly and accurately for orders with complete visibility over availability of materials and customisation options. Documents and data are automatically created at the right time with control over when tasks are processed.



HOW INDUSTRY 4.0 HAS CHANGED MANUFACTURING FOR THE BETTER

Industry 4.0 has permanently changed the face of manufacturing. From faster production to new and improved products and productivity, the fourth industrial revolution is leaving its mark just as much as its predecessors.

And it's well timed. Manufacturing customers are faced with near infinite combinations – size, colour, shape, function, and much more. This complexity brings with it the need for far greater oversight into the manufacturing process to help manage customer expectations.

Because of this, decision makers have been investing. This has led to:

- The prevalence of big data in the manufacturing process to help make decision-making faster and more accurate
- Integration of high-tech IoT devices creating higher productivity and improved quality of products
- Manual inspection business models being replaced with AI-powered visual insights to reduce manufacturing errors and save money and time

It's thanks to these technologies that fewer people are now having to spend time monitoring and maintaining complex and dangerous machinery. This means less room for human error, fewer accidents, and only using people where a human touch is going to add value.

Industry 4.0 is underpinning a boom in the level of customisation manufacturers can offer customers. This customisation is a point of competitive advantage for many, handing people the power of personalisation in a market historically known for its lack of variation.

Today's market is a far cry from Henry Ford's infamous quote, "any customer can have a car painted any colour he wants, so long as it's black." But with customisation comes complexity. Managing so many options can put a strain on those trying to keep track of them. Fortunately, this is where big data and systems such as CPQ and CRMs come in to lighten the load.

The prevalence of big data has allowed for more accurate demand forecasting, improving efficiency and real-time error processing – which leads naturally to fewer shutdowns, improved processes, and optimised facilities.

Ultimately, Industry 4.0 is bringing lower costs, reduced downtimes, less waste and increased customer and employee satisfaction, which can increase cashflow. It's little wonder that 60% of executives surveyed by **Deloitte** are now partnering with specialised tech companies to further their smart factory initiatives in the coming years.

As manufacturers strive to meet stringent ESG targets, Industry 4.0 is also allowing for greater tracking of output and improved efficiency, meaning less waste and a more trackable journey to net-zero.

“Today, manufacturing is changing faster than ever before and the drivers for this include globalization, individualization, time to market and sustainability.”

– Brian Holliday, Managing Director, Digital Factory

LAYING THE ‘GUARDRAILS’ FOR MANUFACTURING

Keeping European manufacturing competitive demands a better approach. Industry 4.0 can offer a single, unified and fully informed process not just on the factory floor, but across an entire business and potentially beyond.

Rather than a physical production line, we need to view the complete process as one long production line. Now is the time to lay down the guardrails of manufacturing – one singular process of rich data decision-making from the sales funnel to factory floor, to delivery.

These guardrails will create best practice. But what does best practice look like?

Step 1: a sales representative provides a quote to a customer, and moves towards the point-of-sale with the benefit of complete oversight of their business’ production capabilities thanks to CPQ software.

Step 2: a bill of materials is produced that tells operations and manufacturing exactly what needs to be built.



Step 3: an automated production line manufactures the product, all the while the customer and business have full visibility of the status of that product and expected time to completion/delivery time.

Step 4: the product is delivered to the customer in a timely fashion and without error thanks to the array of data that has informed the process from start to finish.

It's a simple process. However, we understand that there are also obstacles to making the switch to Industry 4.0. Namely, cost.

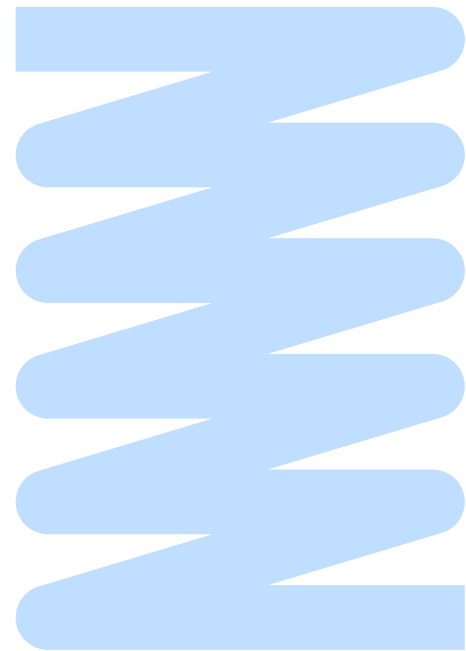
While the cost of transitioning to Industry 4.0 may feel high for some businesses, there is also the significant hidden cost of choosing not to make these changes. This is often called the cost of inaction (COI).

With or without investing, Industry 4.0 will come at a cost – either in the upfront investment to make the necessary changes, or in staying in the old ways that cause you to miss out on significant savings and fall behind your competitors. According to [Ericsson](#), deploying Industry 4.0 solutions can generate operational cost savings of up to 10x to 20x over five years. In contrast, the COI could be up to \$650 million over the same time period.

But Industry 4.0 goes beyond cost and into the realm of necessity.

It makes everything in your supply chain “smart” – from smart manufacturing and factories to smart warehousing and logistics. It doesn't stop at the supply chain. It inter-connects with back-end systems, like enterprise resource planning (ERP), to give companies and decision-makers an unprecedented level of visibility and control.

Ultimately, the technologies at the heart of Industry 4.0 have revolutionised, and continue to revolutionise, the way leading manufacturers are doing business. But the technology involved is only half the battle.



A Culture of Industry 4.0

Empowering employees to embrace a new age

Like the revolutions that came before it, Industry 4.0 is here to stay. Its success for your business now hinges on an often-overlooked element – culture. Namely, ensuring your team is both willing and prepared to embrace change.



Industry 4.0 is here to stay. Now, we must give people the tools they need to fully embrace it.

Even the most established manufacturers in the world can be guilty of running several disparate systems to do the same job – whether that’s multiple ERPs, swathes of old Excel spreadsheets, or other inefficiencies on the factory floor such as endless manual counting processes for taking inventory.

But these old and inefficient processes are also familiar and comfortable. As a manufacturing decision-maker, you can move your systems on from the old ways of doing things – but what about your people?

The truth is that familiar manual processes come at a price . This price includes the risk of human error, the additional time it takes vs. an automated alternative, and the effects of a monotonous process of employee enthusiasm and wellbeing. In the worst case, this can make employees more likely to leave for more engaging work.

A little discomfort around new tech seems a small price to pay in the face of the above.

Automation, data, and robotics are founded on the principles of uniform precision. And it’s this uniformity which has made the manufacturing playing field much more level. Gaining the competitive edge will now come down to how effective employees can be at using these technologies and processes.

Digital transformation is only possible when the entire business aligns with a digital strategy. Research from **McKinsey** found only 16% of respondents say their organisations' digital transformation have successfully improved performance and equipped them for the long term.

This isn't due to the quality of the technology, but the quality of its adoption and usage. Several factors affect a business' willingness to embrace change:

- The size of the manufacturer
- Their core business principles
- The company's maturity and that of its ownership. Are they getting ready to retire? Are they looking forward?
- Tradition and the willingness to overcome it

WHY SKILLS ARE YOUR SECRET WEAPON IN INDUSTRY 4.0

A recent study by **Deloitte** predicts 2.1 million manufacturing positions could go unfulfilled by 2021. Addressing the manufacturing skills gap is a real issue for the industry.

Fortunately, the guardrails of Industry 4.0 mean employees no longer need decades of industry experience to be invaluable members of your team. Big data and set processes are eliminating the reliance on 'tribal knowledge', helping to alleviate the effects of the skills gap.

There's still work to be done. The UK government predicts a need for **169,000** new workers to enter the manufacturing sector before 2024 to meet demand. By increasing safety, efficiency and reducing the burden of repetitive tasks on humans, Industry 4.0 stands to create broader appeal for young people looking to enter the sector seeking more technology driven roles.

The skills required to work in manufacturing are moving away from manual intervention towards monitoring and exception handling. As technology becomes a helping hand for all employees, the tasks they're required to do are becoming more intellectually demanding and require the right skills and information to make better decisions.

“Every industrial revolution brings along a learning revolution.”

- Alexander De Croo, Prime Minister of Belgium

FIRST COME THE SKILLS, THEN COMES CONFIDENCE

Change is hard. When employees were asked to switch to computers from typewriters, it was met with resistance from a workforce that felt overwhelmed by complexity. Decades later, we can't fathom the complexity that working without computers would bring to our daily lives.

It all comes down to training and advocacy. Investing in your employees and their transition to Industry 4.0 technologies is the fastest way to ensure they feel confident in their use and to make them advocates for this change. Companies may also need to hire new types of employees, equipped with more analytical skills who understand how to interpret data and spot trends to inform decision-making.

SHAPING A FORWARD FOCUSED CULTURE

Training is a crucial step on the road to Industry 4.0. Yet effective adoption also comes down to your wider culture and the example you and your peers are setting internally. For a successful digital transformation to take place, you need to consider:

Leadership: embracing Industry 4.0 starts from the top. The C-suite needs to model innovation in the way they do their jobs every day and staff communications must encourage widespread adoption of new tech and processes. Consider performance incentives around adoption, such as a leaderboard with performance objectives to encourage technology adoption and offering bonuses to those employees exceeding these objectives of use.

Measurement: set clear KPIs on what success looks like and measure them before and after adoption, clearly communicating improvements to your entire company. Consider factors such as how long goods take to manufacture, average equipment downtime, time-to-quote, time-to-delivery and more. This not only aids your ROI reporting, it also helps you demonstrate to employees the effectiveness of Industry 4.0 in a tangible way.

Beyond hard KPIs, decision-makers should also consider what soft skills they can measure – innovation and creative-problem solving must be rewarded. Make time for innovation and your employees will make time for change.

Culture: an expense isn't just measured in pounds, euros and dollars, it's the time it takes to put new systems in place and get them working to their full potential. This will take time and trial and error. At first, employees may try to do things in the 'old way' with new equipment.

Be tolerant of mistakes when adopting new systems. And make sure their voices are heard when considering new ways of working. Creating a culture of acceptance and transparency will allow your employees to feel comfortable enough to embrace change.

Big Transformation, Manageable Steps

The world didn't switch to steam power in a day. Machinery didn't take the industry by storm overnight. And Industry 4.0 will be just the same.

European manufacturing isn't alone in the challenges associated with transitioning to a new way of working. This is a global challenge. Yet for Europe, this is also an opportunity for manufacturers to set the standard for the rest of the world to follow and retain the competitive edge.

By combining the right approach to technology with the right approach to leadership, culture, and measurement, European manufacturers can reap the benefits of Industry 4.0. Namely:

- Faster production
- Higher quality products
- Informed decision-making based on rich data
- More accurate and efficient processes
- One singular, measurable approach from the front office to factory floor

Digital transformation can feel like a large undertaking. Budgets aren't limitless and change takes time. But by taking small, measurable steps to implement quick wins along the way, a digitally enabled process from start to finish is well within reach for manufacturers.

And it's a necessary reach. The changes sweeping the manufacturing industry will leave those unwilling to change existing on borrowed time. As competitors embrace change, it becomes a case of evolve or fall behind.

From the days of labourers manually pulling a car down a production line to the robotic lines of today, manufacturing has been on an incredible journey – and still is. The future is bright for the industry if we continue to embrace change.

So, what can you do next?





MAKING THE CHANCE

No matter the size of the transformation you're considering, it's important to do some initial analysis with specialists in different areas of your business to evaluate the entire workflow. Engineers will need to work with management and I.T. system specialists to identify key areas to upgrade. Your plan should consider optimising processes, increasing sales, reducing costs, and saving time throughout the manufacturing process.

Whatever stage your organisation is at in its digital transformation journey, our team of experts can help you create a crucial part of that single process across your organisation – equipping your teams with the right data, so that no matter how a customer comes to you, your people will have everything they need to ensure that customer receives a unified and positive experience.

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in making the complex simple.**

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