



Harnessing Brexit, Technology and Insight

British manufacturers; maintaining a competitive edge
in an age of uncertainty & opportunity





Foreword by Ian Dowd

Chief Marketing Officer, SSG Insight

The UK and its manufacturing sector is going through a defining, disruptive period in history. With Brexit on the horizon, businesses are faced with the short-term uncertainties posed by political and macro-economic events, whilst needing to harness phenomenal technological developments and digitally transform.

It's therefore a timely moment for SSG Insight to partner with academic industry experts from Sheffield Hallam University and commission this extensive piece of research among the UK's leading manufacturing executives, to understand their optimism and concern around two of the most critical challenges facing modern Britain: Brexit, and the relentless rise of technology - particularly in the form of Industry 4.0.

The results were concerning and, in many cases, surprising. They did, however, give hope and insight into this most adaptable and resilient of sectors.

The following paper examines these findings and explores the state of play and how British manufacturers can retain a competitive edge in an age of uncertainty and opportunity.

In this paper you will:

- Understand the biggest challenges facing British manufacturers
- Uncover the potential impacts of Brexit on the manufacturing industry
- Gain a global view of Brexit
- Learn what international business leaders are doing to address Industry 4.0
- View exclusive survey data to help you plan for the future

The paper will specifically consider the impacts of Brexit and Industry 4.0 on:

- Customer orders
- The supply chain
- Employment
- Investment
- Global competition



Introduction

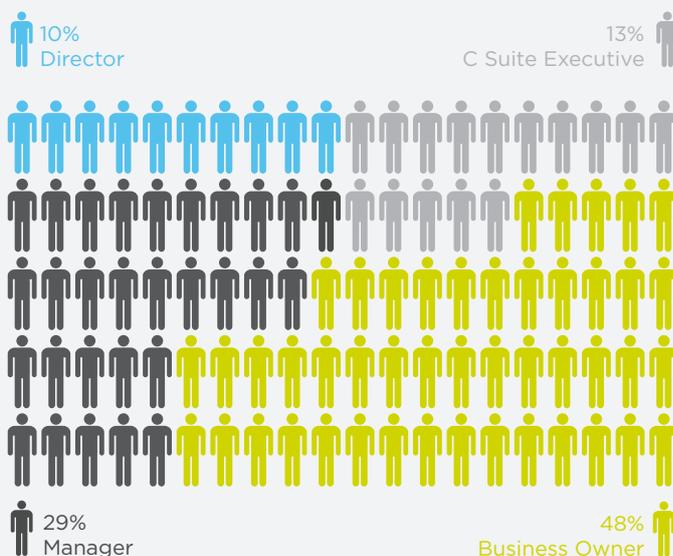
When the United Kingdom (UK) voted to leave the European Union (EU) in June 2016, it triggered an era of turbulence and complex questions that has led to huge disruption for UK business. As the government negotiates its terms for exiting the Union, the most important issues are yet to be resolved which leaves UK PLC in a position of extreme uncertainty.

Britain will be the first country to leave the EU – will it still trade freely with its European counterparts? A market that has developed over 40 years, with tangled relationships and long held agreements. Supply lines, logistics and laws have evolved to deliver often fruitful yet sometimes frustrating outcomes.

Maybe not since the industrial revolution has UK manufacturing been faced with such an extreme set of circumstances. The need for manufacturers to embrace new and important technologies in order to compete has meant that the UK manufacturing sector has never faced more disruption than it does today. Manufacturers must not only get to grips with the explosion of innovation, but they must also ensure that their workforces are sufficiently trained and 'au fait' with a plethora of new opportunities in order to maximise the potential that currently presents itself.

Whilst the UK has been grappling with Brexit, the Rest of the World has focused on 'weaponising' its manufacturing through technology. Britain may now need to re-focus its firepower in order to compete and maximise the opportunities that trading with the Rest of the World could bring.

Research Participants Job Level



Whilst the UK has been grappling with Brexit, the Rest of the World has focused on 'weaponising' its manufacturing through technology.



UK manufacturing – hugely important to the British economy and sense of heritage

Although manufacturing makes up only 10 per cent of the UK economy, the sector accounts for 44 per cent of UK trade. According to the research, 81 per cent of British manufacturers expect their orders from EU countries to reduce as a result of the UK leaving the European Union. This is extremely concerning and could have a huge impact on the UK's economy overall. Britain's manufacturing is broken down into several different subsectors ranging in size and complexity.

The UK has huge expertise in many of the world's most precise, highly skilled and desirable industries. Any decline in these areas could have a lasting legacy on ongoing skills, knowledge, trade relations as well as GDP.

The automotive industry – a specific set of issues

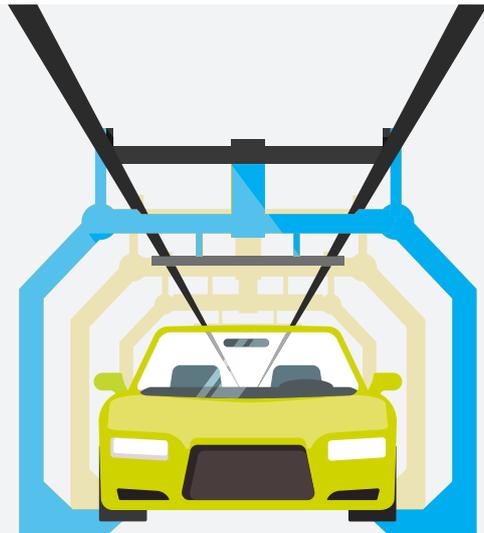
Certain manufacturing industries are likely to be less resilient than others in post-Brexit Britain. Where the Brexit reaction has appeared less detrimental for the pharmaceutical and biotech industries, which are not highly sensitive to macro-economic and financial uncertainties, the automotive industry is far more exposed and likely to be hit harder by a no-deal Brexit scenario.

It is anticipated that car sales will slow by up to ten per cent due to tariffs and disrupted supply chains. 24 per cent of manufacturers said this has placed a question mark over the future of many manufacturing jobs.

There are currently no import tariffs in place, but HSBC estimates that if EU components are imported at an average rate of 4.5 per cent it will cost the UK car industry between £350million and £875million a year. 17 per cent of manufacturers anticipate their supply chains to be impacted by Brexit, with the possible introduction of customs inspections and regulatory requirements, which will cause delays.

For the automotive industry, imported cars and components are expected to become more expensive for both consumer and industry alike. Only 40 per cent of the components needed to assemble UK cars are manufactured locally and the remaining 60 per cent come from elsewhere, mainly Germany.

This climate of uncertainty is also reflected by the reluctance of car manufacturers to make investment decisions and launch new vehicle models.



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Drawing inspiration from other models

The UK will need to either renegotiate its related regulations with the EU or adopt a new model to cope with the impact of Brexit on the manufacturing sector. It should draw inspiration from non-EU countries such as Norway, Turkey and Switzerland. Norway is closely associated with the Union through its membership of the European Economic Area (EEA) but retains control of certain sectors, such as farming and fishing. It accepts EU regulations while having little or no influence on them. On the other hand, the UK could adopt Turkey's relationship with EU through a customs union and have full access for limited goods and services. Switzerland's position is somewhat complicated and based on a number of bilateral agreements. Leaving the EU without a deal would mean reverting to WTO (World Trade Organisation) rules, and this is widely considered the most economically disruptive option: a hard Brexit. The impact would be immediate with tariffs applied to all imports.

EU support versus uncertainty

The research reveals that only 20% of manufacturers expect their budgets to be under greater pressure as a result of the UK leaving the EU. This is likely due to the lifting of EU restrictions and rules on UK funding. Although most funding from the European Union will be revoked for UK companies after Brexit, this will not necessarily adversely affect the subsidies that are provided to industry by the UK government.

It is anticipated that Brexit will lead to manufacturers needing to deal with a divergence in standards and legislation between the UK and EU – in addition to the potentially new, complicated trading arrangements with other EU countries. The EU removes tariff barriers between its members, negotiates free trade deals on behalf of all members, and imposes a common external tariff on those it doesn't have a trade deal with. There is a question over whether the UK will have the same influence on these issues once it leaves the customs union.

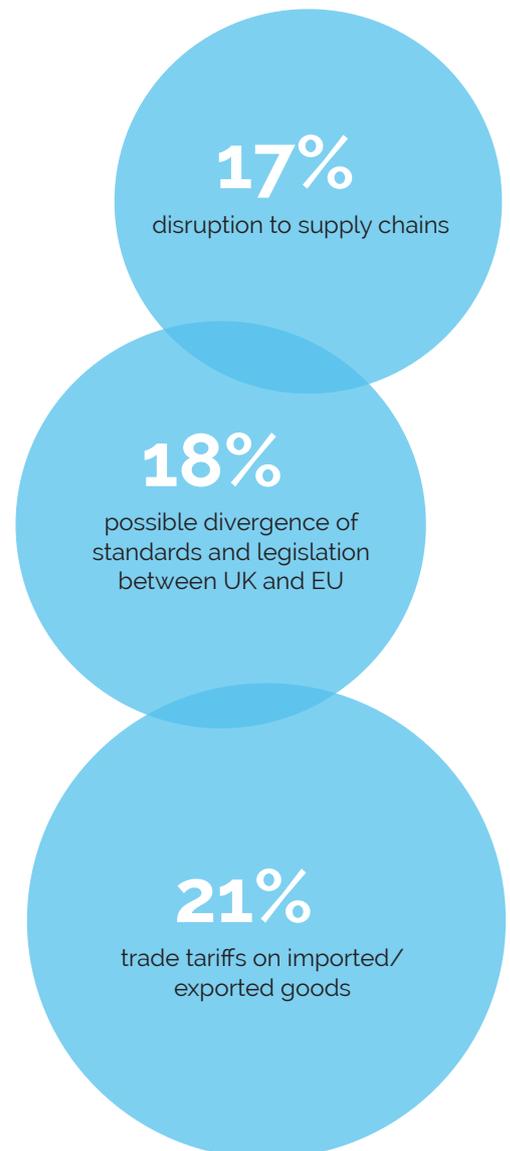
It is expected that if an agreement is not reached on future trading after Brexit, WTO rules will be applied between the UK and EU. As the WTO grants most favoured nation (MFN) status to its members, exports to the EU would be subject to the same customs checks, tariffs and regulatory barriers that the UK and EU currently charge on trade with countries such as the United States. The UK's exports to the EU and other WTO members would also be subject to the importing countries' MFN tariffs.

The imposition of tariffs on trade with the EU will not only increase costs for UK exporters, but will also affect UK consumers. For instance, high EU tariffs and quotas on agriculture could result in significant food price inflation. Although the average EU tariff rate is low – at around 1.5 per cent – the impact at a sectoral level will be much greater.

Preparing for Brexit

Despite this negative outlook, the UK is entering a new era with perhaps greater market opportunities and supply networks worldwide. Armed with the right tools to deliver comprehensive insights and decision-making clarity, UK manufacturing can create opportunity out of uncertainty in this increasingly complex and diverse landscape. As Europe becomes a less obvious choice, a 'fleet of foot' approach will become crucial as the UK enters new, largely untested markets. Having clarity and a greater understanding of strengths and weaknesses will help manufacturing businesses to mitigate the unknowns of these new markets and potentially capitalise on the new opportunities.

What factors will have the biggest impact on your business post-Brexit?





New markets, new opportunities, new uncertainties

In preparation for BREXIT, are you already taking steps to develop your relationships in any of the following territories?



The Rest of the World, enormous possibilities for the UK's expertise

A prevailing view is that UK businesses in general will enjoy greater flexibility to trade with lower-cost suppliers from countries like China. 83 per cent of British manufacturers are preparing for a hard Brexit by actively forging new relationships with Rest of the World territories, primarily in Asia (44 per cent), but also the Americas (12 per cent), Africa (5 per cent) and the Middle East (4 per cent). Unsurprisingly, 67 per cent of manufacturers have started to develop relationships with UK domestic businesses. However, the research also reveals that a similar number (62 per cent) will continue to work with companies in the EU irrespective of the current Brexit uncertainties.

The challenges of uncharted waters

As the adage goes 'with greater opportunity comes greater risk'. The research reveals UK manufacturers anticipate that developing relationships in Asia will be challenging due to cultural and language barriers, as well as a potential lack of standards and specifications and the absence of clear frameworks for trade agreements. The UK government should proactively provide legal certainty on these issues as soon as possible and assist manufacturers to prepare for this monumental shift in operations. The manufacturers that plan for the most disruptive Brexit outcome – by systematically evaluating business risks and opportunities, defining tactics, and closely monitoring the macro environment – will mitigate the immediate structural changes triggered by leaving the EU.

The manufacturers that plan for the most disruptive Brexit outcome... will mitigate the immediate structural changes triggered by leaving the EU



New markets, new opportunities,
new uncertainties

In the event of
a hard BREXIT
(no future
trade deal
agreed)
do you expect
to employ?



A shrinking talent pool from the EU

There are fears that manufacturing production will be affected by a widespread labour skills shortage triggered by Brexit. However reports in the British news have suggested that the rate of EU workers leaving the UK has now eased. Despite reported drops in applications from EU nationals, the research reveals that two thirds of British manufacturers still expect to employ more people in the event of a hard Brexit. Although small manufacturers are unlikely to expand after Brexit, with only 11 per cent planning to hire more people, 80 per cent of businesses with 250-500 employees have intentions to grow their workforce, as do 70 per cent of manufacturers with up to 1,000 employees. Despite the absolute uncertainties that Brexit presents, there is a bullishness amongst manufacturers and 23 per cent have indicated that they will prioritise investment in people to futureproof their business.

Beyond Brexit

The ambiguity and complexity of Brexit is having an unsettling impact on UK manufacturers. But the research indicates that increased competition globally is causing the greatest disruption to the manufacturing sector in Britain today. Businesses recognise the strategic risk that Brexit poses, however they are more than twice as likely to point to global competition and the role of data and connected technologies, such as the Internet of Things, when asked what they consider to be the single biggest challenge they face.

Whilst the UK is focused on Brexit, the Rest of the World is forging ahead with its own agenda – including the adoption of new technology and embracing innovation.

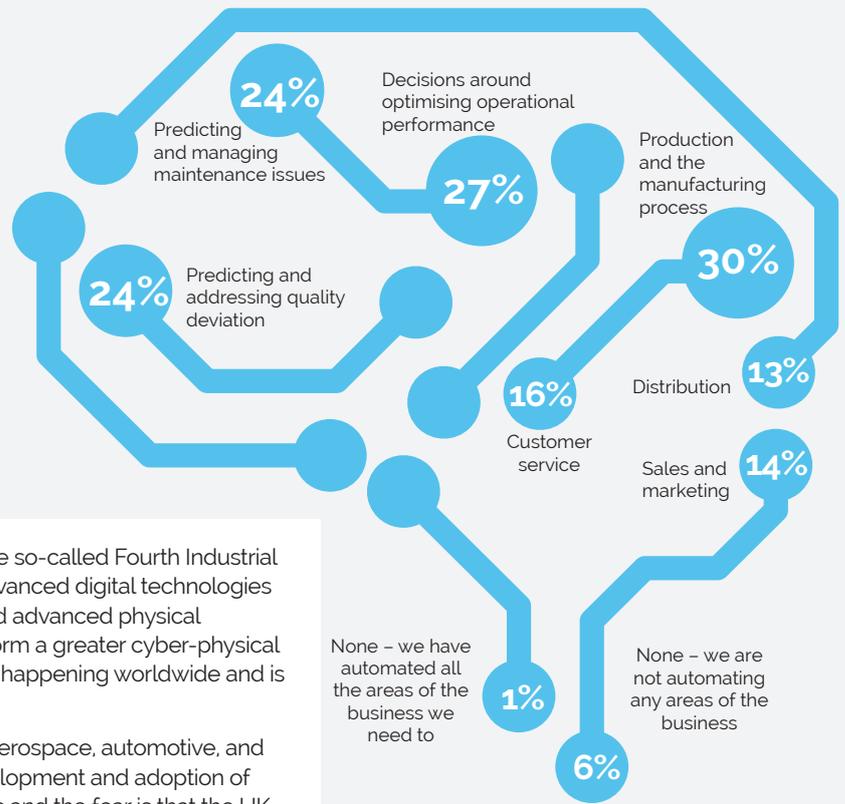
If British manufacturers are to thrive in this new trading environment, they need to harness the best that technology has to offer, in line with their potential new trading partners.

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Innovation at the heart of a global strategy: Industry 4.0 in action

Which areas of your business do you plan to automate with the help of Artificial Intelligence in the next three years?



There has been a lot of buzz about Industry 4.0, or the so-called Fourth Industrial Revolution (4IR), in recent years. It brings together advanced digital technologies – from the Internet of Things to cloud computing, and advanced physical technologies such as automation and robotics – to form a greater cyber-physical system. There is no doubt that Industry 4.0 is already happening worldwide and is significantly affecting UK manufacturing.

Although 4IR is occurring in pockets of the sector – aerospace, automotive, and the food and drink industry have supported the development and adoption of technologies – it is not consistent across all industries and the fear is that the UK is already falling behind major manufacturing countries in Europe and worldwide. This rapid acceleration of technological innovation promises to lead to increased productivity, improved quality, shortened cycle times, better data analysis, increased competitiveness and lower manufacturing costs. It is seen as the single biggest challenge disrupting the manufacturing industry today. Therefore, the question remains, is the UK manufacturing sector prepared to fully embrace the new technology, especially in the context of post-Brexit Britain?

Brexit to accelerate British manufacturers' Industry 4.0 readiness

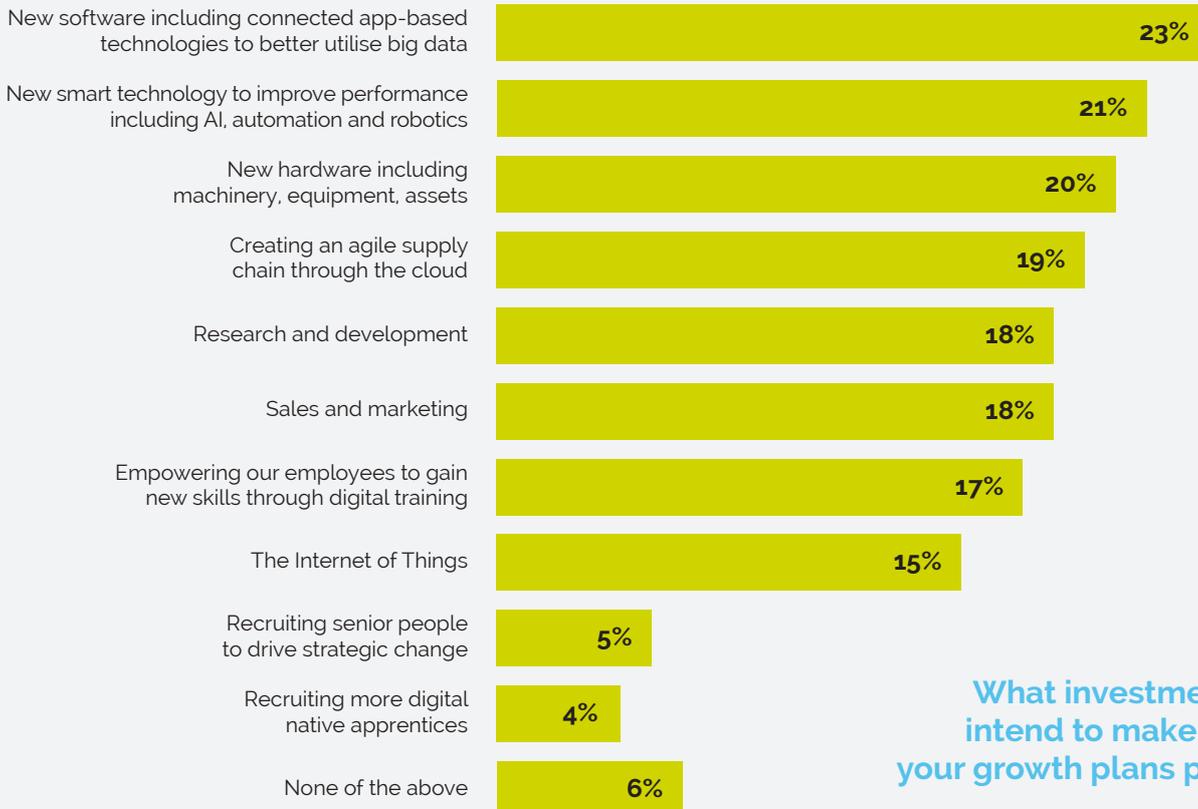
According to the research, the majority of manufacturers expect Brexit to accelerate the use of artificial intelligence (AI) and automation technology – as a means of scaling up volume easily to meet demand from the Rest of the World territories. The technology is also expected to help drive down the cost of production to help compete on price globally, and to efficiently adapt and develop new products for new markets.

More than half – 59 per cent – of UK manufacturers intend to invest in smart technology to support growth plans post-Brexit. This includes new smart technology to improve performance (such as AI, automation and robotics) and new software and connected app-based technologies for organisations to better utilise big data. This compares with 20 per cent investing in machinery and hardware, 18 per cent investing in research and development, and 17 per cent investing in sales and marketing.

Whilst it is pleasing to see that many UK manufacturers have already realised the value of technologies and are committed to embrace these developments, it is more important that they choose the right technology and right moment to invest. Technology needs to solve an identified problem in an efficient and effective way. The appropriate moment is when the investment fits with the business strategy to provide a competitive edge for the organisation.



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What investments do you intend to make to support your growth plans post Brexit?

Skills gap – a warning to the industry

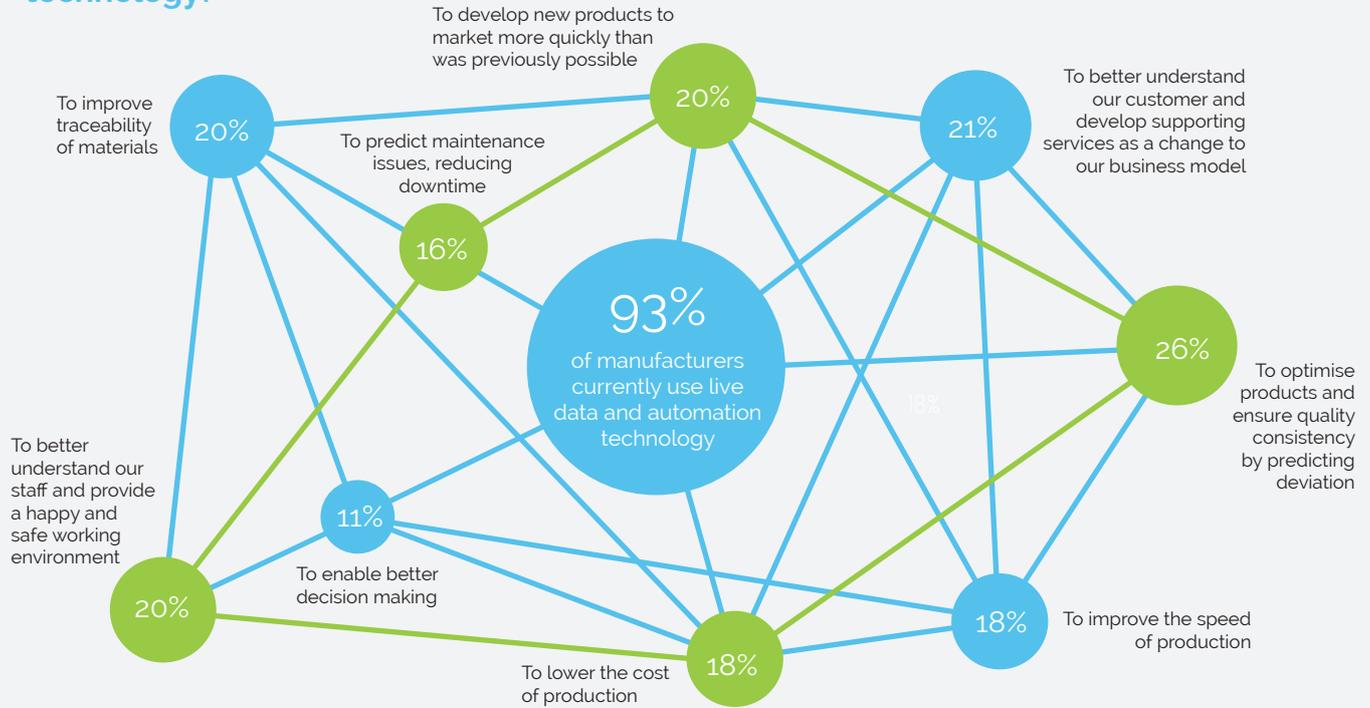
When it comes to growth it is not only machines that will drive success. Skilled staff are a crucial component. However, the research has revealed there is a clear contradiction between businesses investing in digital technology to support their growth strategy and a lack of intent to invest in upskilling existing employees, or employing digital natives, to deliver that digital transformation. This could be a catalyst for future problems because it has been identified that a lack of specialist staff, and training and developing the existing workforce are two of the largest challenges in the implementation of Industry 4.0.

The manufacturing sector is shifting to become a highly skilled white-collar profession, from a workforce that was once predominantly made up of blue-collar staff. For instance, 3D printing requires skilled engineers to design and manufacture shapes rather than an assembly line of workers. It is also becoming cheaper, and less time and materials are required to produce complex designs.

It is crucial to balance investment in people with investment in tech. Adopting new technology will naturally mean that the necessary skills to implement and maintain it will need to evolve. There is already a global shortage of professionals with technical digital and IT skills, so hiring new talent is only a partial solution. Reskilling the existing workforce through continuous learning and skills development will be key to all manufacturing organisations. Schools, colleges and universities have an important role to play, promoting STEM subjects and integrating digital learning into the national curriculum and higher education courses. Teachers, academics and careers advisors need to champion tech amongst students and advance their knowledge and skills so that innovation in the workforce is nurtured and the digital demands of the changing economic landscape can be met.



How are you currently using live data and/or automation technology?

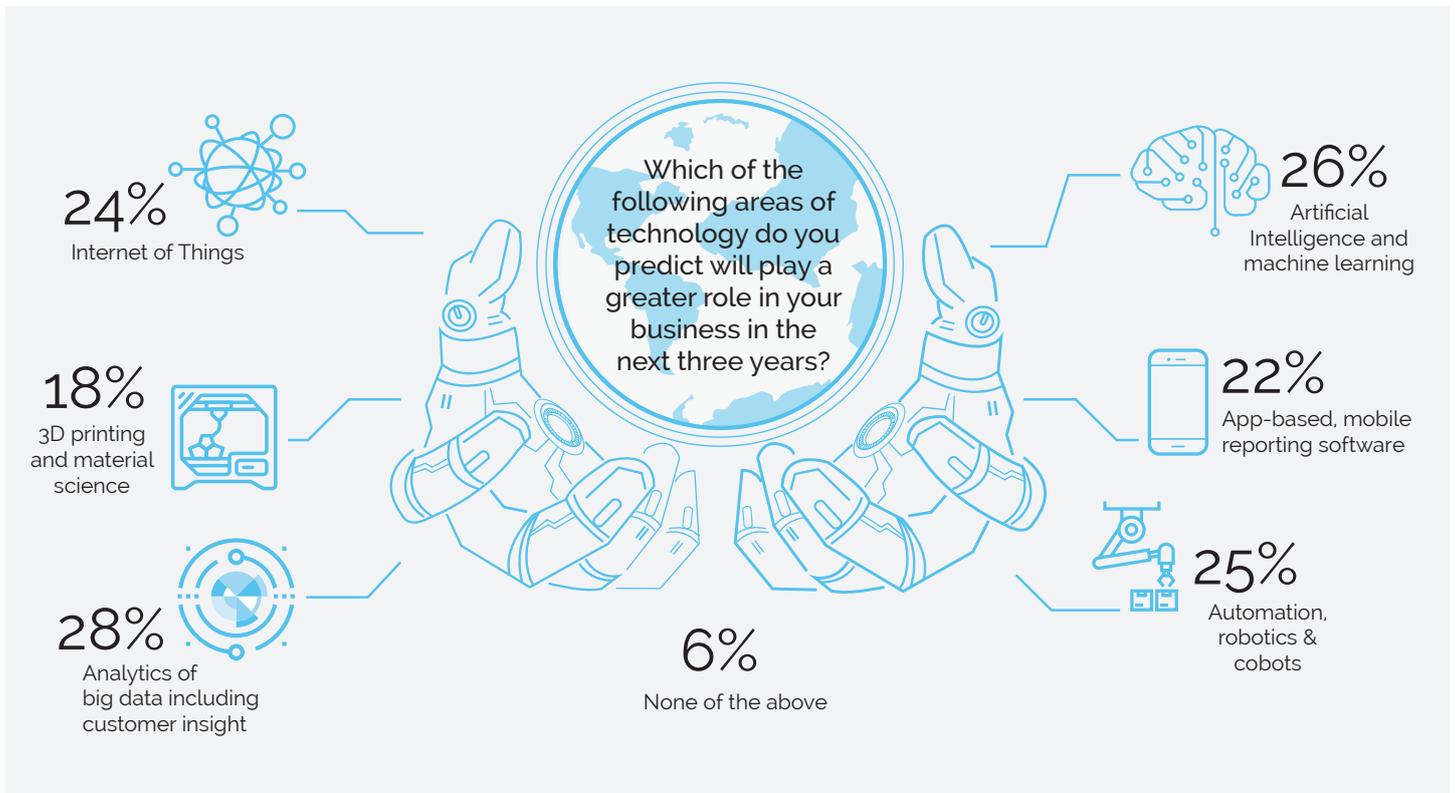


The state of play

Despite the majority of manufacturers making investments in technology, only a third consider that there is room for improvement in the way their business is run. Manufacturers of different sizes have varying perceptions of how well they manage their assets, people and processes.

80 per cent of mid to large organisations, employing over 1,000 people, admit there is more that needs to be done to digitally transform and operate more efficiently. The majority of smaller companies, employing fewer than 500 people, believe their operations to be optimally run. This could be because UK-based SMEs are often operating in niche, or even bespoke, markets with less competition globally, and therefore the need to improve efficiency doesn't seem to be imminent. Or it could be simply due to a lack of understanding of the technology that's available and how it can deliver greater productivity and efficiency. Many larger manufacturers have an appreciation for how they can benefit from embracing technology, through research and development and investment in digital infrastructure. It is not necessarily the case that these organisations are looking to adopt the latest, newest tech to get ahead, but would rather integrate software and systems that have been validated by competitors in the industry. Larger manufacturers are more likely to adopt tech to satisfy the demands of their customers, and to ensure their products are of better quality, lower cost and more readily available in the global marketplace.

Larger manufacturers are more likely to adopt tech to satisfy the demands of their customers



Moving forward with technology

New technologies in data analytics, AI and machine learning, and the Internet of Things have received deserved attention from British manufacturers. Investing in digital technologies will help businesses to better understand the value of their products, respond faster to changes and make better decisions.

According to the research, around a third of British manufacturing is expected to be automated in the next three years. But only 12 per cent of manufacturers expect to automate up to 50 per cent of their business.

The research suggests that support functions such as sales and marketing, distribution and customer service are less likely to be automated.

It is evident that through Industry 4.0, automation and robotics have found new momentum within the manufacturing industry. They are reshaping the ever-changing landscape of manufacturing processes for improved efficiency, lower costs and increased productivity. The outdated manufacturing processes will be redefined by new kinds of automated systems, which will allow companies to remove employees from automated areas of their operations. As an example, with their intelligent peripheries, collaborative robots (cobots) are able to handle new kinds of applications and tasks which haven't been automated before and have the capability to transform manufacturing even further – perhaps into Industry 5.0 which has been claimed by many as already being on the horizon.

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Conclusion

British manufacturers have undeniably faced tough economic times in the past, but they are now at a critical juncture. Brexit presents opportunities as well as threats, and companies must consider their future routes to market and lines of communication. The UK is entering a new era and, whilst a question mark hangs over tariff rates and regulatory barriers, there are now new market opportunities and supply networks worldwide. A confidence is emerging from the uncertainty, and the research has found that many UK manufacturers are actively forging new relationships with Rest of the World territories.

The ambiguity of Brexit is having an unsettling impact on UK manufacturers, but it could also be the catalyst for businesses to transform in a positive way. The rapid acceleration of technology is seen as the biggest challenge disrupting the manufacturing industry today, but it also presents the greatest opportunity. Technological advances have paved the way for manufacturers to boost productivity, operate more efficiently, reduce waste and costs, and respond more effectively to consumer demand. The adoption of technologies such as AI, robotics, automation and 3D printing, as well as innovative data management, will ensure British manufacturers can reap the benefits of Industry 4.0 and become more globally competitive. But as the pace of change accelerates, the gap between supply and demand for the right workforce skills is expected to widen. Whilst Industry 4.0 presents an unprecedented opportunity to revitalise the UK manufacturing sector and position it as a global centre of excellence, it is crucial that manufacturers develop strategies for continuous upskilling of their employees to keep pace with technological innovation.





Authors



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Jon Moody is the Chief Product Officer of SSG Insight, a software and services company helping organisations manage resources, improve performance and make better business decisions.

He has 25 years' experience in the tech industry and a passion for agile and lean methods of working. Jon rose through the ranks of Science Warehouse to become Product and Technology Director, until he joined SSG Insight in 2016.

His interest in technology is based on the value that it can bring to a business. Jon's experience with Microservices and DevOps is driven by the desire to increase process efficiency, improve quality and get the right product in front of customers as quickly as possible.

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He has published over 150 articles in various national and international academic journals and conferences, including keynote addresses a book and four patents. He also received the Emerald Award of Excellence twice for some of his publications.



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