

The Fourth Industrial Revolution

Opportunity and risk for manufacturers

By Lisa Birch, Howden





What to expect

The world is about to embark on the next industrial revolution, inviting intrigue and scepticism from the manufacturing and insurance industry.

As a quick re-cap, the UK has seen three industrial revolutions over the last three hundred years. In the first revolution, mechanisation transformed the textile and agriculture industries; the second revolution saw the emergence of new energy sources such as electricity, oil and gas; and the third revolution was digital, led by the invention of computers. The fourth revolution, coined '4IR', promises to overhaul manufacturing and insurance over the next decade with a heady mix of big data, virtual worlds and technology.

From robots to blockchain, wearable gadgets to 3D printing, the Internet of Things to driverless cars, and gene editing to artificial intelligence, the world is set to change with many experts predicting it will happen at a ferocious pace.

A report by Make UK, the manufacturers' organisation, suggests almost 70 per cent of manufacturers believe the latest revolution will happen faster than previous changes in the industry – with 80 per cent saying it will be a business reality by 2025.

It is not surprising then, that companies have urged the government to ensure the country is ready for what lies ahead by putting a supportive industrial strategy in place. Politicians have been quick to react because they see an opportunity for the UK to be at the forefront of a global industrial wave which could have major economic consequences.

Momentum is building. The government backed this year's Industry 4.0 Summit which will return

¹ <https://www.eef.org.uk/resources-and-knowledge/research-and-intelligence/industry-reports/the-4th-industrial-revolution-a-primer-for-manufacturers>

The challenge with 4IR is managing the risks which run alongside the opportunities. Whether that is insuring against the problems which arise from an ever-greater reliance on technology or protecting a business from an unpredictable market or even potential litigation.

to Manchester in March 2018. Lynne McGregor of *Innovate UK*² reported on the government's official website: "This fourth industrial revolution (4IR), or 'industry 4.0', has the potential to create impressive, new and sometimes unimaginable business opportunities for those who are innovative and agile."

The challenge, however, is managing the risks which run alongside those opportunities. Whether that is insuring against the problems which arise from an ever-greater reliance on technology or protecting a business from an unpredictable market or even potential litigation.

Much of the media focus so far has been driven by negatives, focusing on the loss of jobs as humans are replaced by machines in

the manufacturing chain. A report by Deloitte predicted more than a third of jobs are at high risk of automation in the next 10 to 20 years.³

Manufacturers appear to have a more positive outlook. Chris Richards, Head of Business Environment Policy at Make UK, said: "The benefits for manufacturing are pretty clear – smarter supply chains, smarter production, smarter products. So, if UK manufacturers can keep pace with change then there's a real opportunity to benefit from it.

There has been a lot of talk about robots but for manufacturers the fourth revolution is just as much about data and how it can link physical and cyber networks and provide real insights to boost productivity."

² <https://innovateuk.blog.gov.uk/2017/03/28/what-does-the-fourth-industrial-revolution-4ir-mean-for-uk-business/>

³ <https://www2.deloitte.com/uk/en/pages/public-sector/articles/state-of-the-state.html>

CHANGES AHEAD

Key technologies
expected to change
UK manufacturing



The Internet of Things

This technology allows machines to communicate with each other, enabling greater efficiencies in the manufacturing chain and vastly enhanced business intelligence. It will lead to the emergence of completely 'smart' factories where machines communicate their health and status in real time, vastly reducing 'down time'.

The financial impact of smart factories could be worth up to 3.7 trillion US dollars per year by 2025



Already, internet giant Intel has partnered with technology leaders such as ADLINK, Dell, IBM, PrismTech and SAS in a bid to provide a joined-up package to take full advantage of the technology.

According to estimates made by McKinsey, the financial impact of smart factories could be worth up to 3.7 trillion US dollars per year by 2025.⁴ More recently, Capgemini, in its

Smart Factories report, predicted a 27 per cent increase in manufacturing efficiency over the next five years, adding 500 billion USD to the global economy.⁵

The challenges for manufacturers, however, come from the huge spike in data created - as well as concerns about security, standardisation and interoperability.

⁴ http://www.mckinsey.com/~/media/McKinsey/Business%20Functions/McKinsey%20Digital/Our%20Insights/The%20Internet%20of%20Things%20The%20value%20of%20digitizing%20the%20physical%20world/Unlocking_the_potential_of_the_Internet_of_Things_Executive_summary.ashx

⁵ <https://www.capgemini.com/news/smart-factories-to-add-500-billion-to-the-global-economy-in-next-5-years>

Robotics and artificial intelligence

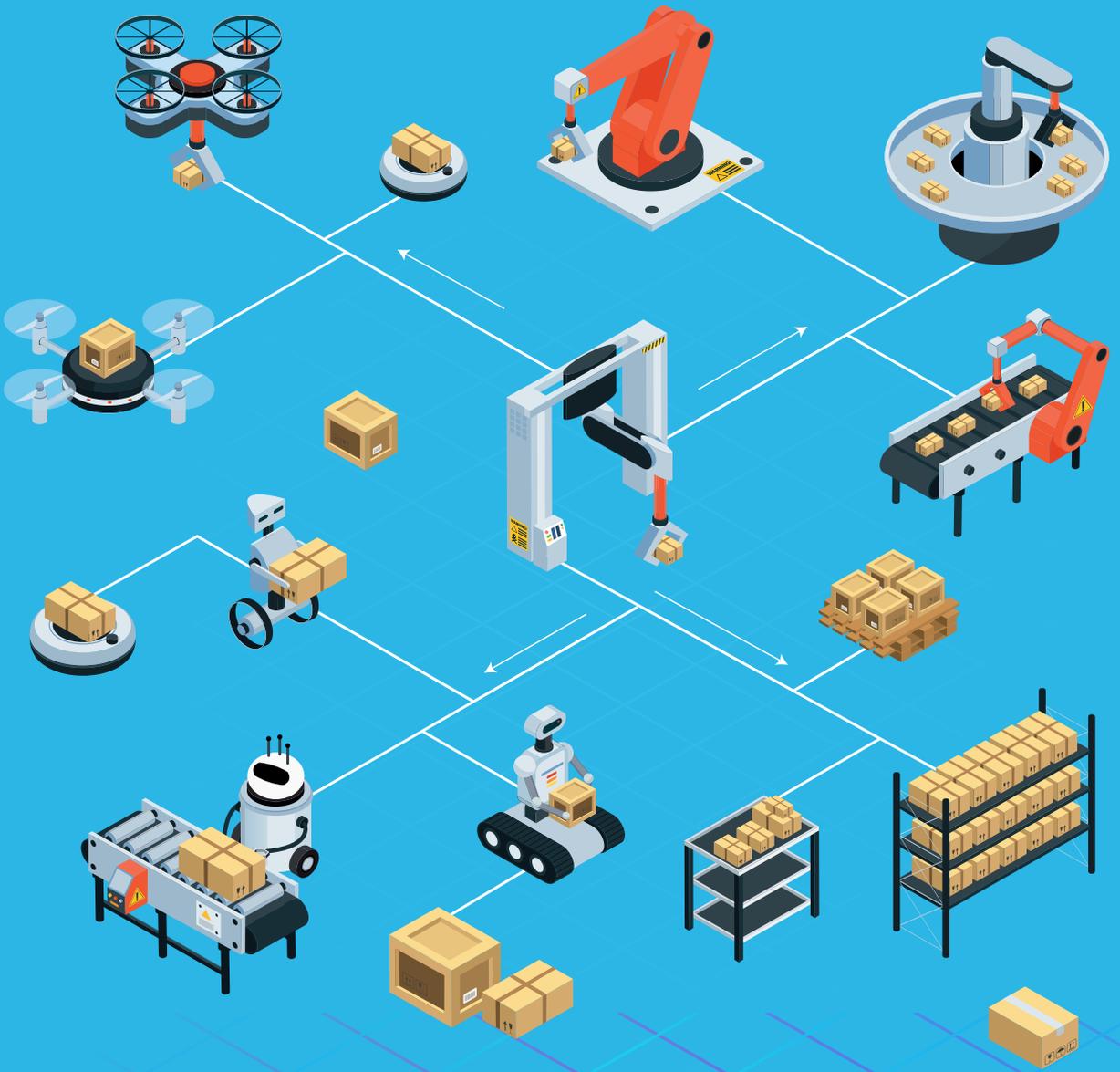
Once the exclusive preserve of science fiction films, the rise of the robot has been well documented. Sectors such as aerospace, defence, industrial manufacturing and automotive manufacturing, where people already work alongside intelligent machines, are leading the way – but other industries are now following suit.

New York based firm Construction Robotics, for instance, recently unveiled a robot called SAM (short for Semi-Automated Mason), which can lay 3,000 bricks a day and could change the face of the construction industry.

Whilst robots could take on the repetitive mundane tasks once completed by humans, it does not always mean fewer jobs. SAM, for instance, requires significant supervision and some commentators believe the number of indirect jobs created to support technology will eventually offset redundancies.

As robots are integrated into the workplace, the insurance challenge will come from a health and safety perspective, as well as business continuity issues, should technology fail or robots malfunction.





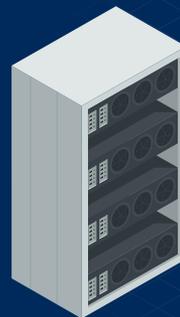
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Blockchain

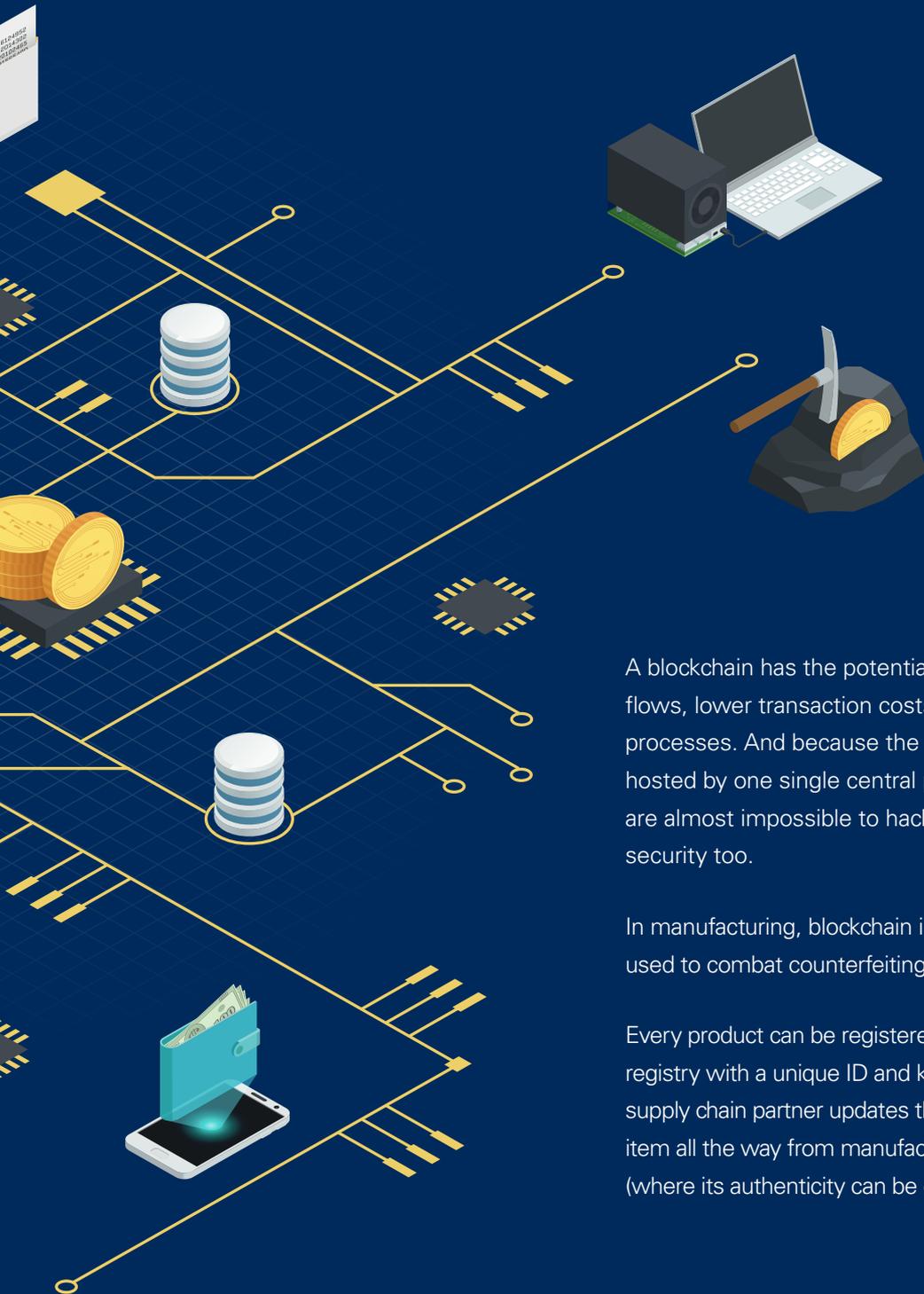
Blockchain technology is most famous for inspiring the bitcoin phenomenon but it is also predicted to revolutionise the product chain in manufacturing.

Essentially blockchain is a method of recording real time data, a digital ledger or spreadsheet for transactions, agreements or contracts which need to be independently recorded and verified.

What makes it different is that the ledger isn't stored in one place, it is distributed across a community of computers all over the world. Everyone in the network can have access to an up-to-date version of the ledger, making it transparent. Once the ledger is updated it cannot be altered or tampered with, only updated again.



A blockchain has the potential to free up capital flows, lower transaction costs and speed up processes.



A blockchain has the potential to free up capital flows, lower transaction costs and speed up processes. And because the ledgers are not hosted by one single central processor they are almost impossible to hack, increasing security too.

In manufacturing, blockchain is already being used to combat counterfeiting and pirated goods.

Every product can be registered on the blockchain registry with a unique ID and key attributes. Each supply chain partner updates the status of the item all the way from manufacture to point of sale (where its authenticity can be easily checked).

Online commerce giant Amazon aims to provide a service in the future where customers can go online to order a product, exactly to their specifications, and have it manufactured and delivered within an hour.

Chris Richards expects 3D printing to cause a few major problems for manufacturing. Whilst there is less data generated by this technology, there could be potential issues with intellectual property rights.

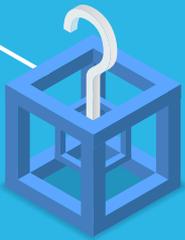
“This technology means it may become easier to copy and reproduce designs illegally,” he said. “Businesses will need to think about new ways of capturing value beyond just selling a product.”

This change from distribution to manufacturing, and manufacturing to designing will alter businesses’ liabilities and will need to ensure any changes are reviewed.

Struan Todd, cyber insurance expert from Howden, explains how these problems manifest in terms of insurance cover.

“From an insurance perspective, it will become more and more difficult to determine the catalyst for a loss, as well as the damage that is caused. The guidelines to ownership of intangible assets and who is responsible for their safekeeping, essentially who has rights to reimbursement, will continue to change as the technology used in modern society evolves and legislation adjusts accordingly.

In conjunction, the cyber insurance market has only recently come to grips with the notion that bodily injury and property damage emanating from a cyber breach is an inherent risk for many businesses. Taking these risks into account, along with the ever-changing technological landscape makes it very difficult for insurers to determine accurate pricing as well as their overall aggregate exposure.”



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Driverless cars

Advances in assisted driving technology and, ultimately, the arrival of driverless cars are predicted to lead to a dramatic reduction in both accidents and insurance premiums in the long-term.

A report by Thatcham Research, the insurance industry's research arm, estimates that insurance premiums could fall by as much as 50 per cent by 2025. This should be good news for businesses which run a commercial fleet and good news for manufacturers as there is a predicted increase in demand for vehicles that run on new technology.

The question still hotly debated is: who is liable for an accident in a car which drives itself? Speaking at an industry event on the subject in 2017 the chief executive of Volvo Cars, Håkan Samuelsson, became the first to say his company would accept liability if one of its driverless cars was in a collision where its technology was at fault. So far, no other company has followed suit but the move to driverless cars continues.

In the UK, the Modern Transport Bill outlines the route to driverless cars on Britain's roads in the future, and Nissan says it has already tested driverless cars in London.

The next possible step is legislation which will permit hands-off driving on the motorway for the first time as manufacturers offer systems that allow drivers to release the controls for a few minutes at a time.

In years to come, there is every expectation that driverless cars will allow drivers to read a book, check emails or watch a film, safe in the knowledge that the computer will look after everything for them. This, however, will require significant changes in the law and potentially big changes to the insurance system.

The possibility of computers being hacked, perhaps even by terrorists looking not just to disrupt journeys but to cause accidents by re-programming driverless cars, remains a concern and has not yet been addressed.

BIBA, the UK's leading general insurance intermediary organisation, has set out its priorities to the government in its 'Pathway to Driverless Cars' government consultation, and is working



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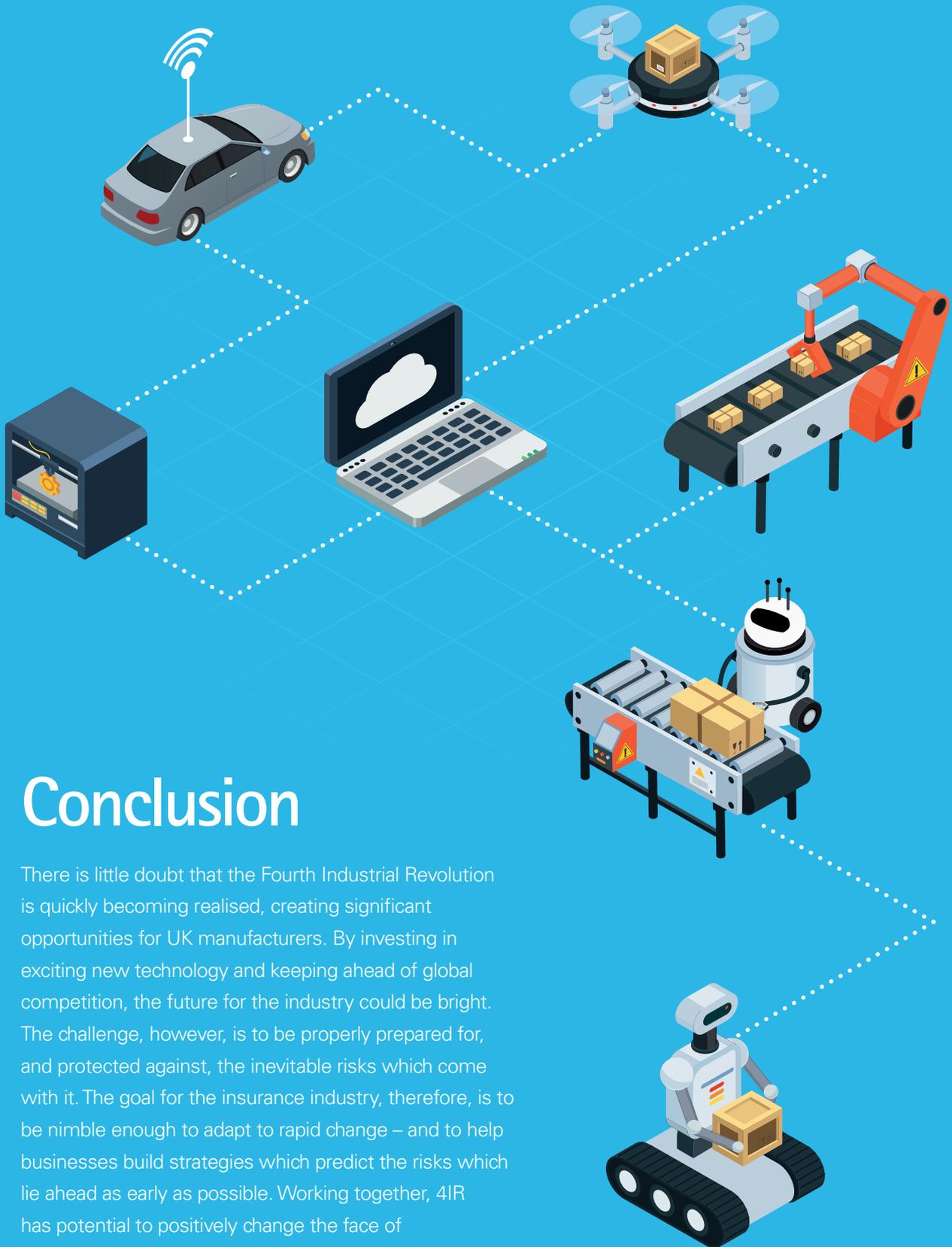
with the Department of Transport to ensure its members and their customers' requirements are met with four key priorities.⁶ This includes the development of a single seamless motor insurance policy that responds to losses by cyber attack and allowing insurers unrestricted access to autonomous vehicle data.

There is also some speculation that car manufacturers may make fundamental changes to their business model which will alter the insurance implications. Manufacturers will no

longer be selling cars through dealer networks but offer self-driving cars on a subscription/usage basis directly or through companies like Uber.

Struan Todd comments, "we have already seen Rolls Royce changing from selling plane engines to leasing them with a maintenance contract. That would mean big changes to the concept of ownership and 'insurable interest' for motor insurance liability and the need for insurance."

⁶ <https://www.biba.org.uk/press-releases/biba-priorities-for-driverless-cars-in-government-consultation-autonomous-vehicle/>



Conclusion

There is little doubt that the Fourth Industrial Revolution is quickly becoming realised, creating significant opportunities for UK manufacturers. By investing in exciting new technology and keeping ahead of global competition, the future for the industry could be bright. The challenge, however, is to be properly prepared for, and protected against, the inevitable risks which come with it. The goal for the insurance industry, therefore, is to be nimble enough to adapt to rapid change – and to help businesses build strategies which predict the risks which lie ahead as early as possible. Working together, 4IR has potential to positively change the face of British manufacturing.

Chris Richards, Head of Business Environment Policy at Make UK

How much is talk of the Fourth Industrial Revolution based on fact? Is there a possibility it is being over-hyped or is it on its way already?

What I can say based on our survey is that the Fourth Industrial Revolution definitely isn't hype – it's something our members believe is happening. In fact 80 per cent think it will be a reality by 2025 and almost all think it will be a good thing.

But perhaps the word revolution is too dramatic. We're looking at the conception phase at the moment and moving towards optimisation of existing technology. The revolution itself will come later.

There's an assumption that robots will have the biggest impact on manufacturing as more and more tasks on the production line become automated. Is that the key factor?

Robotics are already having a big impact on the industry, that's undeniable. But the real key is not the machines themselves but how we capture data insights and how we act on them.

The rise of robotics has been important in manufacturing but the real value of smart factories goes way beyond that. This will be a data-driven revolution.

So how quickly is all this going to happen?

Our members believe it will happen far quicker than previous revolutions but that doesn't mean it will happen overnight.

A high level of trust in the technology – and perhaps an entire change in company culture – is required to take full advantage of everything the

revolution can bring. Automated parts ordering, for instance. That kind of internal change doesn't happen quickly and needs to happen on the shop floor not just at management level.

Do you foresee any other complications or risk factors for businesses?

The interoperability of data platforms will be a more practical challenge in the early phase and there will be concerns, too, about cyber security.

Businesses need to think differently about protecting themselves in this field – because the risk could come from manipulation of data rather than the threat of it being stolen.

Machines depend on the data being fed into them. So what happens if that data is corrupted or deliberately altered? There is potential for serious disruption to the business.

Businesses will also need to think about the possibility of accidents as humans and robots interact. Automation doesn't guarantee safety – and that cannot be ignored.

What about risk factors around the data itself?

A vast amount of data is going to be created and managing it will be a challenge. Some of the big questions will be around who owns the machines and who owns the data they produce? Is it the company or the supplier?

But the real focus should be on the value that data can provide and how best to utilise it in both the manufacturing process and in the supply chain. There is potential for smart factories to vastly increase the efficiency of every process as technology moves on.



If you have a question or concern about the risk to your business please contact the Make UK Insurance team.

T 0800 048 8753

E enquiries@makeukinsurance.co.uk

W www.makeuk.org

About Make UK Insurance

Howden, Make UK's insurance partner, provide specialist cover for businesses in the manufacturing sector. For over ten years Howden has helped numerous Make UK members to achieve their commercial objectives, from reducing business risk with improvement contributions from insurers to stabilising premiums to enable more accurate long-term budgeting. Howden truly understand the nuances of the manufacturing sector and recognise the benefits Make UK membership brings in terms of risk reduction.

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