

eef

The
manufacturers'
organisation

UK MANUFACTURING AND THE 4TH INDUSTRIAL REVOLUTION

MANUFACTURING IS UNDERGOING A
TRANSFORMATION TO THE 4TH INDUSTRIAL
REVOLUTION (4IR)

THIS TRANSFORMATION IS CRUCIAL FOR THE SECTOR

61% of manufacturers agree they
could be using digital technologies
more to boost their productivity

62% of firms plan to invest more
in internet connected capital
equipment in the next 5 years

THE DIFFERENCE WITH OTHER REVOLUTIONS IS
THE SPEED AT WHICH THIS WILL HAPPEN

80% of manufacturers say 4IR will
be a business reality by 2025

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4IR IS ABOUT CONNECTIVITY

It's about linking physical networks with cyber networks as one system, to allow real time information flow. This will allow insights to be discovered and acted upon quickly, boosting the value add to customers.

The three core components:



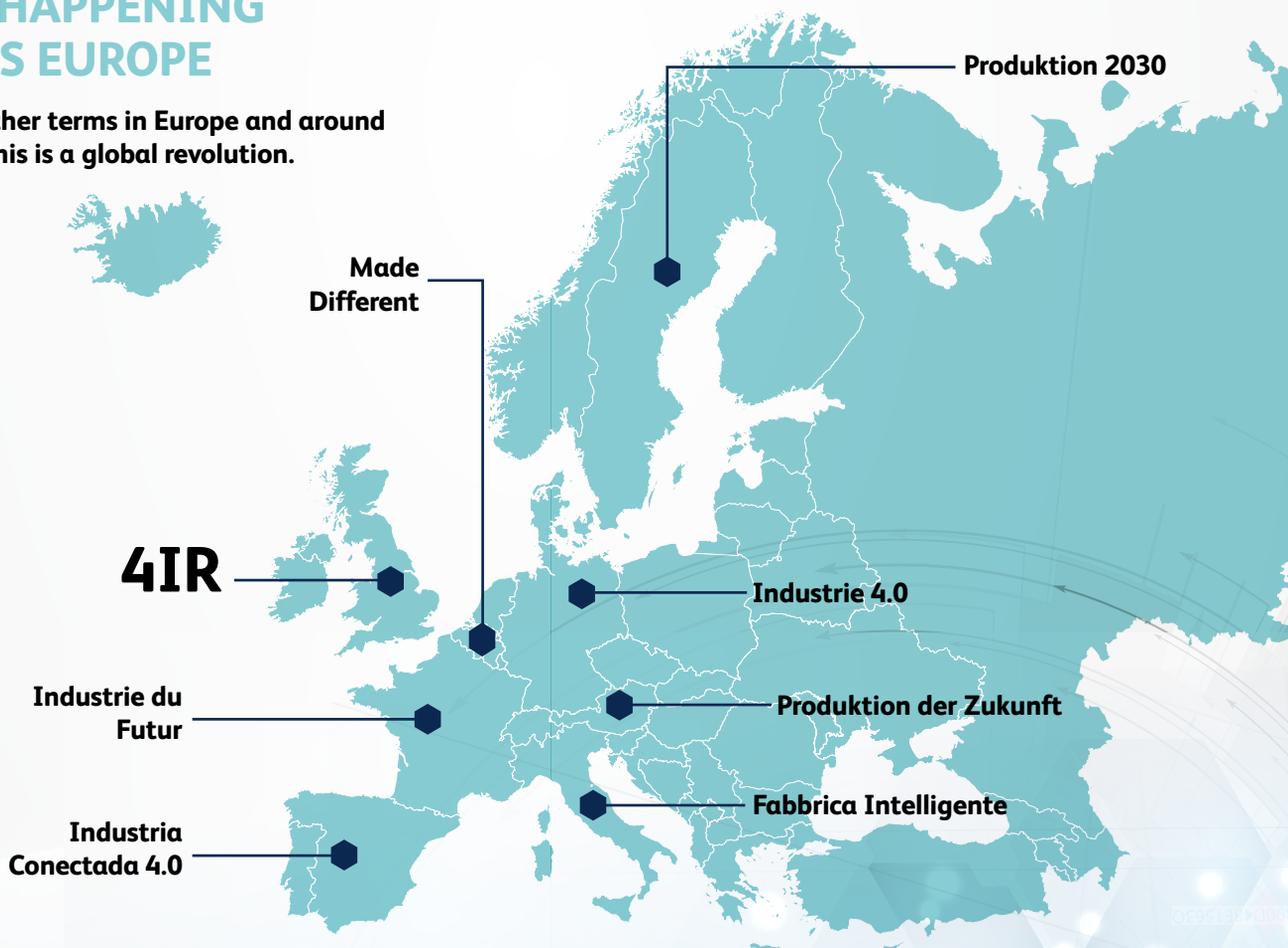
1 The Industrial Internet of Things - machines and other technologies that collect, share and act on data between themselves

2 Big Data (the capture of data on everything) and real time analysis of that data by machines and systems

3 Secure and reliable digital infrastructure to connect it all up

4IR IS HAPPENING ACROSS EUROPE

Known by other terms in Europe and around the world. This is a global revolution.



4IR WILL MAKE MANUFACTURING SMARTER

Smarter Products

Sensors collect usage data from products allowing remote diagnostics and maintenance. Along with direct user feedback and social sentiment on the internet, this information also enables rapid innovation and a faster time to market, with targeted products for different customers.

Smarter Production

Use of data analytics and new production techniques and technologies (such as autonomous robots, multi-purpose production lines and augmented reality) helps to improve yield and speed up production. This allows new business models such as mass customisation.

Smarter Supply Chain

Greater coordination and real time flow of information across supply chains allows better tracking of assets and inventory and integrated business planning and production. This unlocks new ownership and collaboration models across supply chains.

IN MANUFACTURERS' OWN WORDS - WHAT IS 4IR?

CONNECTIVITY AND COMMUNICATION

NEXT STEP IN OPTIMISATION AND EFFICIENCY

INFORMATION FLOW AND EXCHANGE

INFORMATION AND KNOWLEDGE FROM DATA

REAL TIME INFORMATION AVAILABILITY

SPEED OF CHANGE IS THE DIFFERENCE

AN ENABLER OF AMBITION

QUICKER INNOVATION

ABILITY TO PROVIDE ANSWERS MORE QUICKLY

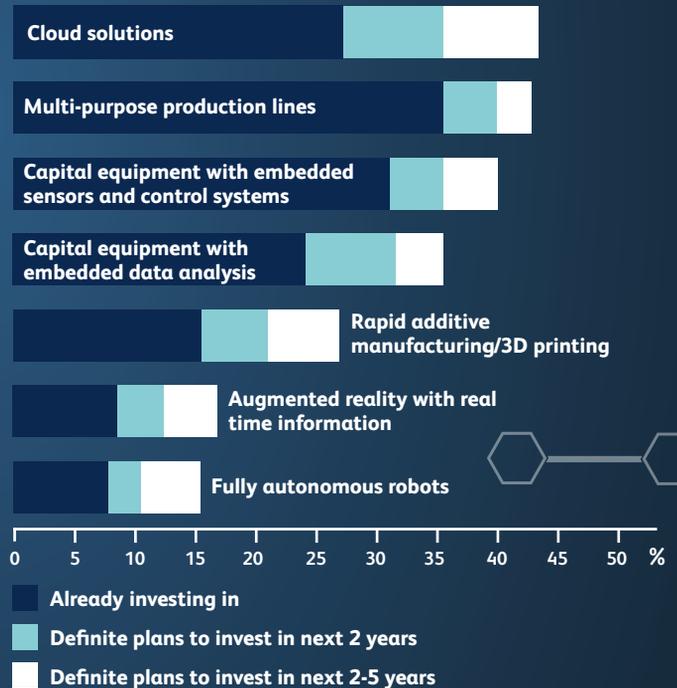
4IR WILL NEED NEW SKILLS AND UNDERSTANDING

What manufacturers say they will need before adopting advances in technology



Source: EEF Manufacturing Outlook Survey Q1 2016

MANUFACTURERS WILL BE INVESTING IN 4IR



Source: EEF Manufacturing Ambitions Survey April 2016



PRE-INDUSTRIAL

HAND CRAFTED

Summary

The pre-industrial age revolved around subsistence agriculture and production.

Products and production techniques

Society being primarily agricultural, products were crafted by hand, focussing on agricultural tools and household products.

Change in production sector example: textiles

Hand woven.

Sharing of information

Domesticated animals were used for any major transportation. Information was shared within communities.



TOWARDS THE END OF 18TH CENTURY

Summary

Mechanical production equipment powered by water and steam provided the energy needed to power this revolution. This change also brought about the concept of the 'factory system'.

Products and production techniques

Through the use of power, production was mechanised significantly increasing productivity.

Change in production sector example: textiles

Spinning jenny and power loom.

Sharing of information

The invention of the steam locomotive and steam ships significantly reduced the time of transport and communication.



TOWARDS THE END OF 19TH CENTURY

Summary

Production equipment moved to electrical power. This change, along with standardised replacement parts and the automated factory line, provided the productivity gains to usher in 'mass production'.

Products and production techniques

The factory system built around mechanical power, namely line shafts and belts, could be replaced by centralised electric power supply improving efficiency.

Change in production sector example: textiles

Industrial sewing machines.

Sharing of information

The rise of motoring and increased use of the railway led to faster transportation and sharing of ideas. With the birth of electrical power came the telegraph.



1970s ONWARDS

Summary

Sometimes known as the digital revolution, the third industrial revolution saw high levels of automation through the increased proliferation of digital logic circuits and microprocessors.

Products and production techniques

Examples of new production technologies included automated robots, control systems, computer aided design and a range of digitally based techniques.

Change in production sector example: textiles

Digital screen printing on fabrics.

Sharing of information

Computer networking, the internet, mobile phones and other forms of digital communication significantly reduced the time needed to share large volumes of information.



TOMORROW

Summary

The 4th industrial revolution is the coming together of cyber networks, with physical networks, to create new autonomous systems.

Products and production techniques

Through the use of sensors, more and more data will be collected allowing new products, processes and integration to be conceived.

Change in production sector example: textiles

Personalised design and 3D printed clothing.

Sharing of information

The autonomous nature of communication systems allows greater coordination with supply chains, tracking of assets and integrated business planning and production.



The manufacturers' organisation

EEF is the voice of UK manufacturing and engineering. Everything we do is designed to help our industry thrive, innovate and compete. Our membership and business services packages deliver expert support to thousands of companies in the UK, helping them to improve processes and productivity, maintain safe workplaces and attract, develop and retain skilled, productive and flexible workforces.

And, because we understand manufacturers so well, policy makers trust our advice and welcome our involvement in their deliberations. We work with them to create policies that are in the best interests of manufacturing, that encourage a high growth industry and boost its ability to make a positive contribution to the UK's real economy.



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The Oracle logo, featuring the word 'ORACLE' in white capital letters on a red rectangular background.

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